Diamond Alkali Superfund Site OU2

ALLOCATION RECOMMENDATION REPORT

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ACRONYMS

(AP_{ABS}) - Adjusted Base Score assigned to each Allocation Party
(AP_{BS}) - Base Score assigned to each Allocation Party
(AP_{AS}) - Allocation Share assigned to each Allocation Party
(C_{MASS}) - Mass of each COC contributed by an Allocation Party to OU2 sediments
(COC) - Contaminant of Concern
(COC_{BS}) - Base Share assigned each COC discharged from a facility
(COC_{RC}) - Relative Contribution of each discharged COC to OU2 sediments
(COC_{RRN}) - COC Relative Risk Number
(COF) – The Cooperation Factor assigned to each Allocation Party
(CUF) – The Culpability Factor assigned to each Allocation Party
(DD_{DMASS}) - Mass of each COC discharged from an Allocation Party's facility via Direct Discharge
(DD_{CMASS}) - Mass of each COC contributed by an Allocation Party to OU2 sediments via Direct Discharge
($DD_{C\%}$) - Probability of each COC reaching OU2 via Direct Discharge
(D_{MASS}) - Mass of each COC discharged from an Allocation Party's facility
(EPA) - The United States Environmental Protection Agency
(GNL) - General Notice Letter
(OFT_{DMASS}) - Mass of each COC discharged from an Allocation Party's facility via Overland, Fate and Transport
(OFT_{CMASS}) - Mass of each COC contributed by an Allocation Party to OU2 sediments via Overland, Fate and Transport
($OFT_{C\%}$) - Probability of each COC reaching OU2 via Overland, Fate and Transport
(OU) - Operable Unit
(PAP) - Participating Allocation Party
($PrePVSC_{\%}$) - Percentage of operational time prior to PVSC system
($PrePVSC_{DMASS}$) - Mass of each COC discharged from an Allocation Party's facility prior to PVSC system
($PrePVSC_{CMASS}$) - Mass of each COC contributed by an Allocation Party to OU2 sediments prior to PVSC system
($PrePVSC_{C\%}$) - Probability of each COC reaching OU2 prior to PVSC system
(PRP) - Potentially Responsible Party
(PVSC) - Passaic Valley Sewer Commission
($PVSC_{\%}$) - Percentage of operational time with PVSC system
($PVSC_{DMASS}$) - Mass of each COC discharged from an Allocation Party's facility via PVSC system
($PVSC_{CMASS}$) - Mass of each COC contributed by an Allocation Party to OU2 sediments via PVSC system
($PVSC_{C\%}$) - Probability of each COC reaching OU2 via PVSC system
(T_{MASS}) - Total mass of each COC in OU2 sediments

DEFINITIONS

a. **Allocation:** The confidential process, conducted with the assistance of the Allocator, consisting of the first phase of a two-phase ADR facilitated settlement process to support settlement between EPA and the Allocation Parties.

b. **Allocation Party:** One of seventy-nine (79) entities identified by EPA as a potentially responsible party for Operable Unit 2 of the Diamond Alkali Superfund Site (the Site) and issued a General Notice Letter for one or more particular facility location, as noted in Attachment B.[1]

c. **Allocation Team:** The Allocator and professional staff of AlterEcho who are supporting conduct of the Allocation.

d. **Allocator:** David C. Batson, the individual contracted by EPA and accepted by the Participating Allocation Parties to conduct the Allocation process.

e. **Chemicals of Concern:** The following eight (8) chemicals designated as COCs by EPA in the ROD for OU2 of the Site, dated March 3, 2016

   1. Dioxin/Furans
      a. Polychlorinated dibenzo-p-dioxins (PCDD), Polychlorinated dibenzofurans (PCDF)
   2. PAH Polycyclic aromatic hydrocarbon
      a. LMW PAHs: acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene, and 2-methylnaphthalene
      b. HMW PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene
   3. PCB Polychlorinated biphenyl
   4. DDx Dichlorodiphenyltrichloroethane (DDT), and its primary breakdown products; Dichlorodiphenyldichloroethane (DDD) and Dichlorodiphenyldichloroethylene (DDE)
   5. Mercury
   6. Copper
   7. Lead
   8. Dieldrin

f. **Operable Unit 2 (OU2):** An operable unit of the Passaic River Superfund Site consisting of the lower 8.3 miles of the Passaic River, in or about Essex and Hudson counties, as defined by the EPA in the ROD.

g. **Participating Allocation Party (PAP)**: An Allocation Party that has agreed to participate in the Allocation, as noted in Attachment I.

[1] Allocation Parties refers to all parties notified by EPA as PRPs for OU2 of the Diamond Alkali Site, but does not include the Passaic Valley Sewerage Commission (PVSC), the Cities of Newark, Harrison, East Newark, and Kearney, or parties that entered into an OU2 cash-out settlement with EPA

Diamond Alkali Superfund Site OU2 Allocation Recommendation Report

1. PURPOSE AND LAYOUT OF ALLOCATION RECOMMENDATION REPORT

This Allocation Recommendation Report compiles and provides an explanation of the results of an allocation conducted by David Batson, the Allocator, at the request of EPA and the concurrence of the Potentially Responsible Parties (PRPs) identified by EPA for participation in the Allocation (the Allocation Parties), to establish the relative equitable responsibility of certain parties for a portion of the costs of remediating Operable Unit 2 (OU2) of the Lower Passaic Diamond Alkali Superfund Site (the Site), as more fully detailed below (the Allocation). The body of this Allocation Recommendation Report provides an overview of the methodology that was utilized to conduct the allocation and a summary of allocated shares of responsibility as determined by the allocation.

2. PURPOSE OF THE ALLOCATION

Conduct of the Allocation is the first phase of a two (2) phase ADR facilitated settlement process to obtain future cash-out and work party settlements between EPA and the Allocation Parties. The first phase (Phase 1) is the allocation conducted by Allocator David Batson. The second phase (Phase 2) is subsequent negotiations between the Allocation Parties and EPA utilizing the Allocator's recommendation regarding the equitable allocation of responsibility among the Allocation Parties. In its September 18, 2017, letter to the Allocation Parties (Attachment A), EPA notes that the OU2 allocation is intended to result in cash-out settlement offers from EPA and identify those parties that should participate in consent decree negotiations for the performance of the remedial action for OU2.

The goal of the Allocation is to provide the EPA with a basis for such future settlements with the Allocation Parties. Therefore, it is not the purpose of this allocation process to ascertain the relative share of responsibility among all PRPs who may have contributed contaminants found in OU2 sediments over the extended history of industrial operations in the Passaic River watershed. Instead, this allocation is limited to assigning relative shares of responsibility between and among only the Allocation Parties, leaving a determination of the appropriate share of responsibility of other PRPs that discharged contaminants impacting OU2 sediments for Phase 2 settlement negotiations. The Allocator recognizes that EPA did not include the Passaic Valley Sewerage Commission ("PVSC") and four municipalities— the cities of Newark, Kearney, Harrison, and East Newark— as Allocation Parties, even though each entity received General Notice Letters from EPA and owns and/or operates a sewer system which discharges industrial effluent into the Passaic River.

Through conduct of the Allocation, the Allocator will recommend a numerical ranking of the relative shares of responsibility between and among the Allocation Parties for that portion of the costs associated with the remedial design (RD) and remedial action (RA) for Diamond Alkali OU2 determined, during Phase 2, to be attributable to the Allocation Parties as a group. The Allocator will recommend a share for each Allocation Party with respect to each facility identified with each such Allocation Party in Attachment B (but not including relative shares for those facilities for which an Allocation Party has settled with the EPA as part of the Early Settlement Option pursuant to Section 4.2), whether the party participates in the allocation process or not. The allocated shares recommended by the Allocator shall total to 100% of the aggregate responsibility of the Allocation Parties (but not including those facilities for which an early cash-out settlement has been reached pursuant to Section 4.2) to be determined during Phase 2.

While neither EPA nor the Allocation Parties are bound by the results of the Allocation, EPA has committed to use the Allocator's recommended shares of relative responsibility among the Allocation Parties as a primary factor in its future negotiations in Phase 2 with the goal of reaching agreement with the Allocation Parties on future cash-out and work party settlements.

As noted above, the Allocation is intended to serve as the first phase of a two-stage settlement process to obtain cash-out and work party agreements between the EPA and the Allocation Parties. As such, it is an intentional variation of how a typical private allocation process would be conducted. Unlike a typical allocation--the outcome of which is a recommendation on the share of responsibility of each PRP for total site related costs--this Allocation will provide a recommendation on the relative shares of responsibility between and among the Allocation Parties for that portion of the costs associated with the RD and RA for OU2, determined through future settlement negotiations to be attributable to the Allocation Parties as a group.

3. HISTORY OF FACILITY OPERATIONS IMPACTING THE SITE

The following sections contain information regarding the description of the site, site history, enforcement activities, and the selected remedy taken from the March 3, 2016, Record of Decision (ROD)[2], the Site as updated by information from the EPA Diamond Alkali Co. Superfund Site website[3]. Text taken from the ROD is denoted in italic. A listing of the seventy-nine (79) Allocation Parties and their related ninety-two (92) facilities which are subject to the final allocation is included as Attachment B. Maps denoting the location of the Allocation Party facilities are included in Attachment C. Descriptions of site Contaminants of Concern (COCs) as designated by EPA in the ROD are included as Attachment D.

Site Description

The ROD presents the selected remedy to address contaminated sediments found in the lower 8.3 miles of the Lower Passaic River, a part of the Diamond Alkali Superfund Site. The lower 8.3 miles of the Lower Passaic River comprise OU2 of the Site, also referred to in the Proposed Plan as the Focused Feasibility Study Area (FFS Study Area). The sediments of the lower 8.3 miles of the Lower Passaic River pose an unacceptable risk to human health and the environment due to the presence of a variety of contaminants, most of which stay in the environment for a long time and bioaccumulate in fish and crab. These contaminants include polychlorinated dibenzo-p-dioxins and furans (dioxins and furans), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), Total DDx[4] and other pesticides, mercury, lead and other metals.

The lower 8.3 miles of the Lower Passaic River are located in a highly developed urban area, with approximately 1.4 million people living in Essex County (west bank) and Hudson County (east bank). At the mouth of the river (RM 0) and around Newark Bay, the near-shore land uses are commercial and industrial, in part to take advantage of the transportation infrastructure (rail, air and marine). Farther upriver, beginning near RM 4, commercial uses of near-shore properties begin to be mixed with more residential and recreational uses as well. There are narrow bands of park and open space along the river, surrounded by commercial and dense urban residential development. Near RM 7, there are marinas and boat launches along with park land surrounded by more suburban residential neighborhoods. Hard shorelines, such as bulkhead and riprap (some with overhanging vegetation) make up approximately 95 percent of the banks of the lower 8.3 miles, while aquatic vegetation predominates along about 5 percent of the banks. Approximately 100 acres of the 650-acre lower 8.3 miles consist of mudflats. Intertidal

[2] https://semspub.epa.gov/work/02/396055.pdf

[3] https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0200613#Status

[4] *DDT is a common name that refers to an industrially produced, chlorinated pesticide, dichlorodiphenyltrichloroethane. DDT breaks down in the environment to form 4,4'-dichlorodiphenyldichloroethane (DDD) and 4,4'-dichlorodiphenyldichloroethylene (DDE). The term Total DDx used in the ROD refers to the sum of DDT, DDD and DDE concentrations.*

mudflats and the associated shallow-water subtidal areas are important habitats for estuarine organisms, providing valuable foraging habitat for fish, blue crab and waterbirds.

The Lower Passaic River has a federally authorized navigation channel which, when it was first constructed in the 1880s, extended to RM 8.1. It was expanded to its maximum length, to RM 15.4, in 1915, with depths ranging from 30 feet (from RM 0 to RM 2.6) to 10 feet at the farthest upstream reaches. After construction, the U.S. Army Corps of Engineers (USACE) dredged the channel regularly to maintain navigation and prevent infilling with sediments. The channel below RM 1.9 was regularly maintained until 1983. The channel above RM 1.9 was dredged periodically through the 1950s, with one segment maintained as late as 1976 (from RM 9.0 to RM 10.2).

As maintenance dredging declined and eventually stopped, this channel filled with sediments. At the same time, industries and municipalities disposed of wastewaters in the river. The coincidence of chemical disposal in the river and the filling-in of the navigation channel created ideal conditions for the accumulation of contaminated sediments in the Lower Passaic River (see Section 5.3 for further discussion).

The Lower Passaic River's cross-sectional area declines steadily moving upstream from RM 0 to RM 17.4, with a pronounced constriction at RM 8.3 (see Figure 2). At that location, there is also pronounced change in sediment texture. The riverbed below RM 8.3, from bank to bank, is dominated by fine-grained sediments (primarily silts) with pockets of coarser sediments (sand and gravel). Above RM 8.3, the riverbed is dominated by coarser sediments with smaller areas of fine-grained sediments, often located outside the channel. About 85 percent of the fine-grained sediment surface area of the Lower Passaic River bed is located below RM 8.3 and, by volume, about 90 percent of fine-grained sediments in the Lower Passaic River are located below RM 8.3. Due to a combination of a wider cross-section and a deeper navigation channel below RM 8.3 (16 to 30 feet) than above RM 8.3 (10 feet), thicker and wider beds of contaminated sediments accumulated below RM 8.3 than above it. The total estimated inventory of contaminated fine-grained sediments in the lower 8.3 miles (surface and deeper sediments combined) is approximately 9.7 million cubic yards (cy).

The contaminants of concern (COCs), discussed in Section 5.2, tend to bind tightly to fine grained sediment particles. Therefore, the majority of the contamination tends to be found in areas that are predominantly comprised of fine-grained sediments which, for the Lower Passaic River, are the lower 8.3 miles.

Site History and Enforcement Activities

The Passaic River was one of the major centers of the American industrial revolution starting two centuries ago. Early manufacturing, particularly textile mills, developed in the area around Great Falls in the city of Paterson, which is eight miles upriver of the Dundee Dam. The Dundee Dam, constructed along with a canal and locks in the mid-nineteenth century on top of an earlier dam, was originally conceived to provide waterpower to nearby businesses, supporting further industrialization along the banks of the river. By the end of the nineteenth century, a multitude of industrial operations, such as manufactured gas plants, paper manufacturing and recycling facilities, petroleum refineries, shipping, tanneries, creosote wood preservers, metal recyclers and

manufacturers of materials such as rubber, rope, textiles, paints and dyes, pharmaceuticals and chemicals, had located along the river's banks as cities such as Newark and Paterson grew. Industrial operations and municipalities used the river for wastewater disposal.

Along with the Dundee Dam, which physically isolates Dundee Lake and the upper river from lower river influences, another defining component of the development and urbanization of the Lower Passaic River was the construction of a navigable channel for commercial vessels. Between 1884 and 1915, dredging projects authorized by Congress and constructed by USACE created a federally authorized navigation channel from RM 0 to RM 15.4 (at Wallington, New Jersey). Further deepening of the channel was authorized by Congress in 1930. In 1932, the navigation channel was constructed to its maximum dredged depth: 30 feet from RM 0 to RM 2.6; 20 feet from RM 2.6 to RM 4.6; 16 feet from RM 4.6 to RM 8.1; and 10 feet from RM 8.1 to RM 15.4. USACE performed dredging to maintain the channel through the 1950s above RM 1.9 and until 1983 below RM 1.9.

Superfund History

The Lower Passaic River is a part of the Diamond Alkali Superfund Site. EPA's response at the Site began at a former manufacturing facility located at 80-120 Lister Avenue in Newark, New Jersey, at RM 3.4. Manufacturing of DDT and other products began at this facility in the 1940s. In the 1950s and 1960s, the facility was operated by the Diamond Alkali Company (later purchased by and merged into Occidental Chemical Corporation, or OCC). Between March 1951 and August 1969, the Diamond Alkali Company manufactured the chemical 2,4,5-trichlorophenol (2,4,5-TCP) and the herbicides 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), ingredients in the defoliant "Agent Orange." A by-product of the manufacturing was 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), the most toxic form of dioxin. These substances have all been found in Lower Passaic River sediment and fish/crab tissue.

Preliminary Actions

Based on investigations by NJDEP and EPA, the Diamond Alkali Site was placed on the National Priorities List in 1984. After further investigations and several emergency response actions that addressed dioxin found on nearby properties, EPA issued a ROD in 1987 to select an interim containment remedy for the Lister Avenue facility. The remedy consisted of capping, subsurface slurry walls, and a groundwater collection and treatment system to prevent exposure to contaminated soil (that originated at the facility and that was brought back to the facility from neighboring lots) and prevent further releases to the river. Construction of the remedy at the 80-120 Lister Avenue facility was carried out by OCC and the owner of the facility, Chemical Land Holdings, Inc., now Tierra Solutions, Inc. (Tierra), under EPA oversight. Construction was completed in 2001. Maintenance of the facility is performed by Tierra on OCC's behalf, under EPA oversight. EPA performs periodic reviews of the remedy.

The Six-Mile Study

In 1994, OCC agreed to an administrative order on consent (AOC) with EPA to investigate a six mile stretch of the Lower Passaic River (RM 1 to RM 7), with the work performed by Tierra on OCC's behalf. This investigation found COCs that originated from the Diamond Alkali facility, in particular, 2,3,7,8-TCDD and pesticides, throughout the six miles, with the highest concentrations adjacent to the 80-120 Lister Avenue facility. This investigation

also found many other COCs not clearly linked to Diamond Alkali's operations, and indicated that contaminated sediments moved into and out of the six-mile stretch, leading to the conclusion that a more comprehensive study was required. In 2002, EPA expanded the scope of the investigation to include the entire 17-mile Lower Passaic River.

The 17-Mile Study

While working with OCC and Tierra on the Lister Avenue facility and the first studies of the river, EPA also identified other potentially responsible parties (PRPs) for the Lower Passaic River. A number of companies that owned or operated facilities from which hazardous substances were potentially discharged to the river formed the Cooperating Parties Group (CPG). In 2004, EPA signed a settlement agreement with CPG members in which the settling parties agreed to pay for EPA to perform the 17-mile LPRSA remedial investigation and feasibility study (RI/FS). The settlement agreement was amended in 2005 and 2007, adding more parties to reach a total of over 70 settling parties. From 2004 to 2007, EPA investigated contamination in sediments and water of the Lower Passaic River, and investigated the major tributaries, combined sewer overflows (CSOs) and stormwater outfalls (SWOs) to the river. In 2007, CPG members entered into a new AOC with EPA, in which the settling parties agreed to take over the performance of the 17-mile LPRSA RI/FS from EPA. Since 2007, the membership of the CPG has continued to change. EPA understands that some of the settling parties that signed the AOC are no longer members of the CPG and, also, that the CPG may include members that are not signatories to the AOC.

The CPG performed sampling for the RI between 2008 and 2014. The lower 8.3-mile RI/FFS prepared by EPA did incorporate data collected by EPA and the CPG for the 17-mile LPRSA RI/FS, among other datasets, and EPA has shared its lower 8.3-mile findings with the CPG to support the 17-mile RI/FS.

The Newark Bay Study

In 2004, EPA and OCC signed an AOC in which OCC agreed to conduct a separate RI/FS of the Newark Bay Study Area (Newark Bay and portions of the Hackensack River, Arthur Kill and Kill van Kull), investigating the extent of dioxin contamination and co-located contaminants, under EPA oversight. As with the 1994 agreement, Tierra is performing the work on OCC's behalf. This study of Newark Bay is ongoing.

The Tierra Removal

In June 2008, EPA, OCC and Tierra signed an AOC for a non-time-critical removal action to remove 200,000 cy of contaminated sediment from the river (from RM 3.0 to RM 3.8) adjacent to the 80-120 Lister Avenue facility. This action is referred to as the "Tierra Removal." Sediment at depth adjacent to the facility has been found to have the highest levels of 2,3,7,8-TCDD measured in the river. Dredging, dewatering and transport off site of the first 40,000 cy of sediment (known as Phase 1 of the Tierra Removal) was completed in 2012. In 2015, Tierra, on behalf of OCC, collected additional samples in the Phase 2 area. Both phases of this removal action are considered "source removal" projects.

EPA's website noted above states that the agreement contemplates the siting and use of a confined disposal facility as a receptacle for the dredged materials from Phase 2 (160,000 cubic yards). However, this has not occurred and may no longer be practicable. EPA is integrating this work with the lower 8.3-mile remedy in a coordinated and consistent manner.

The RM 10.9 Removal

In June 2012, EPA and the CPG signed an AOC for a time-critical removal action to address the risks posed by high concentrations of dioxins, PCBs and other contaminants found at the surface of a mudflat on the east bank of the river at RM 10.9 in Lyndhurst, New Jersey. This action is referred to as the "RM 10.9 Removal." The action involved placing an engineered cap over contaminated sediments, thereby reducing exposure and preventing migration of the contamination to other parts of the river. In order to ensure that the action did not exacerbate flooding, a sufficient volume of surface sediments was first dredged from the area to make space for the cap. The CPG began work in 2013 and substantially completed it in 2014, with the exception of a relatively small area of contaminated sediments located above a utility pipeline that runs under the river. This time critical removal action is not a final remedy; a final decision for the RM 10.9 Removal area will be made by EPA as part of the 17-mile LPRSA ROD.

The Lower 8.3-Mile Study

Concurrent with these river studies and removal actions, EPA concluded that since the lower 8.3 miles of the river contain the bulk of the contaminated sediment which is the source of most of the risk associated with the Lower Passaic River, addressing this portion of the river first would better support the overall protection of human health and the environment than would awaiting the outcome of the 17-mile LPRSA RI/FS to make a decision for the entire Lower Passaic River. Because about 90 percent of the fine-grained (and, therefore, more heavily contaminated) sediment is below RM 8.3, EPA undertook a targeted RI and FFS of the lower 8.3 miles, which led to this ROD. The nature and extent of the contamination in the lower 8.3 miles of the Lower Passaic River and the remedial alternatives summarized in this ROD are described in greater detail in two documents: the Remedial Investigation Report for the Focused Feasibility Study of the Lower Eight Miles of the Lower Passaic River (RI Report) and the Focused Feasibility Study Report for the Lower Eight Miles of the Lower Passaic River (FFS Report).

The Lower Passaic River Restoration Project

In 2002, at the time that the 17-mile LPRSA RI/FS was being developed, EPA also formed a partnership with USACE, the State of New Jersey, the National Oceanic and Atmospheric Administration (NOAA) and U.S. Fish and Wildlife Service (USFWS) [referred to as "the Partner Agencies"], to conduct a joint study that would bring each agency's authorities to bear on the complex environmental problems of the Lower Passaic River. The goal of the Lower Passaic River Restoration Project is to remediate contaminated sediments, improve water quality, restore degraded shorelines, restore and create new habitats and enhance human use along the 17-mile Lower Passaic River and in several tributaries from Dundee Dam near Garfield, to Newark Bay. Actions by EPA to address contaminated sediments under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, is one aspect of the Project.

Selection of the OU2 Remedy

As discussed in the Proposed Plan, EPA has determined that selecting a final remedy at this time for the sediments of the lower 8.3 miles of the Lower Passaic River is consistent with the EPA's approach of using operable units when a phased analysis is necessary or appropriate given the size or complexity of a site. EPA considered awaiting the conclusion of the 17-mile LPRSA RI/FS rather than selecting a remedy for only part of the Lower Passaic River. EPA concluded that the remedy for the lower 8.3 miles will be consistent with any remedy selected for the remainder of the Diamond Alkali Site, including the Lower Passaic River and Newark Bay Study Areas, for reasons discussed below.

EPA investigated potential COC sources to the Lower Passaic River, including atmospheric deposition, groundwater, industrial point sources, the Upper Passaic River (above Dundee Dam), Newark Bay, major tributaries, CSOs and SWOs. Data and screening-level analyses show that contaminated sediments that are already present on the river bottom in the lower 8.3 miles and that are resuspended and then resettle as a result of natural processes are, by a large margin, the biggest component of recently deposited sediment in the Lower Passaic River (see Section 5.3). In comparison, Upper Passaic River and Newark Bay contributions of COCs are small and all other sources are minor.

Sediment Conceptual Site Model

Based on analyses discussed in the RI Report for the lower 8.3 miles, direct atmospheric deposition, groundwater discharge and industrial point sources of contaminants currently are not significant contributors of COC mass (i.e., sediment particles and the COCs bound to them) to the recently deposited sediments of the Lower Passaic River. The Upper Passaic River, Newark Bay, the three main tributaries, and CSOs and SWOs were sampled between 2005 and 2011. Results of a mass balance show that the tributaries, CSOs and SWOs are minor contributors of COCs, since they are minor contributors of sediment particles compared to the Upper Passaic River and Newark Bay, and the mass of contaminants delivered by those particles is low compared to the sediments of the Lower Passaic River main stem. For COCs such as 2,3,7,8- TCDD, Total PCBs and mercury, concentrations on sediment particles from the tributaries, CSOs and SWOs are clearly lower than those on Lower Passaic River surface sediments. Current contributions to the recently deposited sediments of the Lower Passaic River are summarized in Table 3 in Appendix II. Resuspension of Lower Passaic River sediments contributes well over 90 percent of the dioxin in recently deposited sediments of the Lower Passaic River, followed by Newark Bay (approximately 5 percent) and the Upper Passaic River (3 percent or less). Resuspension of Lower Passaic River sediments contributes approximately 80 percent of PCBs and DDE in recently deposited sediments, followed by the Upper Passaic River (approximately 10 percent) and Newark Bay (less than 10 percent). Similar trends are shown for copper, mercury and lead, further supporting the conclusion that resuspension of highly contaminated surface sediments already in the lower 8.3 miles of the river is the predominant contributor to COC mass in the water column, and thus to COC concentrations in fish and crab tissue. As discussed in Section 10.1, these percentage contributions would be altered dramatically through active remediation of the lower 8.3 miles. For example, bank-to-bank replacement of the highly contaminated riverbed with effectively clean material would greatly reduce the component of the mass balance that comes from resuspension of Lower Passaic River sediments. This would reduce the overall contaminant levels in surface sediment, but it would also have the effect of increasing the

relative percentage contribution of the Upper Passaic River, Newark Bay and the Lower Passaic River above RM 8.3 to COCs depositing on top of the newly replaced lower 8.3-mile riverbed.

Under current conditions, the daily movement of contaminated surface sediments combined with the occasional uncovering and resuspension of deeper, more highly contaminated sediments in the lower 8.3 miles are the primary ongoing source of COCs to the water column and surface sediments of the Lower Passaic River.

Risk Characterization

Risk characterization involves estimating the magnitude of the potential adverse health effects associated with the COCs. It also involves making judgments about the nature of the human health threat to the defined receptor populations. The risk characterization combines the results of the dose-response (toxicity assessment) and exposure assessment to calculate cancer risks and noncancer health hazards. In accordance with EPA's guidelines, this assessment assumes that the effects of all contaminants are additive through a specific pathway within an exposure scenario.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk (a unitless probability of an individual's developing cancer) is calculated by multiplying the chronic daily intake averaged over 70 years (mg/kg-day) and the slope factor (per mg/kg-day).

These risks are probabilities that usually are expressed in scientific notation (e.g., 1 x 10-6). An excess lifetime cancer risk of 1 x 10-6 indicates a probability that the RME individual has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other exposures. The upper-bound excess lifetime cancer risks derived in this assessment are compared to the risk range of 10-4 (one in ten thousand) to 10-6 (one in one million) established in the NCP. EPA's goal of protection for cancer risk is 10-6 and risks greater than 10-4 typically will require remedial action.

The potential for noncancer health effects is estimated by comparing the average daily dose (ADD) of a chemical for adult, adolescent and child with the RfD for the specific route of exposure (e.g., oral). The ratio of the intake to reference dose (ADD/RfD) for an individual chemical is the hazard quotient (HQ). When an RfD is available for the chemical, these ratios are calculated for each chemical that elicits a noncancer health effect. Typically, chemical-specific HQs are summed to calculate an HI value for each exposure pathway. EPA's goal of protection for noncancer health effects is an HI equal to 1. When the HI exceeds 1, there may be a concern for health effects. This approach can result in a situation where HI values exceed 1 even though no chemical-specific HQs exceed 1 (i.e., adverse systemic health effects would be expected to occur only if the receptor were exposed to several contaminants simultaneously). In this case, chemicals are segregated by similar effect on a target organ, and a separate HI value for each effect/target organ is calculated. If any of the separate HI values exceed 1, adverse, noncancer health effects are possible. It is important to note, however, that an HI exceeding 1 does not predict a specific disease.

Cancer Assessment: The HHRA shows that all of the risks associated with the RME are greater than the goal of protection established in the NCP of 10-6 (i.e., one additional cancer in 1,000,000 people). All of the risks associated with the RME are also greater than the 10-4 cancer risk that typically would require remedial action at a site or operable unit (see Tables 8 and 9 in Appendix II). In addition, cancer risks to the average exposed (CTE) individual associated with ingestion of fish and crab are above EPA's goal of protection of 10-6 (see Tables 10 and 11 in Appendix II).

For the RME adult and child combined receptor (Table 8), a cancer risk of 4 x 10^{-3} for consumption of fish or 1 x 10-3 for consumption of crab indicates that eating fish or crab from the lower 8.3 miles may cause four additional cancers in a population of 1,000 people or one additional cancer in a population of 1,000 people, respectively, under the stated exposure assumptions. For the adolescent receptor (Table 9), a cancer risk of 2 x 10-3 for consumption of fish or 6 x 10-4 for consumption of crab indicates that eating fish or crab from the lower 8.3 miles may cause two additional cancers in a population of 1,000 people or six additional cancers in a population of 10,000 people, respectively, under the stated exposure assumptions.

The primary contributors to the excess risk are dioxins/furans (70 percent for fish consumption and 82 percent for crab consumption), dioxin-like PCBs (11 percent for fish consumption and 12 percent for crab consumption) and non-dioxin-like PCBs (16 percent for fish consumption and 5 percent for crab consumption). The other COPCs contributed a combined 3 percent to the excess cancer risk.

Noncancer Health Hazards: The results for noncancer health hazards from the HHRA are summarized in Tables 12 through 14 in Appendix II for the RME scenarios and Tables 15 through 17 in Appendix II for the CTE scenarios. For the RME child who eats fish or crab from the lower 8.3 miles, the HIs are 196 and 67, respectively, which are above EPA's goal of protection of an HI equal to 1. RME results for the adult and adolescent also are above EPA's goal of protection of an HI equal to 1. In addition, noncancer HIs for the CTE individual associated with ingestion of fish and crab are above EPA's goal of protection.

Dioxin/furans and PCBs combined contribute more than approximately 98 percent of the excess hazard, while the remaining excess hazard is associated with methyl mercury for all receptors for ingestion of both fish and crab. The total noncancer HI exceeded the goal of protection and the individual HQs based on critical effect also exceeded a threshold of 1 for these contaminants.

Basis for Remedial Action

The response action selected in this ROD is necessary to protect public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment. A response action is necessary for the sediments of the lower 8.3 miles of the Lower Passaic River portion of the Diamond Alkali Superfund Site at this time because:

Human Health Risk: The risk of an RME individual developing cancer or noncancer health effects as a result of COC exposure from ingestion of fish or crab in the lower 8.3 miles of the Lower Passaic River exceeds the acceptable risk range identified in the [National Contingency Plan]. Specifically, fish and crab consumption risks and [hazard indexes] for

the RME scenarios exceed CERCLA- acceptable risk levels of an excess cancer risk of 10-6 to 10-4 and a noncancer goal of protection of an HI of 1.

Ecological Risk: Risks to all ecological receptors (benthic invertebrates, fish, aquatic birds and aquatic mammals) exceed acceptable levels (HQ equal to 1).

Remedial Action Objectives

Remedial action objectives (RAOs) describe what a remedial action is expected to accomplish. The following RAOs have been established for the lower 8.3 miles of the Lower Passaic River:

- *Reduce cancer risks and noncancer health hazards for people eating fish and crab by reducing the concentrations of COCs in the sediments of the lower 8.3 miles.*

- *Reduce the risks to ecological receptors by reducing the concentrations of COCs in the sediments of the lower 8.3 miles.*

- *Reduce the migration of COC-contaminated sediments from the lower 8.3 miles to upstream portions of the Lower Passaic River and to Newark Bay and the New York-New Jersey Harbor Estuary.*

These RAOs address human exposure through fish and/or crab consumption, and ecological exposures. The unacceptable exposures identified in the risk assessments are primarily derived from elevated COC concentrations in surface sediments that result in bioaccumulation of COCs in fish and crab. Addressing these sediments will reduce COC concentrations in biota, including fish and crab tissue, thereby significantly reducing potential human health risks and hazards, and
ecological risks. By addressing exposure to and mobility of the surface sediments, the remedial action is expected to achieve the RAOs.

Preliminary Remediation Goals

There are no chemical-specific federal or State of New Jersey standards for the COCs in sediment. Therefore, EPA developed Site-specific, risk-based preliminary remediation goals (PRGs) for the lower 8.3-mile sediments. Below is a discussion of how the PRGs were developed in the RI/FFS, and what led EPA to select the final remediation goals.

Risk-based sediment concentrations to protect human health were developed based on fish or crab tissue concentrations of COCs (dioxins, PCBs and mercury) that would allow adult anglers to eat self-caught fish or crab from the lower 8.3 miles of the Lower Passaic River at a 10-6 cancer risk level or a noncancer HI of 1 as the goal of protection. (see Table 24 in Appendix II) Protective concentrations in tissue were also developed for risk levels of 10-5 and 10-4 (the last of which is typically the level that triggers the need for remedial action at a site). Protective concentrations in fish and crab tissue were calculated based on the site-specific adult consumption rates of 35 g/day for fish or 21 g/day for crab used in the HHRA. These consumption rates are equivalent to 56 eight-ounce fish meals per year or 34 eight-ounce crab meals per year. Additional tissue concentrations were developed for 12 eight-ounce fish or crab meals per year (or one meal per month), for use as interim remediation milestones (Table 24, columns 8-10). Interim remediation milestones are fish and crab tissue concentrations to be used during monitoring after

remedy implementation to evaluate if contaminant concentrations in fish and crab tissue are decreasing as expected. EPA will share monitoring data and consult with NJDEP about whether the prohibitions on fish and crab consumption can be lifted or adjusted to allow for increased consumption as contaminant levels decline.

Sediment concentrations needed to meet protective fish and crab tissue concentrations were estimated using site-specific biota-sediment accumulation relationships developed from the COC concentrations in sediments and co-located fish or crab tissue concentrations. These relationships between sediment and tissue concentrations take into account the possibility that some of the fish or crab may have been exposed to contamination outside of the lower 8.3 miles of the Lower Passaic River, and are consistent with research showing that tissue concentrations may not decline at the same rate as sediment concentrations after sediments are remediated. These risk-based sediment PRGs for human health are presented in Table 25 in Appendix II, columns 3-8 and 12-13, along with the interim remediation milestones (columns 9-11 and 14).

While all of the COCs discussed in Section 7.2 cause unacceptable risks (HQ greater than 1) to some or all of the receptors evaluated, risk-based PRGs were developed for dioxins, PCBs, mercury and Total DDx, because they are representative COCs (based on the magnitude of HQs and number of receptors affected) and because there were multiple lines of evidence developed to evaluate how the alternatives would achieve PRGs for these four COCs after remediation. In addition, most active alternatives (i.e., alternatives other than No Action) designed to address these COCs would also address the other COCs.

Sediment PRGs that would be protective of benthic invertebrates were developed based on the sediment benchmarks used to evaluate risks in the BERA. The benchmarks are published literature values shown through independent research to be good predictors of toxicity.

Selected Remediation Goals

PRGs become final remediation goals when EPA selects a remedy after taking into consideration all public comments. The NCP identifies a 10-6 cancer risk level or a noncancer hazard of 1 as the goal of protection for determining remediation goals for alternatives when applicable or relevant and appropriate requirements (ARARs) are not available or are not sufficiently protective. EPA has concluded that a 10-6 cancer risk for the fish and crab consumption exposure pathway cannot be attained through remediation, given the Site's urban setting and the ubiquity of Site COCs in the environment. However, a remedy that includes active remediation and natural recovery provides the conditions for eventually achieving protective levels within EPA's risk range of 10-4 and 10-6 and an HI of 1 for the lower 8.3 miles of the Lower Passaic River (see Section 10.1 for further discussion). For the COCs with human health PRGs, remediation goals within the risk range and at an HI equal to 1 were selected, so they are protective of human health. For mercury and Total DDx, remediation goals at an HQ equal to 1 were selected, so they are protective of the environment.

Nearly all surface sediment samples in the lower 8.3 miles have COC concentrations that exceed one or more of the PRGs, which has led to the development of remedial alternatives that address the lower 8.3 miles bank to bank (Alternatives 2 and 3, described in Section 9.2). EPA's analysis indicates that a combination of active remediation in the lower 8.3 miles and natural recovery would result in surface sediment concentrations of

dioxins/furans at or near the remediation goals based on human health PRGs in the lower 8.3-miles under these two alternatives. For the other COCs, a combination of active remediation in the lower 8.3 miles and natural recovery will be needed to achieve surface sediment concentrations in the lower 8.3 miles approaching the remediation goals based on human health PRGs, with additional actions in the Lower Passaic River above RM 8.3, in Newark Bay, and above Dundee Dam needed to reduce recontamination from incoming COCs and maintain the lower surface sediment concentrations achieved by the lower 8.3-mile remediation. For dioxins and PCBs, it is unlikely that the ecological PRGs could be met under any of the alternatives, even with natural recovery processes.

EPA Selected Remedy

The following information was copied directly from EPA's website for the Diamond Alkali Superfund Site noted above.

> The RI/FFS and a Proposed Plan describing EPA's preferred alternative for remediating the sediment of the lower 8.3 miles were released for public comment in April 2014. During a four-month public comment period, hundreds of comments were received. EPA carefully considered the comments and took them into account in developing the Record of Decision that was issued on March 4, 2016.
>
> The selected remedy for the sediment of the lower 8.3 miles includes an engineered cap that will be installed in the lower 8.3 miles, bank to bank. Before installation of the cap, approximately 3.5 million cubic yards of contaminated sediment will be dredged from the lower 8.3 miles, so that the cap does not make flooding worse and to accommodate continued commercial navigation in the 1.7 miles of the river closest to Newark Bay. The dredged materials will be barged to a sediment processing facility on the banks of the Passaic River or Newark Bay, dewatered and transported off-site to permitted facilities for disposal. The estimated cost of the remedy is $1.38 billion. In September 2016, EPA and OCC signed a legal agreement for OCC to perform the design of the lower 8.3-mile remedy, under EPA oversight. The design is underway.
>
> The website states that EPA approved the CPG's Baseline Human Health Risk Assessment and Baseline Ecological Risk Assessment (BERA) for the LPRSA, including a BERA for the discrete upper 9-mile reach, in July 2017 and June 2019, respectively. The final RI Report was submitted by the CPG in July 2019 and has been conditionally approved by EPA pending approval of the bioaccumulation model. The bioaccumulation model is an appendix to the RI that is still under development; the model is expected to be finalized and peer reviewed by approximately fall 2021.
>
> The website notes that in July 2017, the CPG proposed moving away from the original schedule for a final ROD for the LPRSA, or upper 9 miles, and instead evaluating an interim remedy for source control. This would take advantage of cost efficiencies available if work can be undertaken in the upper 9 miles while the infrastructure constructed for the lower 8.3 remedy is in place, as well as reduce the disruption in the river and to the many communities along the river. Such an interim remedy would further incorporate an adaptive management approach into the site cleanup and would be integrated with the remedial action currently being designed for the lower 8.3 miles. EPA expects that an interim remedy that includes the cleanup of areas with elevated concentrations of contaminants (e.g. dioxins and PCBs) could result in expedited recovery of the river. An interim remedy for the upper nine miles, if selected, would

not alter the previously selected cleanup for the lower 8.3 miles of the river. EPA projects that an interim remedy for source control that is initiated in late 2021 will be followed by some years of post-remedy monitoring, development of risk-based remedial goals and conclude in a final ROD. In August 2019, the CPG submitted a draft FS for a possible interim remedy which is currently under EPA review.

4. CONDUCT OF THE ALLOCATION

The Allocation was conducted in furtherance of the Revised Work Plan for the Allocation (denoted as Task Order #096 under Contract EP-W-14-020) (Attachment E) and in compliance with governing documents developed by the Allocator in coordination with and adopted by the Participating Allocation Parties (PAPs) and EPA, including the OU2 Allocation Confidentiality Agreement between and among the PAPs, Allocation Team and EPA (Attachment F), the Diamond Alkali Superfund Site OU2 Allocation Guide (Allocation Guide) (Attachment G), and the Diamond Alkali Superfund Site OU2 Allocation Protocol (Allocation Protocol) (Attachment H), as modified in part by the Allocator based on an evaluation of the unique Site circumstances and available information during conduct of the allocation as explained herein. The process, standards, and procedures used for conduct of the allocation were established consistent with judicial precedent and customary allocation practice, including analysis of site-specific circumstances and application of appropriate equitable factors, including the nexus between the waste contribution of each Allocation Party's and the scope of remedial requirements, the relative degree of toxicity of contributed wastes, and the equitable distribution of orphan shares. However, the Allocator assumes the knowledge of the reader regarding such legal precedents and, therefore, does not include citations to them herein. The Allocation was sponsored by EPA, as set forth in, among other things; EPA's letters to the Allocation Parties dated September 18, 2017, November 28, 2017, January 5, 2018, February 16, 2018, February 23, 2018, and May 1, 2018 (Attachment A).

Of the eighty-four (84) Allocation Parties originally designated by EPA for participation in the allocation, seventy-four (74) parties decided to participate in the allocation pursuant to the provisions of the governing documents noted above, herein referred to as the Participating Allocation Parties (PAPs). Subsequently, five (5) of the PAPs were removed from consideration by the allocation through settlements reached with EPA that resolved their liability regarding the Site. A listing of the PAPs is included as Attachment I. The allocation assigns an allocated equitable share of responsibility for all Allocation Parties (including non-participating parties), with the exception of the five (5) parties that have settled with EPA.

The Allocation was conducted as an alternative dispute resolution (ADR) process pursuant to the provisions of the ADR Act of 1996, 5 USC 571, et seq., and relevant state authorities. Information used for conduct of the allocation was contained in documents provided by EPA and the PAPs. Each received document was assigned a reference code which includes a numerical sequence preceded by "PAS", if received from EPA, and "PAP" if received from a PAP. All received documents, submissions from the PAPs, and information produced by the Allocator were held in an ADR confidential, limited-access document repository during conduct of the allocation. Information obtained from available documents and information received from the PAPs were organized into facility-specific Allocation Party Facility Data Reports prepared by the Allocator and reviewed by the PAPs, included in Attachment J. The determination of allocated shares was computed utilizing a custom software program created by the Allocation Team specifically for the allocation. A spreadsheet summarizing the outputs and operations of the allocation computations is included as Attachment K. The determination of an allocation share for each Allocation Party was made through an analysis of an Allocation Party's contribution of each COC to OU2 sediments, as weighted by the

relative risk each COC poses to human health and the environment, and other relevant equitable factors. The EPA identified COCs included dioxin/furans, PCBs, copper, mercury, lead, DDT, dieldrin and PAHs (Attachment D).

The intent of the allocation process is to produce a numerical ranking of the relative responsibility of the Allocation Parties with a sufficient numerical significance to provide a basis for informed settlement decisions among and between the Allocation Parties and EPA. The following is an outline and explanation of the methodology that was followed by the Allocation Team in conducting the cost allocation regarding OU2.

The unique circumstances and facts presented by the Site, in light of judicial precedents regarding similar sites, make it difficult to determine the appropriate approach for determining allocation shares in this situation. In particular, the extreme differential in risk created by the release of one of the COCs, dioxin/furans, almost exclusively by one of the Allocation Parties, OCC, in relation to that of the other COCs and Allocation Parties could be considered to raise an equitable issue not fully considered by prior legal determinations or allocation practice. When the Allocator believes that this unique situation affects determinations regarding conduct of the Allocation as noted below, he provides suggestions for addressing potential concerns for the consideration of EPA and the Allocation Parties during their Phase 2 settlement deliberations.

Description of Allocation Methodology

The following steps were undertaken in order to conduct the allocation:

Step 1: Establish Allocation Party Facility COC Total Pathway CMass

For each AP facility, the total mass of each COC that was historically discharged by and reached OU2 sediments (Facility COC Total Pathway CMass), was determined following the procedures below.

Substep 1.a. – The mass of each COC that reached OU2 sediments was determined through the analysis of four discharge pathways from facilities to OU2, as described below.

The total mass of each COC contributed by an Allocation Party to OU2 sediments was determined by evaluating the flow of COCs from the facility to OU2 sediments via each of four pathways:

- Discharge via connection to a sewer system prior to the establishment of the Passaic Valley Sewer Commission (PVSC) (PrePVSC);
- Discharge via connection to the PVSC sewer system (PVSC);
- Direct discharge via a pipe or other discrete conveyance to a water body with a hydraulic connection to OU2 (DD); or
- Overland fate and transport from the facility to a surface water body with a hydraulic connection to OU2 (OFT).

For each of the four pathways, the mass of each COC that flowed/flows to OU2 sediments from an Allocation Party's facility via that pathway (Pathway CMass) was determined as the product of the mass of the COC discharged from the facility via that pathway (Pathway D_{Mass}) and the percentage of the Pathway DMass that was determined to have reached the OU2 sediments (Pathway C%) via each pathway, as shown below.

$$PrePVSC_{CMass} = PrePVSC_{DMass} \text{ x } PrePVSC_{C\%}$$

$$PVSC_{CMass} = PVSC_{DMass} \text{ x } PVSC_{C\%}$$

$$DD_{CMass} = DD_{DMass} \text{ x } DD_{C\%}$$

$$OFT_{CMass} = OFT_{DMass} \text{ x } OFT_{C\%}$$

Substep 1.b. – Pursuant to the methodology and considerations established in the Allocation Protocol, DMass was determined for the mass of COC discharged by a facility via each of the four pathways $PrePVSC_{DMass}$, $PVSC_{DMass}$, DD_{DMass} and OFT_{DMass} using the following procedures.

1. For the **PrePVSC, PVSC, and DD** pathways, as noted above, the pathway specific DMass ($PrePVSC_{DMass}$, $PVSC_{DMass}$ and DD_{DMass}) were determined as the product of the volume of effluent discharged from a facility via a pathway over the operational life of the facility and the concentration of each COC in the discharged effluent.

Pathway DMass = (Years of facility operations x Annual volume of facility discharge via pathway) x Concentration of COC in facility effluent

The required operational life of the facility, annual volume of effluent discharged from a facility via each pathway, and concentration of each COC in the discharged effluent were identified based on the following available information or data assumptions made pursuant to the Allocation Protocol:

i. The facility's length of operation based on the year operations started and the year operations ceased, except for the COC PCBs for which only the years of operation after 1930 were utilized.
ii. The hours of operation per day (based on number of shifts), the number of days per week the facility operated, and number of days per year the facility operated.
iii. The number and types of pathways of discharge from the facility and the years that each conveyance operated.
iv. The flow rates of wastewater (process, sanitary or other) via each discharge pathway
v. Calculations for the gallons per year of flow via each pathway
vi. Where multiple flowrates via a pathway were found in data documents, an average of those flowrates were utilized
vii. The concentration of COCs in wastewater (process, sanitary or other) discharged via each pathway; where multiple concentrations of a COC in wastewater were found in the data documents, an average of those concentrations was calculated

In many cases, data provided by the Allocation Party(ies) did not provide information on Polycyclic Aromatic Hydrocarbons (PAHs) in the discharge waste streams. However, information and data were generally available for effluent parameters such as Total Organic Carbon (TOC) and/or Oil & Grease. In order to estimate High Molecular Weight and Low Molecular Weight PAHs (HPAH and LPAH) the following assumptions were made for the purposes of the allocation when a general PAH, TOC or Oil & Grease concentration data were provided.

- General PAH concentration contains 60% HPAH and 40% LPAH
- Oil & Grease concentration contains 10% PAHs
- Oil & Grease comprises 2.5% of TOC concentration

Information regarding the determination of DMass for the PrePVSC, PVSC, and DD pathways for specific Allocation Party facilities are included in the individual Facility Data Computation Spreadsheets in Attachment L.

2. For the **OFT pathway**, as noted above, the pathway specific DMass (OFT DMass) was determined for each facility COC as the product of the volume of contaminated media discharged from a facility via overland flow over the operational life of the facility and the concentration of each COC in the discharged contaminated media.

OFT DMass = (Years of facility operations x Estimated annual volume of contaminated media discharged via overland flow) x Concentration of COC in discharged contaminated media

The operational life of the facility, annual volume of contaminated media discharged from a facility via overland flow, and concentration of each COC in the discharged contaminated media were identified based on the following available information or data assumptions made pursuant to the Allocation Protocol:

i. Estimation of the amount of bare soil based on historic aerial photographs, site maps or text describing the percentage of buildings, structures, and pavement, in a site-specific report.
ii. Determination of the facility length of operation/ownership based on the year operations/ ownership started and the year operations/ownership ceased. For PCBs, the period was adjusted to begin in 1930 if site operations/ownership occurred before 1930.
iii. Estimation of soil density was made based on site-specific soil descriptions.
iv. 0.1 millimeter per year of soil erosion from onsite disturbances was assumed.
    Note: Several PAPs recommended that an annual soil erosion of 0.03 mm/yr be considered. However, though 0.03 mm/yr is on the low end of what could be justified as an acceptable range of soil erosion rates, the Allocation Team determined that the rate of 0.1 mm/yr is appropriate for purposes of the allocation based on analysis of USDA data for lands with a combination of unvegetated and vegetated soils.
v. Determination of the appropriate concentration of each COC was made using data in available documents on concentrations in surface soil, shallow soil, or deeper soil as deemed appropriate if shallow data was unavailable as follows:
    1. For HPAHs, the benzo(a)pyrene equivalent concentration using the seven carcinogenic PAHs was calculated
    2. For LPAHs, detected concentrations were totaled
    3. For PCBs, total PCB concentrations were used
    4. For DDx, total DDx concentrations were used

        Note: The appropriate concentration for calculation of the mass of a COC was determined on a facility-specific basis dependent on the level of sampling data available. Several PAPs suggested that this be calculated based on an averaging of sampling data, however, the wide variation in sampling data available for each of the facility sites

made this approach inequitable. Instead, the Allocation Team selected a single data point for each facility site that was determined to most appropriately represent the level of COC contamination.

vi. For sites located completely on historic fill as determined by the allocation team, soil concentrations were utilized if the selected concentration (mg/kg) of copper, lead, or mercury exceeded the concentrations 1,200 mg/kg, 10,000 mg/kg, or 3.7 mg/kg, respectively, determined from NJDEP-approved historic fill numbers from local sites not included in this allocation, for purposes of the allocation. If a site was partially located or not located on historic fill, the highest, shallowest soil concentration was used, regardless of where it was collected. Maps denoting the location of historic fill on the Allocation Party facility sites, based on mapping conducted and published by NJDEP, is included in Attachment C.

NOTE: NJDEP policy determinations establish that parties are not liable for uneroded or undisturbed contamination existing in historic fill on their property. The maximum concentrations used for purposes of the allocation noted above were selected to establish equitable treatment between those facility properties containing historic fill and those without historic fill.

vii. OFT DMass was not calculated for thirty-five (35) Allocation Party facility sites where available information indicated an extremely low probability that any discharge would reach OU2 sediments due to, among other reasons, location in another watershed or above the Dundee Dam.

viii. For facility sites that caused contamination of an adjacent AP facility property, separate OFTMass calculations were performed to determine the impact on the adjacent property which were then associated with the source facility

ix. Unique calculations were done for other pathways (e.g., large volume releases of products or wastes, lagoons that overflowed, areas where holes were eroded by firehose discharge or by other means, and explosions and resulting airborne dispersion).

x. For owners of sites that had multiple owners, where there was no data for the earlier period of occupancy, data collected for later site owners/operators were used to estimate OFTMass.

xi. Where information was not available from provided documentation, assumptions and estimates were made based on an examination of historic aerial photos and site maps, analytical data collected from the site under a later owner/operator, and limited internet research.

Information regarding the determination of OFT DMass, or the lack of an OFT pathway, for specific Allocation Party facilities is included in the Facility Data Computation Sheets in Attachment L.

Substep 1.c. – Pursuant to the methodology and considerations established in the Allocation Protocol for each pathway, the percentage of discharged mass of each COC that reached OU2 sediments (Pathway COC C%) was determined following the procedures below.

1. **PrePVSC C% and DD C%** - For purposes of the allocation, it is assumed that 100% of COCs discharged via the PrePVSC and DD pathways reached OU2 sediments. As noted above, discharge via connection to a pre-PVSC sewer system would result in the discharge of contaminants to the Passaic River without treatment or loss of mass.

Likewise, direct discharge via a pipe or other discrete conveyance would result in the discharge of contaminants without treatment or loss of mass. Therefore, the $PrePVSC_{C\%}$ and $DD_{C\%}$ both equal 100%.

2. **OFT C% -** For purposes of the allocation, it is assumed that there was sufficient heavy rainfall during periodic tropical storms or hurricanes to transport eroded and disturbed contaminated soil deposited in a ditch, stream, or tributary near a facility from the sediment surface to the Passaic River and OU2 (i.e., multiple tropical storms and hurricanes occurred each decade). Recontamination from flood waters was not considered, although floods likely resulted in deposition of contaminated sediment. Therefore, the $OFT_{C\%}$ equals 100%.

3. **PVSC C% -** As noted in Attachment M and illustrative maps included in Attachment C, the PVSC sewer collection system included a series of CSO valves and Bypass valves to allow for the release of untreated sewerage from the system as needed to prevent overloading of the system and POTW during rain events. This resulted in a percentage of all sewerage passing through the sewer system during rain events to be discharged to the Passaic River. For purposes of the allocation, unless otherwise indicated, it is assumed that any Allocation Party facility served by the PVSC sewer collection area disposed of wastes via connection to the sewer system beginning in 1924.

   A facility specific PVSC C% was calculated for each Allocation Party facility. The facility specific PVSC C% was determined as the sum of the individual CSO C% and bypass valve C% through which a facility's waste passed on its way to the PVSC POTW for treatment and ultimate discharge.

   Facility PVSC C% = facility relevant CSO C% + facility relevant Bypass C%

   Information regarding the determination of the PVSC C% for specific Allocation Party facilities is included in the Facility Data Computation Sheets in Attachment L.

   a. Calculation of CSO C%.

   C% for each CSO was determined as the product of the percentage of total time of CSO overflow and percentage of volume in sewer line lost during CSO overflow

$$CSO\ C\% = \frac{Total\ period\ of\ CSO\ overflow}{Total\ period\ of\ system\ observation} \times CSO\ Overflow\ \%$$

   All data for CSO C% calculations were taken from the Killiam Report (Report Upon Overflow Analysis to Passaic Valley Sewerage Commissioners, Passaic River Overflows, Newark Area, PAP-00091710), except as noted below.

   - Worthington CSO - No metering was performed at this location for the Killiam Report. CSO C% was calculated by the median of the sum of all CSOs in the Harrison municipality
   - Delavan CSO - No metering was performed at this location for the Killiam Report. CSO C% was calculated as the median of the sum of all CSOs in the Newark municipality

Information regarding the determination of CSO C% for each CSO valve is included in Attachment N.

b. Calculation of Bypass C%

C% for each Bypass valve was determined as the product of the percentage of total time of Bypass operation and percentage of volume in sewer line lost during Bypass valve operation (100%).

$$\textit{Bypass C\%} = \frac{\textit{Total period of Bypass operation}}{\textit{Total period of system observation}} \; X \; 100\,\%$$

All data for Bypass C% calculations were taken from Exhibit 2-4 Documented PVSC Bypasses in the May 2020 Koch Report (Koch Report) (PAP-00488395) included as Attachment O.

- The Koch Report included data drawn from observations of system operations for the periods October 1950 - December 1962 and October 1974 - September 1975.
- For purposes of the allocation, CSO C% and Bypass C% calculated using this data was applied to all time periods of Allocation Party facility operations.
- Gail Koch reports that 100% of the flow volume in a sewer line on which a Bypass valve is located is discharged during operation of the Bypass valve.
- An evaluation of data in the Koch Report resulted in identification of the following discrepancies in the Report which were corrected for purposes of the allocation, as noted below for certain Bypass locations.

  Union

  - 1952-1962 several entries were added; either missed or entered in wrong outlet.

  Verona

  - 1950-1962 – Changes made to elapsed time included: Start Bypass to River date 5/12/1952 in Koch Report changed to 5/11/1952 (PAP-00456138); 11/24/1959 to 11/25/1959 (PAP-00456201) entry moved to Union tab.

  4th Street

  - 1950-1962 – Changes made to elapsed time include: Entry for 2/11/1951 to 2/15/1951 was missed (PAP-00456088) and entry for 5/7/1952 to 5/8/1952 (PAP-00456140) was missed in Koch Report.

  Polk

  - 1950-1962 - Changes made to elapsed time include: Entry 4/23/1952 to 4/24/1952 (PAP-00456142) was missed in Koch Report.
  - 1974-1975 - Changes made to elapsed time include: Start bypass to river time was changed from 14:00 to 16:00 (PAP-00456740) incorrectly enter in Koch Report.

  Yantacaw

  - 1950-1962 - Changes made to elapsed time include: Entry 2/7/1951 start bypass time incorrectly enter in Gail Koch report. Entry for 10/1/1958 was

moved to Union tab; and entry for 10/15/1959 end bypass incorrectly enter in Koch Report.

Information regarding the determination of Bypass C% for each Bypass valve is included in Attachment P.

Substep 1.d. – For each pathway, the mass of each COC that reached OU2 sediments via the pathway (Pathway COC CMass) was determined by multiplying the Pathway COC DMass by the Pathway COC C%

A pathway specific CMass for each COC was determined for each pathway as the product of the pathway specific DMass and pathway specific C%

PrePVSC CMass

$$PrePVSC_{\%} = \frac{Years\ prior\ to\ PVSC}{Total\ operational\ years}$$

$$PrePVSC_{DMASS} = POTW_{MASS} \times PrePVSC_{\%}$$

$$PrePVSC_{CMASS} = PrePVSC_{DMASS} \times PrePVSC_{C\%}$$

PVSC CMass

$$PVSC_{\%} = \frac{PVSC\ years}{Total\ operational\ years}$$

$$PVSC_{DMASS} = POTW_{MASS} \times PVSC_{\%}$$

$$PVSC_{C\%} = \sum_{0}^{n} (n_{Time\%} \times n_{Flow\%})$$

$$PVSC_{CMASS} = PVSC_{DMASS} \times PVSC_{C\%}$$

DD CMass

$$DD_{CMASS} = (DD_{DMASS} \times DD_{C\%})$$

OFT CMass

$$OFT_{CMASS} = (OFT_{DMASS} \times OFT_{C\%})$$

Note: The computation of $COC\ C_{Mass}$ has been expanded from what is noted in the Allocation Protocol. As originally proposed in the Allocation Protocol, COC C% was a single value, without reference to the different pathways of COC transport to OU2 sediments. However, during conduct of the allocation, the Allocator determined that the probability of a COCs fate and transport differs depending on the pathway via which it reached OU2 sediments. To account for

this reality, we established a C% for each of the four potential specific pathways (Pathway COC C%) to provide an accurate computation of COC CMass.

Substep 1.e. – For each facility, the total mass of each COC that was discharged by and reached OU2 sediments via all pathways (Facility COC Total Pathway CMass) were determined by summing the 4 Pathway COC CMass values determined for that facility

$$COC\ Total\ PC_{Mass} = PrePVSC_{CMass} + PVSC_{CMASS} + DD_{CMASS} + OFT_{CMASS}$$

The Allocator also considered the following issues in determining an appropriate Facility COC Total PCMass for the COCs discharged from each of the Allocation Party facilities.

Statutory Defenses - A number of PAPs propose that their share of responsibility for any contribution of contamination of OU2 should be lessened or eliminated due to alleged legal defenses associated with their operation of an allocation facility. In particular, parties allege that exercise of the federally permitted releases exception and petroleum exclusion pursuant to CERCLA should limit their responsibility. For purposes of the allocation, the Allocator determines that neither of these provisions exclude or limit the assigned responsivities of Allocation Parties for certain contamination of OU2.

Federally Permitted Releases – CERCLA §107(j), 42 U.S.C. §9601(10(A) provides that "recovery by any person … for response costs or damages resulting from a federally permitted release shall be pursuant to existing law in lieu of this section." In other words, "damages caused by a 'federally permitted release' must be recovered under other statutes, not CERCLA." Idaho v. Hanna Mining Co., 699 F. Supp. 827, 831 (D. Idaho 1987). The term "federally permitted release" includes "discharges in compliance with a permit under section 402 of the Federal Water Pollution Control Act and the introduction of any pollutant into a publicly owned treatment works when such pollutant is specified in and in compliance with applicable pretreatment standards of section 1317(b) or (c) of Title 33 and enforceable requirements in a pretreatment program submitted by a State or municipality for Federal approval under section 1342 of Title 33. 42 U.S.C. § 9601(10)(A).

By the nature of the releases to the Passaic River from the PVSC sewer system, it is the opinion of the Allocator that this statutory provision has a limited application to the determination of an Allocation Party's equitable responsibility for contamination of OU2. Specifically, for purposes of the allocation, the statutory exclusion will only apply to the extent that a COC, for which a permit limit is specified in a CWA §402 or applicable pretreatment permit, was discharged in full compliance with such permit following treatment at the PVSC POTW as anticipated by the permitting authority. Therefore, the discharge of COCs from the PVSC collection system, prior to final treatment at the PVSC POTW, via CSO and Bypass valves, and discharges of COCs for which discharge limitations were not established by applicable permits, will be accounted for in the calculation of an Allocation Party's facility CMass.

Petroleum Exclusion – The term "hazardous substances" is defined in CERCLA §101(14) to exclude "petroleum, including crude oil or any fraction thereof", unless specifically listed or designated under CERCLA. Caselaw has clarified

that substances that are naturally a component of petroleum or added during the refining of petroleum products are also excluded from CERCLA authority. How to apply the petroleum exclusion to the liability of PRPs for remediation of contaminated property has been a source of much confusion and debate--even more so in the field of hazardous waste allocation where the goal is to ensure that entities that contributed to a risk to human health and the environment equitably share the responsibility for its remediation. It is the opinion of the Allocator for purposes of the allocation that the petroleum exclusion should not be considered to limit the responsibility of Allocation Parties for the release of PAHs that contribute to the contamination of OU2. Though Allocation Parties may have utilized or stored petroleum subject to the exclusion in facility operations, insufficient evidence was provided during the allocation to establish that the contaminants spilled or released to facility soils was unadulterated petroleum product or that such product did not become contaminated by hazardous substances in facility soils and surfaces prior to their release from the facility property.

Third-Party Actions - A number of PAPs propose that their share of responsibility should be lessened or eliminated due to the alleged intervention of third parties in the creation of contamination on an allocation facility. Examples of third-party actions ranged from contamination by prior property owner/operators and illegal trespassers to movement of contamination from adjacent properties. As explained in the Facility Data Computation Sheets in Attachment L, each of these allegations was evaluated and appropriate adjustments made to the assigned responsibility of the Allocation Party.

Legal Defenses - A number of PAPs propose that their share of responsibility should be lessened or eliminated due to alleged legal defenses associated with their ownership of an allocation facility or an alleged release from liability associated with a facility. As specified in the Allocation Protocol, Step 2.d.9., the Allocator reviewed such allegations, upon the request of an Allocation Party, to determine whether the DMass of COCs discharged or released by the Allocation Party should be reduced due to the probability that the Allocation Party would prevail in the assertion of a legal defense to its liability for such discharges or releases of COCs from its facility. Where such requests were made, the determination of the Allocator is included with the Facility Data Computation Sheets (Attachment L) for the requesting facility.

Determination of Lessor Liability – One of the Allocation Parties, Foundry Street Complex, is noted by EPA as an Allocation Party solely due to their status as an owner of property that was leased to other Allocation Parties, Sequa Corporation, Sun Chemical, and Automatic Electro Plating, which operated various facilities on its property that contributed to the contamination of OU2. Several other Allocation Parties had a dual status as owner/operator that leased to other entities that operated facilities on their property, however, inadequate information was made available to determine whether such operator entities' operations contributed to the OU2 contamination. It is the opinion of the Allocator that an owner/lessor and operator/ lessee should share the equitable responsibility for contamination caused by the lessees' operations and activities conducted on the lessor's property pursuant to the lease. Therefore, for purposes of the allocation, the equitable responsibility for ownership and releases due to the lessee's operations have been allocated at the ratio of 25% and 75%, respectively.

Step 2: Establish Allocation Party Facility COC CMass

For each AP facility, the total mass of each COC in OU2 sediments that is assigned as the responsibility of the facility's Allocation Party (Facility COC CMass) was determined following the procedures below.

Note: As indicated in the Allocation Protocol, the intent of the determination of a Facility COC CMass and the subsequent determination of the relative contribution of a COC discharged by a facility to the mass of the COC remaining in OU2 sediments (Facility COC RC) is to incorporate into the allocation process a method of appropriately accounting for both a facility's responsibility for its direct contribution to contamination of OU2 sediment and its responsibility, pursuant to CERCLA's joint and several liability, to equitably share responsibility for the contamination of OU2 sediments by PRPs other than the Allocation Parties (Orphan Parties).

In accord with judicial precedent and traditional allocation practice as applied to typical hazardous waste sites, the Allocation Protocol provided for the calculation of each facility COC RC as the quotient of the facility's COC CMass, defined as the percentage of each COC discharged from a facility that remains in the OU2 sediments, and the corresponding COC TMass determined by EPA. This traditional computation results in a pro rata redistribution among the Allocation Parties of the responsibility for risks created by the contributions of Orphan Parties to the contamination of OU2 sediments (the orphan share). The methodology for computation of a facility's COC CMass using the traditional orphan share redistribution method is indicated by Substeps 2.a and 2.b below.

Following conduct of the allocation, however, the Allocator notes that it could be argued that this traditional methodology for redistribution of the orphan share, though accurate, may be too simplistic to account for the complexities of facts and circumstances inherent in the current matter, thereby, potentially creating an inequitable outcome and hampering future settlement efforts. This traditional method, in redistributing responsibility on a pro rata basis, assigns responsibility to each Allocation Party in accord with their overall share of contribution to the risks being addressed in OU2 from all the COCs. This results in Allocation Parties with the largest overall share of relative responsibility for the creation of risks by the Allocation Parties being assigned the same share of the risks attributable to the contributions of any Orphan Parties. As applied to the unique circumstances of the current matter, however, this traditional approach results in the potentially inequitable result of one Allocation Party which has a high relative responsibility for the creation of risks by the Allocation Parties, due almost exclusively to the fact that it contributed close to 100% of the COC dioxin/furans, being assigned responsibility for the same share of the risks attributable to the contributions of any Orphan Parties even though no dioxin/furans were contributed by the Orphan Parties.

Based on these considerations, should EPA and the Allocation Parties wish to explore an alternative method for redistribution of the risks attributable to the contributions of any Orphan Parties, the addition of Substeps 2.c and 2.d, in italic below, should be considered. The addition of these steps into the computation of COC CMass shifts the reassignment of the orphan share to each Allocation Party

in accord with their share of contribution of each COC and their related risks individually, a methodology that has its own potential for inequity. This approach results in those Allocation Parties that contributed a particular COC being assigned responsibility for the totality of the risks attributable to the contributions of that COC by any Orphan Parties. As applied to the unique circumstances of the current matter, this alternative approach results in the potentially inequitable result of a higher overall share of responsibility, for a remedy primarily driven by risks associated with the presence of dioxin/furans, being assigned to Allocation Parties that constitute a relatively small number of parties that contributed a lower risk COC.

An accounting of Allocation Shares calculated utilizing both the traditional approach for redistribution of any orphan share as specified in the Allocation Protocol and the potential alternative approach is included in Attachment Q. The impact on the relative shares of Allocation Parties and potential inequities of the use of the different approaches is evident in the provided information.

Substep 2.a. - Determine the percentage of attenuation of all COCs that remained in OU2 sediments following the actions of natural processes and human activities that diminished their mass from when they may have originally reached OU2 sediments (A%).

Due to the variety of COCs, mix of natural forces and human activities affecting the movement of sediments, and varying periods over which COCs were placed in OU2 sediments, the determination of an appropriate A% for a matter such as this is typically problematic. Such forces and activities include the daily tidal flow in the Lower Passaic River, the effects of storms, flooding, and other hydraulic events on the movement of sediments, and the dredging and removal of sediments for navigation of commercial vessels and other reasons.

Fortunately, EPA has provided the parameters to allow a justifiable estimate to be determined. EPA established in the 2014 Remedial Investigation Report and 2016 Record of Decision that resuspension of historically contaminated OU2 sediments is the predominant contributor to COC concentrations driving the need for the required remedial actions, and that other sources are not significant contributors of contamination for most risk drivers to the OU2 sediments. The EPA analysis also established that all of the COCs tend to bind tightly to fine-grained sediment particles in the Lower Passaic River and are transported in the sediment load in a similar way. The Allocator's analysis of allocation documents determined that OCC contributed the vast majority (99.997%) of the total mass of dioxin/furans contributed by all AP facilities (D/F COC TCMass). Knowing both that close to 100% of dioxin/furans in OU2 sediments was historically contributed by OCC and that there are no other significant sources of dioxin/furans but OU2 sediments, allows the percentage of each COC that reached and remains in OU2 sediments (A%) to be accurately estimated as the quotient of the total mass of the COC determined by EPA to remain in OU2 sediments (D/F COC TMass) and the total mass of dioxin/furan determined to be historically contributed to OU2 sediments (D/F COC TCMass).

$$A\% = \frac{\frac{D}{F}\ COC\ T_{MASS}}{\frac{D}{F}\ COC\ TC_{MASS}} = \frac{38_{kg}}{3764.0051_{kg}} = 0.0100956$$

The total mass of each COC present in OU2 sediments (COC Tmass) was determined by EPA through an analysis based on 1990-2012 data sets and statistical methods presented in Data Evaluation Report No.5 (DER No 5) of the 2014 Remedial Investigation and Focused Feasibility Study Reports (USEPA, 2014), as described in "*Additional Contaminant Inventory Analysis for Lower Eight Miles of the Lower Passaic River*", April 2019 (Attachment R).

> **Note:** A few PAPs propose that the calculation of the mass of the COC copper contributed by their facility should be reduced further because the copper that they discharged to the Lower Passaic River via connection to the local sewer collection systems was discharged to the sewer system in a soluble form and, therefore, would have never been deposited to OU2 sediments. However true this may have been at the point at which the COCs were discharged to the local sewer system, the nature of the solubility of metals indicates that many conditions present in the sewer system and environment once the COCs are discharged to the Passaic River can cause metals to precipitate out of solution and become deposited into OU2 sediments. Given the likelihood of precipitation, for purposes of the allocation, the solubility of metals COCs will not be considered in determining COC CMass.

Substep 2.b. - For each COC contributed by a facility, determine the Facility COC CMass as the product of the facility's COC Total Pathway CMass and A%.

$$Facility\ COC\ CMass\ =\ COC\ Total\ Pathway\ CMass\ x\ A\%$$

Note: If utilizing the alternative approach for redistribution of any orphan share, Substep 2.b. would be restated as follows:

Substep 2.b. - *For each COC contributed by a facility, determine the Facility COC Historic CMass by multiplying the facility's COC Total Pathway CMass by the A%.*

$$Facility\ COC\ Historic\ CMass\ =\ COC\ Total\ Pathway\ CMass\ x\ A\%$$

Substep 2.c. - *For each COC CMass contributed by a facility, determine the level of responsibility of the facility for the historic contribution of the COC to OU2 sediments by PRPs other than the Allocation Parties (COC Orphan Share (OS) CMass) as the product of the Total OS Mass and the percentage of a COC contributed by the facility to OU2 sediments (Facility COC %), as explained below.*

(i) Determine the total attenuated mass of each COC historically contributed by PRPs other than the Allocation Parties that remains in OU2 sediments (Total COC OS Mass) as the difference between the mass of the COC determined by EPA to be in OU2 sediments (COC TMass) and the sum of the AP facilities' attenuated COC CMass (Total COC Historic CMass).

$$Total\ COC\ OS\ CMass\ =\ COC\ TMass - Total\ COC\ Historic\ CMass$$

(ii) For each COC CMass contributed by a facility, determine the Facility COC C% as the quotient of Facility COC CMass and the sum of the COC CMass contributed by all AP facilities

$$COC\ C\% = \frac{Facility\ COC\ Historic\ C_{MASS}}{Total\ COC\ Historic\ C_{MASS}}$$

(iii) Determine the Facility COC OS CMass as the product of the Total COC OS CMass and the Facility COC C%

$$Facility\ COC\ OS\ CMass\ =\ Total\ OS\ COC\ CMass\ x\ Facility\ COC\ C\%$$

Substep 2.d. *- For each COC CMass contributed by a facility, determine the Facility COC CMass as the sum of the Facility COC Historic CMass and the Facility COC OS CMass*

$$Facility\ COC\ CMass\ =\ COC\ Historic\ CMass + \ COC\ OS\ CMass$$

The Allocator determined that the following five (5) Allocation Parties have no discharge of COCs that reached OU2 sediments or, otherwise, have no nexus to COCs in OU2 sediments and, therefore, have been assigned an Allocation Share of 0%.

Automatic Electro Plating Corp. (Foundry Street Complex)
Drum Service of Newark Inc.
Everett Smith Group
Pabst Brewing Company
Sequa Corporation (Foundry Street Complex)

Step 3: Establish Allocation Party Facility COC Relative Responsibility

The Relative Responsibility of an Allocation Party Facility for each COC that reached and remained in OU2 sediments (COC RR) was determined as the quotient of the Facility Total COC CMass and the COC TMass.

$$COC_{RR} = \frac{Facility\ COC\ C_{MASS}}{COC\ T_{MASS}}$$

Note: The COC RR of a facility was titled the "COC Relative Contribution" (COC RC) in the Allocation Protocol. However, the term was changed to allow its use for both the traditional computation method and the alternative method for which it denotes the combination of the relative contribution of a COC by the facility and, if applicable, the facility's relative equitable responsibility for the orphan share of the COC contributed by PRPs other than the Allocation Parties.

Step 4: Establish Allocation Party Facility Base Scores

A Base Score was assigned to each Allocation Party facility (Facility BS) determined as the sum of the products of the COC Relative Risk Number (COC_{RRN}) and COC Relative Responsibility (COC_{RR}) for each COC discharged from the Allocation Party's facility.

Substep 4.a. – For each of the eight COCs, an individual COC Relative Risk Number (COC RRN) was assigned pursuant to the *Methodology for Determination of the Relative Risk of OU2 Contaminants of Concern for the Purpose of the Allocation*, Attachment A to the Allocation Protocol (Attachment H).

$$COC_{RRN} = \left(\frac{RRN}{\sum RRN}\right) \times 100$$

As explained in Attachment A to the Allocation Protocol, a Relative Risk Number for each COC was determined as noted above, taking into consideration the human health cancer, human health noncancer, and ecological risk/harm associated with each COC, based on risk data presented in the RI/FFS and ROD, and consistent with the conclusions presented in the RI, FFS, and ROD. The COC Relative Risk Number for each COC is listed in Attachment A to the Allocation Protocol (Attachment H).

Substep 4.b. – For each COC contributed to OU2 sediments, determine a COC specific base score (COC Base Score) by multiplying the Facility COC Relative Responsibility (COC_{RR}) by the COC Relative Risk Number (COC_{RRN})

$$COC_{BS} = COC_{RRN} \times COC_{RR}$$

Substep 4.c. – Determine the Facility Base Score (Facility BS) by summing the COC Base Scores for all COCs contributed to OU2 sediments by the facility

$$Facility_{BS} = \sum COC_{BS}$$

Step 5: Establish Adjusted Allocation Party Facility Base Scores

An Adjusted Base Score to each Allocation Party (AP ABS) was determined as the sum of the Allocation Party's Base Score and factors for culpability and cooperation established for the Allocation Party.

$$AP_{ABS} = AP_{BS} + CUF + COF$$

Substep 5.a. – As required by the Allocation Protocol, a factor representing the level of culpability evidenced by the facility was established regarding the contribution of COCs to OU2 sediments (CUF)

Establish for each Allocation Party Facility a Culpability Factor (CUF) that addresses the level to which the Allocation Party's contribution of COCs to OU2 sediments were the result of culpable conduct.

$$CUF = CUF_{\%} \times AP_{BS}$$

For purposes of the allocation, culpable conduct is described in the Allocation Protocol as referring to the release or discharge of COCs in contravention of prevailing industrial standards and practices, either (1) knowingly and with intent to skirt environmental regulatory obligations, and/or (2) with conscious awareness that the release or discharge of COCs were illegal or posed substantial risk to human health or the environment. Each Allocation Party was assigned a numerical Culpability Factor equivalent to 0% to 100% of its Base Score, escalating with the level of culpability, depending on the nature, extent and/or

impact of an Allocation Party's culpable conduct. The following scale and definition of relative culpable behavior was utilized to assign Culpability Factors to individual Allocation Party facilities.

0% Operation of facility met industrial standards of environmental conduct for era in which occurred based on available information, or there was insufficient information in available documents upon which to make a determination

5% Occasional or minor releases of COCs during facility operations or other industrial practices potentially impacting operations utilizing COCs

10% Episodic releases of COCs during facility operations or other industrial practices that indicate the potential for mishandling or release of COCs with culpable intent and/or knowledge

100% Significant sustained releases of COCs in contravention of standard industrial practices indicating knowledge of the risk and illegality of the actions and an intentional disregard of the impact on human health or the environment

Note: A number of the PAPs propose that the differential between 100% culpability and other levels of culpability be increased to account for the extreme difference between the culpable behavior of OCC and that of any other Allocation Party. The Allocator selected the scale and definition of relative culpable behavior above in recognition of this fact, while accounting also for the wide divergence of available information regarding Allocation Party behaviors.

Information regarding the rationale for determination of Culpability Factors is included in Attachment S. Information regarding the determination of the Culpability Factor for specific Allocation Party facilities is included in the Facility Data Computation Sheets in Attachment L.

Substep 5.b. – Establish a factor representing the level of cooperation evidenced by the facility regarding remediation of OU2 contamination (COF)

Establish for each Allocation Party Facility a Cooperation Factor (COF) that indicates the level to which the Allocation Party cooperated or failed to cooperate with federal and state authorities in addressing the contamination of OU2.

$$COF = COF_{\%} \times AP_{BS}$$

For purposes of the allocation, each Allocation Party will be assigned a numerical Cooperation Factor equivalent to -20% to +20% of its Base Score, escalating with the level of cooperation. The following scale and definition of relative cooperative behavior was utilized to assign Cooperation Factors to individual Allocation Party facilities.

+20% Failure to cooperate with government efforts to remediate OU2 contamination when requested; Refusal to participate in available group action to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities; Failure to participate in conduct of the allocation

+10% Failure to fully cooperate with conduct of the allocation or requests for related information

0% Compliance with actions required by governmental/regulatory entities (UAO) to address environmental or public harm created by own activities; Full participation in conduct of allocation and requests for related information

-10% Actions taken, or funding provided, in cooperation with governmental/regulatory entities (AOC/CD) to address environmental or public harm created by own activities; Participation in PRP Group action to cooperate with governmental/ regulatory entities to address environmental or public harm created by own activities

-20% Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities

Information regarding the rationale for determination of Cooperation Factors is included in Attachment S. Information regarding the determination of the Cooperation Factor for specific Allocation Party facilities is included in the Facility Data Computation Sheets in Attachment L.

Substep 5.c. – Determine the Facility Adjusted Base Score by increasing or decreasing the determined Facility Base Score by the sum of the Facility CUF and Facility COF

Step 6: Establish an Allocation Party Adjusted Base Score (AP ABS) for each Allocation Party

Substep 6.a. – The AP ABS was determined by summing the Facility ABSs associated with facilities for which the Allocation Party has responsibility (as applicable)

AP ABS = AP Facility #1 ABS + AP Facility #2 ABS

Step 7: Establish the Allocation Share of each Allocation Party

The Allocation Share (AS) of each Allocation Party was determined as the product of 100 and a value equal to the quotient of the Allocation Party's Adjusted Base Score and the sum of all Allocation Party Adjusted Base Scores.

$$AP_{AS} = \left(\frac{AP_{ABS}}{\sum AP_{ABS}}\right) \times 100$$

Substep 7.a. - The Adjusted Base Scores were summed for all Allocation Parties (Sum of ABSs).

Substep 7.b. - For each Allocation Party, the Allocation Party's Adjusted Base Score was divided by the Sum of ABSs and then multiplied by 100 to determine the Allocation Party's Allocation Share.

Step 8: Establish Allocation Tiers

An Allocation Tier was assigned to each Allocation Party based on a consideration of the relative relationship and natural grouping of the Allocation Parties' Allocation Shares.

Assignment of Allocation Party Shares and Tier Designations

Based on information made available to the Allocator and reasonable inferences of fact made pursuant to the Allocation Protocol, the Allocator established Allocation Share Relative Ranking assignments and Allocation Tier designations for each Allocation Party, as noted in Attachment Q.

Upon initiating the allocation process, the Allocator hoped that sufficiently consistent data would be made available regarding operations across all Allocation Party facilities to establish an accurate relative numerical relationship between the Allocation Parties in the assignment of allocation shares. Upon review and application of all available data, however, it is evident that it is impossible for the allocation process to produce a numerical ranking of the Allocation Parties that can identify with any acceptable level of certainty the relative responsibility of similarly situated parties. This is due to the lack of and variability of available data on facility operations and site conditions which required a significant level of allocation data to be inferred through reference to other data sources as detailed in the Allocation Protocol.

These data limitations have created a sufficient uncertainty in the determination of allocation shares and substantially affect the credibility of relative numerical share calculations among and between similarly ranked individual Allocation Parties, with this uncertainty increasing with the diminution in the size of equitable share determinations. In order to account for this inherent limitation on the ability to specify the relative relationship between equitable allocation shares assigned to the Allocation Parties and to ensure the credibility of the allocation, the ultimate results of the allocation, as noted in Attachment Q, presents the results of both the traditional and alternative allocation methodology in a bifurcated form. This presentation provides the numerical relationship between the share of OCC and that of the remaining PRPs and the numerical relationship among the remaining PRPs, in order to provide a clearer relative numerical ranking of the Allocation Parties.

In addition, as specified in the Allocation Protocol, the relative listing of Allocation Parties has been grouped into five numerically significant tiers which signify Allocation Parties of similar responsibility within an acceptable level of certainty. The level of uncertainty in the numerical relationship between assigned allocation shares should be considered to increase by a factor of 10 as numerical values decrease, so that the uncertainty as to the exact ranking of an Allocation Party within Tier 3 equals .1, Tier 4 equals .01, and Tier 5 equals .001. Therefore, the specific location of an Allocation Party within each tiered grouping should be considered insignificant for purposes of the allocation.

As specified in Step 2.2(c) of the Allocation Protocol and as noted in Section 4, Step 2 above, the Allocator determined that the following five (5) Allocation Parties should be assigned an Allocation Share of 0%. Therefore, they have been removed from the list of Allocation Parties in Attachment Q.

Automatic Electro Plating Corp. (Foundry Street Complex)	
Drum Service of Newark Inc.	Everett Smith Group
Pabst Brewing Company	Sequa Corporation (Foundry Street Complex)

A spreadsheet summarizing the outputs and operations of the allocation computations is included as Attachment K. Information regarding the determination of an Allocation Share Relative Ranking for specific Allocation Parties is included in the Facility Data Computation Sheets in Attachment L.

ATTACHMENTS

A. EPA'S LETTERS TO THE ALLOCATION PARTIES DATED SEPTEMBER 18, 2017, NOVEMBER 28, 2017, JANUARY 5, 2018, FEBRUARY 16, 2018, FEBRUARY 23, 2018, AND MAY 1, 2018

B. LIST OF ALLOCATION PARTIES & RELATED FACILITIES

C. FACILITY LOCATION AND PVSC SEWER SYSTEM MAPS

D. CONTAMINANTS OF CONCERN FROM THE ROD

E. REVISED WORK PLAN FOR THE ALLOCATION

F. OU2 ALLOCATION CONFIDENTIALITY AGREEMENT

G. DIAMOND ALKALI SUPERFUND SITE OU2 ALLOCATION GUIDE

H. DIAMOND ALKALI SUPERFUND SITE OU2 ALLOCATION PROTOCOL

I. LIST OF PARTICIPATING ALLOCATION PARTIES

J. ALLOCATION PARTY FACILITY DATA REPORTS

K. ALLOCATION OPERATIONS SPREADSHEET

L. FACILITY DATA COMPUTATION SHEETS

M. HISTORY OF SEWER COLLECTION AND TREATMENT IN THE PASSAIC VALLEY

N. CSO VALVE WORKSHEETS

O. MAY 2020 KOCH REPORT

P. BYPASS VALVE WORKSHEETS

Q. ALLOCATION SHARE RELATIVE RANKING AND ALLOCATION TIER DESIGNATIONS

R. ADDITIONAL CONTAMINANT INVENTORY ANALYSIS FOR LOWER EIGHT MILES OF THE LOWER PASSAIC RIVER, APRIL 2019

S. CULPABILITY & COOPERATION FACTORS WORKSHEET

ATTACHMENT A

EPA LETTERS TO THE ALLOCATION PARTIES DATED SEPTEMBER 18, 2017, NOVEMBER 28, 2017, JANUARY 5, 2018, FEBRUARY 16, 2018, FEBRUARY 23, 2018 & MAY 1, 2018

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

SEP 18 2017

BY EMAIL AND CERTIFIED MAIL
RETURN RECEIPT REQUESTED

To: See List of Addressees - Attachment A

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

On August 28, 2017, the U.S. Environmental Protection Agency ("EPA") hosted a meeting at its New York City offices to provide you with an opportunity to share your views on the Agency's proposed settlement framework for implementation of the remedy selected for the lower 8.3 miles of the Passaic River, which is Operable Unit 2 ("OU2") of the Diamond Alkali Superfund Site (the "Site"). I want to once again thank all of the parties that participated in the meeting. Your participation has helped both EPA and the other parties better understand the issues and concerns regarding the framework.

After careful consideration, the Agency has concluded that the allocation process should include all of the potentially responsible parties ("PRPs") for OU2 (apart from the Passaic Valley Sewerage Commission ("PVSC"), the four municipal PRPs referred to below, and the PRPs that settle pursuant to the "early" cash-out settlement that EPA offered in March 2017), and should not be limited to the "middle tier" parties. Transparency and fairness are concepts that EPA has consistently stated are of importance to the Agency in this matter and, after considering your comments and concerns, we think those concepts are best served by having one allocation for all of these parties.

Numerous parties at the August 28, 2017 meeting expressed concern regarding the financial burden that would be placed on PRPs that are not responsible for the release of dioxins, furans and/or polychlorinated biphenyls ("PCBs") into the Lower Passaic River if those parties are not given the opportunity to settle with the United States for their OU2 liability, as opposed to having to implement the remedial action for OU2. EPA appreciates those concerns. As we have stated, we anticipate that with the help of the allocation process, EPA will be able to offer cash-out settlements to a number of the parties.

Similarly, EPA's expectation that the private PRPs responsible for the release of dioxins, furans and/or PCBs will perform the OU2 remedial action has not changed. It is therefore our goal that, in addition to supporting potential additional cash-out settlements, the allocation will lead to a consent decree in which those parties agree to perform the OU2 remedial action under EPA oversight.

To perform the allocation, EPA has retained AlterEcho and its senior allocation specialist, Mr. David Batson, Esq., through the Agency's prime contract with CSRA. EPA and AlterEcho invite you to attend a meeting to introduce the allocation process. Among other things, the allocation will provide opportunities for participating parties to comment on factors that should be part of the allocation and to contribute relevant information about themselves and other parties for use in the allocation. This meeting will be held on October 13, 2017 at 9:00 A.M. on the 27th floor of EPA's offices, which are located at 290 Broadway, New York, NY 10007.

Mr. Batson has requested that each party designate a primary contact for future communications on the allocation and that the primary contact attend the October 13th meeting in person. EPA has established a conference line for others wishing to participate. The call-in number is 866-299-3188, and the conference code is 212-637-3136. Please respond to EPA by October 5, 2017 with the following information: 1) name of and party represented by the primary contact attending the meeting; 2) names of other representatives planning to call in for each such party. Your response should be directed to Alice Yeh, Remedial Project Manager, Emergency and Remedial Response Division at yeh.alice@EPA.gov or U.S. EPA Region 2, 290 Broadway - 19th Floor, New York, NY 10007.

After the allocator assigns shares to the parties, EPA will make a decision as to which parties should receive cash-out settlement offers, the dollar amount of each offer, and how the money raised by the cash-out settlements will be applied towards OU2 costs.

During the August 28, 2017 meeting, several parties raised questions concerning EPA's enforcement approach for PVSC and the municipalities to which EPA issued notices of potential liability (the City of Newark, Borough of East Newark, Town of Harrison and Town of Kearny). EPA has initiated discussions with PVSC and the municipalities about substantial contributions that, collectively, they might make to the OU2 remedy. At this time, we do not believe it would be helpful to include them in the allocation.

If you have any questions regarding this matter, please contact Assistant Regional Counsel Juan Fajardo at 212-637-3132 or fajardo.juan@epa.gov.

Very truly yours,

Eric J. Wilson
Deputy Director for Enforcement and Homeland Security
Emergency and Remedial Response Division

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Attachment A – List of Addressees

Diamond Alkali Superfund Site
Lower 8.3 Miles - Passaic River

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Teval Corporation 99 Cherry Hill Road, Suite 105 Parsippany, NJ 07054	Lee D. Henig-Elona, Esq. Gordon & Rees 18 Columbia Turnpike, Suite 220 Florham Park, NJ 07932 973-549-2520(T direct) 973-549-2500(T office) lhenig-elona@gordonrees.com	Guyon Pipe 900-1000 South 4th Street Harrison, NJ
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

November 28, 2017

Via Electronic Mail

To: Diamond Alkali – Lower 8.3 Miles Contact Group

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

On September 18, 2017, we notified you that the U.S. Environmental Protection Agency (EPA), through the Agency's prime contract with CSRA, had retained AlterEcho and its senior allocation specialist Mr. David Batson, Esq., to perform an allocation for implementation of the remedy selected for the lower 8.3 miles of the Lower Passaic River Study Area. We also invited you to attend a "kick-off" meeting with Mr. Batson on October 13, 2017 at EPA's offices in New York.

Since that time, we understand that some parties have raised several issues of concern with Mr. Batson, including limits in the current allocation contract. For instance, several parties would like to exceed the limits in the current allocation contract on the amount of documents that can be submitted to the allocator, and on the number of meetings that parties can have with Mr. Batson. We also understand that some parties are seeking to include within the allocation process an opportunity to exit the allocation "early" and be considered by EPA for cash out settlement offers, ahead of the schedule established in current scope of work with CSRA.

With this in mind, EPA is notifying you that it is considering the above requests to modify the current allocation contract. EPA will discuss with Mr. Batson potential changes to the current allocation process, taking into account the feedback received from parties participating in the allocation.

Please keep in mind that EPA established an allocation process for the lower 8.3 miles and has entered into a contract for the performance of that allocation. Separate agreements concerning EPA's allocation for the lower 8.3 miles, might not be consistent with EPA's current allocation contract; might undermine the current allocation process; and/or might violate conflict of interest rules or provisions.

Finally, note that the costs of the allocation are currently being borne by EPA and that the Agency is not requesting that parties pay to participate in the allocation.

Sincerely,

Eric J. Wilson
Deputy Director for Enforcement and Homeland Security
Emergency and Remedial Response Division

cc: David Batson, Esq., AlterEcho
Mary Apostolico, CSRA
Kathryn Barton, EPA - OARM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

JAN - 5 2018

Via Electronic Mail

To: Diamond Alkali – Lower 8.3 Miles Contact Group

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

I am writing to follow-up on my letter of November 28, 2017, as well as to address communications received by the U.S. Environmental Protection Agency (EPA) since that time with respect to the allocation for the lower 8.3 miles of the Lower Passaic River Study Area.

As you know, the allocator, Mr. David Batson, Esq., has informed EPA of the issues raised to him by the allocation parties. Several parties have also contacted EPA directly, both in writing and by phone, to express their views and concerns regarding the allocation process as it is currently structured. After careful consideration, EPA has arrived at the following determinations:

1. The Agency is prepared to increase the current number of documents subject to the allocation process. The current allocation contract allows for up to 150,000 pages of documents to be submitted and reviewed as part of the allocation. EPA will, as necessary, modify the allocation contract to allow additional documents to be submitted by the allocation parties and be reviewed by Mr. Batson and his team. The allocation parties who sign the Participation Agreement will be provided access to a SharePoint site with documents relevant to the allocation. Each party should review the documents on the SharePoint site and provide Mr. Batson with a list of documents (including the number of pages) that the party seeks to add to the allocation process. EPA, in consultation with Mr. Batson, will evaluate the documents for relevance to the allocation and consider an appropriate increase to the existing contract. Note, however, that the document submission and review portion of the allocation process is not intended to duplicate the full discovery process that a court would include, and therefore, there may be some documents that will be beyond the scope of the process.

2. EPA understands and appreciates that parties to the allocation need sufficient time to communicate directly with Mr. Batson to address their views regarding their potential allocation share and the share potentially attributed to other allocation parties. The Agency is therefore prepared to increase the current allocation contract to allow additional time for parties to meet with and discuss their positions and concerns with Mr. Batson. EPA will consult with Mr. Batson on an appropriate amount of time to add to the existing contract.

3. Several parties in the allocation have contacted EPA claiming to be similarly situated to parties that received an "early" cash out settlement offer from EPA. Those parties requested that the allocation process provide for an early determination (an "off-ramp") that they are in fact similarly situated to the early cash out parties and should receive a similar cash out offer from EPA prior to the completion of the allocation process. EPA agrees that an early determination should be provided for in the allocation process to allow such parties, if any exist, to exit the allocation process prior to its completion. EPA will work with Mr. Batson to incorporate an early exit into the allocation process.

4. Finally, at the present time, EPA is not adding more parties to the allocation. As we have previously stated, if we receive or gather evidence that a party that has not yet received a notice letter is responsible for the release or discharge of a hazardous substance into the lower 8.3 miles, then we would consider issuing a notice letter to such a party and adding that party to the allocation process.

Also, as EPA has indicated, the Passaic Valley Sewerage Commission and the four municipalities identified as potential responsible parties are uniquely situated to provide in-kind services with respect to the remedy selected for Operable Unit 2 (OU2) of the Diamond Alkali Superfund Site. EPA has been in discussions with those parties regarding the substantial contributions that, collectively, they may make to the OU2 remedy, and the Agency has facilitated conversations between technical personnel from PVSC and Occidental Chemical Corporation (OCC) related to the OU2 remedial design, which OCC is performing pursuant to a settlement agreement and order on consent with EPA.

We look forward to your continued participation in the allocation process, and we will continue to work with Mr. Batson to ensure it proceeds in a fair and efficient manner. Please contact Juan M. Fajardo at 212 637-3132 if you have questions regarding this matter.

Very truly yours,

Eric J. Wilson
Deputy Director for Enforcement and Homeland Security
Emergency and Remedial Response Division

cc: David Batson, Esq., AlterEcho (by email)
Mary Apostolico, CSRA (by email)
David Moora, EPA (by email)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

FEB 16 2018

Via Electronic Mail

To: Diamond Alkali – Lower 8.3 Miles Contact Group

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

We understand from the Small Parties Group[1] and David Batson, the allocator, among others, that some of the parties that agreed to participate in the Operable Unit 2 (OU2) allocation are seeking to "convene" with the U.S. Environmental Protection Agency (EPA or Agency) to further discuss issues previously raised and addressed by EPA in its letter to the parties of January 5, 2018. I am writing to further address those issues to ensure that the allocation for OU2 proceeds on schedule.

First, the remedial design for OU2 is on schedule for completion in September 2020, and the allocation is intended to be completed prior to that date in order for EPA to have an enforcement document in place for the timely initiation of the remedial action for OU2. For that reason, EPA strongly encourages the parties participating in the allocation to work towards its timely completion.

Second, while we are willing to increase the number of documents that the parties may submit in the allocation and the time to communicate directly with Mr. Batson in order to make the allocation a success (i.e., by providing a basis for a remedial action consent decree and potential cash out settlements), we reiterate that the process is not intended to duplicate the full discovery process that litigation would include. We are aware that when private parties undertake an allocation, it can sometimes evolve into a process that stretches on for many years, and become almost as burdensome as litigation. In contrast, this allocation should follow the basic structure established in the work plan that Mr. Batson shared with the group after the initial meeting in October 2017.

[1] EPA was notified that there is a "Small Parties Group" and received a memorandum dated February 9, 2018 on behalf of that Group. However, the members of that Group have not been identified.

Documents Relevant to the Allocation

The purpose of the allocation is to determine a share of relative responsibility among the allocation parties[2] for costs associated with the remedial design and remedial action to be undertaken for OU2 of the Diamond Alkali Superfund Site (Site). Accordingly, documents providing information or related to the following factors would be relevant to the allocation for OU2[3]:

- Identification of the contaminants of concern (COCs), as defined in the March 2016 Record of Decision (ROD) for Diamond Alkali OU2, released or discharged to the Lower Passaic River from a facility with which a party is associated;

- The amount of COCs involved in such release or discharge;

- The likelihood that discharged COCs reached an area of the river associated with the selected remedy;

- The degree of control and care exercised by the party with respect to the released COC, taking into account the characteristics of such hazardous substance and the associated risk to public health or the environment about which the party should have been aware;

- The degree of cooperation by the party with federal, state, or local officials to prevent any harm to the public health or the environment related to the release; and,

- The extent to which a release impacted the need for or cost of the remedy.

As described in EPA's January 5, 2018 letter, the parties that have agreed to participate in the allocation should review the documents on the SharePoint site established by Mr. Batson and his team to support the allocation. Each party should provide Mr. Batson with a list of documents (including number of pages) that the party seeks to add to the allocation process. Using the factors above, EPA, in consultation with Mr. Batson, will evaluate the documents for relevance to the allocation and increase as appropriate the number of pages to be reviewed for the allocation under EPA's contract with CSRA-AlterEcho. In order for the allocation to proceed expeditiously, parties should provide Mr. Batson with their lists of documents to be added to the SharePoint site by March 2, 2018.

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[2] The allocation parties are the potential responsible parties (PRPs) that received a notice letter from EPA for OU2, with the exception of those parties to whom EPA offered an "early" cash out settlement, the Passaic Valley Sewerage Commission (PVSC), and the four municipal PRPs.

[3] The relative toxicity of the COCs involved is a factor for the allocator to consider. That information is found in the ROD for OU2.

Opportunities to Communicate with Mr. Batson

As described in the work plan that Mr. Batson provided to you shortly after the initial allocation meeting in October 2017, the allocation process provides for the parties to communicate with Mr. Batson as follows:

- Under Task 2 (Public Announcement of Project), a meeting with the allocation parties to introduce the allocation; and communication via email or phone with the allocation parties as a group to answer questions about and obtain execution of the Participation Agreement.

- Under Task 5 (Meeting with PRPs on Draft Allocation Process and Database Design), a meeting with the allocation parties to describe to and obtain comments from the parties on the anticipated conduct of the allocation process, and the anticipated organization of data and contents of the database; and communications between Mr. Batson and the parties by phone, email or other electronic media averaging 20 minutes for each party to obtain additional information, if any, for the allocation database.

- Under Task 6 (Final Allocation Design), communications between Mr. Batson and the allocation parties by phone, email or other electronic media averaging 20 minutes for each party to obtain any additional comments from the parties regarding the allocation process design.

- Under Task 8 (Final Data Reports), communications by Mr. Batson with individual allocation parties as required to answer questions regarding the contents of their data report.

EPA is prepared to modify the allocation contract to allow for additional communications with Mr. Batson. Parties seeking additional opportunities to meet or communicate with Mr. Batson should provide, in detail, such a request to EPA by March 2, 2018 and the Agency will promptly respond to the request.

Passaic Valley Sewerage Commission (PVSC) and the Municipalities

EPA has explained in several letters (including most recently in EPA's January 5, 2018 letter to the allocation parties) the basis on which we have chosen not to add to the allocation PVSC and the four municipalities that were notified of their status as PRPs for OU2. We also informed the allocation parties that EPA has facilitated conversations between technical personnel from PVSC and Occidental Chemical Corporation (OCC) related to the OU2 remedial design. We understand that some parties would prefer for PVSC and the municipalities to participate in the allocation or to be assigned a share of liability in the allocation, but at the present time the Agency is not adding more parties to the allocation.

Other Non-Notified Parties

Similarly, EPA has notified the allocation parties that the Agency will not be expanding the allocation to include parties to which EPA has not issued a notice of liability. Mr. Batson has informed EPA of several parties that, while not yet in receipt of a notice of liability, are expecting to participate. Where warranted, EPA will issue notice letters to those parties.

With respect to the list of industrial users of PVSC that William Hengemihle of FTI Consulting provided to EPA in February 2017, the list includes a number of entities that EPA (and/or the Cooperating Parties Group) evaluated in the past, and some of them received notice letters. In other cases, EPA could not establish sufficient information to support a notice of potential responsibility and some of the entities on the list are defunct. In short, as discussed with Mr. Hengemihle at the time, the list itself is not an especially useful indication of the existence of additional PRPs.

Early Cash Out Settlement Criteria

As you know, EPA made early cash out settlement offers to 20 PRPs identified by EPA as "not associated with the release or disposal of any of the COCs for OU2" (EPA's May 17, 2017 letter)[4]. EPA has stated that it will, as part of the allocation, consider making additional early cash out settlement offers to parties similarly situated. The Agency recognizes that AlterEcho, and then EPA, may need to determine, based on the available information, whether a party is responsible for the release or disposal of a COC for OU2.

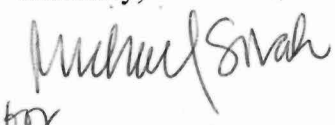
Certification

We agree that parties participating in the allocation should certify that they have conducted a thorough, comprehensive, good faith search for documents, and have fully and accurately disclosed all relevant information to Mr. Batson for his consideration in the allocation.

[4] As you also know, 15 of those PRPs have entered into a proposed cash out settlement agreement with EPA.

Finally, as you know, the next step of the allocation process is for you to review and comment on the draft allocation process and database design document, which you may have received from AlterEcho by now. In order to keep the allocation moving in a timely manner, we urge you to give that document, and this letter, your immediate attention.

Sincerely,



for
Eric J. Wilson
Deputy Director for Enforcement and Homeland Security

cc: David Batson, Esq., AlterEcho (by email)
Mary Apostolico, CSRA (by email)
David Moora, EPA (by email)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

FEB 23 2018

Via Electronic Mail

To: Diamond Alkali – Lower 8.3 Miles Contact Group

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

In my letter of February 16, 2018 regarding the allocation for Operable Unit 2 (OU2) of the Diamond Alkali Superfund Site (Site), I stated that parties participating in the allocation should provide David Batson with a list of documents to be added to the SharePoint site by March 2, 2018. Some participants to the allocation have, since receipt of my February 16th letter, requested that the United States Environmental Protection Agency (EPA or Agency) extend the March 2, 2018 deadline. This letter serves to modify that deadline.

We understand that the allocation parties are providing input to Mr. Batson on the development of an allocation process and database design document specifying the allocation factors, and that the final allocation process design will be issued by David Batson to the parties by the end of May 2018.

Some of the parties participating in the allocation would like to have the opportunity to submit documents after the final allocation design is completed. While we recognize that some parties may benefit by having an opportunity to review the final allocation design prior to identifying the documents they seek to include in the allocation (since the identification of the documents is influenced by the allocation factors), we also realize that the factors themselves are unlikely to change much, if at all, from the factors in my February 16th letter, which are drawn from the draft allocation process design document David Batson provided to the parties.

Importantly, the parties that contacted EPA maintained that the parties participating in the allocation understand that the remedial design for OU2 is on schedule for completion in September 2020, and that the allocation must be completed prior to that date.

Based on the above, EPA is modifying the March 2, 2018 deadline for each party to submit a list of additional documents to April 13, 2018 which should provide the parties sufficient time to examine the material presently in SharePoint and to review the factors relevant to the allocation as they relate to documents parties would like to have made part of the allocation. It is important

that the additional documents submitted by parties not duplicate the materials already in SharePoint. We also welcome receipt of the information prior to April 13. The list of documents should be submitted in the following format:

Document Date	Title	Number of Pages	Document Type	Addressee Name & Organization	Author Name & Organization	Reason Relevant to Allocation & Relevant Party

If after receipt of the final allocation design a party believes it has documents pertinent to the allocation which it did not identify by the April 13th deadline, such party may identify such documents within two weeks of receipt of the final allocation design, provide an explanation why each document was not identified by the April 13th deadline and request that the Agency have the documents included in the allocation.

Finally, please note that the March 2, 2018 deadline for submitting to EPA a request for additional opportunities to communicate with Mr. Batson has not been changed.

Sincerely,

Eric J. Wilson
Deputy Director for Enforcement and Homeland Security

cc: David Batson, Esq., AlterEcho (by email)
Mary Apostolico, CSRA (by email)
David Moora, EPA (by email)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

MAY - 1 2018

By Email and Regular Mail

David G. Mandlebaum, Esq.
Eric S. Aronson, Esq.
Greenberg Traurig, LLP
2700 Two Commerce Square
2001 Market Street
Philadelphia, PA 19103

Re: Diamond Alkali Superfund Site ("Site") - OU2 Allocation Proceeding

Dear Messrs. Mandlebaum and Aronson:

We understand that David Batson of AlterEcho will be responding to your letter of April 10, 2016 [sic] regarding the allocation process for Operable Unit 2 (OU2) of the Diamond Alkali Superfund Site (Site). There are, however, statements in your letter that the U.S. Environmental Protection Agency (EPA) Region 2 seeks to clarify and correct.

The OU2 allocation process is not mandatory. As you know, Eric Wilson of EPA issued a letter dated September 18, 2017 to 80 potentially responsible parties (PRPs) inviting those parties to participate in the allocation. Some of the parties have declined to do so, including, as you note, Occidental Chemical Corporation (OCC). That EPA's contractor AlterEcho, after consideration of the facts through the allocation, will assign a share to all 80 PRPs invited to participate does not make participation in the allocation process mandatory.

Your letter also states that EPA prohibited the parties from undertaking their own allocation. That is not the case. Rather than preventing the parties from undertaking an allocation, EPA initiated the allocation process because of the unwillingness (or inability) of the PRPs to undertake and complete their own allocation. For example, the Lower Passaic River Cooperating Parties Group (CPG) retained an allocator in 2015, but failed to complete the allocation. Similarly, in 2012, the CPG initiated an allocation effort intended to apply to the costs of the removal action at River Mile 10.9, an effort that also was unsuccessful. This track record is what has led EPA to offer the PRPs the opportunity to participate in the present allocation process.

Initially, EPA intended to facilitate a more limited allocation process than the present one. As you know, EPA intended to limit the allocation to parties not associated with the release of dioxin, furans and polychlorinated biphenyls (PCBs), the contaminants of concern (COCs) driving the remedy for OU2. Numerous parties contacted EPA, requesting that we expand the allocation process to include all the OU2 PRPs. After much consideration, EPA agreed to include all OU2 PRPs, apart from the PRPs that settle pursuant to EPA's "early" cash out settlement offered in March 2017, and the Passaic Valley Sewerage Commission and four municipal PRPs.

Further, EPA has responded to concerns raised by parties participating in the allocation and supplemented the allocation contract to allow the parties to submit additional documents, to provide additional time for the parties to consult with the allocator and to include an "off-ramp" in the allocation process.

Confidentiality

For the OU2 allocation, confidentiality is addressed in EPA's prime contract with CSRA (through which EPA retained AlterEcho), [1] and in the Task Order Statement of Work (SOW), pursuant to which AlterEcho is performing the allocation. The SOW, a copy of which was provided to the allocation parties, contains the confidentiality terms in EPA's agreement with CSRA-AlterEcho and references the Administrative Dispute Resolution Act of 1996 (ADR Act).

Section 2.0 of the SOW states, in relevant part:

> Unless otherwise noted herein, all allocation related communications by the CSRA Team involving the OU2 PRPs or representatives of EPA or DOJ, individually or in groups, will be held confidential pursuant to the provisions of the ADR Act of 1996, 5 USC 574.
>
> In order to ensure a common expectation of confidentiality, all PRP participants in the allocation process will be required to enter, and EPA will appropriately acknowledge, a confidentiality agreement.

Section 3.0 of the SOW reads, in relevant part:

> CSRA will approach this task in accordance with the basic terms of the contract and according to the established norms and ethical standards of ADR professionals. Except as otherwise noted herein, information provided to the ADR professional by any of the parties, including EPA, communications between parties and the ADR professional, and notes and dispute resolution work product generated by the ADR professional during

[1] The allocation parties were also provided with the web link (https://www.epa.gov/sites/production/files/2015-09/documents/adr_contract_sow.pdf) to EPA's prime contract with CSRA when the OU2 allocation SOW was provided to the parties.

work pursuant to the Task Order will be maintained as confidential by the ADR professional pursuant to the provisions of the ADR Act of 1996 (Public Law 104-320; 5 USC 571 et al.) and applicable federal, state and judicial requirements.

The information that is not confidential is noted in Section 4, Task 3 of the SOW that reads, in relevant part:

> The allocation process will be designed based upon information received during consultations with EPA and OU2 PRPs on the allocation database and using all relevant non-confidential received information, including data, records, and other documents.
>
> No confidential information will be included in the allocation database. Though to be designed for purposes of conducting the allocation, the database will be designed in such a way as to allow access and use by EPA and DOJ staff for their settlement purposes following submission of the Allocation Data Reports in Task 8.

Confidentiality is also addressed in the ADR Act, a federal statute that EPA, as a federal agency, is required to abide by even in the absence of a signed confidentiality agreement. The Interagency ADR Working Group, established by Presidential Memorandum dated May 1, 1998, provides guidance on the confidentiality provisions of the ADR Act at https://www.adr.gov/adrguide/ch29.html. In summary, the guidance states the following:

- The ADR Act affirmatively bans neutrals from voluntarily disclosing dispute resolution communications and any communication provided in confidence to the neutral unless one of four statutory exceptions apply (see guidance for exceptions).
- Parties to an ADR proceeding have a similar prohibition on releasing information unless one of seven exceptions apply. Those exceptions include the following (see guidance for a listing of all seven exceptions):
    - Dispute resolution communications relevant in disputes involving a settlement agreement reached in an ADR; and
    - A dispute resolution communication **(except those generated by the neutral)** that was provided or available to all parties to the ADR proceeding.
- The common law of evidence and Federal Rules of Evidence (FRE) 408 have long restricted the admission of settlement discussions – like those in ADR – into evidence to prove or disprove liability or a defense.
- It should be noted that confidentiality clauses in a settlement agreement may not withstand a request under FOIA

With the above guidance in mind, EPA has endeavored to protect the confidentiality of the OU2 allocation communications as much as possible in the following ways:

- EPA does not participate in the meetings between AlterEcho and the allocation parties.
- The allocation work plan specifies that AlterEcho will provide summaries of input obtained from the allocation parties at various steps in the allocation process, without attribution to contributions of individual participants.
- AlterEcho will not share with EPA the position briefs and reply briefs submitted by the allocation parties.

However, given the limitations in the ADR Act, there are allocation documents that EPA does not believe can be protected. First, the nexus documents contained in the document repository (or SharePoint site) are not confidential. In addition, EPA does not expect it will be able to protect the data in the allocation database from disclosure under FOIA or common law protection or privilege. Accordingly, the SOW specifies that "No confidential information will be included in the allocation database".[2] The allocation parties should not, therefore, include confidential information in their submissions to the document repository. If a document is within the categories of documents that must be submitted and certified to, and it contains confidential business information, it would be prudent to redact the protected information. If the allocation parties are concerned that the certification requires them to submit documents or material that is entitled to confidentiality under the attorney-client privilege or other privilege, that concern could be resolved by addressing the language of the certification.

With respect to the Allocation Data Reports and the draft and final Allocation Recommendation Reports, which are the work product of neutral but that the allocation parties and EPA will all receive and review, EPA has the following observations:

- In responding to a FOIA request, EPA may assert FOIA Exemption 3, which allows the withholding of information prohibited from release by another federal statute, in this case the ADR Act, as a basis to withhold disclosure of any confidential communication in the possession of an internal neutral. Note that this protection from disclosure pursuant to FOIA does not apply to communications not protected by the ADR Act, such as written communications shared directly by a party with all other parties to the process, even if the parties have agreed in writing that such communications are confidential. Also, because the contents of the Data Reports and the draft and final Allocation Recommendation Reports will be shared with the allocation parties and EPA, and will be relevant to any settlement that the United States is able to enter into, it is possible that

[2] Also note that the ADR Act does not protect documents that are exchanged during an ADR process but were produced for an entirely different purpose, and are not otherwise protected from disclosure, such as a document required to be prepared by regulation or discussions regarding an unrelated subject. Much of the information submitted by the allocation parties is likely to fall into this category.

the data reports and the final allocation report cannot be protected from disclosure under FOIA, unless they are deemed to comprise communications generated by the neutral, which under Section 574(7) would not be subject to release.

As described in EPA's September 18, 2017 letter, the OU2 allocation is intended to result in cash-out settlement offers from EPA to those parties that are not associated with the release or disposal of dioxin, furans and/or PCBs, and is also intended to identify those parties that should participate in consent decree negotiations for the performance of the remedial action for OU2 due to their association with the release or disposal of dioxin, furans and/or PCBs into the lower 8.3 miles of the Lower Passaic River.

Any settlement entered into by EPA will require public notice before becoming effective, thereby providing interested parties with an opportunity to comment on the proposed settlement. EPA will respond to comments received and may modify or withdraw from the proposed settlement if comments demonstrate that the proposed settlement is inappropriate, improper or inadequate. In responding to any such comments, and in seeking entry by the court of a consent decree, EPA will very likely need to rely on documentary evidence. EPA, along with the Department of Justice, will make every effort to use documents that are not confidential, such as those from the SharePoint site. However, even if the court were to request the Allocation Recommendation Report, EPA and the Department of Justice can take steps to protect it, such as objecting or moving to file it under seal.

We hope this letter clarifies for you EPA's position with respect to the various categories of information that will be part of the OU2 allocation process.

Sincerely,

Juan M. Fajardo
Assistant Regional Counsel

cc: David Batson, Esq., AlterEcho *(by email)*
Brian Donohue, Esq., USDOJ *(by email)*
Laura Rowley, Esq., USDOJ *(by email)*
David Moora, Esq., US EPA *(by email)*
Allocation Parties, Appendix A *(by email)*

ATTACHMENT B

LIST OF ALLOCATION PARTIES & RELATED FACILITIES

Allocation Parties & Related Facilities

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
21st Century Fox America, Inc. (21CFA)	> 100 Lister Ave. Newark, NJ	Chris-Craft Industries, Inc. Baldwin- Montrose Chemical Co. Montrose Chemical Co.
Alden Leeds Inc.	> 2145 McCarter Highway > 100 Hakensack Ave Newark, NJ > 55 Jacobus Avenue Kearny, NJ	Leeds Terminal Q-Pak
Alliance Chemical Inc.	> 33 Avenue P Newark, NJ	Pfister Pfister Urban Renewal Corporation
Arkema Inc. (Legacy Site Services)	> 25 & 67 Main Street Belleville, NJ	Wallace & Tiernan Elf Atochem North America Inc.
Ashland LLC	> 221 Foundry St. Newark, NJ	Ashland Chemical Company
Atlantic Richfield (ARCO)	> 86 Doremus Ave. Newark, NJ	The Atlantic Refining Company
Atlas Refining, Inc.	> 142 Lockwood St. Newark, NJ	
Automatic Electro Plating Corp.	> 185 Foundry Street Complex Newark, NJ (Bldgs 19, 21, 22)	
BASF Corporation on its own behalf, and on behalf of its wholly owned subsidiary, BASF Catalysts, LLC	> BASF Catalysts, LLC One West Central Avenue East Newark, NJ > BASF Corporation 50 Central Ave. Kearny, NJ	Hanovia Engelhard Corporation BASF Wyandotte Corporation United Cork
Benjamin Moore & Co	> 134 Lister Ave. Newark, NJ	

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Berol Corporation	> 41 Dickerson Street Newark, NJ	
Campbell Foundry Company	> 800 Bergen Street Harrison, NJ	
Canning Gumm LLC (c/o MacDermid Inc)	> 538 Forest Street Kearny, NJ	Frederick Gumm Chemical Co
CBS Corporation	> 95 Orange St. Newark, NJ	Westinghouse Electric Corporation
Celanese Ltd./CNA Holdings LLC (Essex County Improvement Authority - indemnitor of Celanese)	> 290 Ferry St > 226 Rome St > 354 Doremus Ave Newark, NJ	
Chevron Environmental Management Company	> Getty Newark Terminal 86 Doremus Ave. Newark, NJ	Texaco Inc. TRMI- H LLC
Coats and Clark Inc. (as successor to Clark Thread Company)	> 260 Ogden St/900 Passaic Ave Newark/East Newark, NJ > 735 Broad Street Bloomfield, NJ	Clark Thread Co.
Congoleum Corporation	> 195 Belgrove Drive > 113 Passaic Avenue Kearney, NJ	
Conopco, Inc d/b/a Unilever (as successor to CPC/Bestfoods, former parent of the Penick Corporation)	> 540 New York Avenue Lyndhurst, NJ	Penick Corporation

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Cooper Industries LLC	> 7, 13, & 26 Bank Street > 33 Littleton Avenue (aka 400 West Market Street) Newark, NJ > 75 Belmont Avenue Bellevile, NJ	J. Wiss & Sons Co Thomas A. Edison, Inc.
Covanta Essex Co.	> 183 Raymond Blvd > 66 Blanchard St Newark, NJ	American Ref-Fuel
Curtiss-Wright Corporation	> 1 Passaic St. Woodridge, NJ	
DII Industries, LLC (c/o Halliburton)	> 401 Worthington Avenue Harrison, NJ	Worthington Corp. & Dresser Industries, Inc.
Drum Service of Newark, Inc.	> 120 Lister Ave Newark, NJ	Hilton-Davis 360 North Pastoria
Elan Chemical Co., Inc.	> 268 Doremus Ave. Newark, NJ	
EnPro Holdings, Inc.	> 900-1000 South Fourth St. Harrison, NJ	Crucible Steel Co. Coltec Industries
EPEC Polymers	> 290 River Drive Garfield, NJ	
Essex Chemical Corporation	> 330 Doremus Ave. & > 352 Doremus Ave. Newark, NJ (contiuous lots)	Essex Industrial Chemicals, Inc.
Everett Smith Group	> 20 Bruen Street Newark, NJ	Blanchard Bro. & Lane, Inc.

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Foundry Street Corporation	> 185 Foundry Street Complex Newark, NJ (Block 5005, Lot 22 - Bldgs 19, 21, 22)	Automatic Electroplating Morrel Truck Grignard Honig Norpak Avon Berg County Lift Truck Conus Chemical Arkansas Chemical
Franklin-Burlington Plastics	> 113 Passaic Ave Kearny, NJ	Spartech
Garfield Molding Company, Inc.	> 10 Midland Avenue Wallington, NJ	
General Electric Company	> 415 South 5th Street > 1000 South 2nd Street Harrison, NJ	RCA
Givaudan Fragrances Corp (originally known as Fragrances North America)	> 125 Delawanna Avenue Clifton, NJ	Givaudan Roure
Goodrich Corp.	> Kalama Chemical 290 River Drive Garfield, NJ	Kalama Chemical, Inc.
Goody Products, Inc. on behalf of itself and Newell Brands Inc. (f/k/a Newell Rubbermaid Inc.)	> 969 Newark Turnpike Kearny, NJ	

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Hartz Consumer Group, Inc.	> 600/700 South 4th Street Harrison, NJ	
Hexcel Corporation	> 205 Main St. Lodi, NJ	
Hoffmann-LaRoche Inc.	> 340 Kingsland Road Nutley, NJ	
Honeywell International, Inc.	> 65 Lodi Street/8th Street Passaic, NJ	General Chemical Co.
ISP Chemicals LLC	> 1 Main St./11 William St. Belleville, NJ	ISP Van Dyk, Inc. International Specialty Products
Harris Corporation, for itself and as successor in interest to Exelis, Inc. successor in interest to the former defense business ITT Corporation	> 100 Kingsland Drive > 77 River Road Clifton, NJ (contiguous properties) > 500 Washington Avenue > 390 Washington Avenue > 417 River Road > 491/493 River Road > 483 River Road > 492 River Road Nutley, NJ (contiguous properties)	
Kearny Smelting	> 936 Harrison Ave. Kearny, NJ	MAC Metals
Leemilt's Petroleum, Inc. (successor by merger to Power Test of New Jersey, Inc.)	> 86 Doremus Ave. Newark, NJ	
Legacy Vulcan Corporation (f/k/a Vulcan Materials Company)	> 600 Doremus Ave. Newark, NJ	

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Lucent Technologies (now known as Nokia of America Corporation.)	> Kearny Works 100 Central Avenue Kearney, NJ	AT&T/Western Electric
National Standard LLC	> 714-716 Clifton Avenue Clifton, NJ	Iron Oxide Corp.
Newark Group, Inc.	> 17 Blanchard Street Newark, NJ	The Newark Boxboard Co.
Newark Morning Ledger Co.	> 1 Star Ledger Plaza Newark, NJ	
Neu Holdings (f/k/a Eden Wood Corporation)	> 1 Ackerman Avenue Clifton, NJ	Whippany Paper Board
Occidental Chemical Corp.	> 80 & 120 Lister Ave. Newark, NJ	Diamond Shamrock Chemicals Company
The Okonite Company, Inc.	> Canal and Jefferson Streets Passaic, NJ	
Otis Elevator Co.	> 1000 First St Harrison, NJ	
Pabst Brewing Company	> 400 Grove Street Newark, NJ	
Passaic Pioneer Properties Co	> 35 Eighth Street > 65 Lodi Street/8th Street Passaic, NJ	Eclipse Interstate Dyeing Parra Sun Brite

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Pharmacia LLC	> Foot of Pennsylvania Ave. Kearny, NJ	Monsanto Company (now known as Pharmacia LLC)
Pitt-Consol Chemical Company	> 191 Doremus Ave. Newark, NJ	
PMC, Inc.	> 450 Schuyler Avenue Kearny, NJ	American Polymers Ampol HD Acquisitions K&M Plastics King Finishing Kleer Kast Plastics Manufacturing
PPG Industries, Inc.	> 29 Riverside Ave. Newark, NJ	
PSEG (Public Service Enterprise Group)	> 155 Raymond BlvdNewark, NJ > 4th St. Harrison, NJ	
Purdue Pharma Technologies	> 199 Main St. Lodi, NJ	Napp Technologies
Quality Carriers, Inc.	> 80 Doremus Avenue Newark, NJ	Chemical Leaman Tank Lines Quala Systems, Inc.
Revere Smelting & Refining Corp / RSR Corp	> 387 Avenue P Newark, NJ	
Roman Asphalt Corporation	> 14 Ogden Street Newark, NJ 07104	

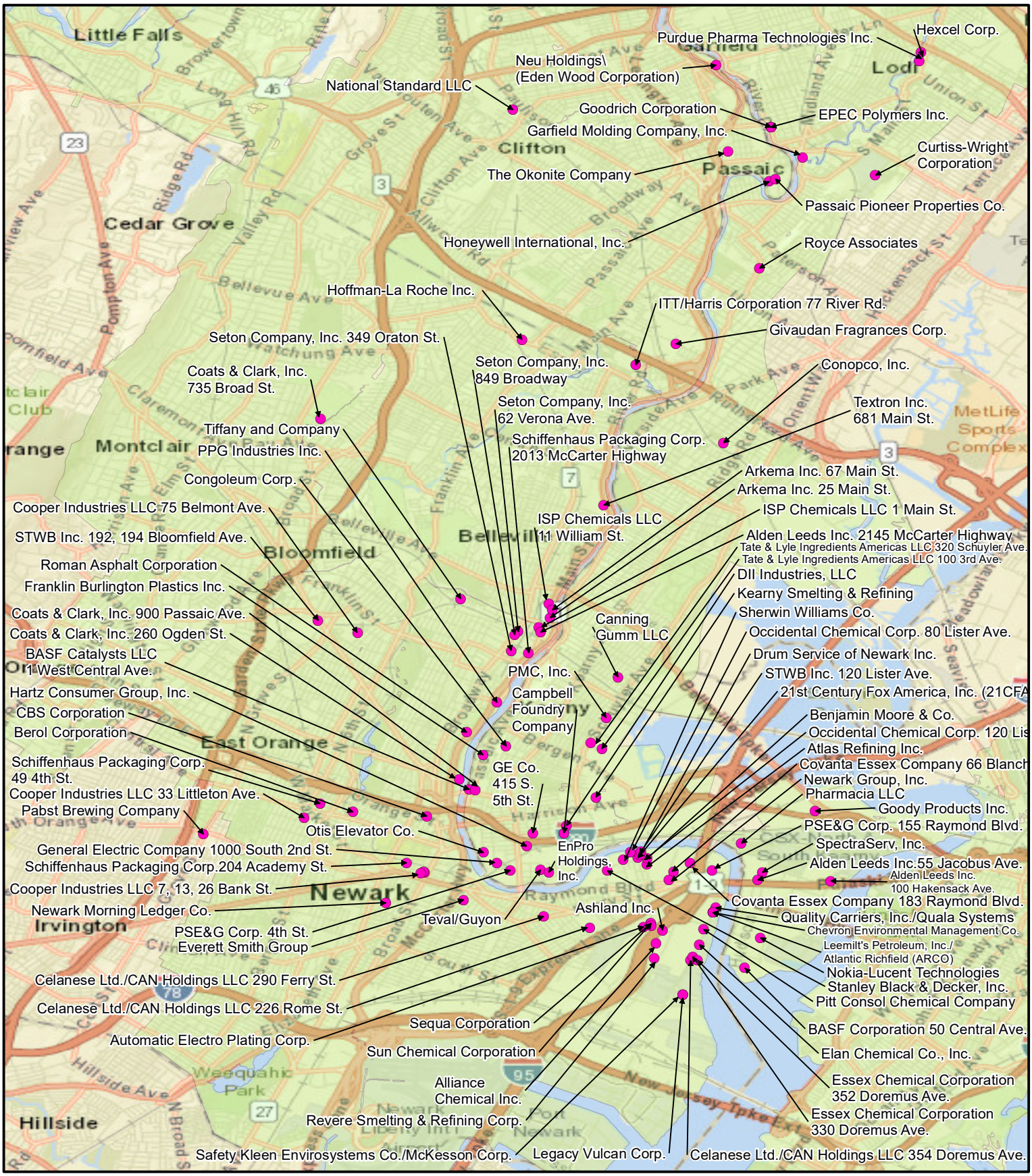
Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Royce Associates	> 17 Carlton Avenue East Rutherford, NJ	Royce Chemical Company
Safety Kleen Envirosystems Company/McKesson Corp.	> 600 Doremus Ave. Newark, NJ	McKesson Envirosystems Company/McKesson Corp. Inland Chemical Corporation
Schiffenhaus Packaging Corp. (c/o Rock-Tenn Company)	> 204 Academy Street > 49 Fourth Street > 2013 McCarter Highway Newark, NJ	Southern Consolidated
Sequa Corporation	> 185 Foundry Street Newark, NJ	
Seton Company, Inc. (now Seton Tanning)	> 349 Oraton Street > 849 Broadway > 62 Verona Ave Newark, NJ 07104	Radel Seton Leather Company
Sherwin Williams Company	> 60 Lister Ave. Newark, NJ	
Spectraserv, Inc.	> 75 Jacobus Ave Kearny, NJ	Modern Transportation
Stanley Black & Decker, Inc. (formerly known as The Stanley Works)	> 140 Chapel St. Newark, NJ	Stanley Tools Atha Tool Company
STWB Inc. (c/o Bayer Corporation)	> 192-194 Bloomfield Avenue Bloomfield, NJ 07003 > 120 Lister Ave. Newark, NJ	Lehn & Fink Products Corp. Thomasett Colors/Sterling Hilton-Davis Chemical Company

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Sun Chemical	> 185 Foundry Street Newark, NJ	
Tate & Lyle Ingredients Americas LLC (A.E. Staley Maufacturing Company & its former division Staley Chemical Company)	> 320 Schuyler Avenue & > 100 Third Avenue Kearny, NJ	
Teval Corporation	> 900-1000 South 4th Street Harrison, NJ	Guyon Pipe Crucible Steel Van Leeuwen Smith International
Textron Inc.	> Spencer Kellogg Division 400 Doremus Avenue Newark, NJ > 681 Main Street Belleville, NJ	
Tiffany and Company	> 820 Highland Avenue Newark, NJ	

ATTACHMENT C

FACILITY LOCATION AND PVSC SEWER SYSTEM MAPS

ALLOCATION PARTY FACILITY LOCATIONS



Allocation Facilities

Lower Passic River

Allocation Facilities

PVSC Service Area

ALTERECHO
plan - act - grow

0 1.25 2.5 5 Miles

N



Allocation Facilities & Historic Fill

River Mile 1 of the Lower Passaic River

ALTERECHO
plan · act · grow

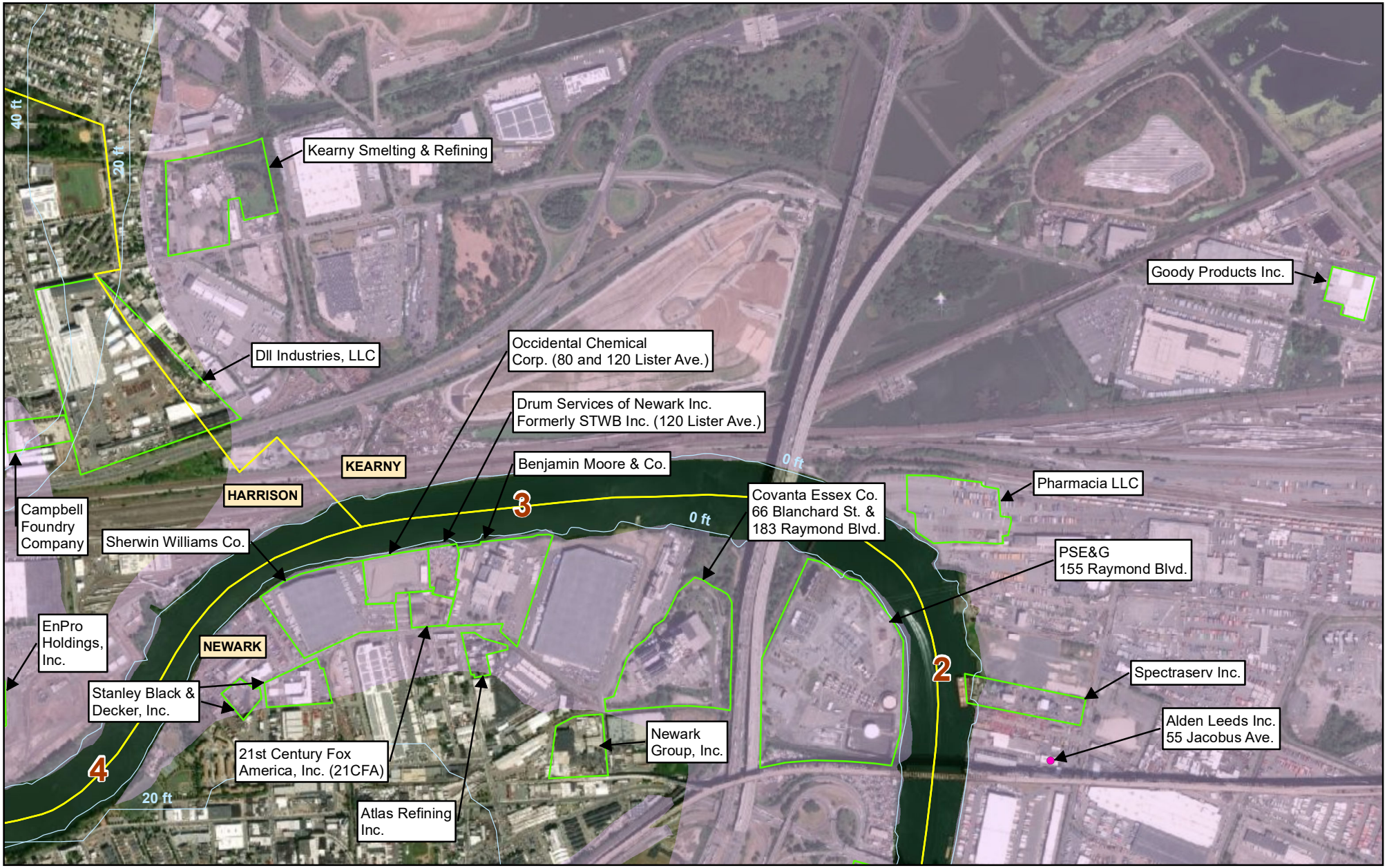
0 250 500 1,000 Feet

N

- Allocation Facility Location
- Allocation Facility Property Boundary
- Historic Fill
- Municipality
- Contour Elevations (ft above sea level)
- # River Mile

NOTE:
When only a point symbol is present for an Allocation Facility, no Polygon facility property boundary could be attained.





Allocation Facilities & Historic Fill

River Miles 2-4 of the Lower Passaic River

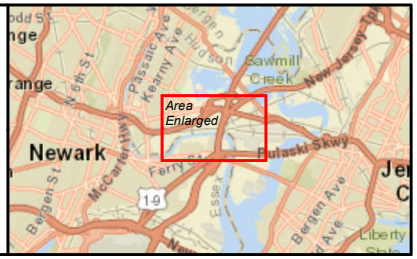
ALTERECHO plan · act · grow

0 500 1,000 2,000 Feet

N

- Allocation Facility Location
- Allocation Facility Property Boundary
- Historic Fill
- Municipality
- Contour Elevations (ft above sea level)
- # River Mile

NOTE:
When only a point symbol is present for an Allocation Facility, no Polygon facility property boundary could be attained.





Allocation Facilities & Historic Fill

River Miles 4-6 of the Lower Passaic River

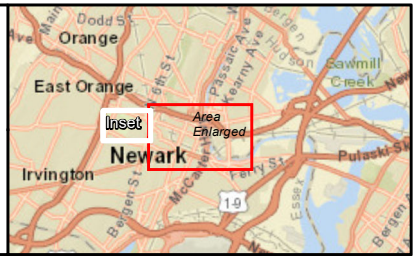
ALTERECHO plan · act · grow

0 500 1,000 2,000 Feet

N

- Allocation Facility Location
- Allocation Facility Property Boundary
- Historic Fill
- Municipality
- Contour Elevations (ft above sea level)
- # River Mile

NOTE:
When only a point symbol is present for an Allocation Facility, no Polygon facility property boundary could be attained.





Allocation Facilities & Historic Fill

River Miles 6-8 of the Lower Passaic River

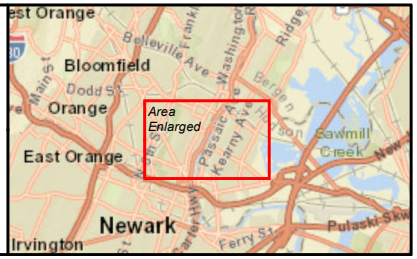
ALTERECHO
plan · act · grow

0 500 1,000 2,000
Feet

N

- Allocation Facility Location
- Allocation Facility Property Boundary
- Historic Fill
- Municipality
- Contour Elevations (ft above sea level)
- # River Mile

NOTE:
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Allocation Facilities & Historic Fill

River Miles 8-10 of the Lower Passaic River

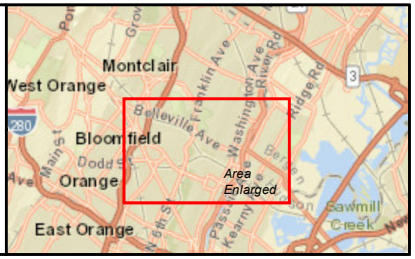
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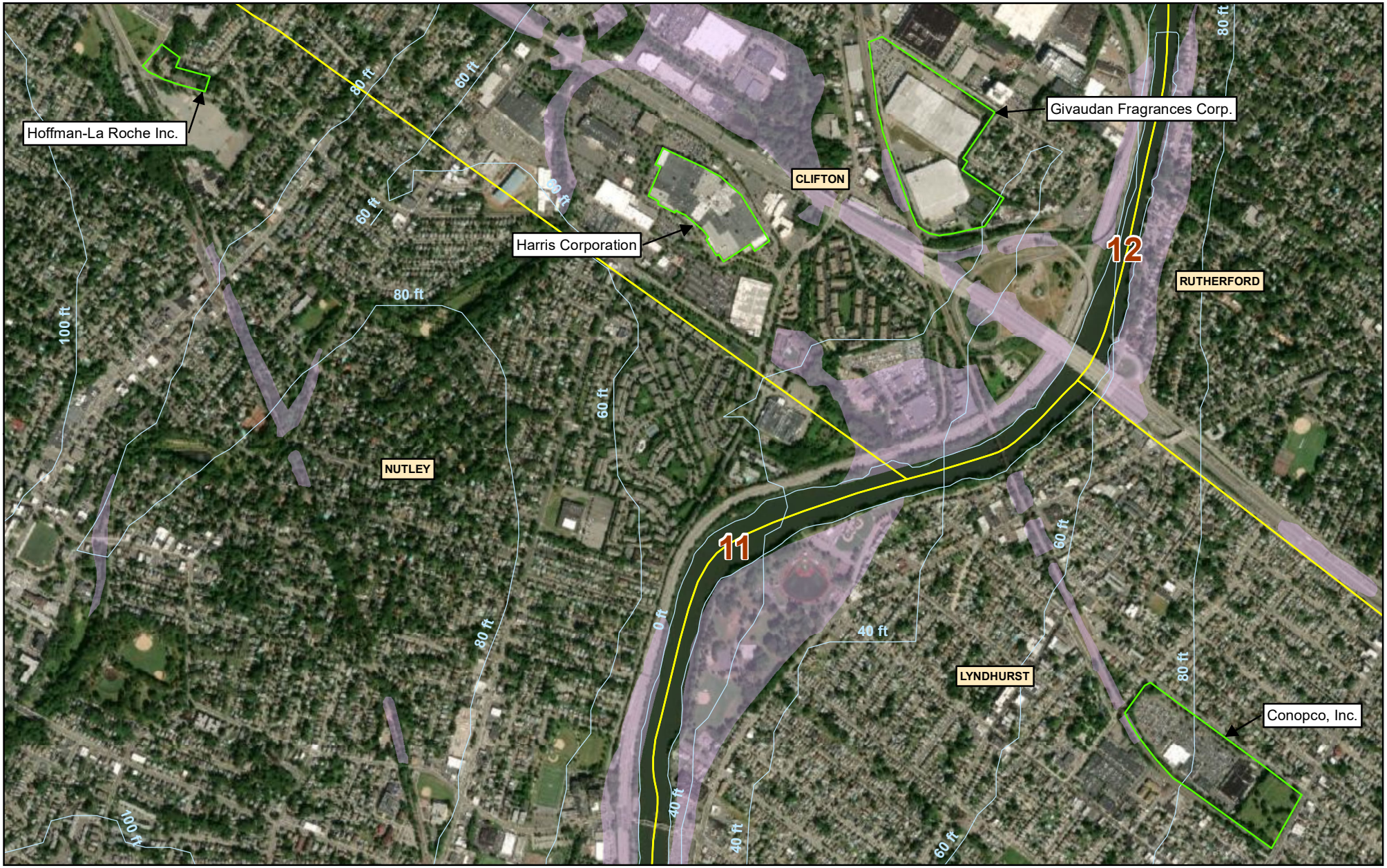
0 750 1,500 3,000
Feet

N

- Allocation Facility Location
- Allocation Facility Property Boundary
- Historic Fill
- Municipality
- Contour Elevations (ft above sea level)
- # River Mile

NOTE:
When only a point symbol is present for an Allocation Facility, no Polygon facility property boundary could be attained.





Allocation Facilities & Historic Fill

River Miles 11-12 of the Lower Passaic River

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0 500 1,000 2,000
Feet

N

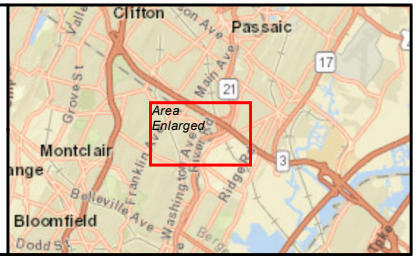
Allocation Facility Property Boundary

Historic Fill

River Mile

Municipality

Contour Elevations (ft above sea level)





Allocation Facilities & Historic Fill

River Miles 13-16 of the Lower Passaic River

ALTERECHO
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0 500 1,000 2,000
Feet

N

- Allocation Facility Location
- Allocation Facility Property Boundary
- Historic Fill
- Municipality
- Contour Elevations (ft above sea level)
- # River Mile

NOTE:
When only a point symbol is present for an Allocation Facility, no Polygon facility property boundary could be attained.





Allocation Facilities & Historic Fill

River Miles 16-17 of the Lower Passaic River

ALTERECHO
plan · act · grow

0 500 1,000 2,000
Feet

N

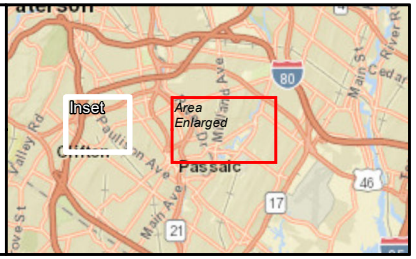
Allocation Facility Property Boundary

Historic Fill

\# River Mile

Municipality

Contour Elevations
(ft above sea level)



PVSC SEWER COLLECTION FIELDS



CSO Collection Areas

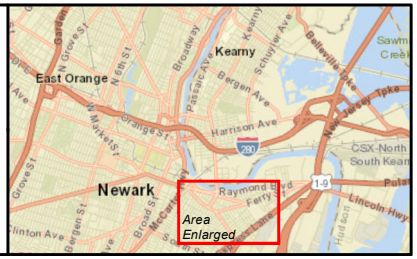
Jackson St., Polk St., and Freeman St. at River Mile 4

ALTERECHO plan · act · grow

0 500 1,000 Feet

N

CSO (Combined Sewer Overflow)
CSO Collection Area
Allocation Facility Location
Allocation Facility Property Boundary
Municipality
Regulator
PVSC Trunk Line
Sanitary Sewer
Combined Sewer
Stormwater Sewer
River Mile
Bypass





CSO Collection Area

City Dock at River Mile 5

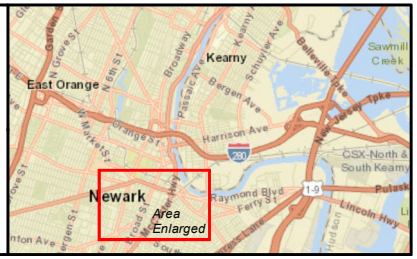
ALTERECHO plan · act · grow

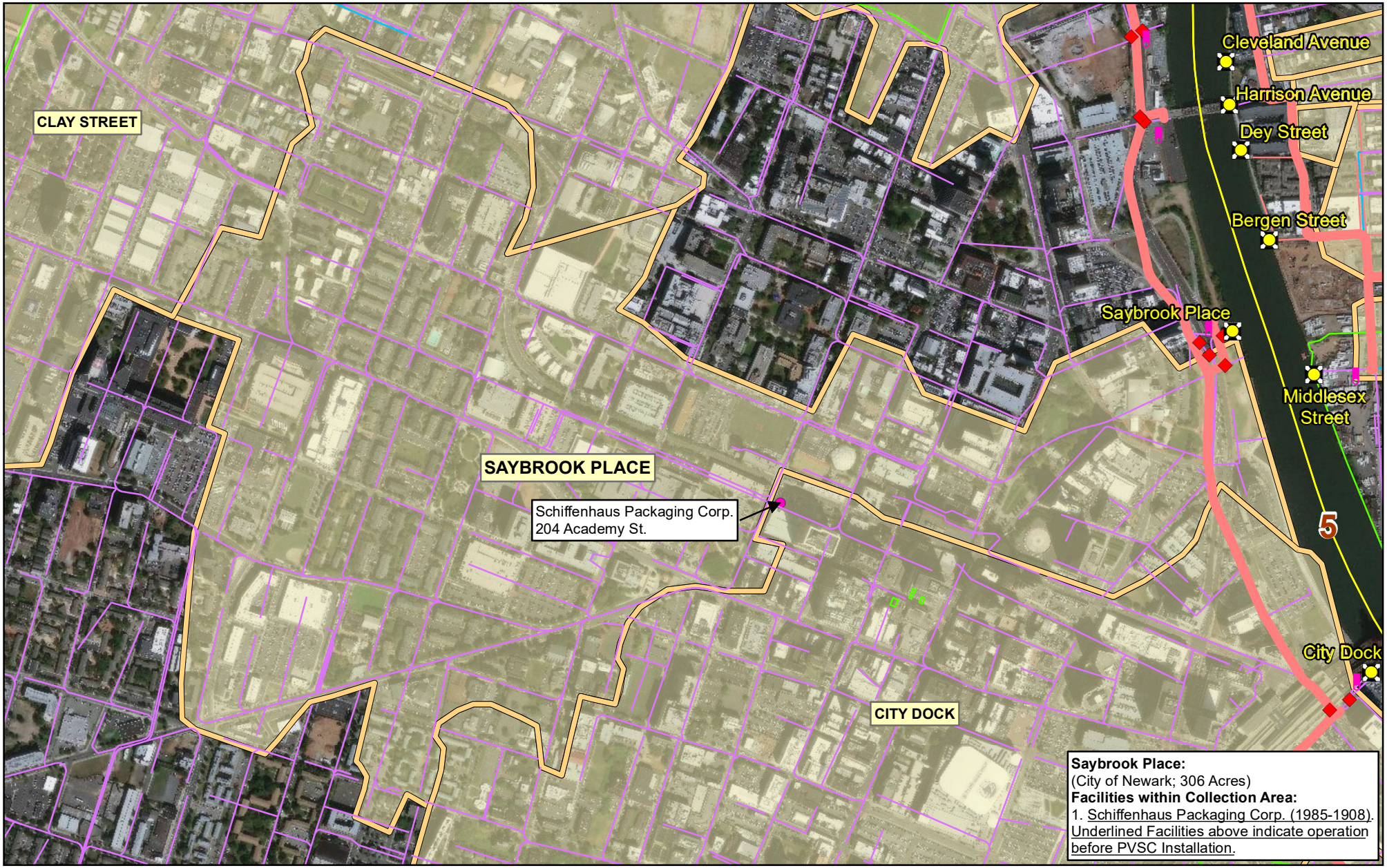
0 500 1,000 Feet

N

- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- Regulator
- Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer
- River Mile

NOTE:
When only a point symbol is present for an Allocation Facility, no Polygon facility property boundary could be attained.





CSO Collection Area

Saybrook Place at River Mile 5

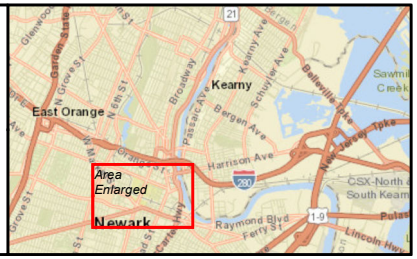
ALTERECHO plan · act · grow

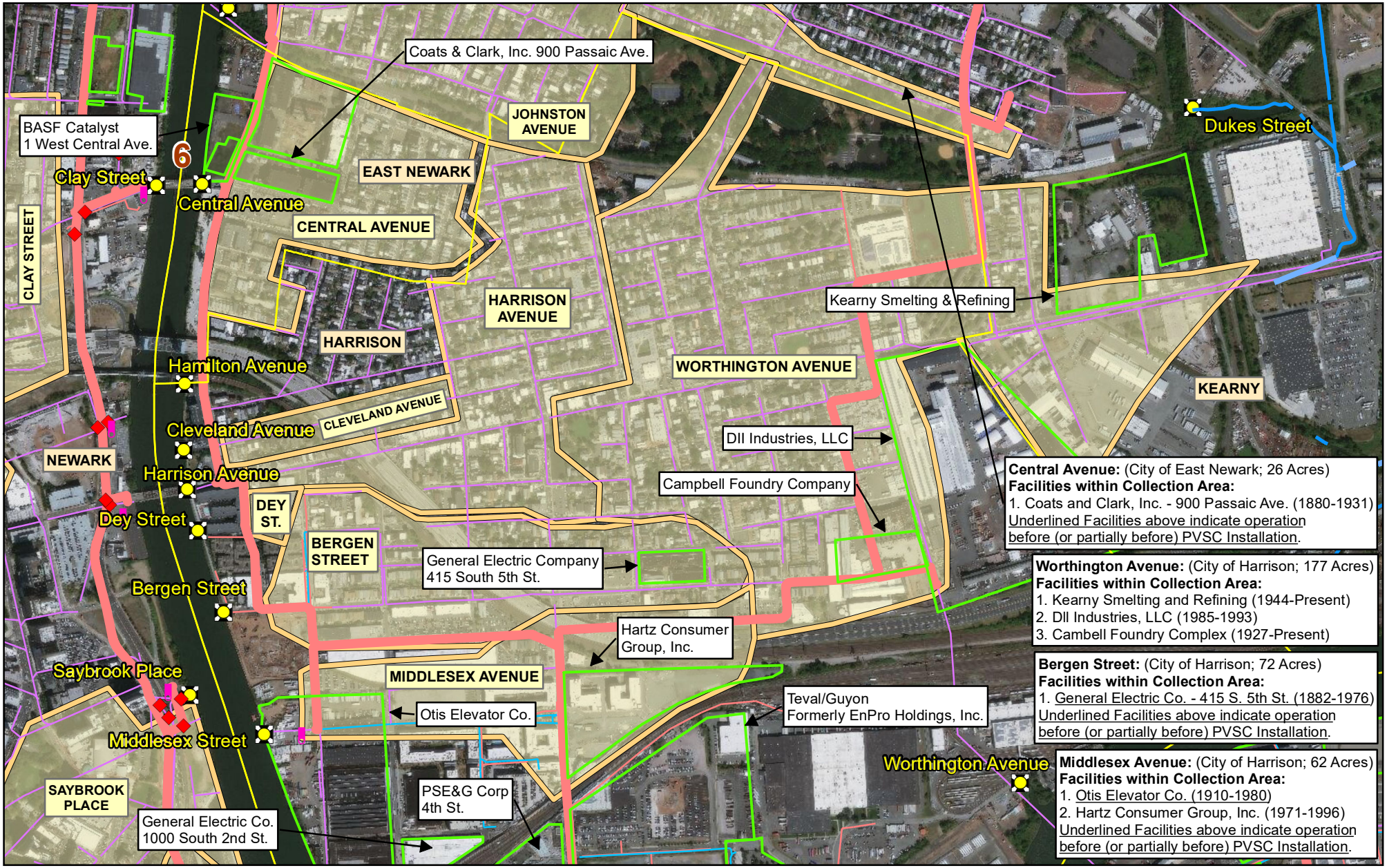
0 500 1,000 Feet

N

- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- River Mile
- Regulator
- Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer

NOTE:
When only a point symbol is present for an Allocation Facility, no Polygon facility property boundary could be attained.





CSO Collection Areas

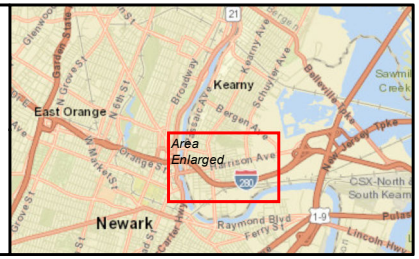
Central Ave., Worthington Ave., Bergen St., Middlesex Ave. at River Miles 5-6

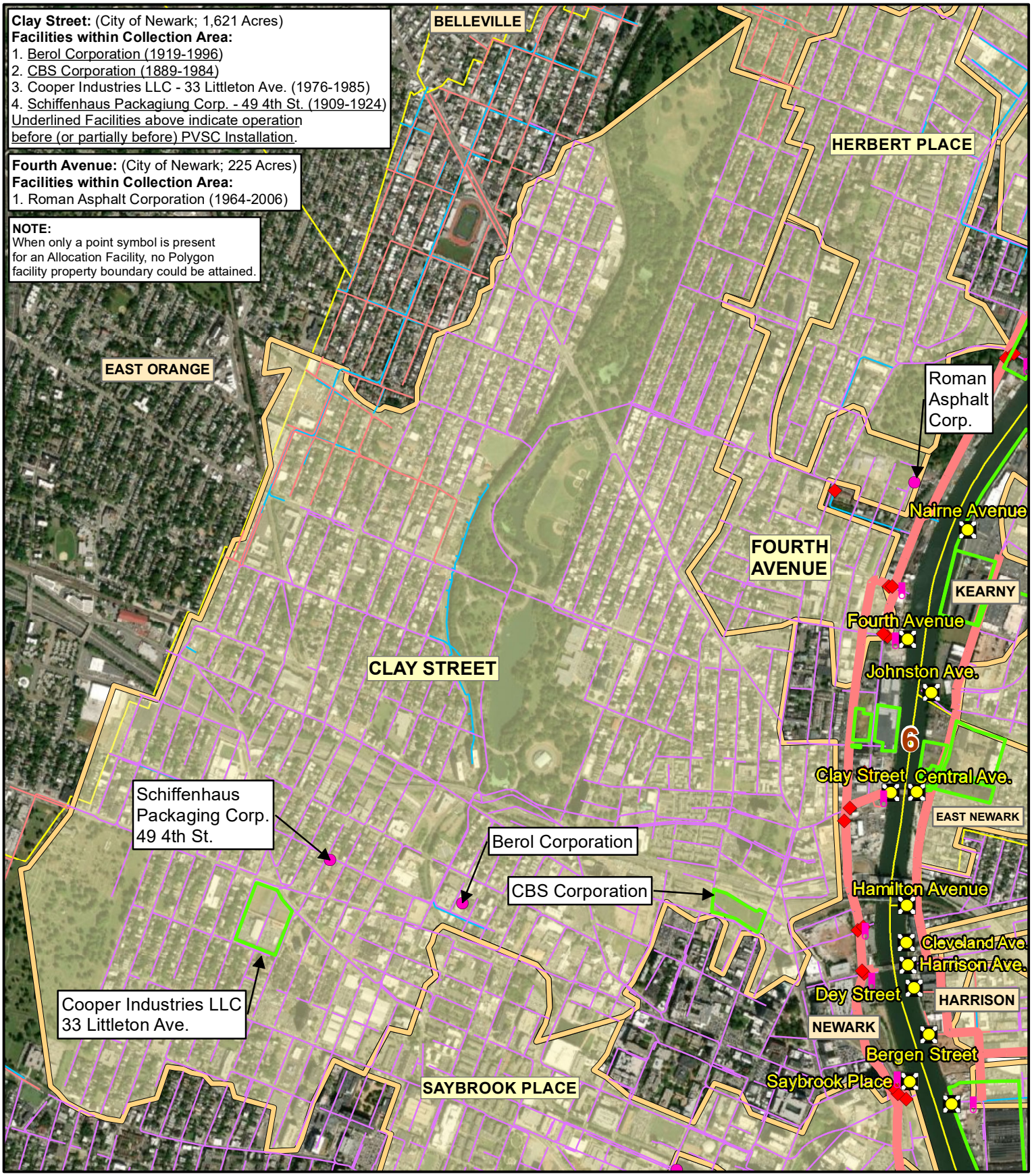
ALTERECHO plan · act · grow

0 500 1,000 Feet

N

- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- Regulator
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer
- Bypass
- River Mile
- Waterway





CSO Collection Areas

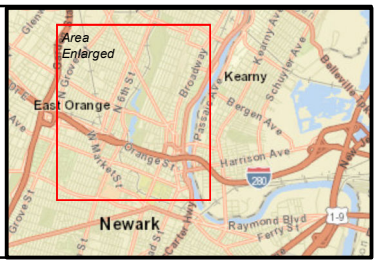
Clay St. & Fourth Ave. at River Mile 6

ALTERECHO plan · act · grow

0 500 1,000 2,000 Feet

N

- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- River Mile
- Regulator
- Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer
- Waterway





CSO Collection Areas

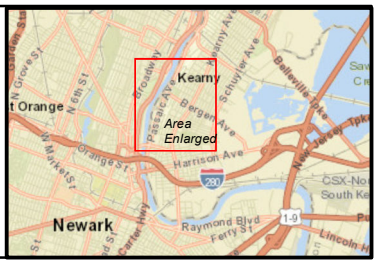
Johnston Avenue at River Miles 6-7

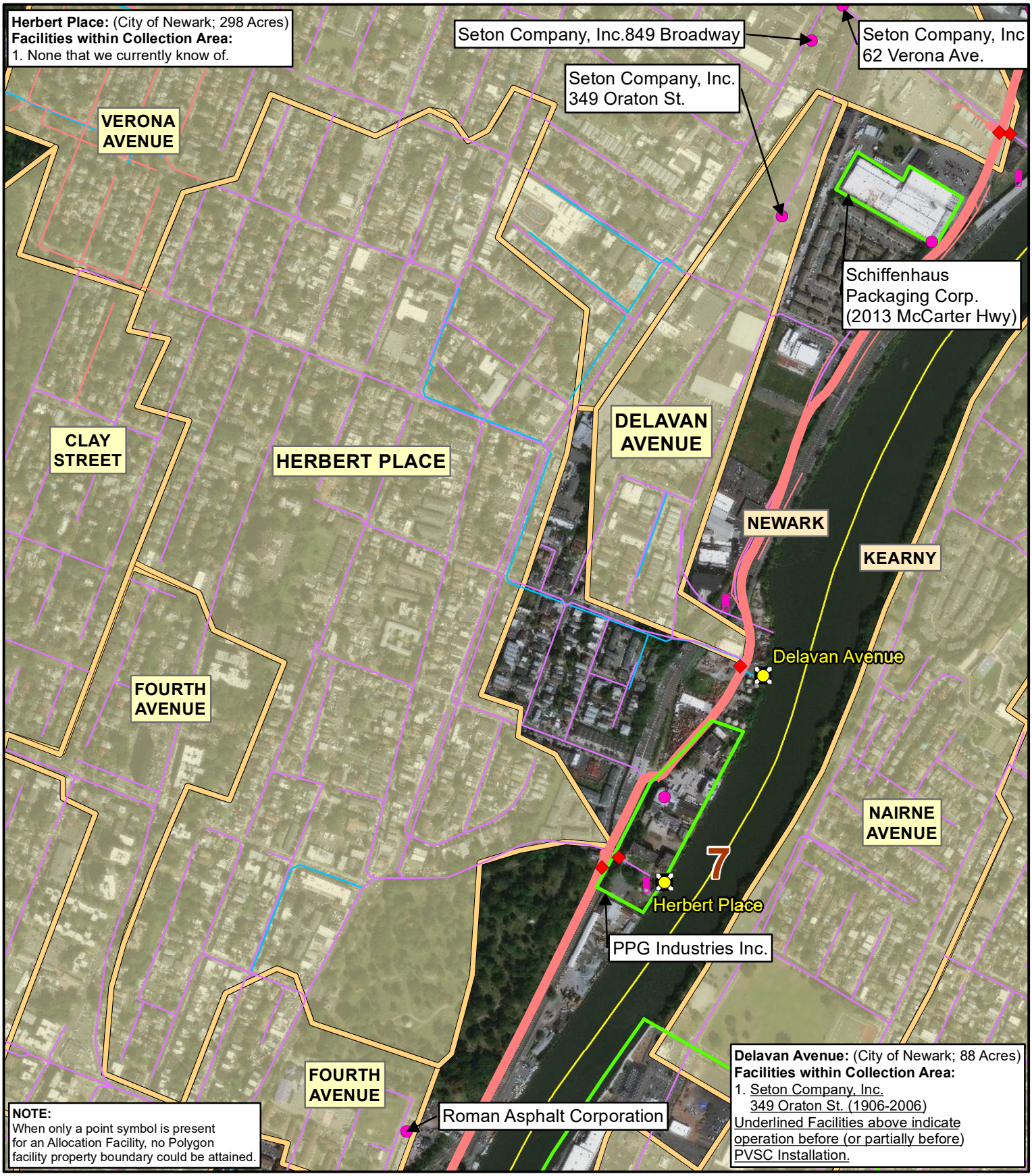
ALTERECHO plan · act · grow

0 250 500 Feet

N

- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- Regulator
- Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer
- # River Mile





CSO Collection Areas

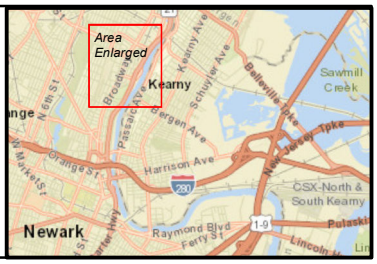
Herbert Place and Delavan Avenue at River Mile 7

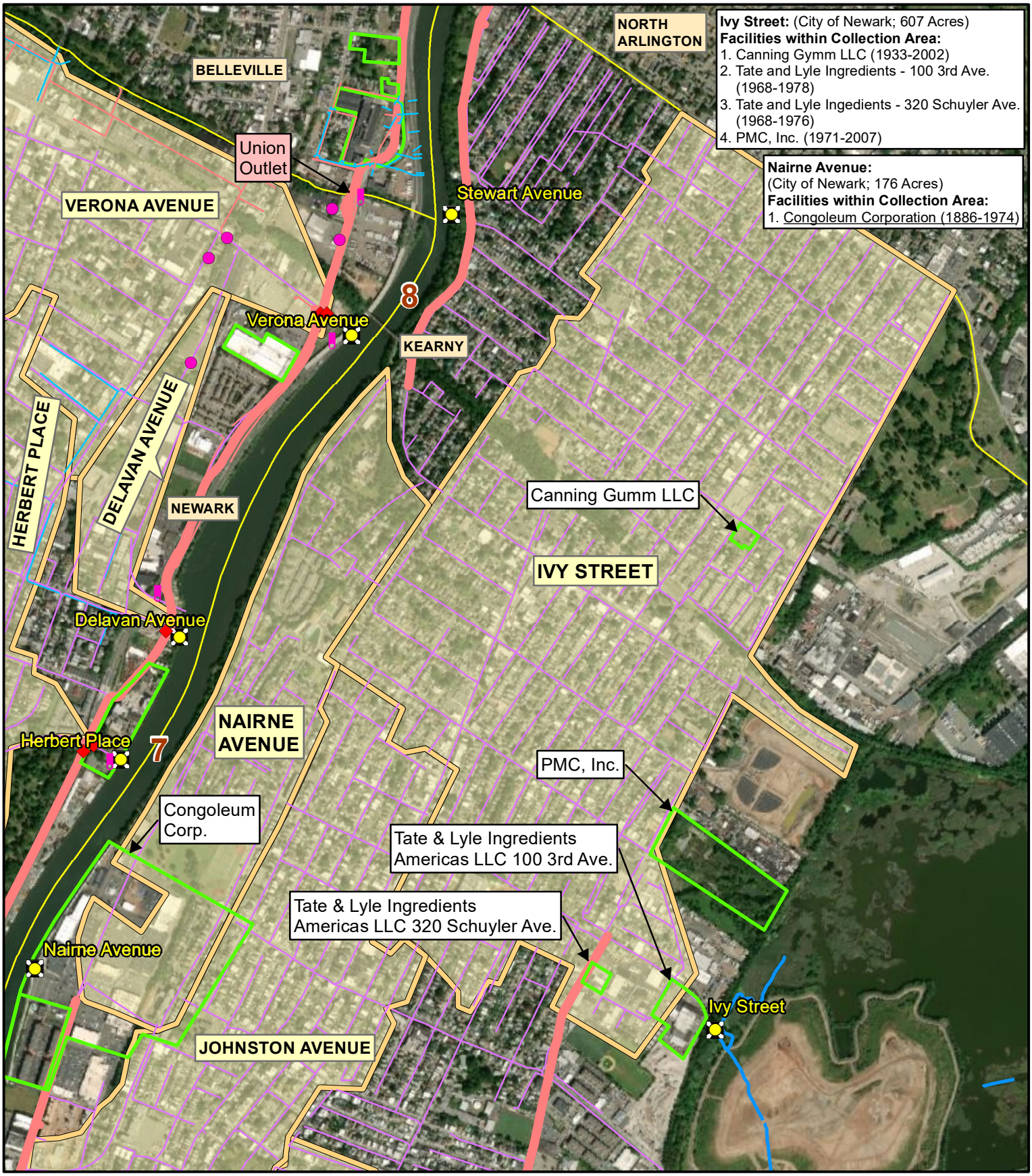
ALTERECHO plan · act · grow

0 250 500 Feet

N

- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- River Mile
- Regulator
- Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer





CSO Collection Areas

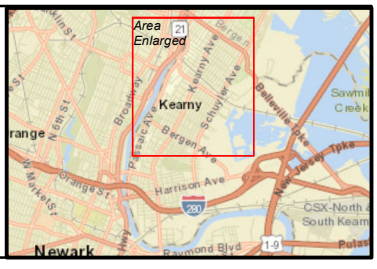
Ivy St. & Nairne Ave. at River Miles 7-8

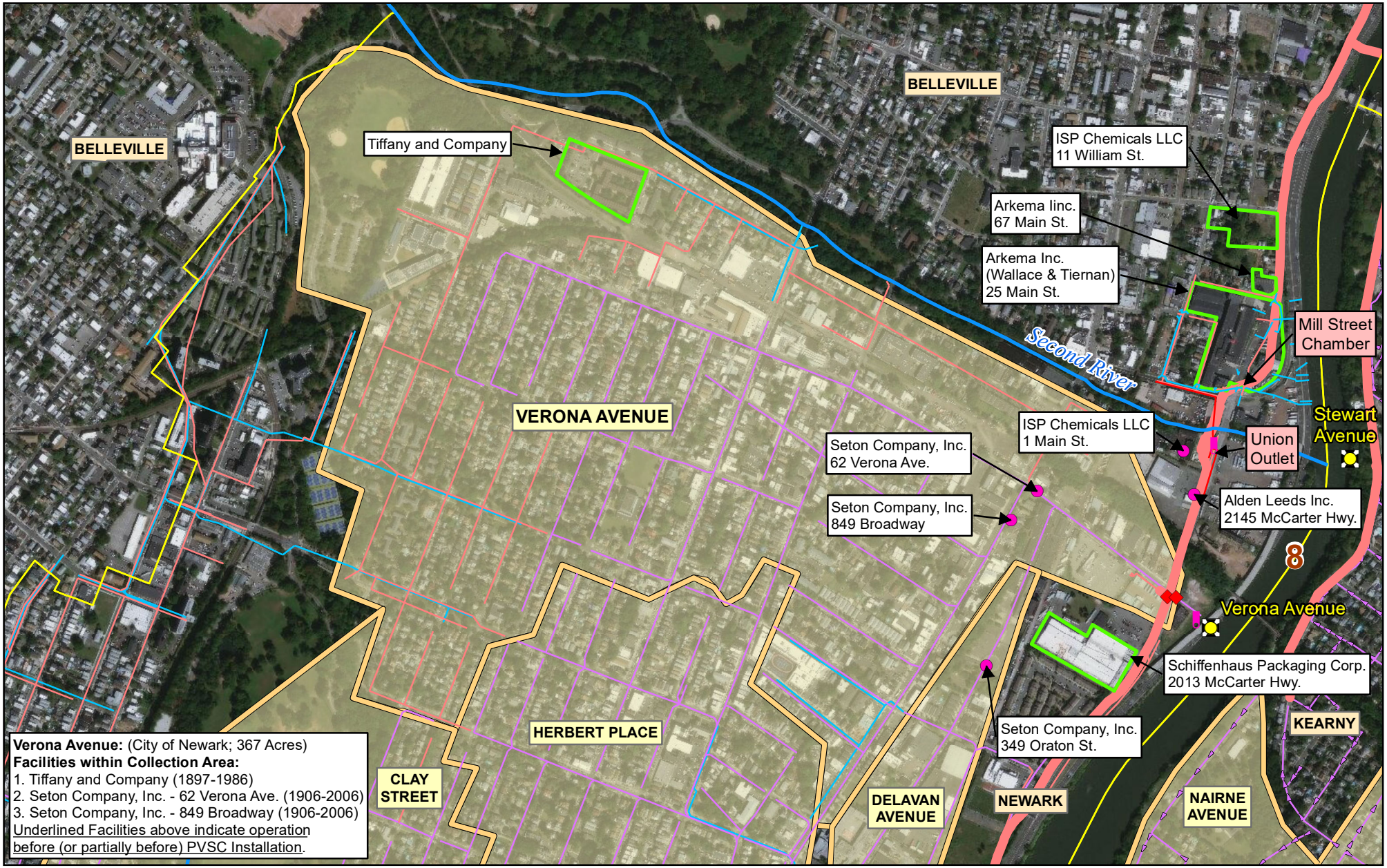
ALTERECHO plan · act · grow

0 500 1,000 Feet

N

- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- # River Mile
- Regulator
- Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer
- Waterway





CSO Collection Area

Verona Avenue & Union Outlet at River Mile 8

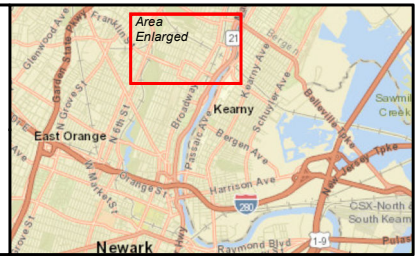
ALTERECHO plan · act · grow

0 500 1,000 Feet

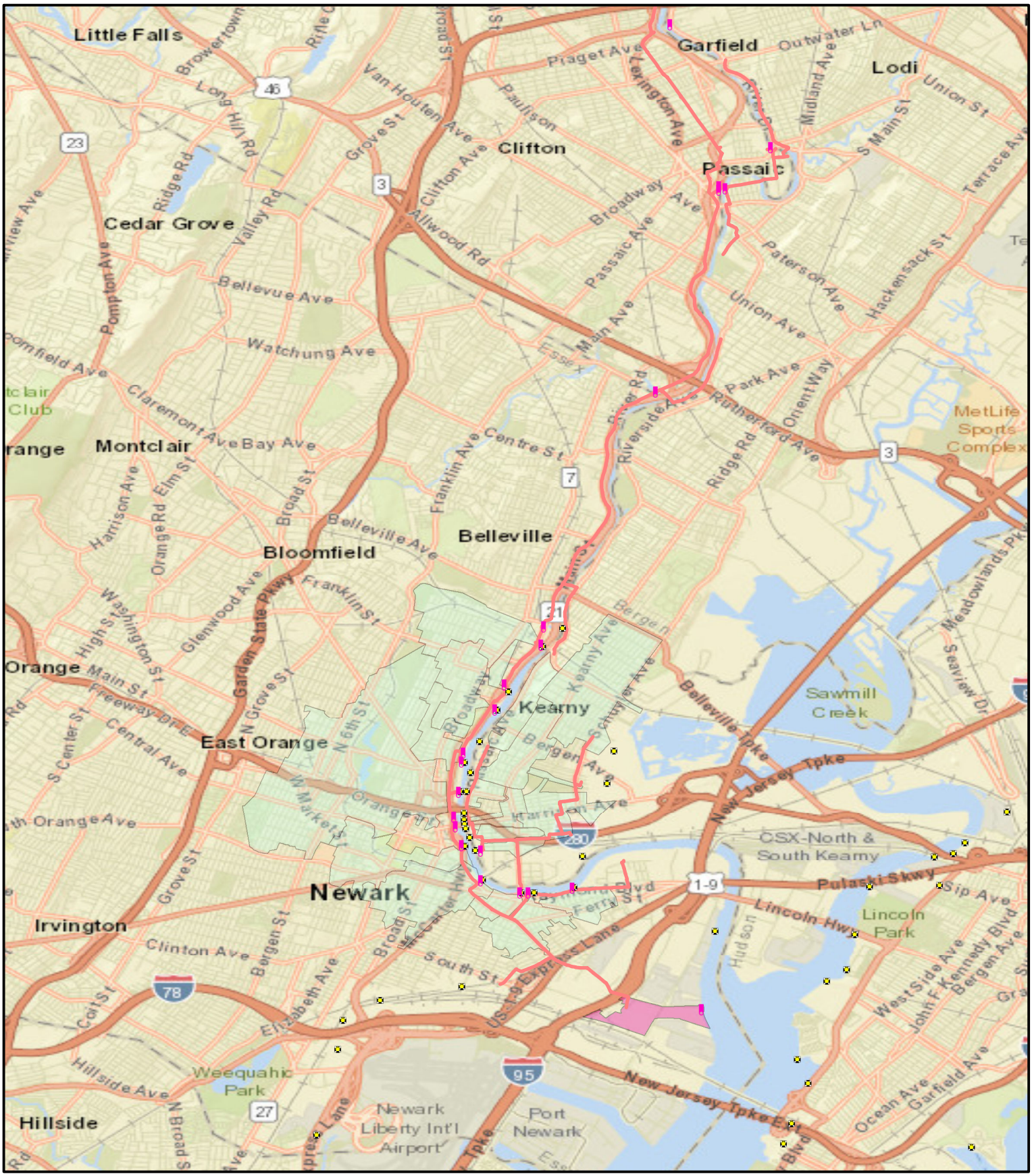
N

- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- River Mile
- Regulator
- Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer
- Union River Outlet

NOTE:
When only a point symbol is present for an Allocation Facility, no Polygon facility property boundary could be attained.



PVSC SEWER SYSTEM


Little Falls
Garfield
Lodi
Clifton
Passaic
Cedar Grove
Montclair
Belleville
Bloomfield
Orange
East Orange
Kearny
Newark
Irvington
Hillside
Weequahic Park
Newark Liberty Int'l Airport
Port Newark
Sawmill Creek
CSX-North & South Kearny
Lincoln Park
MetLife Sports Complex
Garden State Pkwy
New Jersey Tpke
Pulaski Skwy
Lincoln Hwy
US-1-9 Express Lane
New Jersey Tpke Ext
Belleville Tpke
Bergen Ave
Broad St
Main St
Clinton Ave
Hillside Ave
Ocean Ave
Garfield Ave
Union Ave
Park Ave
Rutherford Ave
Orient Way
Hackensack St
Paterson Ave
Passaic Ave
Broadway
Lexington Ave
Piaget Ave
Outwater Ln
Midland Ave
Union St
S Main St
Terrace Ave
Van Houten Ave
Grove St
Paulison
Clifton Ave
Allwood Rd
Valley Rd
Ridge Rd
Long Hill Rd
Browertown
Rifle
Pompton Ave
Bellevue Ave
Watchung Ave
Claremont Ave
Bay Ave
Harrison Ave
Elm St
Orange Rd
Broad St
Belleville Ave
Franklin Ave
Centre St
Essex
Main Ave
River Rd
Riverside Ave
Ridge Rd
Rutherford Ave
Orient Way
Meadowlands Pkwy
Seaview Dr
Franklin St
Glenwood Ave
Washington St
High St
Main St
Freeway Dr E
Central Ave
S Center St
N Grove St
N 6th St
Orange Ave
W Market St
Grove St
Bergen St
Clinton Ave
Elizabeth Ave
Carl St
South St
Ferry St
Hudson
Kearny Ave
Schuyler Ave
Harrison Ave
Bergen Ave
Broadway
Central Ave
Orange Ave
Sip Ave
John F Kennedy Blvd
West Side Ave
Bergen Ave
Gra
Spring St
N Broad St
Express Lane
Tpke
Blvd
Esse
Bergen
Orange
Harrison
Ferry St
Hudson
Kearny
Schuyler
Belleville
Sawmill
Creek
Meadowlands Pk
Seaview Dr
Lincoln
Park
Sip Ave
John F Kennedy Blvd
West Side Ave
Bergen Ave
Gra



Facilities within City of Newark:

1. 21st Century Fox America, Inc. (1939-1972)
2. Alliance Chemical, Inc. (1945-2001)
3. Ashland, Inc. (1968-1992)
4. Atlantic Richfield ARC) (1930-1951)
5. Atlas Refining Inc. (1897-Present)
6. Automatic Electro Plating Corp. (1970-2005)
7. Celanese Ltd./CAN Holdings LLC 354 Doremus Ave. (1954-1996)
8. Chevron Env Management Co. (1951-1984)
9. Covanta Essex Co. - (1990-Present)
10. Elan Chemical Co., Inc. (1977-Present)
11. Essex Chemical Co. (1955-1989)
12. Foundry Street Corp. (1970-2001)
13. Leemilt's Petroleum, Inc. (1985-1997)
14. Legacy Vulcan Corp. (1952-1975)
15. Newark Group, Inc. (1912-2003)
16. Pitt Consol Chemical Co. (1955-1983)
17. PSE&G Essex - 155 Raymond Blvd. (1915-Present)
18. Quality Carriers, Inc./Quala Systems (1970-2007)
19. Revere Smelting & Refining Corp. (1970-1972)
20. Safety Kleen Envirosystems Co./ McKesson Corp. (1975-1982)
21. Sequa Corp. (1967-1986)
22. Sun Chemical Corp. (1986-2003)

Underlined Facilites above indicate operation before (or partially before) PVSC installation.

NOTEa:

1. Roanoke Avenue CSO is owned and operated by the City of Newark (constructed in 1983).
2. Kearny Point Facilities are features in a separate figure.

Sewer Network

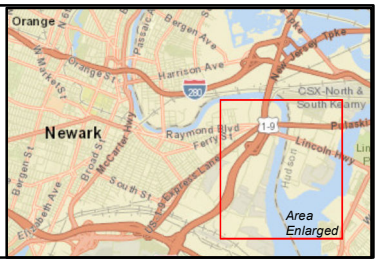
River Miles 1-2, Lower Passaic River

ALTERECHO plan · act · grow

0 500 1,000 Feet

N

- CSO (Combined Sewer Overflow)
- Newark Bay Bypass
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- River Mile
- Regulator
- POTW
- POTW Oufall
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer





Sewer Network

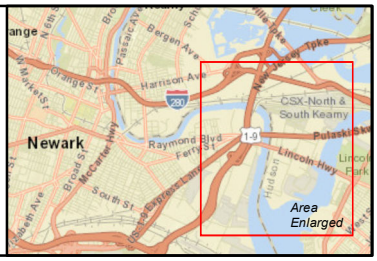
Kearny Point at River Miles 1-2

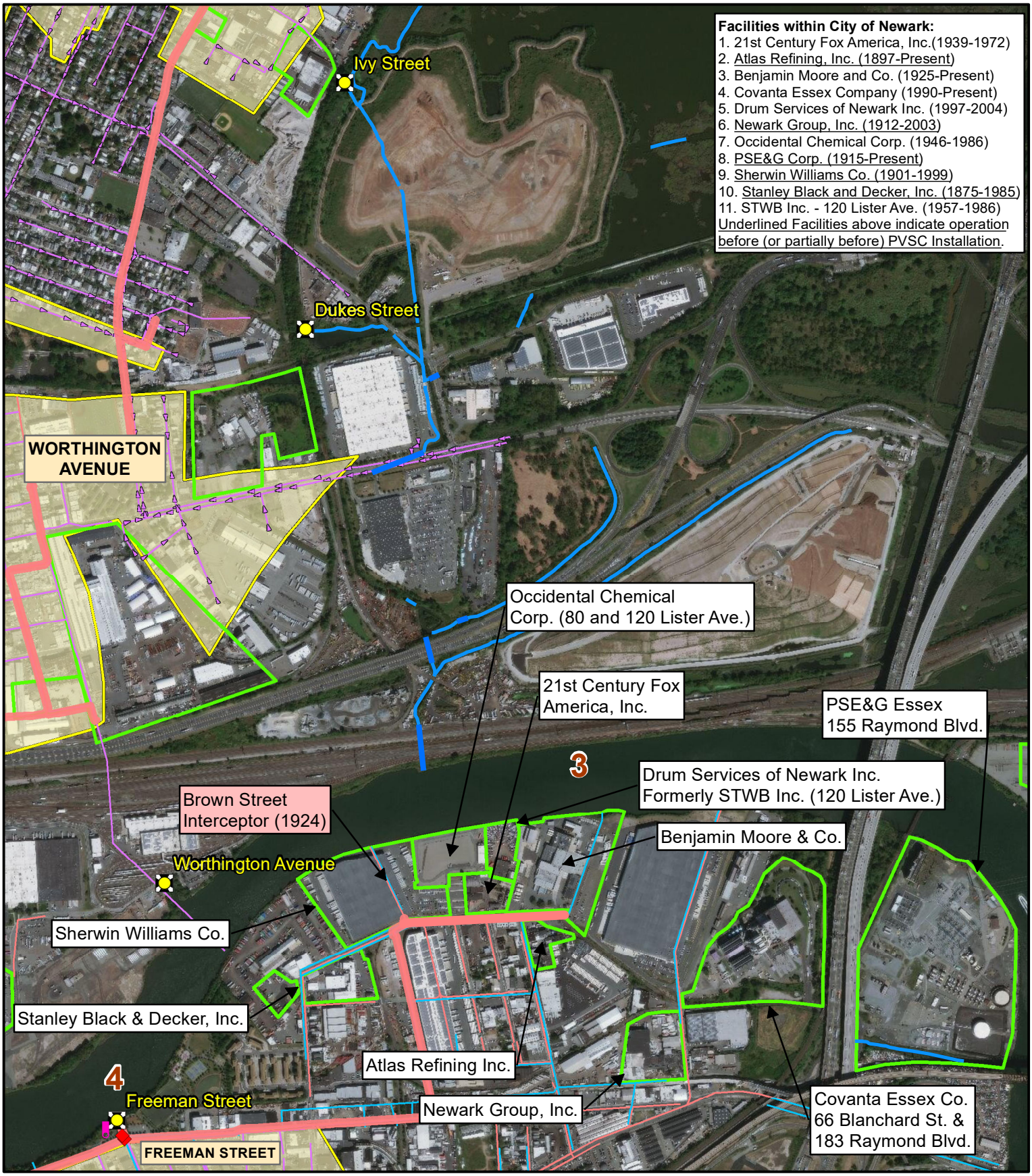
ALTERECHO plan · act · grow

0 500 1,000 Feet

N

- CSO (Combined Sewer Overflow)
- Bypass
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- River Mile
- Regulator
- POTW
- POTW Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer





Sewer Network

River Miles 2-4, Lower Passaic River

ALTERECHO plan · act · grow

0 500 1,000 Feet

N

CSO Collection Area

CSO (Combined Sewer Overflow)

Allocation Facility Property Boundary

Municipality

\# River Mile

Regulator

Bypass

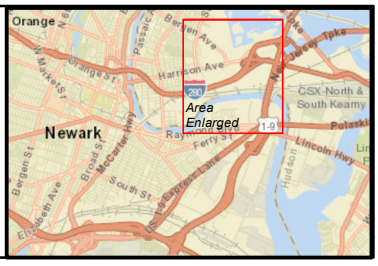
PVSC Trunk Line

Sanitary Sewer

Combined Sewer

Stormwater Sewer

Stream/River





Sewer Network

Harrison, NJ side of Passaic River at River Miles 4-5

ALTERECHO plan · act · grow

0 250 500 Feet

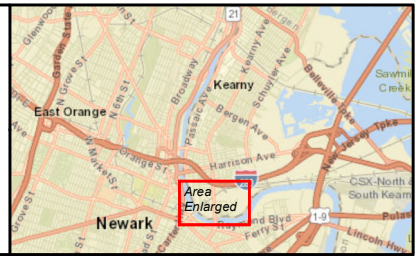
N

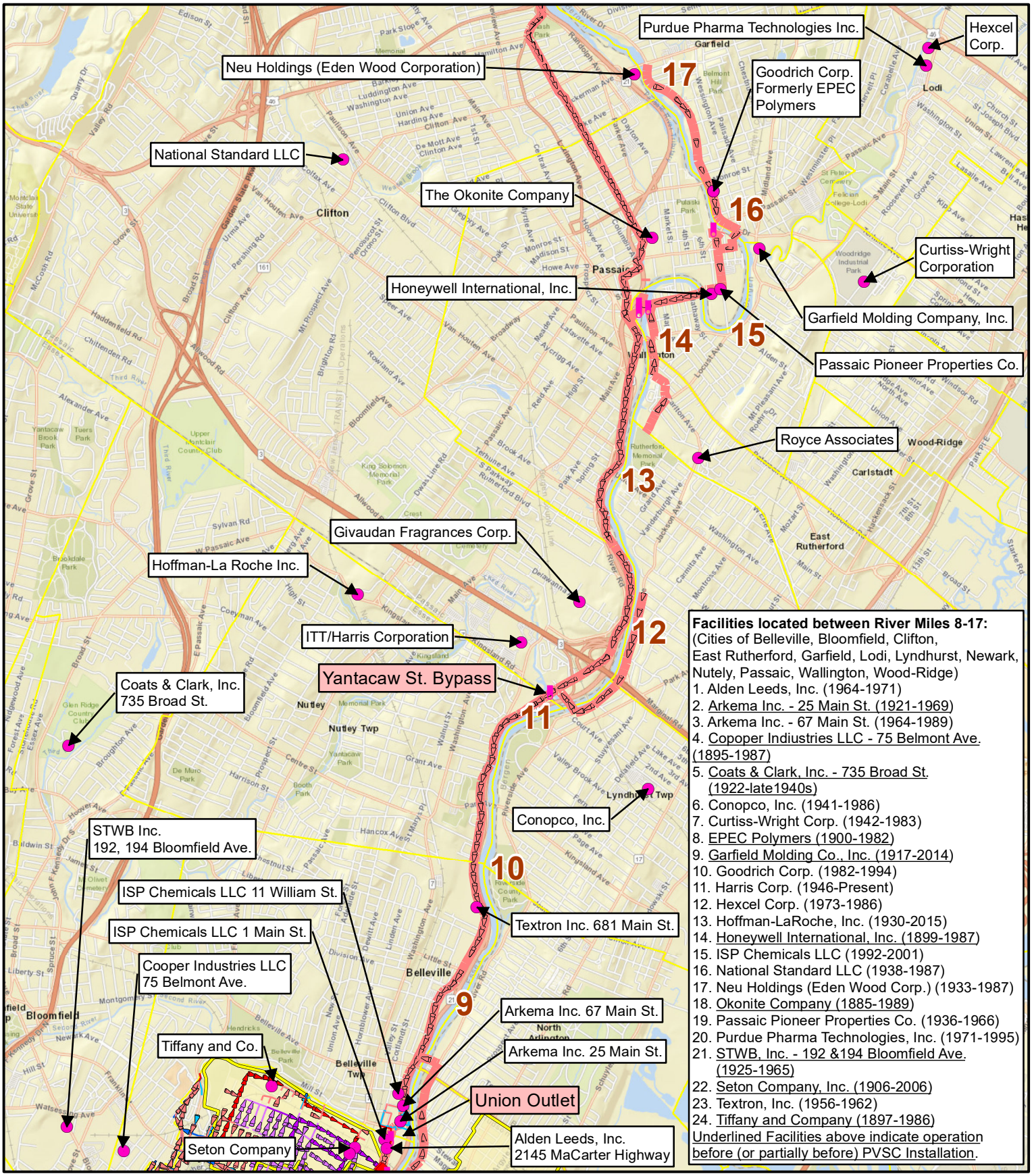
- CSO (Combined Sewer Overflow)
- CSO Collection Area
- Allocation Facility Location
- Allocation Facility Property Boundary
- Municipality
- Bypass
- PVSC Trunk Line
- Sanitary Sewer
- Combined Sewer
- Stormwater Sewer
- Waterway
- # River Mile

Harrison, NJ side of Passaic River at River Mile 4-5:

1. EnPro Holdings, Inc. (1900-1947)
2. Hartz Consumer Group, Inc. (1971-1996)
3. Otis Elevator Co. (1910-1980)
4. PSE&G Harrison - 4th Street (1902-Present)
5. Teval/Guyon (1947-1992)

Underlined Facilities above indicate operation before (or partially before) PVSC Installation.





Facilities located between River Miles 8-17:
(Cities of Belleville, Bloomfield, Clifton, East Rutherford, Garfield, Lodi, Lyndhurst, Newark, Nutely, Passaic, Wallington, Wood-Ridge)

1. Alden Leeds, Inc. (1964-1971)
2. Arkema Inc. - 25 Main St. (1921-1969)
3. Arkema Inc. - 67 Main St. (1964-1989)
4. Copooper Indiustries LLC - 75 Belmont Ave. (1895-1987)
5. Coats & Clark, Inc. - 735 Broad St. (1922-late1940s)
6. Conopco, Inc. (1941-1986)
7. Curtiss-Wright Corp. (1942-1983)
8. EPEC Polymers (1900-1982)
9. Garfield Molding Co., Inc. (1917-2014)
10. Goodrich Corp. (1982-1994)
11. Harris Corp. (1946-Present)
12. Hexcel Corp. (1973-1986)
13. Hoffman-LaRoche, Inc. (1930-2015)
14. Honeywell International, Inc. (1899-1987)
15. ISP Chemicals LLC (1992-2001)
16. National Standard LLC (1938-1987)
17. Neu Holdings (Eden Wood Corp.) (1933-1987)
18. Okonite Company (1885-1989)
19. Passaic Pioneer Properties Co. (1936-1966)
20. Purdue Pharma Technologies, Inc. (1971-1995)
21. STWB, Inc. - 192 &194 Bloomfield Ave. (1925-1965)
22. Seton Company, Inc. (1906-2006)
23. Textron, Inc. (1956-1962)
24. Tiffany and Company (1897-1986)

Underlined Facilities above indicate operation before (or partially before) PVSC Installation.

Sewer Network

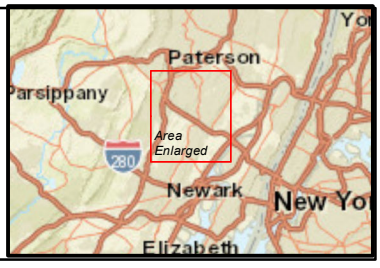
North of Dam (River Miles 8-17)

ALTERECHO plan · act · grow

0 2,000 4,000 Feet

N

CSO Collection Area
Allocation Facility Location
Municipality
River Mile
Regulator
Bypass
PVSC Trunk Line
Sanitary Sewer
Combined Sewer
Stormwater Sewer



ATTACHMENT D

CONTAMINANTS OF CONCERN FROM THE ROD

ATTACHMENT D

Contaminants of Concern

The following is the description of the COCs from the ROD for the Diamond Alkali Superfund Site.

EPA has identified many hazardous substances in the lower 8.3-mile sediments. The following eight COCs[1] pose the greatest potential risks to human health and the environment in the lower 8.3 miles of the Lower Passaic River.

***Dioxins and furans** are human health and ecological COCs. They are by-products of chemical manufacturing, combustion (either in natural or industrial settings), metal processing and paper manufacturing. The dioxin congener[2] 2,3,7,8-TCDD is the most toxic form of dioxin. 2,3,7,8- TCDD and other dioxin congeners were by-products in manufacturing processes at the former Diamond Alkali facility and elsewhere. The herbicides manufactured at the former Diamond Alkali facility included "Agent Orange," a defoliant manufactured for military purposes and shipped in drums with an orange stripe. Dioxins stay in the environment for a long time and bioaccumulate in fish and crab. Dioxins are classified as a probable human carcinogen. Toxic effects in humans include reproductive problems, problems in fetal development or early childhood, immune system damage and cancer. In birds and mammals, effects include developmental and reproductive problems, hemorrhaging and immune system problems.*

***PCBs** are human health and ecological COCs. They are manmade chemicals that were banned in the late 1970s. PCBs refers to a group of 209 congeners. Some of the congeners are referred to as dioxin-like PCBs, because they have chemical structures, physico-chemical properties and toxic responses similar to 2,3,7,8-TCDD. Some commercial PCB mixtures are known in the United States by an industrial trade name, Aroclor. Because they do not burn easily and are good insulating materials, PCBs were used widely as coolants and oils, and in the manufacture of paints, caulking and building material. PCBs stay in the environment for a long time and bioaccumulate in fish and crab. PCBs are classified as probable human carcinogens. Children exposed to PCBs may*

[1] *This section identifies whether a chemical was identified as a human health and/or an ecological COC for the lower 8.3 miles of the Lower Passaic River in the risk assessments. While all of the ecological COCs cause unacceptable risks to some or all of the receptors evaluated, risk-based preliminary remediation goals (PRGs) were developed for dioxins, PCBs, mercury and Total DDx, because they are representative COCs and because there were multiple lines of evidence developed to evaluate how the alternatives would achieve PRGs for these four COCs after remediation.*

[2] *The "dioxins and furans" referred to in this ROD describe 75 individual polychlorinated dibenzo-p-dioxins and 135 polychlorinated dibenzofurans that are considered related compounds, or "congeners." Tetrachlorodibenzo-p-dioxin (TCDD), refers to a group of dioxin congeners with four chlorine atoms, and 2,3,7,8-TCDD is a congener with a specific arrangement of those chlorine atoms in its molecular structure.*

develop learning and behavioral problems later in life. PCBs are known to impact the immune system and may cause cancer in people who have been exposed to them over a long time. In birds and mammals, PCBs can cause adverse effects such as anemia and injuries to the liver, stomach and thyroid gland. PCBs also can cause problems with the immune system, behavioral problems and impaired reproduction.

***Mercury** is a human health and ecological COC. It is a metal that is released to the environment through a variety of processes, including metals processing, burning of coal, improper disposal of medical and other wastes, industrial effluent discharge, and atmospheric deposition. Mercury stays in the environment for a long time and bioaccumulates in fish and crab. Once mercury is released to the environment, it can be converted to the biologically toxic form of methyl mercury. Most of the mercury in fish and crab tissue is present as methyl mercury, so the RI/FFS risk assessments evaluated all of the mercury detected in fish and crab as methyl mercury. Toxic effects in humans include developmental and reproductive problems, and effects on the brain, nervous system and kidney. In birds and mammals, mercury can cause adverse effects in the central nervous system.*

***DDT (dichlorodiphenyltrichloroethane) and its primary breakdown products**, dichlorodiphenyldichloroethane (DDD) and dichlorodiphenyldichloroethylene (DDE), are ecological COCs. DDT is a pesticide that was banned for use in the United States in 1972. It was used widely to control insects on crops and to control mosquitoes that spread malaria. These compounds bioaccumulate in fish and crab, are persistent in the environment and can cause adverse reproductive effects such as eggshell thinning in birds. The concentrations of these three forms of DDT are summed together for evaluation and collectively referred to as Total DDx throughout the ROD and associated documents.*

***Copper** is an ecological COC. It is a metal that enters the environment through releases from factories that make or use copper metal or compounds, leachate from landfills, combustion of fossil fuels, wood processing, fertilizer production and from natural sources such as dust from soils, volcanoes and forest fires. Although copper is an essential dietary element at low levels, at higher levels it is highly toxic in aquatic environments and bioaccumulates in fish and crab. Copper can cause adverse effects in fish, invertebrates and amphibians. Copper impacts growth, development and causes organ problems in birds and mammals.*

***Dieldrin** is an ecological COC. It is a pesticide that is no longer produced or used, but was once used extensively as an insecticide on crops or to control termites. It bioaccumulates in fish and crab, and is persistent in the environment. Dieldrin is highly toxic to aquatic crustaceans and fish. Dieldrin also causes liver*

damage, central nervous system effects and suppression of the immune system in mammals and eggshell thinning in birds.

***PAHs** are ecological COCs. These chemicals are a major component of petroleum products, and are formed during incomplete burning of coal, oil, gas, wood or other substances. PAH molecules are composed of two or more carbon and hydrogen rings. Low molecular weight (LMW) PAHs have two or three rings, while high molecular weight (HMW) PAHs have more than three rings. There are more than 100 different PAHs, which generally occur as complex mixtures. Typically, PAHs are readily metabolized by fish and wildlife, and do not bioaccumulate in aquatic food webs. They can persist in the environment under certain conditions. PAHs are toxic to invertebrates and cause inhibited reproduction, delayed emergence, sediment avoidance and mortality. In fish, PAHs cause liver abnormalities and impairment of the immune system. PAHs can cause adverse effects on reproduction, development and immunity in birds and mammals.*

***Lead** is an ecological COC. Lead occurs naturally in the environment, but most of the higher levels found in the environment come from mining or factories that use lead compounds. Lead is also released into the air during the burning of coal, oil or waste. Lead is persistent in the environment, but does not bioaccumulate in aquatic organisms. Lead can cause muscular and neurological effects in fish. It is also toxic to invertebrates and can cause damage to the nervous system in birds and mammals.*

ATTACHMENT E

REVISED WORK PLAN FOR THE ALLOCATION

Conflict Prevention and Resolution Services

Contract # 68HERH19D0033

Task Order #009

Diamond Alkali-Lower Passaic River Allocation

EPA Customer	EPA Region 2
EPA Task Order Contracting Officer's Representative (TOCOR)	Alice Yeh, EPA Region 2 212-637-4427 yeh.alice@epa.gov
ERG Task Order Manager (TOM)	Laura Bachle 703-841-1705 laura.bachle@erg.com
Period of Performance	Task Order Issuance to October 30, 2020

Contents

1. Background
2. Assumptions
3. Project Methods and Approach
4. Work Tasks
5. Reports, Transmittals, and Deliverables
6. Staffing Plan

1. Background

The lower 8.3 miles of the Lower Passaic River are one of four Operable Units (OUs) of the Diamond Alkali Superfund site. This OU is designated as OU2. The site has been on the National Priorities List since 1984. Contaminated sediments in this portion of the river are a significant source of contamination to the rest of the river down to Newark Bay. Contaminants including dioxins, mercury, PCBs, and DDT and its breakdown products can accumulate in in aquatic life and pose an unacceptable risk to human health and the environment.

Under an administrative order on consent (AOC), Occidental Chemical Corporation (OCC) is performing the remedial design for this OU. The cost for remedial action (RA) is estimated at $1.38 billion. EPA Region 2 has issued a notice of potential liability to approximately 100 parties and has offered a first round of cash-out settlements to approximately 20 potentially responsible parties (PRPs). Region 2 will address the liability of municipalities and public entities separately.

Under this TO, a third-party allocator will support Region 2 in assigning a share of responsibility to 83 non-public, non-municipal PRPs (representing 97 facilities) not included in the first round of cash-out settlements. The Region expects to use the results of the allocation to enter into settlement agreements with the subset of PRPs with the greatest share of responsibility to perform the RA and enter into another round of cash-out settlements. This effort will be based in part on existing information and contacts generated from previous attempts to develop a mutually acceptable allocation of liability.

This is an ongoing project with a well-qualified service provider already in place under a previous contract. ERG has selected the same service provider, AlterEcho, as the most effective way to continue the work.

2. Assumptions

This work plan and pricing estimate are based on the following assumptions:

General Assumptions

- Activities and pricing are included for the entire 13-month period of performance.
- ERG reserves the right to adjust the amount of the budget for general task order management if the contract and task order periods of performance are extended beyond the current period of performance.
- This TO can be modified to change the statement of work or add funding.

ERG's Understanding of the Work

ERG's work plan reflects our team's understanding of what work has already been completed on this allocation project and what work remains to be done. As the project has evolved, some key numbers and factors have changed, such that this estimate may differ from previous projections regarding the level of effort needed to complete the tasks envisioned in the SOW. Specific factors that have evolved include:

- There has been an increase in the number of facilities that must be calculated an equitable share, from 83 to 92 (+11%).
- Occidental (OCC) not being a participating party as had been anticipated and OCC filing a lawsuit against PAPs have substantially increased the level of effort required of the Allocation Team, which will spend additional resources to ensure that OCC is fairly represented in the allocation process, and complicates communications and other considerations regarding maintaining confidentiality.
- The level of anticipated interaction required with PAP counsel, including the volume of comments that will be received and that will require analysis and confirmation, is substantially greater than anticipated.
- The complexity of the required allocation analysis is greater than anticipated as a result of:
    - Data gaps relating to facility operation and contaminant discharge data, significant variability of available data across the PAP facilities, and the need for equitable analysis to discern and develop appropriate surrogate data
    - The pervasiveness of historic fill at facility locations.
    - The large volume of data on OCC submitted by PAPs
    - The complexity and multiplicity of overflow valves and bypasses and each facility's specific connections and historic uses of system.
    - Different dredging events have varied with respect to area and sediment removal impacts, which in turn varies the potential for contaminant removal
    - The diverse hydrology of impacted area, fate and transport of contaminants, and tidal influences on the system.

Task B: Allocation Design and Production

- A maximum of 83 PRPs will be provided an opportunity to participate in or be evaluated for the purpose of determining a share of responsibility in the allocation process. They are designated herein as Allocation Parties. Ten of these PRPs are non-participating parties.
- The allocation will cover a maximum of 92 facilities associated with the 83 Allocation Parties.
- All OU2 Allocation Parties will be designated a share of responsibility in the Final Allocation Recommendation Report.
- All OU2 PRPs which have agreed or agree in the future to participate in the allocation by executing the OU2 Allocation Guide and Confidentiality Agreement (Participating Allocation Parties or PAPs) will be provided an opportunity to participate in the design of the allocation database and process and to provide additional site-related information for possible addition to the database.
- The Final Allocation Recommendation Report will divide the Allocation Parties into logical groupings of similarly situated PRPs

- EPA will provide the ERG Team with a listing and contact information for each OU2 PAP. Reference herein to meetings or other forms of communication with the OU2 PAPs means communication with the identified representatives of such parties.
- A maximum of 593,895 pages of documents will be reviewed and utilized to conduct the allocation, including:
  - A maximum of 130,000 pages of documents received from EPA for ERG Team review under the previous contract.
  - A maximum of 413,895 extra pages of documents received from PRPs for ERG Team review under the previous contract.
  - The PAPs have indicated to the ERG Team that they have an additional 50,000 pages of relevant documents to submit over the remainder of the project.
- At the time of termination of the prior Task Order, the contractor was awaiting notice from EPA on its determination regarding an offer of Early Settlement to 20 of the PAPs. Consequently, the contractor was unable to complete Draft Facility Data Reports for the PAPs being considered for a possible EPA Early Settlement offer. Therefore, Draft Facility Data Reports for such PAPs will be completed pursuant to the current work plan. The timing of EPA's determination regarding Early Settlement offers may affect the contractor's ability to complete the tasks specified in Tasks B4 and B5 within specified deadlines. For the Work Plan, the ERG Team is assuming receipt of notice of EPA's determination regarding Early Settlement offers on or before October 31, 2019.
- All communications by the ERG Team will be by phone or email unless a meeting is noted.
- The ERG Team estimates 4 hours of communications per PAP over the remainder of the project. This time is presented as communications in Tasks B3, B4, and B5, and meetings in Tasks B5 and B6. This partially responds to the PRP outreach requirements specified in Section II.B.2 of the SOW.
- A maximum of 4 hours of combined project status/update calls will be held by the ERG Team with EPA per month. ERG assumes these calls will be held on a weekly basis. This time is included under Task A3.
- The allocation database will be designed and organized primarily for purposes of allocation.
- Any part of a communication, attachment to a communication, presentation, or written material provided to OU2 PRPs by the ERG Team that involves a description of the site or EPA actions or activities will be provided to EPA for review and approval prior to submission to the OU2 PAPs.
- Unless otherwise noted herein, all allocation-related communications by the ERG Team involving the OU2 PAPs or representatives of EPA or DOJ, individually or in groups, will be held confidential pursuant to the provisions of the ADR Act of 1996, 5 USC 574.
- In order to ensure a common expectation of confidentiality, all PAP participants in the allocation process have entered, and EPA has appropriately acknowledged, a confidentiality agreement.

Pricing Estimate

- Travel:
  - Key project meetings will be held at the EPA Region 2 office or another location in the greater New York City metropolitan area as determined by EPA or hosted by OU2 PAPs if they supply meeting space. These meetings will require travel for ERG's selected service provider, whose

key staff for this project are located in the Washington, DC, area.

  - Four meetings, each involving two staff from ERG's selected service provider, are assumed. Two of these four meetings will require overnight stays.

- Space and equipment for meetings will be provided by EPA or PAPs.

3. Project Methods and Approach

- As agreed upon with EPA, all reports, transmittals and deliverables—with the exception of Items B-5 and B-6 in Table 3—will be submitted to the TOCOR and Project Officer (PO). Items B-2 and B-3 will be submitted with Item B-7.
- ERG will be responsible for evaluating the service provider's performance at the end of the project and during the project if it lasts through the annual contract evaluation performance schedule.
- ERG understands that during the performance of this work, Region 2 may share information with the ERG Team that is pre-decisional and deliberative or is considered to be attorney work product in preparation of potential litigation. ERG recognizes that such work is privileged to the United States and EPA under the Freedom of Information Act. While the ERG Team will conduct the allocation process in a manner transparent to the public to the extent possible, the ERG Team will consult with EPA before releasing information to the public to ensure confidential information is protected.

In conducting this work, ERG will comply with all terms in the overall contract, including—but not limited to—the following requirements:

- ERG and subcontractor AlterEcho (ERG Team) will not interpret EPA policy on behalf of the EPA or make decisions on items of policy, regulation or statutes. The ERG Team also will not take a stand on the merits of substantive items under discussion.
- In gathering information or performing research with parties outside the EPA, ERG Team members will identify themselves as contractors to EPA and not as EPA employees.
- ERG will approach this task in accordance with the basic terms of the contract and according to the established norms and ethical standards of ADR professionals. Specifically, ERG will ensure that ADR professionals supporting this TO abide by ethical codes of conduct such as those defined in the SOW. Information provided to the ADR professional by any of the parties, communications between parties and the ADR professional, and notes and dispute resolution work product generated by the ADR professional during work pursuant to the TO will be maintained as confidential by the ADR professional pursuant to the provisions of the ADR Act of 1996 (Public Law 104-320; 5 USC 571 et al.) and applicable federal, state, and judicial requirements.
- To enhance the positive substantive, relational, and procedural outcomes from ADR cases, ERG will direct all ADR professionals providing services under this TO to do the following prior to the mediation or facilitation and throughout the process:
  - Inquire about whether individual participants have the time, financial, and logistical resources necessary to participate effectively in the process and—where resources are inadequate—assist them in identifying appropriate resources or in making necessary adjustments to the process to accommodate resource constraints.
  - Assist the participants in identifying the issues that are important to resolving any controversy and solutions that will address the needs shared by the participants.

- Conduct the process to promote active engagement from all participants.
- Explore with the participants appropriate ways to incorporate high quality and relevant information resources necessary to resolve the issues.
- To support productive dialogue and effective implementation of any agreements reached by the participants, ensure that participants have appropriate authority to make commitments on behalf of their organizations.

- Obtain approval in writing for any long-distance travel.

4. Work Tasks

Task B: Allocation Design and Production

Task B1: Initial Review

Under the previous contract, EPA provided the contractor with the information, materials, and reports generated pertaining to the allocation. AlterEcho organized and reviewed this information under that contract. No further activity or level of effort is anticipated for this task.

Task B2: PRP Outreach

Throughout the course of the allocation, the ERG Team will conduct outreach to OU2 PRPs participating in the allocation to provide them with the opportunity to comment on and correct the draft data reports produced under the previous contract and to provide input on the drafting of the allocation recommendation report. This will include:

- Ensuring that each PRP's data or information used in the allocation is correctly input into the database.
- Soliciting PRP positions on the drafting of the allocation recommendation report.
- Communicating how their input was or was not taken into consideration in developing the allocation recommendation report.

The activities and level of effort associated with the PRP outreach activities described above are directly linked to the Allocation Design and Production task described below. They are incorporated into the descriptions and estimates for those tasks.

Per Section II.B.2.b of the SOW, the ERG Team will prepare and provide to EPA a report regarding outreach efforts conducted with the OU2 PAPs during the entire project, including a list of participants in outreach efforts, a description of topics discussed, and a summary of issues or concerns raised.

This task will require the following efforts on the part of the ERG Team:

- Review and provide EPA with a generalized description of topics discussed and summary of issues or concerns raised by OU2 PAPs during conduct of the TO, without attribution to individual OU2 PAPs.
- Prepare and provide EPA an overview of conducted outreach efforts, including a list of OU2 PAPs that have participated in outreach meetings, conference calls, or individual communications with the ERG Team.

Task B3: Searchable Database

Per Section II.B.3 of the SOW, the ERG Team will maintain and update the searchable database developed under the previous contract. The searchable database contains and organizes all of the information and data used in the allocation.

- Under the previous contract, the database was designed and initially populated with information received from EPA, including PRP disclosure statements and nexus documents from third party litigation totaling approximately 130,000 pages.
- Under the previous contract, the database was also populated with up to 413,895 pages of documents received from PRPs deemed relevant to the allocation by the previous contractor and any other information used in the allocation.
- The database is designed in such a way as to allow access and use by EPA and DOJ staff for their settlement purposes.
- Completion of database: The ERG Team will upload applicable new documents received as part of the TO activities. The PAPs have indicated to the ERG Team that they have an additional 50,000 pages of relevant documents to submit. The ERG Team will complete the database and provide the completed database to EPA when the final allocation recommendation report, described in Task B7, is complete.

Task B4: Draft and Final Facility Data Reports

Per Section II.B.4.a of the SOW, the ERG Team will organize and conduct a technical and scientific evaluation of data in the allocation database to develop individual data reports for each of the OU2 PAP facilities for which an early settlement was not offered by EPA. Under the previous contract, 72 Draft PRP Data Reports were completed and made available to the PAPs for submission of corrections or suggestions. At the time of termination of the prior contract, the contractor was awaiting notice from EPA on its determination regarding an offer of Early Settlement to 20 additional PAPs. Consequently, the contractor was unable to complete Draft Facility Data Reports for the PAPs being considered for a possible EPA Early Settlement offer. Therefore, Draft Facility Data Reports for such PAPs will be completed pursuant to this work plan. For this work plan, the ERG Team is assuming receipt of notice of EPA's determination regarding Early Settlement offers on or before October 31, 2019. The Draft Facility Data Reports for the up to 20 Early Settlement facilities will supplement existing limited scope data reports prepared for those facilities to support the Early Settlement evaluation process and criteria. This will include review and evaluation of additional Facility Questionnaire information and supporting documents to be submitted and expanding the depth of data review focused on mass of contaminants associated with the facility. The reports will provide selected information regarding each OU2 PAP's relation to OU2 and OU2 contaminants of concern that will be used in conduct of the allocation. The ERG Team will establish a deadline of 10 business days from receipt of the Draft Facility Data Reports for submission of corrections or suggestions by the OU2 PAPs for improving the quality of the received Draft Facility Data Reports.

This task will require the following efforts on the part of the ERG Team:

- Conduct coding of data and loading of coded data obtained from OU2 PAPs into database.
- Review preliminary factual submission by OU2 PAPs.
- Review site data loaded into database to determine appropriate organization for allocation.

- Compile and organize site data in database to support allocation analysis and share computations.
- Organize data in allocation database into and draft individual OU2 PRP data reports for each of the OU2 PAP facilities for which an early settlement was not offered by EPA (up to 20 facilities).
- Provide a copy of the Draft Facility Data Reports to the OU2 PAPs for review.

Timing of this task is dependent upon receipt of notice of EPA's determination regarding Early Settlement offers on or before October 31, 2019.

Conduct of this task is dependent upon the following factors:

- Access by the ERG Team to EPA technical data regarding site conditions and the selected OU2 remedy.
- Sufficient data on identified PRPs to allow analysis of associated contaminants of concern and hazardous substance fate and transport at the site.
- Successful establishment of the allocation database.
- Receipt of additional data from OU2 PAPs for inclusion in the allocation database within established timeframes.
- As indicated in the Assumptions section of this Work Plan, it is assumed that there are an additional 50,000 pages of relevant documents to submit over the remainder of the project.

Per Section II.B.4.c of the SOW, the ERG Team will analyze corrections or suggestions for improving the quality of the Draft Facility Data Reports received from OU2 PAPs to determine whether modifications of the original draft data reports are warranted. Based on this analysis, the ERG Team will modify the data reports, as deemed appropriate. The ERG Team will then provide a copy of all of the Final Facility Data Reports to the OU2 PRPs, with an explanation of how suggested changes were, or were not, incorporated.

- This task will require the following efforts on the part of the ERG Team: Employ a rigorous approach to filling data gaps with additional information requested and obtained from EPA or the PAPs (e.g., industry resources, EPA/NJDEP files, Sanborn Fire Insurance Maps, aerial photographs and possibly supplemental 104e requests) in accordance with the protocol for handling data gaps and ambiguities included in the Allocation Methodology.
- Analyze received suggestions and corrections to Draft Facility Data Reports in relation to existing Site data and the final allocation design in order to determine appropriate modifications.
- Modify the individual data reports, as warranted based on the above analysis.
- Provide an explanation to the OU2 PAPs regarding whether, and if so how, received suggestions resulted in changes to their individual data report, including a description of why their suggestions and comments were, or were not, taken into account. Upload Final Facility Data Reports to the confidential allocation document repository.
- As required, the ERG Team will conduct communications with individual OU2 PAPs to answer questions regarding their Final Facility Data Reports.

Timing of this task is dependent upon the following factors:

- Receipt of comments from OU2 PRPs regarding their Draft Facility Data Reports within established timeframes.
- Receipt of notice of EPA's determination regarding Early Settlement offers on or before October 31, 2019.

Task B5: Allocation and Allocation Recommendation Report

The ERG Team will ensure that each PRP's data or information used in the allocation is accurately input into the database and will solicit from the PRPs participating in the allocation positions on the drafting of the allocation recommendation report (as described below). AlterEcho will perform the allocation. The activities and level of effort associated with performing the allocation are directly linked to the subtasks described below. They are incorporated into the descriptions and estimates for those tasks.

Per Section II.B.5.a and b of the SOW, the ERG Team will prepare a first draft of the allocation recommendation report and submit it to the OU2 PAPs for review. The draft allocation report will designate shares of responsibility among the OU2 PRPs, as appropriate based on the allocation analysis. The draft allocation report will include a recommendation on the possible grouping of the OU2 PRPs into tiers of similar levels of responsibility.

This task will require the following efforts on the part of the ERG Team:

- Conduct communications, including conference calls and/or meetings, with OU2 PAPs regarding recommendations on and legal/equitable theories pertinent to conduct of the allocation raised in Position and Response Briefs received from the OU2 PAPs. The ERG Team will focus on establishing routine group communication calls and electronic updates to achieve greater efficiency in communication and as a means to reduce individual PAP-initiated calls and electronic inquiries.
- Review and consider input regarding allocation received from the OU2 PAPs and EPA.
- Review and understand the basis for EPA's selected remedy for OU2, in consultation with EPA technical and legal personnel.
- Analyze the relative toxicity of materials discharged by OU2 PRPs and other differentiating factors, including fate and transport of hazardous substances released by PRPs based on the data contained in the RI/FFS, in relation to the selected remedy.
- Compile and analyze allocation data related to each OU2 PRP, including contaminants of concern, to establish the relative impact of the actions of each OU2 PRP on the conditions that resulted in EPA selecting the OU2 remedy.
- Load compiled PRP data into allocation calculations to determine relative relationships among the OU2 PRPs.
- As appropriate, establish appropriate tiers of OU2 PRP responsibility based on calculations and consideration of equitable factors.
- Prepare the draft allocation recommendation report.
- Submit the draft report to the OU2 PAPs for review and comment.

Timing of this task is dependent upon receipt of position briefs and reply briefs regarding allocation from OU2 PAPs within established timeframes.

Per Section II.B.5.c of the SOW, the ERG Team will plan, schedule, and conduct a meeting with the OU2 PAPs as a group regarding the draft allocation recommendation report. The purpose of the meeting will be to advise the OU2 PAPs as a group regarding the draft allocation recommendation report and to obtain preliminary PAP comments regarding the draft allocation recommendation report. The ERG Team will also communicate with the OU2 PAPs individually as necessary to obtain the input of OU2 PAPs, including those that did or were unable to attend the meeting, regarding the draft allocation recommendation report. As noted previously, the ERG Team will focus on establishing routine group communication calls and electronic updates to achieve greater efficiency in communication and as a means to reduce individual PAP initiated calls and electronic inquiries.

This task will require the following efforts on the part of the ERG Team:

- Making arrangements for a meeting in the greater New York City metropolitan area sufficient to accommodate the OU2 PAPs as a group.
- Coordination of meeting space and equipment for meetings provided by EPA or OU2 PAPs.
- Communication via email with the OU2 PAPs regarding substance, date/time, and location of meeting.
- Development of the meeting agenda.
- Development of participant materials, as needed.
- Travel of two senior staff from Washington, DC, to attend the meeting.
- Communications by a Dispute Resolution Professional via phone, email, or other electronic media with OU2 PAPs as required.
- Recording of PAP general comments regarding the draft allocation recommendation report, without attribution to individual OU2 PAP comments.

Per Section II.B.5.c of the SOW, the ERG Team will prepare a Final Allocation Recommendation Report. The Final Allocation Recommendation Report will take into consideration comments on the Draft Allocation Recommendation Report received during meetings with and received in position and reply briefs from the OU2 PAPs and during communications with EPA regarding the nature and scope of the Final Allocation Recommendation Report; address any identified ambiguities in the draft report; include references to all materials considered and relied upon, and a complete description of the allocation process and the basis upon which shares were assigned. The Final Allocation Recommendation Report will include an overview of the basis for the determinations of shares among the OU2 PRPs, including a description of the use of data sources and application of allocation factors and methodology utilized, and reason for potential vulnerabilities, if any, in the resulting allocation. The report will identify and explain the rationale, if applicable, for grouping OU2 PRPs into tiers of similar relative responsibility. The Final Allocation Recommendation Report will also address any identified ambiguities in the draft report and provide a summary of how comments of the OU2 PRPs regarding the Draft Allocation Recommendation Report were, or were not, taken into account in the final report, without attribution to individual comments.

This task will require the following efforts on the part of the ERG Team:

- Review and consider the comments received from OU2 PAPs regarding the Draft Allocation Recommendation Report.
- Conduct communications, including conference calls and/or meetings, with OU2 PAPs regarding

comments regarding the Draft Allocation Recommendation Report received from OU2 PAPs.

- Edit the Draft Allocation Recommendation Report to incorporate appropriate modifications based on received comments to produce the Final Allocation Recommendation Report.

The ERG Team will provide access the OU2 Allocation Database to identified members of the EPA Case Team. This task will require the following efforts on the part of the ERG Team:

- Submission to members of the EPA Case Team Review of credentials and instructions for accessing information in the OU2 Allocation Database.

Task B6: Meetings or Conference Calls

The activities and level of effort associated with performing the allocation are directly linked to the other tasks in this work plan. They are incorporated into the descriptions and estimates for those tasks as noted. The ERG Team will attend and participate in the following meetings either in person or by telephone or video conference at EPA's discretion.

- Progress meetings or conference calls. Please see Task A2 of this work plan.
- Kickoff meeting or conference call with EPA. Please see Task A2 of this work plan.
- Draft allocation recommendation report meeting or conference call with PRPs. Please see Task B5 of this work plan.

It is anticipated that all meetings will be held at EPA or PRP-provided facilities.

Task B7: Task Order Closeout Report

Per Section II.B.7 of the SOW, the ERG Team will design and produce the first draft of a report regarding the conduct of tasks pursuant to the TO and submit it for review by EPA. The report will not contain any confidential or sensitive information. The contents of the Draft Task Order Closeout Report will include:

- A half-page description of the project that describes the nature of the project, the parties, the process, and the outcomes.
- If appropriate, a short section reflecting on the process and procedural lessons learned and recommendation for improvements and identification of those activities conducted that contributed to the success of the process.
- A brief summary of the final costs of the project, broken out by percentage of labor hours and other direct costs.

This task will require the following efforts on the part of the ERG Team:

- Review of project activities and compilation of a project summary.
- Consideration and compilation of thoughts on lessons learned regarding this project.
- Compilation of project budget costs.
- Preparation of the Draft Task Order Closeout Report.

The ERG Team will prepare a Final Task Order Closeout Report and submit it to EPA. The Final Task Order Closeout Report will take into consideration comments received from EPA regarding the draft of the Task

Order closeout report. ERG will provide one copy of the Final Task Order Closeout Report to the PO and one copy to the TOCOR in electronic format.

This task will require the following efforts on the part of the ERG Team:

- Review and consideration of comments by EPA regarding the draft Task Order Closeout Report.
- Editing, and as required redesign, of the closeout report to incorporate modifications based on EPA comments in order to produce the Final Task Order Closeout Report.
- As directed by the TOCOR, the ERG Team will participate in a post-process debriefing with EPA officials to discuss lessons learned and potential next steps.

Per discussions with EPA, while the Final Allocation Report is referenced under this task in the EPA SOW, report development is not included under this task, but rather under Task B5.

Task B8: Post-Process Debriefing

As directed by the EPA TOCOR, the ERG Team will participate in a post-process debriefing with EPA officials, including the PO, TOCOR, and relevant EPA management, to discuss lessons learned and next steps. It is anticipated that this meeting will take place via teleconference.

Table 3. Transmittals and Deliverables Under Task B

Item	Title	Due no later than*	Type
B-1	Kickoff meeting or conference call	Within 20 business days of work plan approval	Activity
B-2	Completion of searchable database	Upon submission of final allocation recommendation report	Deliverable
B-3	Completion of final facility data reports	Within 40 business days of work plan approval	Transmittal
B-4	Perform allocation	140 business days after completion of final facility data reports	Activity
B-5	Draft allocation recommendation report	140 business days after completion of final facility data reports	Transmittal
B-6	Draft allocation recommendation report meeting	Within 20 business days of submittal of draft allocation recommendation report	Transmittal
B-7	Final allocation recommendation report	65 business days after completion of draft allocation recommendation report	Deliverable
B-8	Final PRP outreach report	10 business days after completion of final allocation recommendation report	Transmittal
B-9	Draft case closure report	10 business days after acceptance of final allocation recommendation report	Transmittal
B-10	Final case closure report	10 business days after receipt of EPA comments	Deliverable

5. Reports, Transmittals, and Deliverables

ERG will submit deliverables in accordance with the contract. As agreed upon with EPA, with the exception of Items B-5 and B-6 in Table 3, copies of all contract deliverables will be sent to both the PO

and the TOCOR. Items B-2 and B-3 will be submitted with Item B-7. If oral briefings are scheduled for EPA staff, the PO will be notified in time to attend. Specific deliverables and the timing of their delivery are identified in the tables in Section 5 above.

6. Staffing Plan

This task order will be staffed as described in Table 4.

Table 4. Preliminary Staffing Matrix

Individual (firm)†	Labor category	Project role
David Batson (AlterEcho)	Dispute Resolution Professional - Level 3A	Senior allocation specialist; conduct allocation and prepare draft and final allocation recommendation reports; lead communication and meetings with PAPs
Mark Heaney (AlterEcho)	Scientific/Technical Consultant or Analyst-Level 3A	Subcontractor's project manager; quality assurance; deliverable preparation; draft and final facility data reports; draft and final allocation recommendation reports
Ann Schnitz, Ph.D. (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 3A	Senior human health toxicologist; support performance of allocation
Mike Carney, Ph.D. (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 3A	Senior ecological toxicologist; support performance of allocation
Rachel Shay (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 1A	Researcher; maintenance of searchable database; preparation of draft and final facility data reports; preparation of PRP Outreach Report
Derek Lawrence (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 2B	Researcher; preparation of draft and final facility data reports
Lynne Larsen (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 1A	Researcher; preparation of draft and final facility data reports
Dan Michor (AlterEcho)	Communications Specialist Level 3	GIS specialist; draft and final facility data reports; draft and final allocation recommendation reports

Individual (firm)[†]	Labor category	Project role
Holly Sprunger (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 2B	Quality assurance; draft and final facility data reports; draft and final allocation recommendation reports data management
Pam Ginger (AlterEcho)	Administrative Clerical/Technical Support A	Administrative; monthly reports
Rachel Ireland (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 2B	Researcher and data specialist; draft and final facility data reports; draft and final allocation recommendation reports data management
Amanda Rohrbaugh (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 2B	Researcher and data specialist; draft and final facility data reports; draft and final allocation recommendation reports data management
Judy Manley (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 3A	Data specialist; quality assurance; maintenance of searchable database; draft and final facility data reports; draft and final allocation recommendation reports
Karla Brasaemle (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 3A	Contaminant fate and transport specialist; support allocation; draft and final allocation recommendation reports
Nicole Goers (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 3A	Senior engineer; quality assurance; draft and final facility data reports; support allocation; draft and final allocation recommendation reports data management
Kristen Rapal (AlterEcho)	Scientific/Technical Consultant or Analyst - Level 3A	Researcher and data specialist; draft and final facility data reports; draft and final allocation recommendation reports data management

ATTACHMENT F

OU2 ALLOCATION CONFIDENTIALITY AGREEMENT

Diamond Alkali Superfund Site OU2 Allocation
Confidentiality Agreement

This Confidentiality Agreement made and entered into by and among the Allocation Neutral and those Participants whose authorized representatives have executed this Agreement (collectively, the "Participants" and individually, a "Participant").

RECITALS

1. The Participants to this Confidentiality Agreement have been offered an opportunity to participate in the design and conduct of an allocation of certain costs associated with remediation of OU2 of the Diamond Alkali Superfund Site (the "Site") as described in the letter from Eric Wilson, Deputy Director for Enforcement and Homeland Security, Emergency and Remedial Response Division, US EPA, dated September 18, 2017. The allocation is intended to establish an impartial third-party expert recommendation that may be considered by the United States and the Participants as the basis of settlements equitably resolving potential liabilities associated with the Site.

2. The Participants have a common interest in working together to consider and establish a fair and reasonable, impartial allocation process for equitably resolving potential liabilities associated with the Site.

3. The Confidentiality Agreement is intended to document the common understanding of the Participants regarding the confidentiality of the allocation process and shall not be construed as an admission of liability or against interest or otherwise cited or used in any way against any Participant in any other dispute or proceeding.

AGREEMENT

1. Confidentiality.

   (a) To promote frank and productive discussion, the Participants agree that the allocation process shall be confidential. All oral and written communications regarding this matter by or between the Participants, including communications at meetings (whether by telephone or in person) with Participants present, or by or to the Allocation Neutral, shall be Dispute Resolution Communications. Such Dispute Resolution Communications are confidential, and shall not be disclosed to third persons by the Allocation Neutral, any Participant, their elected and appointed officials and officers, representatives, employees, agents, financial auditors, insurance carriers, or other persons associated with the Participant, except as provided elsewhere in the agreement, or with the consent of the Participants to this dispute, or as required by law to be made public.

Diamond Alkali Superfund Site OU2
ALLOCATION CONFIDENTIALITY AGREEMENT

(b) The allocation process, including all dispute resolution communications, is confidential pursuant to the Administrative Dispute Resolution Act of 1996, 5 U.S.C. Section 574, ("ADR Act") and all other applicable federal and state laws. The allocation process shall be treated as compromise negotiations under Rule 408 of the Federal Rules of Evidence and applicable state law.

(c) The Allocation Neutral shall not disclose to any Participant or any third party information conveyed to him in confidence by any other Participant, unless authorized to do so by that Participant or as required by law, of which requirement Allocation Neutral shall advise the Participant in writing prior to disclosure. Except as specified in the allocation process design, the Allocation Neutral shall, upon termination of the allocation process, destroy any notes and written records created by or provided to him, unless a Participant requests the return of written records, in which case the Allocation Neutral shall return the original and all copies of the requested materials to the Participant. Allocation meetings and other sessions shall not be recorded verbatim and no formal minutes or transcripts shall be maintained.

(d) Participation in the allocation process, including attendance at meetings, statements made and documents prepared or furnished by any Participant, or other participant, for the purposes of the process shall not be construed as an admission of liability or against interest or otherwise cited or used in any way against any Participant in any other dispute or proceeding. Where a Participant references, discusses, or produces documents or information during settlement discussions, doing so will not render otherwise discoverable documents or information confidential, privileged, non-discoverable, or inadmissible.

(e) The Allocation Neutral shall not be deemed a "necessary or indispensable" party, as defined in Rule 19 of the Federal Rules of Civil Procedure and any equivalent state law, in any pending or future judicial, administrative or arbitral action related to matters discussed in the allocation process. No Participant shall subpoena or otherwise seek from the Allocation Neutral any information provided to him by another Participant that relates to the allocation. In no event shall the Allocation Neutral voluntarily testify on behalf of a Participant, or participate as a consultant or expert, in any pending or future judicial, administrative, or arbitral action related to matters discussed in the allocation.

(f) The Participants and the Allocation Neutral shall remain bound by these confidentiality provisions following termination or expiration of this Agreement without regard to whether any legal actions or issues arising out of the case are settled or concluded by final judgment or otherwise.

2. Expiration. This Confidentiality Agreement will expire upon completion of the allocation process or as otherwise agreed by a consensus of the Participants.

Diamond Alkali Superfund Site OU2
ALLOCATION CONFIDENTIALITY AGREEMENT

3. Withdrawal. Any Participant may withdraw from the allocation referred to herein upon written notice to the other Participants and Allocation Neutral.

4. Modification. All provisions of this Confidentiality Agreement may be modified by unanimous written consent of all Participants, who have not withdrawn from this Agreement.

5. Counterparts. This Confidentiality Agreement may be executed in multiple counterparts, each of which will be deemed an original, but all of which will constitute one and the same instrument.

6. Entire Agreement. This Confidentiality Agreement constitutes the entire understanding of the Participants with respect to its subject matter.

7. Governing Law. This Confidentiality Agreement is to be construed under and in accordance with the laws of the State of New Jersey.

8. Survival. The respective obligations of the Allocation Neutral and the Participant hereunder shall survive the expiration or sooner termination of this Confidentiality Agreement.

9. Recitals. The recitals to this Confidentiality Agreement are incorporated herein as though set forth in full.

[Signatures follow on succeeding pages]

Diamond Alkali Superfund Site OU2
ALLOCATION CONFIDENTIALITY AGREEMENT

We agree to abide by the terms and conditions of this Confidentiality Agreement and indicate our assent by signing this document below.

Date: _____ By: _____

Title: _____

_____
[Signature]

On Behalf of: _____

Diamond Alkali Superfund Site OU2
ALLOCATION CONFIDENTIALITY AGREEMENT

I agree to abide by the terms and conditions of this Confidentiality Agreement and indicate my assent by signing this document below.

ALLOCATION NEUTRAL:

Date: October 17, 2017 _____

David C. Batson

ATTACHMENT G

DIAMOND ALKALI SUPERFUND SITE OU2 ALLOCATION GUIDE

Diamond Alkali Superfund Site OU2
Allocation Guide

June 15, 2018
As amended by addendum dated July 6, 2018 and incorporating consensus of Participating Allocation Parties on March 22, 2019

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ADR CONFIDENTIAL DOCUMENT

This document is a confidential dispute resolution communication provided by a neutral to parties involved in resolving an issue in controversy and, as such, may not be disclosed pursuant to the provisions of the ADR Act of 1996 and all relevant state and federal authorities.
Do Not Release Under FOIA

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Diamond Alkali Superfund Site OU2 Allocation Guide

1. PURPOSE OF ALLOCATION GUIDE

a. This Allocation Guide (Guide), created by the Allocator in consultation with the Participating Allocation Parties and EPA, documents the understanding of the Participating Allocation Parties and EPA regarding the conduct of the two (2) phase facilitated settlement process for the resolution of the liability of Allocation Parties related to OU2 as described herein.

b. By participating in Phase 1 of the facilitated settlement process, a Participating Allocation Party commits to do so in compliance with the provisions of the Guide.

c. The failure of a Participating Allocation Party to participate in compliance with the provisions of the Guide may be considered by the Allocator as a factor in determining such party's allocated share.

2. DEFINITIONS

a. **Allocation**: The confidential process, conducted pursuant to this Guide with the assistance of the Allocator, consisting of the first phase of a two-phase ADR facilitated settlement process to support settlement between EPA and the Allocation Parties.

b. **Allocation Party:** One of eighty-three (83) entities identified by EPA as a potentially responsible party (PRP) for operable unit 2 (OU2) of the Diamond Alkali Superfund Site (the Site) and issued a General Notice Letter (GNL) for one or more particular facility location, as noted on Attachment A.

c. **Allocation Team:** The Allocator and professional staff of AlterEcho who are supporting conduct of the Allocation.

d. **Allocator:** David C. Batson, the individual contracted by EPA and accepted by the Participating Allocation Parties to conduct the Allocation process.

e. **Chemicals of Concern (COCs):** The following eight (8) chemicals designated as COCs by EPA in the Record of Decision for OU2 of the Site, dated March 3, 2016 (ROD) (Attachment K):

1. Dioxin/Furans
    a. Polychlorinated dibenzo-p-dioxins (PCDD), Polychlorinated dibenzofurans (PCDF)
2. PAH Polycyclic aromatic hydrocarbon
    a. LMW PAHs: acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene, and 2-methylnaphthalene
    b. HMW PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene
3. PCB Polychlorinated biphenyl
4. DDx Dichlorodiphenyltrichloroethane (DDT), and its primary breakdown products; Dichlorodiphenyldichloroethane (DDD) and Dichlorodiphenyldichloroethylene (DDE)
5. Mercury

6. Copper
7. Lead
8. Dieldrin

f. **EPA**: The United States Environmental Protection Agency.

g. **Operable Unit 2 (OU2):** An operable unit of the Site consisting of the lower 8.3 miles of the Passaic River, in or about Essex and Hudson Counties, as defined by the EPA in the ROD.

h. **Participating Allocation Party (PAP)**: An Allocation Party that has agreed to participate in the Allocation, as noted in Attachment B.

3. SCOPE OF ALLOCATION

3.1 Determination of relative relationship between identified Allocation Parties

a. The Allocation is being conducted at the direction of EPA, as set forth in, among other things: (i) EPA's letters to the Allocation Parties dated September 18, 2017, November 28, 2017, January 5, 2018, February 16, 2018, February 23, 2018, and May 1, 2018 (Attachment C); and (ii) the Revised Work Plan for the Allocation (denoted as Task Order #096 under Contract EP-W-14-020) (Attachment D).

b. EPA has designated the Allocation as the first phase of a two (2) phase ADR facilitated settlement process to obtain future cash-out and work party settlements with the Allocation Parties. The first phase (Phase 1) is the Allocation conducted by Allocator David Batson. The second phase (Phase 2) is subsequent negotiations between the Allocation Parties and EPA utilizing the Allocator's recommendation. In its September 18, 2017 letter to the Allocation Parties, EPA notes that the OU2 allocation is intended to result in cash-out settlement offers from EPA and identify those parties that should participate in consent decree negotiations for the performance of the remedial action for OU2.

c. As structured by EPA, the goal of the Allocation is to provide the EPA with a basis for such future settlements with the Allocation Parties. Through conduct of the Allocation, the Allocator will recommend relative shares of responsibility between and among the Allocation Parties for that portion of the costs associated with the remedial design and remedial action for Diamond Alkali OU2 determined, during Phase 2, to be attributable to the Allocation Parties as a group. The Allocator will recommend a share for each Allocation Party with respect to each facility identified with each such Allocation Party in Attachment A (but not including relative shares for those facilities for which an Allocation Party has settled with the EPA as part of the Early Settlement Option pursuant to Section 4.2), whether the party participates in the allocation process or not. The allocated shares recommended by the Allocator shall total to 100% of the aggregate responsibility of the Allocation Parties (but not including those facilities for which an early cash-out settlement has been reached pursuant to Section 4.2) to be determined during Phase 2.

d. While neither EPA nor the Allocation Parties are bound by the results of the Allocation and subject to EPA's acceptance of the Final Allocation Recommendation Report consistent with the provisions of the Revised Work Plan, EPA has committed to use the Allocator's recommended shares of relative responsibility among the Allocation Parties as a primary factor in its future negotiations in Phase 2 with the goal of reaching agreement with the Allocation Parties on future cash-out and work party settlements.

e. Exclusions from the Allocation - The Allocator will not recommend shares of responsibility for the costs associated with OU2 during Phase 1 to any person or entity not noticed or designated by EPA as an Allocation Party. However, the Allocator's Preliminary Allocation Recommendation Report and Final Allocation Recommendation Report may include factual and other information about parties that are not Allocation Parties to the extent such facts and information are relevant to the relative responsibility of any of the Allocation Parties.

3.2 Retention of Rights

By participating in the Allocation, no Participating Allocation Party waives, releases or otherwise relinquishes any legal or equitable defense in any subsequent proceeding, nor any right or ability to later object in any fashion to any aspect of the Allocation, including without limitation to object based on the exclusions contained in paragraph 3.1.e., nor an argument that the Allocation does not support a settlement between EPA and one or more Allocation Parties. Participation in the Allocation is not an indication of liability regarding OU2 or any aspect of the Diamond Alkali Superfund Site.

4. ALLOCATION TIMELINE (INCLUDING SUBMISSION DEADLINES AND DESCRIPTIONS OF VARIOUS TASKS)

4.1 Allocation Related Tasks and Timeline

The Allocation Team and PAPs will complete the following allocation related tasks in compliance with the following timeline:

a. Tasks Required of All PAPs and the Allocation Team

6/11/18 Allocation Team completes Guide in consultation with PAPs and EPA

6/15/18 PAPs provide non-confidential documents deemed relevant by EPA, as identified in email from Judy Manley dated 5/25/18, to Allocation Team and Allocation Team loads documents into non-confidential document repository

b. Tasks Required of PAPs Requesting Early Settlement Opportunity and the Allocation Team

6/22/18 PAPs interested in submitting a request for consideration for early settlement with respect to a facility identified with such PAP in Attachment A send a notice of intent to the Allocation Team.

6/29/18 In compliance with Section 4.2, PAPs submit to Allocation Team and all other PAPs: (1) a written self-designation as eligible for early settlement with respect to relevant facility location (up to 3-page description, exclusive of attachments), and (2) completed Preliminary Questionnaire, with expert report as deemed necessary by the submitting PAP to support facts indicated in such Preliminary Questionnaire. Each expert report shall be limited to a maximum of twenty-five (25) pages of text and include a minimum of a one page executive summary. In addition, each PAP requesting early settlement consideration shall, in such form as directed by the Allocation Team, submit indices of non-

confidential and confidential documents, and copy of all documents noted in such indices, that either: (1) based on a search of documents in its possession and control consistent with guidance set forth in the "List of Relevant Document Categories for Allocation" (Attachment F) were not previously submitted to the Allocation Team with respect to such facility location; or (2) were relied upon in drafting its written self-designation as eligible for early settlement and Preliminary Questionnaire, and were not previously provided to the Allocation Team for loading into an appropriate confidential or non-confidential document repository.

7/6/18 Allocation Team submits recommendation on relevancy of additional non-confidential documents to PAPs and EPA

7/20/18 *(EPA communicates decision regarding relevancy of additional non-confidential documents to Participating Allocation Parties and the Allocation Team)*

7/20/18 Allocation Team loads documents into appropriate non-confidential or confidential document repository

7/27/18 Allocation Team submits preliminary draft Data Reports for Early Settlement Facilities to PAPs for review (Comments due to Allocation Team by 8/3/18)

8/10/18 Allocation Team submits draft Data Reports for Early Settlement Facilities to PAPs and EPA

8/24/18 PAPs submit comments on draft Data Reports for Early Settlement Facilities

8/31/18 Allocation Team submits final Early Settlement Facility Data Report to PAPs and EPA

8/31/18 Allocation Team submits preliminary draft recommendations regarding Early Settlement Facilities to PAPs for review (Comments due to Allocation Team by 9/7/18)

9/7/18 PAPs with Early Settlement Facilities submit executed certification of data search regarding non-confidential documents

Upon receipt of executed certification, Allocation Team loads Early Settlement Facility Data reports into ADR Confidential repository

9/25/18 Allocation Team submits draft recommendations regarding Early Settlement Facilities to PAPs and EPA

10/12/18 PAPs submit comments on draft Early Settlement Facility recommendations

10/19/18 Allocation Team submits final Early Settlement Facility recommendations to EPA and PAPs

TBD (*EPA communicates determination regarding facilities eligible for early settlement)*

c. Tasks Required of the Allocation Team and PAPs for Facilities Not Self-Designated by PAPs as Early Settlement Facilities

4/19/19 PAPs submit to Allocation Team and all other PAPs, with respect to each of the PAPs' identified facilities: (1) a Preliminary Factual Statement, which includes a written summary of facts regarding the facility's connection with OU2 (up to 5-page description, exclusive of attachments), and (2) completed Preliminary Questionnaire, with expert report(s) as deemed necessary by the submitting PAP to support facts indicated in such Preliminary Questionnaire. Each expert report shall be limited to a maximum of twenty-five (25) pages of text and include a minimum of a one page executive summary. In addition, each PAP shall, in such form as directed by the Allocation Team, submit indices of non-confidential and confidential documents, and a copy of all documents noted in such indices, that either: (1) based on a search of documents in its possession and control consistent with guidance set forth in the "List of Relevant Document Categories for Allocation" (Attachment F) were not previously submitted to the Allocation Team with respect to such facilities; or (2) were relied upon in drafting its Preliminary Factual Statement(s) and Preliminary Questionnaire(s), and were not previously provided to the Allocation Team for loading into an appropriate confidential or non-confidential document repository.

5/3/19 Allocation Team submits determination on relevancy of additional non-confidential documents to PAPs

5/10/19 Allocation Team loads approved documents into appropriate non-confidential or confidential document repository

5/17/19 Allocation Team submits a preliminary recommendation regarding allocation factors and methodology for the determination of relative shares of responsibility for relevant facility locations between and among the Allocation Parties to PAPs and EPA

5/24/19 Allocation Team meeting with the PAPs regarding preliminary recommendation on allocation factors and methodology

6/7/19 Allocation Team submits a final allocation factors and methodology for the determination of relative shares of responsibility for relevant facility locations between and among the Allocation Parties to PAPs and EPA

6/28/19 Allocation Team submits draft Data Reports for all remaining identified facilities of Allocation Parties to PAPs for review

8/23/19 PAPs submit comments on draft Allocation Party Facility Data Reports

9/20/19 Allocation Team submits final Allocation Party Facility Data Reports to PAPs

9/27/19 PAPs submit executed certification regarding search for non-confidential documents, to Allocation Team with copies to PAPs

Upon receipt of executed certification, Allocation Team loads Allocation Party Facility Data Reports into ADR Confidential repository

11/15/19 PAPs submit Position Briefs, with expert report as deemed necessary by the submitting PAP, to Allocation Team and all PAPs

1/10/20 PAPs submit Responsive Briefs, with expert report as deemed necessary by the submitting PAP, to Allocation Team and all PAPs

4/3/20 Allocation Team submits Preliminary Allocation Recommendation Report to PAPs for consideration

5/1/20 Allocation Team meeting with PAPs regarding Preliminary Allocation Recommendation Report

6/5/20 PAPs submit comments on Preliminary Allocation Recommendation Report to Allocation Team and all PAPs

7/3/20 Allocation Team submits Final Allocation Recommendation Report to PAPs and EPA

4.2 Early Settlement Option

Each Participating Allocation Party with an identified facility that meets eligibility criteria established by EPA will have the opportunity to seek an early cash-out settlement with EPA as an alternative to participation in the Allocation with respect to such facility.

a. EPA eligibility criteria – A PAP must demonstrate that its identified facility meets the requirements established by EPA to be eligible for consideration of an early cash-out settlement with EPA and removal from consideration in the allocation process. Eligibility criteria were established in the letter from Eric Wilson to the Operable Unit 2 potentially responsible parties, dated May 17, 2017 (Attachment C), as further refined through discussions between EPA staff and the Allocator (which the Allocator communicated to the Participating Allocation parties via email on April 6, 2018 and during the April 24 meeting of the Participating Allocation Parties). Based on these communications, a PAP facility may qualify for an early cash-out settlement in the following circumstances:

(i) The PAP is able, based on information in the non-confidential document repository or submitted by the PAP to support its written self-designation as eligible for early settlement and Preliminary Questionnaire and without the need to provide expert analysis of facts regarding the fate and transport of COCs, to show a lack of discharge/release of any of the COCs from the relevant facility into the Lower Passaic River, whether from facility operations or from contamination otherwise present on the property, including from contaminated soils. For example, if a PAP did not use the COCs on the

facility site or the PAP can show that any COCs did not leave the facility, then the PAP may be eligible for an early cash-out settlement with respect to such facility.

b. **Process for Requesting Early Settlement Consideration** – A PAP may request the recommendation of the Allocator that its identified facility be considered a candidate for an early cash-out settlement with EPA by submitting the documents noted in 4.2.c to the Allocation Team and all PAPs on or before the deadline noted in 4.1.b. above, June 29, 2018.

c. **Required Submissions** - The following submissions are required of a PAP that requests consideration for an early settlement opportunity with respect to one or more of its identified facility(ies):

   (i) Justification of Eligibility for Early Settlement – This document shall comprise a written explanation of no more than three (3) pages detailing the reasons that the PAP's facility meets the established criteria for consideration for an early settlement with EPA.

   (ii) Preliminary Questionnaire – Requesting parties shall provide a completed Preliminary Questionnaire in compliance with the requirements and deadline of 4.1.b. above.

   (iii) Certification – Requesting parties shall provide an executed certification of their data search regarding non-confidential documents in compliance with the requirements and deadline of 4.1.b. above. A template for creation of such certification is at Attachment H.

d. **Role of Allocator** – The Allocator will review and provide a final recommendation on whether a requesting party's facility meets the criteria for consideration by EPA for an early settlement in compliance with the tasks and deadlines noted in 4.1.b. above.

e. **Anticipated EPA Settlement** – It is anticipated that any Party with which EPA enters a settlement following the early cash-out recommendation of the Allocator will be offered a settlement on the same terms and conditions as the cash-out settlement agreements previously entered by the United States with OU2 PRPs (See Administrative Settlement Agreement, CERCLA Docket No. 02-2017-2023). Any PAP that enters a settlement with EPA with respect to a facility will not be assigned a recommended allocation share by the Allocator for such facility. To the extent such facility was the only facility identified for the PAP on Attachment A, such PAP will be removed from the list of Allocation Parties.

f. **No Adverse Effect** - The request by a PAP for a recommendation of the Allocator that it be considered a candidate for an early cash-out settlement with EPA pursuant to Section 4.2.c. regarding one of multiple facilities identified by EPA noted in Attachment A shall not affect the ability of such PAP to participate in the subsequent Allocation activities regarding another of its identified facilities.

g. **Ability to Rejoin Allocation** - Any PAP that EPA initially determines ineligible for an early settlement and any PAP EPA determines is eligible for an early settlement (based on the recommendation of the Allocator) but does not enter a settlement with EPA for any reason, may rejoin ongoing allocation activities on the same basis and with the same rights as other PAPs. Reasonable accommodation, commensurate with the time in the Allocation process a PAP rejoins, will be provided by the Allocator to ensure that any party rejoining ongoing allocation activities may augment prior submissions or provide any submission required to fulfill its responsibilities, or otherwise avail itself of any rights, under 4.1.c. above.

4.3 Document Repositories

The Allocator will establish limited access, password protected, electronic databases as required to maintain and allow PAPs, and EPA as designated herein, to view documents and information used in conduct of the Allocation.

a. **Non-confidential Document Repositories** – Documents in the non-confidential document repository may be viewed by the Allocation Team, PAPs, and EPA, and used by EPA and the PAPs for any purpose.

   (i) Non-Confidential allocation documents – Documents in the non-confidential repository will come from the following sources;

      1. Documents received by the Allocator from EPA, and

      2. Non-confidential documents recommended for inclusion by PAPs and deemed relevant to conduct of the Allocation by EPA or the Allocator.

      3. If the number of pages of documents submitted by a PAP is determined to be unreasonably excessive, AlterEcho will discuss the issue with EPA as a contractual matter and propose a resolution.

   (ii) Determination of PAP Recommended Documents for Inclusion in Non-Confidential Document Repository - In compliance with the timeframes specified in Section 4.1, additional documents for the non-confidential document repository are determined in the following manner:

      1. PAPs submit an index of additional documents recommended for inclusion in the non-confidential document repository to the Allocator based on a search of documents in its possession and control consistent with guidance set forth in the "List of Relevant Document Categories for Allocation" (Attachment F);

      2. The Allocator submits a determination on relevancy of recommended additional documents to conduct of the allocation to PAPs, with an explanation for the exclusion of any recommended document;

b. **Confidential EPA-Accessible Document Repository** - Documents in the confidential EPA-accessible document repository may be viewed by the Allocation Team, PAPs, and EPA, but are ADR confidential and may be utilized only for purposes of the 2-phase ADR facilitated settlement process.

   (i) Confidential EPA-accessible repository documents – Documents in the confidential EPA-accessible document repository will comprise ADR confidential work product of the Allocator created for purposes of the allocation, including:

      1. Allocator's Final Early Settlement Recommendation Report; and

      2. Allocator's Final Allocation Recommendation Report.

c. **Confidential Document Repository** - Documents in the confidential document repository may be viewed by only the Allocation Team and PAPs, are ADR confidential, and may be utilized only for purposes of the 2-phase ADR facilitated settlement process.

   (i) Confidential repository documents – Documents in the confidential document repository will comprise ADR confidential documents provided to the Allocator by PAPs during the conduct of the Allocation, including party work product, submissions, and expert reports. Documents in the confidential document repository will not be used as the main factual basis for the allocation share assigned by the

Allocator in the Final Allocation Recommendation Report. Documents in the confidential document repository will include the following:

1. Preliminary Questionnaire
2. Self-Designation of Eligibility for Early Settlement
3. Preliminary Factual Statement
4. Position Brief
5. Responsive Brief

4.4 Allocation Party Facility Data Reports

a. **Purpose of Data Reports** – The Allocation Team will prepare a data report for each facility identified with an Allocation Party in Attachment A that summarizes the site-related, factual information available to the Allocation Team regarding the impact of the Party's use, storage, generation, disposal, remediation, and/or handling of COCs related to the facility on the need for and costs of the OU2 remedy.

b. **Content of Data Reports** – A template to be used by the Allocation Team in drafting the Allocation Party Facility Data Reports is included as Attachment G.

(i) If an Allocation Party has more than one facility, it will receive a data report for each of the different facilities. The Allocation Team may combine the Facility Data Reports of an Allocation Party that has more than one facility to avoid duplication of reported data.

(ii) An Allocation Party's data report will include information on the ownership and/or operations of an entity associated with an Allocation Party's facility identified by EPA listed in Attachment A and identified by EPA or the Allocation Team as affiliated with the Allocation Party, unless the Allocation Party disagrees that it has accepted responsibility for the entity's actions or liabilities. If EPA or the Allocation Team has listed an entity as being affiliated with an Allocation Party facility but the Allocation Party disagrees that it has responsibility for the actions or liabilities of such entity, the Allocation Team and Allocation Party will raise the matter with EPA for resolution.

4.5 Participating Allocation Party Certifications of Relevant Document Search

a. In compliance with the time frames specified in Section 4.1., the PAPs will execute and provide to the Allocation Team a certification regarding the nature of their search and provision of non-confidential documents for use in conduct of the Allocation. A template for use in creating such certifications is included as Attachment H.

b. The Preliminary Questionnaire to be submitted in compliance with Section 4.1 (Attachment I) includes a required certification regarding the nature of their search and provision of documents for use in conduct of the Allocation.

c. PAPs shall include and execute the following certification regarding the nature of their search and provision of documents for use in conduct of the Allocation as part of any Justification of Eligibility for Early Settlement, Advocacy Brief, and Responsive Brief submitted in compliance with Section 4.1.

CERTIFICATION

By signing this certification, the Allocation Party identified below certifies that, to the best of its knowledge and belief, the factual information reflected in its [*include name of submitted document*] is (1) true, correct, and complete, and (2) based on the result of the search for documents pursuant to the Allocation Guide. The Allocation Party further certifies that, to the extent it relied on documents in preparing its [*include name of submitted document*] that had not already been submitted to the Allocator, it has submitted such documents to the Allocator for inclusion in the appropriate allocation document repository and use in the Allocation.

FOR _____**:**
[*Insert Name of Allocation Party*]

_____

Dated[*Insert Name of Signatory*]
[*Title*]
[*Company*]
[*Address*]

5. RIGHTS & RESPONSIBILITIES OF PARTICIPANTS

5.1 Submission of Joint Papers/Presentations

a. With the exception of submissions related to Early Settlement consideration (Section 4.2.c.) and submission of individual Preliminary Questionnaires (Section 4.1.c.) and Certifications (Section 4.5), any PAP may satisfy its requirement for a required submission, in whole or in part, by identifying itself as the member of a subgroup of the Allocation Parties providing the submission on behalf of its subgroup members. In addition to required submissions, any PAP or group of PAPs may voluntarily submit a separate certified Preliminary Factual Statement and/or Preliminary Questionnaire regarding a facility of a non-participating Allocation Party.

5.2 Communications with Allocator

a. Communications with the Allocator or the Allocation Team shall be limited to communications specified in this Section 5.2 of the Guide.

b. *Ex Parte* Rules - Communications by a PAP or group of PAPs to the Allocator and the Allocation Team shall be limited to required submissions and communications during participation in meetings or conference calls of the group of PAPs convened by the Allocator.

c. Exceptions to *Ex Parte* Rule - A PAP or group of PAPs may communicate via email;

   (i) with the Allocator for any purpose so long as all PAPs are copied on such communication, and

   (ii) with a member of the Allocation Team for a purely technical reason, such as assistance with difficulty accessing the database, however, the Allocator retains the discretion to share such communications with all other PAPs as deemed prudent.

d. The Allocator may contact and conduct communications with PAPs, individually or in groups, in any manner he deems appropriate to support conduct of the Allocation.

e. The Allocator and Allocation Team shall limit communications with EPA to communications that are either; (1) specifically required by the Revised Work Plan (Attachment D), (2) related to the administration of EPA's contract EP-W-14-020 with AlterEcho, or (3) required in the judgment of the Allocator for the efficient functioning of the Allocation. Except for communications relating to payment for services pursuant to AlterEcho's contract with EPA or communications that are required by the Revised Work Plan or AlterEcho's contract with EPA, all communications between AlterEcho and EPA shall be in writing with a copy provided to all Participating Allocation Parties.

f. Except for communications relating to payment for services pursuant to AlterEcho's contract with EPA or communications that are required by the Revised Work Plan or AlterEcho's contract with EPA, the Allocator shall notify the Participating Allocation Parties in writing of any communication from EPA, not made pursuant to Section 5.2.e, received by the Allocator or the Allocation Team regarding the Allocation, with a description, subject to appropriate confidentiality protections, of the communication and any associated discussions.

6. CONFIDENTIALITY

6.1 Confidentiality Agreement

a. Each of the PAPs previously executed the Diamond Alkali Superfund Site OU2 Allocation Confidentiality Agreement (Attachment J). This Section 6 supplements and clarifies the understanding of the PAPs regarding the confidentiality of the Allocation process.

6.2 Scope of Confidentiality Protections

a. Except as specifically enumerated in Section 6.3 below, all communications and submissions related to conduct of the Allocation, are protected by and will be held confidential by the Participating Allocation Parties, the Allocation Team, and EPA, pursuant to the provisions of 5 USC 574 and other applicable authorities, the OU2 Allocation Confidentiality Agreement between and among the PAPs and Allocation Team (Attachment J), and the terms of the Revised Work Plan between the Allocation Team and EPA (Attachment D).

b. The PAP representatives, on behalf of their clients, and the Allocator, on behalf of the Allocation Team, have entered a Confidentiality Agreement (Attachment J) evidencing their understanding of the confidentiality requirements of 5 USC 574 and their agreement to maintain the confidentiality of all allocation related communications. Through its letters to the Allocation Parties dated May 1, 2018 (Attachment A) EPA has set forth its understanding of the confidentiality requirements of 5 USC 574.

6.3 Exceptions to the Confidentiality of the Allocation Process

a. It is the understanding of the PAPs and EPA that the documents noted in 4.3.a.(i) will be considered non-confidential documents and available for use by EPA and the Participating Allocation Parties for any purpose.

7. CONDUCT OF ALLOCATION

7.1 General Information

At Superfund sites involving contaminated sediments, such as OU2 of the Diamond Alkali Superfund Site, an equitable allocation involves the consideration and application of relevant allocation factors to the facts of the case in order to determine the relative responsibility of PRPs for the costs associated with remediation of harm created by each party's activities. In such cases, allocations are based primarily on an analysis of activities of parties that contributed to the need for

and scope of remedial efforts to address the contamination at issue (i.e., that are driving the need for and cost associated with the investigation and remediation of OU2).

An allocation, as an equitable distribution of remedy costs, should consider the type of anticipated remedy in order to determine the relationship between a Party's activities and the costs of the remedy. (See; United States v. Atlas Minerals and Chems., Inc., Civ. A. No. 91-5118, 1995 U.S. Dist. LEXIS 13097, at *271 (E.D. Pa. Aug. 22, 1995) ("Ultimately, the allocation of response costs should consider each party's relative responsibility for (1) the need for remediation at the site, (2) the selection of the particular remedy, and (3) the cost of the selected remedy.")

The remedy selected for OU2 of the Diamond Alkali Site addresses contaminated sediments in the lower 8.3 miles of the Passaic River. Varieties of facilities adjacent to, or within the sewershed of the waterway, have engaged in operations or practices that have led to the release of a wide variety of hazardous substances into the environment over an extended period. These substances have ultimately migrated to the aquatic sediments through various pathways, including process discharges, spills, dumping, sewer systems, surface (land) runoff, and surface and groundwater flow. The current presence of these substances in the sediments has been affected by daily tidal flows, daily river flows, storm events, contributions from upstream and downstream sources, and navigational dredging.

EPA has determined that sediments of the lower 8.3 miles of the Lower Passaic River pose an unacceptable risk to human health and the environment due to the presence of eight identified COCs which are bound to fine-grained sediment particles located primarily in this reach of the river. The EPA identified COCs include dioxin/furans, PCBs, mercury, DDx, copper, dieldrin, PAHs, and lead.

As noted in the Record of Decision for OU2 (Attachment K), the remedy selected for OU2 is a final action for sediments and an interim action for the water column. The primary components of this selected remedy include the following:

- An engineered cap, generally consisting of two feet of sand and armored where necessary to prevent erosion constructed over the river bottom of the lower 8.3 miles

- Before installation of the engineered cap, dredging of the river bank to bank will occur (approximately 3.5 million cubic yards) so that the cap can be placed without increasing the potential for flooding, to allow for the continued commercial use of a federally-authorized navigation channel in the 1.7 miles of the river closest to Newark Bay, and to accommodate reasonably-anticipated future recreational use above River Mile 1.7.

- Dredged materials will be barged or pumped to a sediment processing facility in the vicinity of the Lower Passaic River/Newark Bay shoreline for dewatering and transport to permitted treatment facilities and landfills in the United States or Canada for disposal

- Mudflats dredged during implementation of the remedy will be covered with an engineered cap consisting of one foot of sand and one foot of mudflat reconstruction (habitat) substrate

- Institutional controls will be implemented to protect the engineered cap and current New Jersey prohibitions on fish and crab consumption will be enhanced with additional community outreach, and

- Long-term monitoring and maintenance of the engineered cap and long-term monitoring of fish, crab, sediment and water column will be performed to determine when remedial action objectives and remedial goals are reached

The selected remedy addresses all 8.3 miles of OU2 without variation in remedial action based on the existence or location of a specific COC or contaminant level. The primary design parameter for dredging is to allow for placement of the engineered cap without an increase in the potential for flooding of the Lower Passaic River and to allow for continued use of a part of the navigation channel.

7.2 Purpose and Role of Allocation

a. As noted in Section 3.1, the Allocation is intended to serve as the first phase of a two-stage settlement process to obtain cash-out and work party agreements between the EPA and the Allocation Parties. As such, it is an intentional variation of how a typical private allocation process would be conducted. Unlike a typical allocation, the outcome of which is a recommendation on the share of responsibility of each PRP for total site related costs, this Allocation will provide a recommendation on the relative shares of responsibility between and among the Allocation Parties for that portion of the costs associated with the remedial design and remedial action for Diamond Alkali OU2 determined in the future to be attributable to the Allocation Parties as a group.

7.3 Allocation Parameters

a. The Allocator will provide a recommendation on the share of responsibility of the Allocation Parties related to each of the facilities identified by EPA listed in Attachment A.

b. The responsibility of Allocation Parties will be analyzed and calculated only for the period of their actual ownership/operation of each of their related facility(ies) and any additional period for which they have legal liability for the actions of another entity associated with the facility.

c. Though neither the natural flow of groundwater or rainwater bearing COCs under or across the surface of a PAP's facility will be considered for purposes of determining the responsibility of such a PAP during the Allocation, the substantial actions of a PAP that causes contamination by COCs of groundwater or rainwater (such as a spill, drum burial, or disturbance of contaminated soil without appropriate protections) that has the potential to reach the Passaic River may be considered by the Allocator in conduct of the Allocation.

7.4 Advocacy Briefs

a. In compliance with the schedule specified in Section 4.1.c., each PAP has the opportunity to submit an Allocation Position Brief and Responsive Brief for each facility identified with such PAP in Attachment A for the consideration of the Allocator.

b. Allocation Position Brief – Allocation Position Briefs shall be no longer than twenty (20) pages in length, exclusive of attachments. Each expert report shall be limited to a maximum of twenty-five (25) pages of text and shall include a minimum of a one page executive summary. PAPs may use Allocation Position Briefs to provide the Allocator with perspective and suggestions deemed relevant to the Allocation by the submitting PAP, including opinions regarding allocation methodology and equitable factors for use in conduct of the Allocation, legal and equitable considerations for determining the responsibility of the submitting PAP, , other PAPs, and non-participating Allocation Parties, the distribution of responsibility among the Allocation Parties, and other information deemed relevant by the submitting PAP for the consideration of the Allocator.

c. Responsive Brief – Responsive Briefs shall be no longer than fifteen (15) pages in length, exclusive of attachments. Each expert report shall be limited to a maximum of twenty (25) pages of text and shall include a minimum of a one page executive summary. PAPs may use Responsive Briefs to provide the Allocator with perspective and suggestions deemed relevant to the Allocation by the submitting PAP, including comment on the perspective and suggestions of other PAPs expressed in their submission of an Advocacy Brief.

7.5 Allocation Recommendation Report

a. In compliance with the schedule specified in Section 4.1.c. and the provisions of the Revised Work Plan, the Allocator will provide to the Allocation Parties a Preliminary and Final Allocation Recommendation Report and to EPA a Final Allocation Recommendation Report for their use in Phase 2 of the facilitated settlement process. The Allocation Recommendation Report will recommend relative shares of responsibility between and among the Allocation Parties for that portion of the costs associated with the remedial design and remedial action for Diamond Alkali OU2 determined, during Phase 2, to be attributable to the Allocation Parties as a group. The Allocator will recommend an equitable share for each Allocation Party's related facilities (other than for those facilities for which an Allocation Party has settled as part of an early cash-out settlement pursuant to Section 4.2), whether the Allocation Party has participated in the Allocation or not.

b. In compliance with the schedule specified in Section 4.1.c., PAPs may provide comments and suggestions regarding the Preliminary Allocation Recommendation Report for the consideration of the Allocator. Such written comments shall be no longer than fifteen (15) pages in length.

c. The Allocator will develop the Allocation Recommendation report in consultation with the Participating Allocation Parties, taking into consideration the equitable factors, principles, and methodology to be developed pursuant to Section 7.6.

d. The Final Allocation Recommendation Report will include an explanation of the basis upon which the Allocator made his allocation determinations, including how ambiguities or gaps in site data were resolved or taken into account. In addition, the Final Allocation Recommendation Report will include as attachments, or EPA will be provided access to, the sources of data upon which the recommendation of the Allocator is premised, including the Allocation Party Facility Data Reports, and the Participating Allocation Party Certifications of Relevant Document Search submitted pursuant to Section 4.5.

7.6 Determination of Equitable Factors and Methodology

a. In compliance with the schedule specified in Section 4.1.c., the Allocator will develop relevant allocation factors and methodology for the determination of relative shares of responsibility between and among the Allocation Parties for that portion of the costs associated with the remedial design and remedial action for Diamond Alkali OU2 determined in the future to be attributable to the Allocation Parties as a group in consultation with the PAPs and EPA. Such allocation factors and methodology shall be developed in consideration of case law, judicial dicta, and practice standards of allocation professionals relevant to the allocation of responsibility of PRPs at similar contaminated sediment hazardous waste sites.

b. Based on analysis of received allocation documents and site technical information, review of case law, judicial dicta, and practice standards of allocation professionals relevant to the allocation of responsibility of PRPs at similar contaminated sediment hazardous waste sites, and prior input from the PAPs and EPA, the Allocator will provide the PAPs and EPA with his preliminary recommendation regarding allocation factors and methodology for the determination of relative shares of responsibility between and among the Allocation Parties for

that portion of the costs associated with the remedial design and remedial action for Diamond Alkali OU2 determined in the future to be attributable to the Allocation Parties as a group for their consideration in compliance with the schedule specified in Section 4.1.c.

c. PAPs will have the opportunity to provide opinions and recommendations to the Allocator regarding the application of such relevant allocation factors and methodology through the submittal of Allocation Position Briefs, Responsive Briefs, and comments on the Allocator's Preliminary Allocation Recommendation Report.

TABLE OF ATTACHMENTS

A. CHART OF ALLOCATION PARTIES, FACILITIES, AND REPRESENTATIVES

B. LIST OF PARTICIPATING PARTIES

C. LETTERS FROM ERIC WILSON, EPA, TO THE ALLOCATION PARTIES DATED SEPTEMBER 18, 2017, NOVEMBER 28, 2017, JANUARY 5, 2018, FEBRUARY 16, 2018, FEBRUARY 23, 2018, AND MAY 1, 2018

D. REVISED WORK PLAN FOR THE ALLOCATION (DENOTED AS TASK ORDER #096 UNDER CONTRACT EP-W-14-020)

E. LETTER FROM ERIC WILSON, EPA, TO THE OPERABLE UNIT 2 POTENTIALLY RESPONSIBLE PARTIES, DATED MAY 17, 2017

F. LIST OF RELEVANT DOCUMENT CATEGORIES FOR ALLOCATION

G. TEMPLATE: ALLOCATION PARTY DATA REPORT

H. TEMPLATE: CERTIFICATION OF PARTICIPATING ALLOCATION PARTY REGARDING CONDUCT OF SEARCH FOR NON-CONFIDENTIAL DOCUMENTS

I. PRELIMINARY FACTUAL QUESTIONNAIRE

J. DIAMOND ALKALI SUPERFUND SITE OU2 ALLOCATION CONFIDENTIALITY AGREEMENT

K. RECORD OF DECISION FOR OU2

Diamond Alkali Superfund Site OU2
Allocation Guide

Attachment A

ATTACHMENT A

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
21st Century Fox America, Inc. (21CFA)	> 100 Lister Ave. Newark, NJ	Chris-Craft Industries, Inc. Baldwin-Montrose Chemical Co. Montrose Chemical Co.
Alden Leeds Inc.	> 2145 McCarter Highway > 100 Hakensack Ave Newark, NJ > 55 Jacobus Avenue Kearny, NJ	Leeds Terminal Q-Pak
Alliance Chemical Inc.	> 33 Avenue P Newark, NJ	Pfister Pfister Urban Renewal Corporation
Arkema Inc. (Legacy Site Services)	> 25 & 67 Main Street Belleville, NJ	Wallace & Tiernan Elf Atochem North America Inc
Ashland LLC	> 221 Foundry St. Newark, NJ	Ashland Chemical Company

ATTACHMENT A

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Atlantic Richfield (ARCO)	> 86 Doremus Ave. Newark, NJ	The Atlantic Refining Company
Atlas Refining, Inc.	> 142 Lockwood St. Newark, NJ	
Automatic Electro Plating Corp.	> 185 Foundry Street Complex Newark, NJ (Bldgs 19, 21, 22)	

ATTACHMENT A

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
BASF Corporation on its own behalf, and on behalf of its wholly owned susidiary, BASF Catalysts, LLC	> BASF Catalysts, LLC One West Central Avenue East Newark, NJ BASF Corporation 50 Central Ave. Kearny, NJ	Hanovia Engelhard Corporation BASF Wyandotte Corporation United Cork
Benjamin Moore & Co	> 134 Lister Ave. Newark, NJ	
Berol Corporation	> 41 Dickerson Street Newark, NJ	
Campbell Foundry Company	> 800 Bergen Street Harrison, NJ	
Canning Gumm LLC (c/o MacDermid Inc)	> 538 Forest Street Kearny, NJ	Frederick Gumm Chemical Co

ATTACHMENT A

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
CBS Corporation	> 95 Orange St. Newark, NJ	Westinghouse Electric Corporation
Celanese Ltd./CNA Holdings LLC (Essex County Improvement Authority - indemnitor of Celanese)	> 290 Ferry St > 354 Doremus Ave Newark, NJ	
Chargeurs, Inc.	> 199 Main Street > 205 Main Street > 42 Arnot Street Lodi, NJ	The United Piece Dye Works
Chevron Environmental Management Company	> Getty Newark Terminal 86 Doremus Ave. Newark, NJ	Texaco Inc. TRMI-H LLC
Coats and Clark Inc. (as successor to Clark Thread Company)	> 260 Ogden St/900 Passaic Ave Newark/East Newark, NJ > 735 Broad Street Bloomfield, NJ	Clark Thread Co.
Congoleum Corporation	> 195 Belgrove Drive > 113 Passaic Avenue Kearney, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Conopco, Inc d/b/a Unilever (as successor to CPC/Bestfoods, former parent of the Penick Corporation)	> 540 New York Avenue Lyndhurst, NJ	Penick Corporation
Cooper Industries LLC	> 7, 13, & 26 Bank Street > 33 Littleton Avenue (aka 400 West Market Street) Newark, NJ > Belleville Avenue & Sherman Avenue Bloomfield, NJ > 75 Belmont Avenue Bellevile, NJ	J. Wiss & Sons Co Thomas A. Edison, Inc.
Covanta Essex Co.	> 183 Raymond Blvd > 66 Blanchard St Newark, NJ	American Ref-Fuel
Croda, Inc.	> 185 Foundry Street Complex Newark, NJ (Block 5005, Lot 21; Bldg 39)	Hummel Lanolin

ATTACHMENT A

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Curtiss-Wright Corporation	> 1 Passaic St. Woodridge, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Darling Ingredients Inc.	> 61 Blanchard Street Newark, NJ > 1215 Harrison Avenue Kearny, NJ	Standard Tallow Corp.
DII Industries, LLC (c/o Halliburton)	> Worthington Corp. & Dresser Industries, Inc. 401 Worthington Avenue Harrison, NJ	
Drum Service of Newark, Inc.	> 120 Lister Ave. Newark, NJ	Hilton-Davis 360 North Pastoria
Eden Wood Corporation	> 1 Ackerman Avenue Clifton, NJ	Whippany Paper Board
Elan Chemical Co., Inc.	> 268 Doremus Ave. Newark, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
EnPro Holdings, Inc.	> 900-1000 South Fourth St. Harrison, NJ	Crucible Steel Co. Coltec Industries
EPEC Polymers	> 290 River Drive Garfield, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Essex Chemical Corporation	> 330 Doremus Ave. & > 352 Doremus Ave. Newark, NJ (contiuous lots)	Essex Industrial Chemicals, Inc.
Everett Smith Group	> 20 Bruen Street Newark, NJ	Blanchard Bro. & Lane, Inc.
Foundry Street Corporation	> 185 Foundry Street Complex Newark, NJ (Block 5005, Lot 22 - Bldgs 19, 21, 22)	Automatic Electroplating Morrel Truck Grignard Honig Norpak Avon Berg County Lift Truck Conus Chemical Arkansas Chemical
Franklin-Burlington Plastics	> 113 Passaic Ave. Kearny, NJ	Spartech
Garfield Molding Company, Inc.	> 10 Midland Avenue Wallington, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
General Electric Company	> 415 South 5th Street & > 1000 South 2nd Street Harrison, NJ	RCA
Givaudan Fragrances Corp (originally known as Fragrances North America)	> 125 Delawanna Avenue Clifton, NJ	Givaudan Roure
Goodrich Corp.	> Kalama Chemical 290 River Drive Garfield, NJ	Kalama Chemical, Inc.
Goody Products, Inc. on behalf of itself and Newell Brands Inc. (f/k/a Newell Rubbermaid Inc.)	> 969 Newark Turnpike Kearny, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Hartz Consumer Group, Inc.	> 600/700 South 4th Street Harrison, NJ	
Hexcel Corporation	> 205 Main St. Lodi, NJ	
Hoffmann-LaRoche Inc.	> 340 Kingsland Road Nutley, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Honeywell International, Inc.	> General Chemical Co. 65 Lodi Street/8th Street Passaic, NJ	
ISP Chemicals LLC	> ISP Van Dyk, Inc. 1 Main St./11 William St. Belleville, NJ	International Specialty Products
Harris Corporation, for itself and as successor in interest to Exelis, Inc. successor in interest to the former defense business ITT Corporation	> 100 Kingsland Drive > 77 River Road Clifton, NJ (contiguous properties) > 500 Washington Avenue > 390 Washington Avenue > 417 River Road > 491/493 River Road > 483 River Road > 492 River Road Nutley, NJ (contiguous properties)	
Kearny Smelting	> 936 Harrison Ave. Kearny, NJ	MAC Metals

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Leemilt's Petroleum, Inc. (successor by merger to Power Test of New Jersey, Inc.)	> 86 Doremus Ave. Newark, NJ	
Legacy Vulcan Corporation (formerly known as Vulcan Materials Company)	> 600 Doremus Ave. Newark, NJ	
Lucent Technologies (now known as Nokia of America Corporation.)	> Kearny Works 100 Central Avenue Kearney, NJ	AT&T/Western Electric
National Standard LLC	> 714-716 Clifton Avenue Clifton, NJ	Iron Oxide Corp.
Newark Group, Inc.	> 17 Blanchard Street Newark, NJ	The Newark Boxboard Co.
Newark Morning Ledger Co.	> 1 Star Ledger Plaza Newark, NJ	
Occidental Chemical Corp.	> 80 & 120 Lister Ave. Newark, NJ	Diamond Shamrock Chemicals Company
The Okonite Company, Inc.	> Canal and Jefferson Streets Passaic, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Otis Elevator Co.	> 1000 First St. Harrison, NJ	
Palin Enterprises	> 44 Passaic Ave. (a/k/a 25 Belgrove Drive) Kearny, NJ	American Modern Metals
Pabst Brewing Company	> 400 Grove Street Newark, NJ	
Passaic Pioneer Properties Co	> 35 Eighth Street > 65 Lodi Street/8th Street Passaic, NJ	Eclipse Interstate Dyeing Parra Sun Brite
Pharmacia LLC	> Foot of Pennsylvania Ave. Kearny, NJ	Monsanto Company (now known as Pharmacia LLC)
Pitt-Consol Chemical Company	> 191 Doremus Ave. Newark, NJ	

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
PMC, Inc.	> 450 Schuyler Avenue Kearny, NJ	American Polymers Ampol HD Acquisitions K&M Plastics King Finishing Kleer Kast Plastics Manufacturing
PPG Industries, Inc.	> 29 Riverside Ave. Newark, NJ	
PSEG (Public Service Enterprise Group)	> 155 Raymond Blvd. Newark, NJ > 4th St. Harrison, NJ	
Purdue Pharma Technologies	> 199 Main St. Lodi, NJ	Napp Technologies

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Quality Carriers, Inc.	> 80 Doremus Avenue Newark, NJ	Chemical Leaman Tank Lines Quala Systems, Inc.
Revere Smelting & Refining Corp / RSR Corp	> 387 Avenue P Newark, NJ	
Roman Asphalt Corporation	> 14 Ogden Street Newark, NJ 07104	
Royce Associates	> 17 Carlton Avenue East Rutherford, NJ	Royce Chemical Company
Safety Kleen Envirosystems Company/McKesson Corp.	> 600 Doremus Ave. Newark, NJ	McKesson Envirosystems Company/McKesson Corp. Inland Chemical Corporation
Schiffenhaus Packaging Corp. (c/o Rock-Tenn Company)	> 204 Academy Street > 49 Fourth Street > 2013 McCarter Highway Newark, NJ	Southern Consolidated

ATTACHMENT A

Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Sequa Corporation	> 185 Foundry Street Newark, NJ	
Seton Company, Inc. (now Seton Tanning)	> 349 Oraton Street > 849 Broadway > 62 Verona Ave Newark, NJ 07104	Radel Seton Leather Company
Sherwin Williams Company	> 60 Lister Ave. Newark, NJ	
Spectraserv, Inc.	> 75 Jacobus Ave. Kearny, NJ	Modern Transportation
Stanley Black & Decker, Inc. (formerly known as The Stanley Works)	> 140 Chapel St. Newark, NJ	Stanley Tools Atha Tool Company

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
STWB Inc. (c/o Bayer Corporation)	> 192-194 Bloomfield Avenue Bloomfield, NJ 07003 > 120 Lister Ave. Newark, NJ	Lehn & Fink Products Corp. Thomasett Colors/Sterling Hilton-Davis Chemical Company
Sun Chemical	> 185 Foundry Street Newark, NJ	
Tate & Lyle Ingredients Americas LLC (A.E. Staley Maufacturing Company & its former division Staley Chemical Company)	> 320 Schuyler Avenue & > 100 Third Avenue Kearny, NJ	
Teval Corporation	> 900-1000 South 4th Street Harrison, NJ	Guyon Pipe Crucible Steel Van Leeuwen Smith International

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Allocation Party	Related OU2 Facility Address	Entities Associated w Property for Which Allocation Party Allegedly has CERCLA Responsibility re Entities' Ownership/Operation of Facility
Textron Inc.	> Spencer Kellogg Division 400 Doremus Avenue Newark, NJ > 681 Main Street Belleville, NJ	
Tiffany and Company	> 820 Highland Avenue Newark, NJ	

Diamond Alkali Superfund Site OU2
Allocation Guide

Attachment B

Diamond Alkali SF Site OU2
Participating Allocation Parties

1. 21st Century Fox America Inc.(21CFA)
2. Alliance Chemical Inc.
3. Arkema / Legacy Site Services
4. Ashland LLC
5. Atlantic Richfield (ARCO)
6. Atlas Refining Inc.
7. BASF Corporation
8. Benjamin Moore & Co
9. Berol Corporation
10. Campbell Foundry Company
11. Canning Gumm LLC
12. CBS Corporation
13. Celanese Ltd./CNA Holdings LLC
14. Chargeurs Inc.
15. Chevron Environmental Management Company
16. Coats and Clark Inc.
17. Congoleum Corporation
18. Conopco Inc
19. Cooper Industries LLC
20. Covanta Essex Co.
21. Croda Inc.
22. Curtiss-Wright Corporation
23. Darling Ingredients Inc.
24. DII Industries, LLC
25. Eden Wood Corporation
26. Elan Chemical Co Inc.
27. EnPro Holdings Inc.
28. EPEC Polymers
29. Essex Chemical Corporation
30. Everett Smith Group
31. Franklin –Burlington Plastics
32. Garfield Molding Company Inc.
33. General Electric Company
34. Givaudan Fragrances Corp
35. Goodrich Corp
36. Goody Products, Inc. on behalf of itself and Newell Brands Inc. (f/k/a Newell Rubbermaid Inc.)
37. Hartz Consumer Group Inc.
38. Hexcel Corporation
39. Hoffman – LaRoche Inc.
40. Honeywell International Inc.
41. ISP Chemicals LLC
42. Harris Corporation
43. Kearny Smelting
44. Leemilt's Petroleum Inc.
45. Legacy Vulcan Corporation
46. Lucent Technologies
47. National Standard LLC
48. Newark Group Inc.
49. Newark Morning Ledger Co.
50. The Okonite Company, Inc.
51. Otis Elevator Co.
52. Palin Enterprises
53. Pabst Brewing Company
54. Passaic Pioneer Properties Co
55. Pharmacia LLC
56. Pitt-Consol Chemical Company
57. PPG Industries Inc.
58. PSEG (Public Service Enterprise Group)
59. Purdue Pharma Technologies
60. Quality Carriers Inc.
61. Revere Smelting & Refining Corp/RSR Corp
62. Safety Kleen Ecirosystems Company/ McKesson Corp.
63. Sequa Corporation
64. Sherwin Williams Company
65. Spectraserv Inc.
66. Stanley Black & Decker Inc.
67. STWB Inc.
68. Sun Chemical
69. Tate & Lyle Ingredients Americas LLC
70. Teval Corporation
71. Textron Inc.
72. Tiffany and Company

Diamond Alkali Superfund Site OU2
Allocation Guide

Attachment C

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

SEP 18 2017

BY EMAIL AND CERTIFIED MAIL
RETURN RECEIPT REQUESTED

To: See List of Addressees - Attachment A

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

On August 28, 2017, the U.S. Environmental Protection Agency ("EPA") hosted a meeting at its New York City offices to provide you with an opportunity to share your views on the Agency's proposed settlement framework for implementation of the remedy selected for the lower 8.3 miles of the Passaic River, which is Operable Unit 2 ("OU2") of the Diamond Alkali Superfund Site (the "Site"). I want to once again thank all of the parties that participated in the meeting. Your participation has helped both EPA and the other parties better understand the issues and concerns regarding the framework.

After careful consideration, the Agency has concluded that the allocation process should include all of the potentially responsible parties ("PRPs") for OU2 (apart from the Passaic Valley Sewerage Commission ("PVSC"), the four municipal PRPs referred to below, and the PRPs that settle pursuant to the "early" cash-out settlement that EPA offered in March 2017), and should not be limited to the "middle tier" parties. Transparency and fairness are concepts that EPA has consistently stated are of importance to the Agency in this matter and, after considering your comments and concerns, we think those concepts are best served by having one allocation for all of these parties.

Numerous parties at the August 28, 2017 meeting expressed concern regarding the financial burden that would be placed on PRPs that are not responsible for the release of dioxins, furans and/or polychlorinated biphenyls ("PCBs") into the Lower Passaic River if those parties are not given the opportunity to settle with the United States for their OU2 liability, as opposed to having to implement the remedial action for OU2. EPA appreciates those concerns. As we have stated, we anticipate that with the help of the allocation process, EPA will be able to offer cash-out settlements to a number of the parties.

Similarly, EPA's expectation that the private PRPs responsible for the release of dioxins, furans and/or PCBs will perform the OU2 remedial action has not changed. It is therefore our goal that, in addition to supporting potential additional cash-out settlements, the allocation will lead to a consent decree in which those parties agree to perform the OU2 remedial action under EPA oversight.

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

To perform the allocation, EPA has retained AlterEcho and its senior allocation specialist, Mr. David Batson, Esq., through the Agency's prime contract with CSRA. EPA and AlterEcho invite you to attend a meeting to introduce the allocation process. Among other things, the allocation will provide opportunities for participating parties to comment on factors that should be part of the allocation and to contribute relevant information about themselves and other parties for use in the allocation. This meeting will be held on October 13, 2017 at 9:00 A.M. on the 27th floor of EPA's offices, which are located at 290 Broadway, New York, NY 10007.

Mr. Batson has requested that each party designate a primary contact for future communications on the allocation and that the primary contact attend the October 13th meeting in person. EPA has established a conference line for others wishing to participate. The call-in number is 866-299-3188, and the conference code is 212-637-3136. Please respond to EPA by October 5, 2017 with the following information: 1) name of and party represented by the primary contact attending the meeting; 2) names of other representatives planning to call in for each such party. Your response should be directed to Alice Yeh, Remedial Project Manager, Emergency and Remedial Response Division at yeh.alice@EPA.gov or U.S. EPA Region 2, 290 Broadway - 19th Floor, New York, NY 10007.

After the allocator assigns shares to the parties, EPA will make a decision as to which parties should receive cash-out settlement offers, the dollar amount of each offer, and how the money raised by the cash-out settlements will be applied towards OU2 costs.

During the August 28, 2017 meeting, several parties raised questions concerning EPA's enforcement approach for PVSC and the municipalities to which EPA issued notices of potential liability (the City of Newark, Borough of East Newark, Town of Harrison and Town of Kearny). EPA has initiated discussions with PVSC and the municipalities about substantial contributions that, collectively, they might make to the OU2 remedy. At this time, we do not believe it would be helpful to include them in the allocation.

If you have any questions regarding this matter, please contact Assistant Regional Counsel Juan Fajardo at 212-637-3132 or fajardo.juan@epa.gov.

Very truly yours,

Eric J. Wilson
Deputy Director for Enforcement and Homeland Security
Emergency and Remedial Response Division

cc: Brian Donohue, Esq., USDOJ
Mark Barash, Esq., USDOI
Kate Barfield, Esq., NOAA
John Dickinson, Esq., New Jersey Attorney General's Office

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Attachment A – List of Addressees

Diamond Alkali Superfund Site
Lower 8.3 Miles - Passaic River

Company	Contact Information	Facility
A.E. Staley Manufacturing Co., Inc. 2200 E. Eldorado Street Decatur, IL 62521-1578 Now Tate & Lyle Ingredients Americas LLC	John R. Holsinger, Esq. Two University Plaza, Suite 300 Hackensack, NJ 07601 201-487-9000 (T) johnh@jrholsinger.com Heidi R. Balsley, Esquire Corporate Counsel A.E. Staley Manufacturing Co., Inc. 2200 E. Eldorado Street Decatur, IL 62521 Heidi.Balsley@tateandlyle.com	320 Schuyler Avenue and 100 Third Avenue Kearny, NJ
Alden Leeds Inc. 55 Jacobus Ave. Kearny, NJ 07032	Mark Epstein, President Alden Leeds Inc. 55 Jacobus Ave. Kearny, NJ 07032 Joseph Fiorenzo, Esq. Sills Cummis & Gross The Legal Center One Riverfront Plaza Newark, NJ 07102 973-643-7000 (T) jfiorenzo@sillscummis.com	2145 McCarter Highway Newark, NJ 55 Jacobus Avenue Kearny, NJ
Alliance Chemical, Inc. Linden Avenue Ridgefield, NJ 07657	Fredi Pearlmutter, Esq. Lindabury, McCormick, Estabrook & Cooper, P.C. 53 Cardinal Drive Box 2369 Westfield, NJ 07091 908-233-6800 (T) fpearlmutter@lindabury.com	33 Avenue P Newark, NJ

American Ref-Fuel Co. 155 Chestnut Ridge Road Montvale, NJ 07645 Now Covanta Essex Company	Nancy Tammi, Esq. VP, Associate General Counsel Covanta 445 South Street Morristown, NJ 07960 862-345-5133 Barbara Hopkinson Kelly, Esq. Wilson Elser Moskowitz Edelman & Dicker LLP 200 Campus Drive Florham Park, NJ 07932-0668 973.735.5765 (Direct) 609.213.8589 (Cell) 973.624.0808 (Fax) barbara.kelly@wilsonelser.com	183 Raymond Blvd & 66 Blanchard St Newark, NJ
Arkema Incorporated 2000 Market Street Philadelphia, PA 19103-3222	Paula Martin, Esq. Doug Loutzenhiser Legacy Site Services, LLC 468 Thomas Jones Way, Suite 150 Exton, PA 19341-2528 Paula.martin@total.com	Wallace & Tiernan 25 Main Street Belleville, NJ
Ashland, Inc. 5200 Blazer Parkway Dublin, OH 43017	Robin E. Lampkin Ashland Inc. 5200 Blazer Parkway Dublin, OH 43017 Telephone: 614-790-3019 realmpkin@ashland.com William S. Hatfield, Esq. Gibbons P.C. One Gateway Center Newark, NJ 07102 whatfield@gibbonslaw.com	221 Foundry St. Newark, NJ
Atlas Refining, Inc. 142 Lockwood Street Newark, NJ 07105 Now Atlas Refinery, Inc.	Steven Schroeder, Jr., President & CEO Atlas Refinery, Inc. 142 Lockwood Street Newark, NJ 07105 Thomas H. Prol, Esq. Laddey, Clark & Ryan, LLP 60 Blue Heron Road, Suite 300 Sparta, NJ 07871 tryan@lcrlaw.com tprol@lcrlaw.com	142 Lockwood St. Newark, NJ

Automatic Electro Plating Corp. 185 Foundry Street, Suite 3 Newark, NJ 07105	Michael O'Rourke, President Automatic Electro Plating Corp. 1017 Applegate Parkway Waxhaw, NC 28173-6738 Michael.orourke@aol.com	185 Foundry Street Complex Newark, NJ (Bldgs 19, 21, 22)
BASF Catalysts LLC 100 Campus Drive Florham Park, NJ	Karyllan D. Mack, Esq. (see below)	Engelhard Corporation One West Central Avenue East Newark, NJ
BASF Corp. 3000 Continental Drive Mount Olive, NJ 07828	Karyllan D. Mack, Esq. Environmental Counsel BASF Corporation 100 Park Avenue Florham Park, NJ 07932 Karyllan.mack@basf.com David Schneider, Esquire Bressler, Amery & Ross Post Office Box 1980 Morristown, NJ 07962 dschneider@bressler.com	50 Central Ave. Kearny, NJ & 150 Wagaraw Rd Hawthorne, NJ
Benjamin Moore & Co. 51 Chestnut Ridge Rd. Montvale, NJ 07645	Paul Sangillo, Esq. Benjamin Moore & Co. 101 Paragon Drive Montvale, NJ 07645 201.949.6318 (T) Paul.sangillo@benjaminmoore.com Eric S. Aronson, Esq. David G. Mandelbaum, Esq. GreenbergTraurig 500 Campus Drive Suite 400 Florham Park, NJ 07932 aronsone@gtlaw.com	134 Lister Ave. Newark, NJ
Berol Corporation c/o Newell Rubbermaid Inc. 2707 Butterfield Road, Suite 100 Oak Brook, IL 60523	Andrew Sawula, Esq. Schiff Hardin LLP One Westminster Place, Suite 200 Lake Forest, IL 60045 847-295-4336 (T) asawula@schiffhardin.com	Faber-Castell Corporation 41 Dickerson Street Newark, NJ

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For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

November 28, 2017

Via Electronic Mail

To: Diamond Alkali – Lower 8.3 Miles Contact Group

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

On September 18, 2017, we notified you that the U.S. Environmental Protection Agency (EPA), through the Agency's prime contract with CSRA, had retained AlterEcho and its senior allocation specialist Mr. David Batson, Esq., to perform an allocation for implementation of the remedy selected for the lower 8.3 miles of the Lower Passaic River Study Area. We also invited you to attend a "kick-off" meeting with Mr. Batson on October 13, 2017 at EPA's offices in New York.

Since that time, we understand that some parties have raised several issues of concern with Mr. Batson, including limits in the current allocation contract. For instance, several parties would like to exceed the limits in the current allocation contract on the amount of documents that can be submitted to the allocator, and on the number of meetings that parties can have with Mr. Batson. We also understand that some parties are seeking to include within the allocation process an opportunity to exit the allocation "early" and be considered by EPA for cash out settlement offers, ahead of the schedule established in current scope of work with CSRA.

With this in mind, EPA is notifying you that it is considering the above requests to modify the current allocation contract. EPA will discuss with Mr. Batson potential changes to the current allocation process, taking into account the feedback received from parties participating in the allocation.

Please keep in mind that EPA established an allocation process for the lower 8.3 miles and has entered into a contract for the performance of that allocation. Separate agreements concerning EPA's allocation for the lower 8.3 miles, might not be consistent with EPA's current allocation contract; might undermine the current allocation process; and/or might violate conflict of interest rules or provisions.

Finally, note that the costs of the allocation are currently being borne by EPA and that the Agency is not requesting that parties pay to participate in the allocation.

Sincerely,

Eric J. Wilson
Deputy Director for Enforcement and Homeland Security
Emergency and Remedial Response Division

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

cc: David Batson, Esq., AlterEcho
Mary Apostolico, CSRA
Kathryn Barton, EPA - OARM

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

JAN - 5 2018

Via Electronic Mail

To: Diamond Alkali – Lower 8.3 Miles Contact Group

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

I am writing to follow-up on my letter of November 28, 2017, as well as to address communications received by the U.S. Environmental Protection Agency (EPA) since that time with respect to the allocation for the lower 8.3 miles of the Lower Passaic River Study Area.

As you know, the allocator, Mr. David Batson, Esq., has informed EPA of the issues raised to him by the allocation parties. Several parties have also contacted EPA directly, both in writing and by phone, to express their views and concerns regarding the allocation process as it is currently structured. After careful consideration, EPA has arrived at the following determinations:

1. The Agency is prepared to increase the current number of documents subject to the allocation process. The current allocation contract allows for up to 150,000 pages of documents to be submitted and reviewed as part of the allocation. EPA will, as necessary, modify the allocation contract to allow additional documents to be submitted by the allocation parties and be reviewed by Mr. Batson and his team. The allocation parties who sign the Participation Agreement will be provided access to a SharePoint site with documents relevant to the allocation. Each party should review the documents on the SharePoint site and provide Mr. Batson with a list of documents (including the number of pages) that the party seeks to add to the allocation process. EPA, in consultation with Mr. Batson, will evaluate the documents for relevance to the allocation and consider an appropriate increase to the existing contract. Note, however, that the document submission and review portion of the allocation process is not intended to duplicate the full discovery process that a court would include, and therefore, there may be some documents that will be beyond the scope of the process.

2. EPA understands and appreciates that parties to the allocation need sufficient time to communicate directly with Mr. Batson to address their views regarding their potential allocation share and the share potentially attributed to other allocation parties. The Agency is therefore prepared to increase the current allocation contract to allow additional time for parties to meet with and discuss their positions and concerns with Mr. Batson. EPA will consult with Mr. Batson on an appropriate amount of time to add to the existing contract.

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3. Several parties in the allocation have contacted EPA claiming to be similarly situated to parties that received an "early" cash out settlement offer from EPA. Those parties requested that the allocation process provide for an early determination (an "off-ramp") that they are in fact similarly situated to the early cash out parties and should receive a similar cash out offer from EPA prior to the completion of the allocation process. EPA agrees that an early determination should be provided for in the allocation process to allow such parties, if any exist, to exit the allocation process prior to its completion. EPA will work with Mr. Batson to incorporate an early exit into the allocation process.

4. Finally, at the present time, EPA is not adding more parties to the allocation. As we have previously stated, if we receive or gather evidence that a party that has not yet received a notice letter is responsible for the release or discharge of a hazardous substance into the lower 8.3 miles, then we would consider issuing a notice letter to such a party and adding that party to the allocation process.

Also, as EPA has indicated, the Passaic Valley Sewerage Commission and the four municipalities identified as potential responsible parties are uniquely situated to provide in-kind services with respect to the remedy selected for Operable Unit 2 (OU2) of the Diamond Alkali Superfund Site. EPA has been in discussions with those parties regarding the substantial contributions that, collectively, they may make to the OU2 remedy, and the Agency has facilitated conversations between technical personnel from PVSC and Occidental Chemical Corporation (OCC) related to the OU2 remedial design, which OCC is performing pursuant to a settlement agreement and order on consent with EPA.

We look forward to your continued participation in the allocation process, and we will continue to work with Mr. Batson to ensure it proceeds in a fair and efficient manner. Please contact Juan M. Fajardo at 212 637-3132 if you have questions regarding this matter.

Very truly yours,

Eric J. Wilson
Deputy Director for Enforcement and Homeland Security
Emergency and Remedial Response Division

cc: David Batson, Esq., AlterEcho (by email)
Mary Apostolico, CSRA (by email)
David Moora, EPA (by email)

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

FEB 16 2018

Via Electronic Mail

To: Diamond Alkali – Lower 8.3 Miles Contact Group

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

We understand from the Small Parties Group[1] and David Batson, the allocator, among others, that some of the parties that agreed to participate in the Operable Unit 2 (OU2) allocation are seeking to "convene" with the U.S. Environmental Protection Agency (EPA or Agency) to further discuss issues previously raised and addressed by EPA in its letter to the parties of January 5, 2018. I am writing to further address those issues to ensure that the allocation for OU2 proceeds on schedule.

First, the remedial design for OU2 is on schedule for completion in September 2020, and the allocation is intended to be completed prior to that date in order for EPA to have an enforcement document in place for the timely initiation of the remedial action for OU2. For that reason, EPA strongly encourages the parties participating in the allocation to work towards its timely completion.

Second, while we are willing to increase the number of documents that the parties may submit in the allocation and the time to communicate directly with Mr. Batson in order to make the allocation a success (i.e., by providing a basis for a remedial action consent decree and potential cash out settlements), we reiterate that the process is not intended to duplicate the full discovery process that litigation would include. We are aware that when private parties undertake an allocation, it can sometimes evolve into a process that stretches on for many years, and become almost as burdensome as litigation. In contrast, this allocation should follow the basic structure established in the work plan that Mr. Batson shared with the group after the initial meeting in October 2017.

[1] EPA was notified that there is a "Small Parties Group" and received a memorandum dated February 9, 2018 on behalf of that Group. However, the members of that Group have not been identified.

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Documents Relevant to the Allocation

The purpose of the allocation is to determine a share of relative responsibility among the allocation parties[2] for costs associated with the remedial design and remedial action to be undertaken for OU2 of the Diamond Alkali Superfund Site (Site). Accordingly, documents providing information or related to the following factors would be relevant to the allocation for OU2[3]:

- Identification of the contaminants of concern (COCs), as defined in the March 2016 Record of Decision (ROD) for Diamond Alkali OU2, released or discharged to the Lower Passaic River from a facility with which a party is associated;
- The amount of COCs involved in such release or discharge;
- The likelihood that discharged COCs reached an area of the river associated with the selected remedy;
- The degree of control and care exercised by the party with respect to the released COC, taking into account the characteristics of such hazardous substance and the associated risk to public health or the environment about which the party should have been aware;
- The degree of cooperation by the party with federal, state, or local officials to prevent any harm to the public health or the environment related to the release; and,
- The extent to which a release impacted the need for or cost of the remedy.

As described in EPA's January 5, 2018 letter, the parties that have agreed to participate in the allocation should review the documents on the SharePoint site established by Mr. Batson and his team to support the allocation. Each party should provide Mr. Batson with a list of documents (including number of pages) that the party seeks to add to the allocation process. Using the factors above, EPA, in consultation with Mr. Batson, will evaluate the documents for relevance to the allocation and increase as appropriate the number of pages to be reviewed for the allocation under EPA's contract with CSRA-AlterEcho. In order for the allocation to proceed expeditiously, parties should provide Mr. Batson with their lists of documents to be added to the SharePoint site by March 2, 2018.

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[2] The allocation parties are the potential responsible parties (PRPs) that received a notice letter from EPA for OU2, with the exception of those parties to whom EPA offered an "early" cash out settlement, the Passaic Valley Sewerage Commission (PVSC), and the four municipal PRPs.

[3] The relative toxicity of the COCs involved is a factor for the allocator to consider. That information is found in the ROD for OU2.

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Opportunities to Communicate with Mr. Batson

As described in the work plan that Mr. Batson provided to you shortly after the initial allocation meeting in October 2017, the allocation process provides for the parties to communicate with Mr. Batson as follows:

- Under Task 2 (Public Announcement of Project), a meeting with the allocation parties to introduce the allocation; and communication via email or phone with the allocation parties as a group to answer questions about and obtain execution of the Participation Agreement.

- Under Task 5 (Meeting with PRPs on Draft Allocation Process and Database Design), a meeting with the allocation parties to describe to and obtain comments from the parties on the anticipated conduct of the allocation process, and the anticipated organization of data and contents of the database; and communications between Mr. Batson and the parties by phone, email or other electronic media averaging 20 minutes for each party to obtain additional information, if any, for the allocation database.

- Under Task 6 (Final Allocation Design), communications between Mr. Batson and the allocation parties by phone, email or other electronic media averaging 20 minutes for each party to obtain any additional comments from the parties regarding the allocation process design.

- Under Task 8 (Final Data Reports), communications by Mr. Batson with individual allocation parties as required to answer questions regarding the contents of their data report.

EPA is prepared to modify the allocation contract to allow for additional communications with Mr. Batson. Parties seeking additional opportunities to meet or communicate with Mr. Batson should provide, in detail, such a request to EPA by March 2, 2018 and the Agency will promptly respond to the request.

Passaic Valley Sewerage Commission (PVSC) and the Municipalities

EPA has explained in several letters (including most recently in EPA's January 5, 2018 letter to the allocation parties) the basis on which we have chosen not to add to the allocation PVSC and the four municipalities that were notified of their status as PRPs for OU2. We also informed the allocation parties that EPA has facilitated conversations between technical personnel from PVSC and Occidental Chemical Corporation (OCC) related to the OU2 remedial design. We understand that some parties would prefer for PVSC and the municipalities to participate in the allocation or to be assigned a share of liability in the allocation, but at the present time the Agency is not adding more parties to the allocation.

Other Non-Notified Parties

Similarly, EPA has notified the allocation parties that the Agency will not be expanding the allocation to include parties to which EPA has not issued a notice of liability. Mr. Batson has informed EPA of several parties that, while not yet in receipt of a notice of liability, are expecting to participate. Where warranted, EPA will issue notice letters to those parties.

With respect to the list of industrial users of PVSC that William Hengemihle of FTI Consulting provided to EPA in February 2017, the list includes a number of entities that EPA (and/or the Cooperating Parties Group) evaluated in the past, and some of them received notice letters. In other cases, EPA could not establish sufficient information to support a notice of potential responsibility and some of the entities on the list are defunct. In short, as discussed with Mr. Hengemihle at the time, the list itself is not an especially useful indication of the existence of additional PRPs.

Early Cash Out Settlement Criteria

As you know, EPA made early cash out settlement offers to 20 PRPs identified by EPA as "not associated with the release or disposal of any of the COCs for OU2" (EPA's May 17, 2017 letter)[4]. EPA has stated that it will, as part of the allocation, consider making additional early cash out settlement offers to parties similarly situated. The Agency recognizes that AlterEcho, and then EPA, may need to determine, based on the available information, whether a party is responsible for the release or disposal of a COC for OU2.

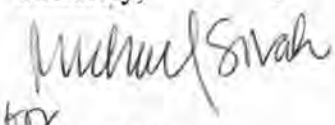
Certification

We agree that parties participating in the allocation should certify that they have conducted a thorough, comprehensive, good faith search for documents, and have fully and accurately disclosed all relevant information to Mr. Batson for his consideration in the allocation.

[4] As you also know, 15 of those PRPs have entered into a proposed cash out settlement agreement with EPA.

Finally, as you know, the next step of the allocation process is for you to review and comment on the draft allocation process and database design document, which you may have received from AlterEcho by now. In order to keep the allocation moving in a timely manner, we urge you to give that document, and this letter, your immediate attention.

Sincerely,



Eric J. Wilson
Deputy Director for Enforcement and Homeland Security

cc: David Batson, Esq., AlterEcho (by email)
Mary Apostolico, CSRA (by email)
David Moora, EPA (by email)

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

FEB 23 2018

Via Electronic Mail

To: Diamond Alkali – Lower 8.3 Miles Contact Group

Re: Allocation for Operable Unit 2 Remedial Action
Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

In my letter of February 16, 2018 regarding the allocation for Operable Unit 2 (OU2) of the Diamond Alkali Superfund Site (Site), I stated that parties participating in the allocation should provide David Batson with a list of documents to be added to the SharePoint site by March 2, 2018. Some participants to the allocation have, since receipt of my February 16th letter, requested that the United States Environmental Protection Agency (EPA or Agency) extend the March 2, 2018 deadline. This letter serves to modify that deadline.

We understand that the allocation parties are providing input to Mr. Batson on the development of an allocation process and database design document specifying the allocation factors, and that the final allocation process design will be issued by David Batson to the parties by the end of May 2018.

Some of the parties participating in the allocation would like to have the opportunity to submit documents after the final allocation design is completed. While we recognize that some parties may benefit by having an opportunity to review the final allocation design prior to identifying the documents they seek to include in the allocation (since the identification of the documents is influenced by the allocation factors), we also realize that the factors themselves are unlikely to change much, if at all, from the factors in my February 16th letter, which are drawn from the draft allocation process design document David Batson provided to the parties.

Importantly, the parties that contacted EPA maintained that the parties participating in the allocation understand that the remedial design for OU2 is on schedule for completion in September 2020, and that the allocation must be completed prior to that date.

Based on the above, EPA is modifying the March 2, 2018 deadline for each party to submit a list of additional documents to April 13, 2018 which should provide the parties sufficient time to examine the material presently in SharePoint and to review the factors relevant to the allocation as they relate to documents parties would like to have made part of the allocation. It is important

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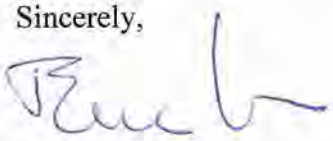
that the additional documents submitted by parties not duplicate the materials already in SharePoint. We also welcome receipt of the information prior to April 13. The list of documents should be submitted in the following format:

Document Date	Title	Number of Pages	Document Type	Addressee Name & Organization	Author Name & Organization	Reason Relevant to Allocation & Relevant Party

If after receipt of the final allocation design a party believes it has documents pertinent to the allocation which it did not identify by the April 13th deadline, such party may identify such documents within two weeks of receipt of the final allocation design, provide an explanation why each document was not identified by the April 13th deadline and request that the Agency have the documents included in the allocation.

Finally, please note that the March 2, 2018 deadline for submitting to EPA a request for additional opportunities to communicate with Mr. Batson has not been changed.

Sincerely,



Eric J. Wilson
Deputy Director for Enforcement and Homeland Security

cc: David Batson, Esq., AlterEcho (by email)
Mary Apostolico, CSRA (by email)
David Moora, EPA (by email)

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

MAY – 1 2018

By Email and Regular Mail

David G. Mandlebaum, Esq.
Eric S. Aronson, Esq.
Greenberg Traurig, LLP
2700 Two Commerce Square
2001 Market Street
Philadelphia, PA 19103

Re: Diamond Alkali Superfund Site ("Site") - OU2 Allocation Proceeding

Dear Messrs. Mandlebaum and Aronson:

We understand that David Batson of AlterEcho will be responding to your letter of April 10, 2016 [sic] regarding the allocation process for Operable Unit 2 (OU2) of the Diamond Alkali Superfund Site (Site). There are, however, statements in your letter that the U.S. Environmental Protection Agency (EPA) Region 2 seeks to clarify and correct.

The OU2 allocation process is not mandatory. As you know, Eric Wilson of EPA issued a letter dated September 18, 2017 to 80 potentially responsible parties (PRPs) inviting those parties to participate in the allocation. Some of the parties have declined to do so, including, as you note, Occidental Chemical Corporation (OCC). That EPA's contractor AlterEcho, after consideration of the facts through the allocation, will assign a share to all 80 PRPs invited to participate does not make participation in the allocation process mandatory.

Your letter also states that EPA prohibited the parties from undertaking their own allocation. That is not the case. Rather than preventing the parties from undertaking an allocation, EPA initiated the allocation process because of the unwillingness (or inability) of the PRPs to undertake and complete their own allocation. For example, the Lower Passaic River Cooperating Parties Group (CPG) retained an allocator in 2015, but failed to complete the allocation. Similarly, in 2012, the CPG initiated an allocation effort intended to apply to the costs of the removal action at River Mile 10.9, an effort that also was unsuccessful. This track record is what has led EPA to offer the PRPs the opportunity to participate in the present allocation process.

Initially, EPA intended to facilitate a more limited allocation process than the present one. As you know, EPA intended to limit the allocation to parties not associated with the release of dioxin, furans and polychlorinated biphenyls (PCBs), the contaminants of concern (COCs) driving the remedy for OU2. Numerous parties contacted EPA, requesting that we expand the allocation process to include all the OU2 PRPs. After much consideration, EPA agreed to include all OU2 PRPs, apart from the PRPs that settle pursuant to EPA's "early" cash out settlement offered in March 2017, and the Passaic Valley Sewerage Commission and four municipal PRPs.

Further, EPA has responded to concerns raised by parties participating in the allocation and supplemented the allocation contract to allow the parties to submit additional documents, to provide additional time for the parties to consult with the allocator and to include an "off-ramp" in the allocation process.

Confidentiality

For the OU2 allocation, confidentiality is addressed in EPA's prime contract with CSRA (through which EPA retained AlterEcho),[1] and in the Task Order Statement of Work (SOW), pursuant to which AlterEcho is performing the allocation. The SOW, a copy of which was provided to the allocation parties, contains the confidentiality terms in EPA's agreement with CSRA-AlterEcho and references the Administrative Dispute Resolution Act of 1996 (ADR Act).

Section 2.0 of the SOW states, in relevant part:

> Unless otherwise noted herein, all allocation related communications by the CSRA Team involving the OU2 PRPs or representatives of EPA or DOJ, individually or in groups, will be held confidential pursuant to the provisions of the ADR Act of 1996, 5 USC 574.
>
> In order to ensure a common expectation of confidentiality, all PRP participants in the allocation process will be required to enter, and EPA will appropriately acknowledge, a confidentiality agreement.

Section 3.0 of the SOW reads, in relevant part:

> CSRA will approach this task in accordance with the basic terms of the contract and according to the established norms and ethical standards of ADR professionals. Except as otherwise noted herein, information provided to the ADR professional by any of the parties, including EPA, communications between parties and the ADR professional, and notes and dispute resolution work product generated by the ADR professional during

[1] The allocation parties were also provided with the web link (https://www.epa.gov/sites/production/files/2015-09/documents/adr_contract_sow.pdf) to EPA's prime contract with CSRA when the OU2 allocation SOW was provided to the parties.

> work pursuant to the Task Order will be maintained as confidential by the ADR professional pursuant to the provisions of the ADR Act of 1996 (Public Law 104-320; 5 USC 571 et al.) and applicable federal, state and judicial requirements.

The information that is not confidential is noted in Section 4, Task 3 of the SOW that reads, in relevant part:

> The allocation process will be designed based upon information received during consultations with EPA and OU2 PRPs on the allocation database and using all relevant non-confidential received information, including data, records, and other documents.
>
> No confidential information will be included in the allocation database. Though to be designed for purposes of conducting the allocation, the database will be designed in such a way as to allow access and use by EPA and DOJ staff for their settlement purposes following submission of the Allocation Data Reports in Task 8.

Confidentiality is also addressed in the ADR Act, a federal statute that EPA, as a federal agency, is required to abide by even in the absence of a signed confidentiality agreement. The Interagency ADR Working Group, established by Presidential Memorandum dated May 1, 1998, provides guidance on the confidentiality provisions of the ADR Act at https://www.adr.gov/adrguide/ch29.html. In summary, the guidance states the following:

- The ADR Act affirmatively bans neutrals from voluntarily disclosing dispute resolution communications and any communication provided in confidence to the neutral unless one of four statutory exceptions apply (see guidance for exceptions).
- Parties to an ADR proceeding have a similar prohibition on releasing information unless one of seven exceptions apply. Those exceptions include the following (see guidance for a listing of all seven exceptions):
    - Dispute resolution communications relevant in disputes involving a settlement agreement reached in an ADR; and
    - A dispute resolution communication **(except those generated by the neutral)** that was provided or available to all parties to the ADR proceeding.
- The common law of evidence and Federal Rules of Evidence (FRE) 408 have long restricted the admission of settlement discussions – like those in ADR – into evidence to prove or disprove liability or a defense.
- It should be noted that confidentiality clauses in a settlement agreement may not withstand a request under FOIA

With the above guidance in mind, EPA has endeavored to protect the confidentiality of the OU2 allocation communications as much as possible in the following ways:

- EPA does not participate in the meetings between AlterEcho and the allocation parties.
- The allocation work plan specifies that AlterEcho will provide summaries of input obtained from the allocation parties at various steps in the allocation process, without attribution to contributions of individual participants.
- AlterEcho will not share with EPA the position briefs and reply briefs submitted by the allocation parties.

However, given the limitations in the ADR Act, there are allocation documents that EPA does not believe can be protected. First, the nexus documents contained in the document repository (or SharePoint site) are not confidential. In addition, EPA does not expect it will be able to protect the data in the allocation database from disclosure under FOIA or common law protection or privilege. Accordingly, the SOW specifies that "No confidential information will be included in the allocation database".[2] The allocation parties should not, therefore, include confidential information in their submissions to the document repository. If a document is within the categories of documents that must be submitted and certified to, and it contains confidential business information, it would be prudent to redact the protected information. If the allocation parties are concerned that the certification requires them to submit documents or material that is entitled to confidentiality under the attorney-client privilege or other privilege, that concern could be resolved by addressing the language of the certification.

With respect to the Allocation Data Reports and the draft and final Allocation Recommendation Reports, which are the work product of neutral but that the allocation parties and EPA will all receive and review, EPA has the following observations:

- In responding to a FOIA request, EPA may assert FOIA Exemption 3, which allows the withholding of information prohibited from release by another federal statute, in this case the ADR Act, as a basis to withhold disclosure of any confidential communication in the possession of an internal neutral. Note that this protection from disclosure pursuant to FOIA does not apply to communications not protected by the ADR Act, such as written communications shared directly by a party with all other parties to the process, even if the parties have agreed in writing that such communications are confidential. Also, because the contents of the Data Reports and the draft and final Allocation Recommendation Reports will be shared with the allocation parties and EPA, and will be relevant to any settlement that the United States is able to enter into, it is possible that

[2] Also note that the ADR Act does not protect documents that are exchanged during an ADR process but were produced for an entirely different purpose, and are not otherwise protected from disclosure, such as a document required to be prepared by regulation or discussions regarding an unrelated subject. Much of the information submitted by the allocation parties is likely to fall into this category.

the data reports and the final allocation report cannot be protected from disclosure under FOIA, unless they are deemed to comprise communications generated by the neutral, which under Section 574(7) would not be subject to release.

As described in EPA's September 18, 2017 letter, the OU2 allocation is intended to result in cash-out settlement offers from EPA to those parties that are not associated with the release or disposal of dioxin, furans and/or PCBs, and is also intended to identify those parties that should participate in consent decree negotiations for the performance of the remedial action for OU2 due to their association with the release or disposal of dioxin, furans and/or PCBs into the lower 8.3 miles of the Lower Passaic River.

Any settlement entered into by EPA will require public notice before becoming effective, thereby providing interested parties with an opportunity to comment on the proposed settlement. EPA will respond to comments received and may modify or withdraw from the proposed settlement if comments demonstrate that the proposed settlement is inappropriate, improper or inadequate. In responding to any such comments, and in seeking entry by the court of a consent decree, EPA will very likely need to rely on documentary evidence. EPA, along with the Department of Justice, will make every effort to use documents that are not confidential, such as those from the SharePoint site. However, even if the court were to request the Allocation Recommendation Report, EPA and the Department of Justice can take steps to protect it, such as objecting or moving to file it under seal.

We hope this letter clarifies for you EPA's position with respect to the various categories of information that will be part of the OU2 allocation process.

Sincerely,

Juan M. Fajardo
Assistant Regional Counsel

cc: David Batson, Esq., AlterEcho *(by email)*
Brian Donohue, Esq., USDOJ *(by email)*
Laura Rowley, Esq., USDOJ *(by email)*
David Moora, Esq., US EPA *(by email)*
Allocation Parties, Appendix A *(by email)*

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Appendix A
Diamond Alkali Superfund Site - Operable Unit 2
Participating Allocation Parties

1. 21st Century Fox
2. Alliance Chemical
3. Arkema / Legacy Site Services
4. Ashland
5. Atlantic Richfield
6. Atlas Refinery
7. BASF
8. Benjamin Moore
9. Campbell Foundry
10. Canning Gumm
11. CBS Corp
12. Celanese
13. Chargeurs
14. Chevron Environmental Management
15. Coats & Clark
16. Congoleum
17. Conopco
18. Cooper Industries
19. Covanta Essex
20. Croda
21. Curtiss Wright
22. Darling Ingredients
23. DII
24. Eden Wood
25. Elan Chemical
26. EnPro Holdings
27. EPEC Polymers
28. Essex Chemical
29. Everett Smith Group
30. Franklin Burlington
31. Garfield Molding
32. General Electric
33. Givaudan Fragrances
34. Goodrich
35. Hartz Consumer Group
36. Hexcel
37. Hoffman – LaRoche
38. Honeywell
39. ISP Chemicals
40. ITT/Excelis/Harris
41. Kearney Smelting
42. Leemilt Petroleum
43. Legacy Vulcan
44. Lucent Technologies
45. National Standard
46. Newark Group
47. Newark Morning Ledger
48. Newell Brands
49. Okonite
50. Otis Elevator
51. Palin Industries
52. Pabst Brewing
53. Passaic Properties
54. Pharmacia
55. Pitt-Consol Chemical
56. PPG Industries
57. PSEG
58. Purdue Pharma Technologies
59. Quality Carriers
60. Revere Smelting
61. Safety Kleen – McKesson
62. Sequa
63. Sherwin Williams
64. Spectraserv
65. Stanley Back & Decker
66. STWB
67. Sun Chemical
68. Tate & Lyle
69. Teval
70. Textron
71. Tiffany

Diamond Alkali Superfund Site OU2
Allocation Guide

Attachment D

Public Version

Revised Work Plan

EPA Conflict Prevention and Resolution Services Contract

Contract # EP-W-14-020

Work Plan for Task Order #096

Diamond Alkali-Lower Passaic River Allocation

Prepared for:

US Environmental Protection Agency
Washington, DC 20460

EPA Program Office:	Region 2
EPA Task Order Contracting Officer's Representative (TOCOR):	Alice Yeh
CSRA Task Order Manager (TOM):	Mary Apostolico
Subcontractor Task Manager:	~~David Batson~~ **Judy Manley** TechLaw / AlterEcho

Public Version

This **Revised** Work Plan describes CSRA's approach for performing the tasks described in the **Revised** Statement of Work. It includes a description of the activities associated with each task as well as a list of transmittals and deliverables and their due dates. A cost estimate for this Task Order Work Plan is provided as a separate attachment. **Revisions to this work plan are presented with strike thru and in bold blue. This modification adds additional documents relevant to the allocation to be submitted by the PRPs (along with associated time to evaluate the documents for relevance), additional time for PRPs to communicate, meet, and exchange information with the allocator, and a step for early identification of PRPs who are similarly situated to the parties that received the first round of cash out settlement offers from EPA for EPA's use in making early settlement determinations.**

The Work Plan is organized as follows:

Section 1.0 - Background
Section 2.0 - Assumptions
Section 3.0 - Project Methodology and Approach
Section 4.0 - Work Tasks
Section 5.0 - Reports, Transmittals and Deliverables
Section 6.0 - Staffing Plan
Section 7.0 - Quality Management
Section 8.0 - Conflict of Interest
Section 9.0 - Cyber Security
Section 10.0 - Project Budget
Section 11.0 - Period of Performance

1.0 Background

The Diamond Alkali Site (the Site) has a long history, involving over 100 potentially responsible parties (PRPs). Since the late 1800s, the Lower Passaic River has been a highly industrialized waterway, receiving direct and indirect discharges from numerous industrial facilities. Data collected in the Lower Passaic River, and EPA's analyses, show that contaminated sediment in the lower 8.3 miles are a major source of contamination to the rest of the river and Newark Bay and pose an unacceptable risk to human health and the environment due to the presence of a variety of contaminants that stay in the environment for a long time and can build up in fish and shellfish. These contaminants include dioxins and furans, PCBs, mercury, DDT and its primary breakdown products, copper, dieldrin, PAHs, and lead.

On March 4, 2016, EPA issued a record of decision selecting the remedy for the lower 8.3 miles of the Lower Passaic River, which is Operable Unit 2 (OU2) of the Site. Currently, the remedial design (RD) for OU2 is being performed by Occidental Chemical Corporation (OCC) pursuant to an administrative order on consent. The cost of the remedial action (RA), estimated for purposes of remedy selection, is $1.38 billion.

Region 2 has issued a notice of potential liability to approximately 100 parties, informing them of their responsibility for the RD/RA for OU2. The Region has offered a first round of cash-out settlements to a group of approximately 20 PRPs. The Region expects to separately address the liability of municipalities and public entities. For the remaining PRPs, the Region expects to enter into settlement negotiations for performance and funding of the remedy with OCC and other parties (the "Major PRPs") that the Region considers to be major PRPs for OU2. The Region plans another round of cash-out settlements with "Middle Tier PRPs", i.e., not part of the phase 1 cash-out group, but also not Major PRPs. The Region requires the services of a third

party allocator to develop a settlement framework and evaluate the 80 Middle Tier and Major parties within the framework.

Region 2 understands that the PRP group (the Cooperating Parties Group, or CPG) has made at least two previous attempts to develop a mutually acceptable allocation of liability to promote settlement with EPA for costs and work at the Site, however both efforts fell short of agreement. Region 2 believes that because of these previous efforts, additional information available from responses to CERCLA 104(e) letters, information available from previous litigation at the state level and numerous conversations with PRPs over the years, the project will be able to be built primarily upon existing information and contacts. Some minor augmentation of background, data and allocation factors may need to occur to develop what is hoped to be an acceptable settlement proposal and structure. In 2016, the Department of Justice retained a mediator/allocation specialist, David Batson of TechLaw/AlterEcho, to assist in settlement analysis. Those discussions and analyses have resulted in this effort.

2.0 Assumptions

This work plan and the attached cost estimate are based on the following assumptions, in addition to Task-specific assumptions noted in Section 4.0 of the Work Plan. All work will be conducted in accordance with the specific tasks in the Work Plan to the performance metrics specified therein.

General Assumptions:

- EPA will provide the CSRA Team with a list of parties noticed regarding their responsibility for the RD/RA for OU2, including:
    - a list of Major and Middle Tier Parties ("OU2 PRPs");
    - a list of Phase 1 cash-out parties; and
    - a list of other OU2 parties, including municipalities and other entities
- Maximum of 80 PRPs will be provided an opportunity to participate in or be evaluated for the purpose of determining a share of responsibility in the allocation process
- All OU2 PRPs will be provided an opportunity to participate in the design of the allocation database and process and to provide additional Site-related information for possible addition to the database, and will be designated a share of responsibility in the Final Allocation Recommendation Report
- The Final Allocation Recommendation Report will also divide the parties into logical groupings of similarly-situated PRPs
- EPA will provide the CSRA Team with a listing and contact information for each OU2 PRP; Reference herein to meetings or other forms of communication with the OU2 PRPs means communication with the identified representatives of such parties
- A maximum of ~~150,000~~ ***290,000*** pages of documents will ***be*** reviewed and utilized to conduct the allocation, including;
    - A maximum of 130,000 pages of documents received from EPA for CSRA Team review
    - A maximum of ~~20,000~~ ***160,000*** extra pages of documents received from PRPs for CSRA review
- All communications by the CSRA Team will be by phone or email unless meeting noted
- **The CSRA Team estimates 8-10 hours of communications per party over the remainder of the project. This time is presented as 2 hours per party in Tasks 5.A.1 and 6.A.4; additional meetings (5.A.1, 5.B.1, 9, 10.2); and an undefined number of calls and e-mails allowed for in remaining tasks.**
- Maximum of 4 hours of combined project status/update calls will be held by the CSRA Team with EPA per month

- Out-of-DC Area Meetings:
  - ~~3~~ ***6*** meetings involving 2 contractor staff
- Out-of-DC area meetings will be held at the EPA Region 2 offices or other location in the greater New York City metropolitan area as determined by EPA, or OU2 PRPs they supply meeting space
- Travel for and timing of out-of-DC area meetings will be scheduled to allow CSRA Team members to travel from Washington, DC and return on the same day
- Meetings will be scheduled and held within noted timeframes
- The allocation database will be designed and organized primarily for purposes of allocation
- Space and equipment for meetings will be provided by EPA or PRPs
- The CSRA Team will provide EPA with a copy of all communications sent to OU2 PRPs regarding the subject, substance, and logistics of OU2 PRP meetings with CSRA Team members
- Any part of a communication, attachment to a communication, presentation, or written material provided to OU2 PRPs by the CSRA Team that involves a description of the Site or EPA actions or activities will be provided to EPA for review and approval prior to submission to the OU2 PRPs
- Unless otherwise noted herein, all allocation related communications by the CSRA Team involving the OU2 PRPs or representatives of EPA or DOJ, individually or in groups, will be held confidential pursuant to the provisions of the ADR Act of 1996, 5 USC 574
- In order to ensure a common expectation of confidentiality, all PRP participants in the allocation process will be required to enter, and EPA will appropriately acknowledge, a confidentiality agreement
- The CSRA Team will provide invoices to EPA at the end of each month in which a task is completed (activity, transmittal, and/or deliverable) identified in Section 4.0 of the Work Plan, with a written Progress Report detailing associated activities accomplished during the reporting period, how such activities meet Task Order performance standards, and associated labor and other direct costs
- "Staffing" referenced in Section 4.0 Work Tasks refers to TechLaw staff.
- This Task Order can be modified to change the statement of work or add funding.

3.0 Project Methodology and Approach

The proposed methodology and approach consists of the following:

- To support this Task Order, CSRA selected TechLaw support.
- CSRA and TechLaw (the CSRA Team) will not interpret EPA policy on behalf of the EPA or make decisions on items of policy, regulation or statutes. The CSRA Team also will not take a stand on the merits of substantive items under discussion including, but not limited to, any substantive issues raised by OU2 PRPs. The CSRA Team will not interpret EPA's March 4, 2016, record of decision selecting the remedy for OU2 of the Site.
- In gathering information or performing research with parties outside the EPA, CSRA Team members will identify themselves as contractors to EPA and not as EPA employees.
- CSRA will approach this task in accordance with the basic terms of the contract and according to the established norms and ethical standards of ADR professionals. Except as otherwise noted herein, information provided to the ADR professional by any of the parties, including EPA, communications between parties and the ADR professional, and notes and dispute resolution work product generated by the ADR professional during

work pursuant to the Task Order will be maintained as confidential by the ADR professional pursuant to the provisions of the ADR Act of 1996 (Public Law 104-320; 5 USC 571 et al.) and applicable federal, state and judicial requirements.

- To enhance the positive substantive, relational, and procedural outcomes from ADR cases, CSRA will direct all ADR professionals providing ADR services under this task order to do the following prior to the mediation or facilitation and throughout the process:
    - Inquire about whether individual participants have the time, financial, and logistical resources necessary to participate effectively in the process and – where resources are inadequate – assist them in identifying appropriate resources or in making necessary adjustments to the process to accommodate resource constraints;
    - Assist the participants in identifying the issues that are important to resolving any controversy and solutions that will address the needs shared by the participants;
    - Conduct the process to promote active engagement from all participants;
    - Explore with the participants appropriate ways to incorporate high quality and relevant information resources necessary to resolve the issues; and
    - To support productive dialogue and effective implementation of any agreements reached by the participants, ensure that participants have appropriate authority to make commitments on behalf of their organizations.

As prime contractor, CSRA will support this Task Order through the following activities:

- Provide progress reports at the end of each month in which an activity, transmittal, and/or deliverable identified in Section 5.0 of the Work Plan is completed;
- Communicate and coordinate with the EPA Task Order Contracting Officer's Representative (TOCOR) by phone as needed;
- Coordinate with the subcontractor, TechLaw;
- Incorporate the principles of Quality Management while carrying out this task;
- Provide deliverables in electronic format (as agreed to by the TOCOR) to the EPA TOCOR; and
- NOTIFY THE EPA PROJECT DIRECTOR AND PROGRAM OFFICE CONTACT WHEN 75% OF THE FUNDS PROVIDED HAVE BEEN EXPENDED.

4.0 Work Tasks

Task 0.0 **Task Order Management**

In accordance with proper contract implementation, CSRA and TechLaw will ensure effective management of the resources and deliverables required by EPA.

Specifically, the CSRA Task Order Manager (TOM) for this effort will:

- Ensure that all technical direction received falls into the scope of work prior to initiating any action;
- Ensure completion and maintain copies of all contract transmittals and deliverables;
- Oversee subcontractor activities through regular and periodic conversations with the subcontractor to ensure effective performance;
- Ensure that progress and financial reports accurately clearly articulate the work completed as per the approved work plan, and identify any problems encountered and activities to address them;
- Speak on an as-needed basis with the EPA TOCOR to review the financial and work status of the project;

- Review the progress report and invoice with the EPA TOCOR; and
- Update the Dashboard task order management tracking system as invoices are submitted.

The CSRA Team developed this Work Plan to provide a detailed explanation of all activities associated with and a proposed approach for completing each of the defined tasks. The CSRA Team identified the transmittals and deliverables and their associated due dates and developed a detailed fixed price budget, including a breakout of labor and travel costs.

Item	Title	Due No Later Than†	Type
0.1	Work Plan	Within 10 days* of SOW issuance or as approved by the EPA CO	**Deliverable**
0.1a	***Revised Work Plan***	***Within 10 days* of SOW issuance or as approved by the EPA CO***	***Deliverable***
0.2	Progress Reports	Submitted after completion of each task and with submission of invoice	**Deliverable**

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

Task 1 Preliminary Work - Complete

Item	Title	Due No Later Than†	Type
1.1	Task Order Kick-Off Meeting	Within 20 days* of Task Order approval	Transmittal

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

The CSRA Team will prepare for and participate in a meeting with EPA to discuss tasks described in the Task Order, EPA's expectations for the project, and a plan for conducting the outreach to PRPs. Prior to the meeting, the CSRA Team will develop its overall strategy for conduct of the allocation process, including a timeline of tasks and strategy for communications with the OU2 PRPs. During the meeting, the EPA will advise the CSRA Team regarding the identity of the OU2 PRPs and the scope and nature of the selected remedy. Following the meeting, the CSRA Team will send an email summarizing the agreed-upon PRP Outreach Plan for approval of the EPA technical lead in consultation with EPA legal personnel. The developed PRP outreach plan will include a process for contacting and receiving information from PRPs, including for meetings and conference calls with the OU2 PRPs as a group, and individual OU2 PRP contacts via email, letter, or phone, and confidentiality procedures.

This task will require the following efforts on the part of the CSRA Team:

- Development of a plan for conducting outreach to OU2 PRPs that includes an opportunity for all OU2 PRPs to (1) provide feedback on the design of the allocation, including additional data, information or factors which should be considered in design of the database, (2) review their individual PRP data report for accuracy, (3) provide suggestions regarding design of the allocation process and (4) provide feedback on the allocation report. The plan will also explain how the CSRA Team will update EPA on PRP outreach efforts
- Drafting and submission of an email summarizing the agreed-upon PRP outreach plan for approval of the EPA technical lead
- The CSRA Team will supply two (2) senior staff located in Washington, DC for the meeting

Tech Law Staffing - Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team participates in the Task Order Kick-Off Meeting
- The submitted summary of the PRP Outreach Plan provides a summary of the agreement reached at the Task Order Kick-Off Meeting regarding the plan for communications by the CSRA Team with the OU2 PRPs

Task 2 Public Announcement of Project - Complete

Item	Title	Due No Later Than†	Type
2.1	EPA Project Public Announcement Meeting	Within 40 days* of Task Order approval	Activity

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

The CSRA Team will participate in a meeting, sponsored by EPA, with the OU2 PRPs to announce and explain the allocation project, including opportunities for participation of the OU2 PRPs in the development of the allocation process. Following the project announcement meeting noted in Task 2, the CSRA Team will work to obtain and record signatures of the OU2 PRPs and acknowledgement of EPA to the Participation Agreement distributed during the project announcement meeting.

This task will require the following efforts on the part of the CSRA Team:

- Preparation of talking points and handout material for participants regarding the allocation process in consultation with the EPA technical lead in consultation with EPA legal personnel
- Preparation of a written Participation Agreement for consideration and execution of the OU2 PRPs, incorporating an explanation of relevant confidentiality protections and requirements associated with the allocation process
- The CSRA Team will supply two (2) senior staff located in Washington, DC to participate in the meeting
- Communication via email, and as required via phone, with the OU2 PRPs as a group regarding execution of and to answer questions regarding the Participation Agreement
- Recording and compilation of executed Participation Agreement signature pages

Conduct of this task is dependent upon EPA's ability to successfully make arrangements for and schedule the meeting, and communicate with OU2 PRPs regarding the meeting, and upon receipt of EPA's final approval of the PRP outreach plan agreed upon during the Task Order Kick-Off Meeting within 10 business days of the meeting.

Staffing - Senior Allocation Specialist, Senior Project Manager

Performance Standards/Metrics:

- Talking points and materials prepared for the meeting provide an overview of the project and opportunities for PRP participation noted in the PRP Outreach Plan developed in Task 1
- The CSRA Team participates in the Task Order Kick-Off Meeting
- A majority of the members of the OU2 PRPs execute the Participation Agreement

Public Version

Task 3 Initial Allocation Process and Database Design

Item	Title	Due No Later Than†	Type
3.1	Submit initial allocation process and database design to EPA	Within 100 days* of Task Order approval	Transmittal

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

The CSRA Team will review documents received from EPA and prepare a written descriptive summary of the initial design for the allocation process, including a design of the allocation database, and submit to EPA for review.

The allocation process will be designed based upon information received during consultations with EPA and OU2 PRPs on the allocation database and using all relevant non-confidential received information, including data, records, and other documents. The initial design will include recommendations for: (1) data sources to be considered for the allocation; (2) applicable allocation factors; and (3) methodology for determination of shares.

The searchable database will be designed to have the capability to contain and organize all of the information and data used in the allocation, including received PRP disclosure statements and nexus documents from third party litigation. No confidential information will be included in the allocation database. Though to be designed for purposes of conducting the allocation, the database will be designed in such a way as to allow access and use by EPA and DOJ staff for their settlement purposes following submission of the Allocation Data Reports in Task 8. The CSRA Team will, as an interim measure, create and provide EPA access to a SharePoint site in which any site documents received from the OU2 PRPs will be maintained.

This task will require the following efforts on the part of the CSRA Team:

- Conduct a preliminary review of Site data on OU2 contaminants of concern as identified in the OU2 ROD to determine appropriate allocation data sets
- Conduct preliminary research, analysis, and determine applicable case law, legal requirements, and equitable considerations for use in conducting allocation
- Conduct initial review and analysis of EPA selected remedy for OU2 to determine method to account for differential impact of contaminants of concern and source location
- Conduct a preliminary review of information received from EPA, including PRP disclosure statements and nexus documents from third party litigation, in order to determine the appropriate design of the database required to support conduct of the allocation process
- Conduct initial coding of data and loading of coded data into database to determine credibility of database design concept
- Establish preliminary recommendations regarding allocation computations appropriate for OU2, procedures for use of data in allocation computations, and appropriate allocation methodology, and the design of a searchable database with capability to contain and organize all of the information and data used in the allocation
- Preparation of a written descriptive summary of the initial design for the allocation process, including (1) a timeline for submission of allocation related documents,

including PRP position briefs and reply briefs, and (2) a written description of the design of the database with a suggested method for providing OU2 PRPs specific information on the contents of the database, suggestions on methods for resolving data gaps in data regarding OU2 PRPs not identified in documents received from EPA, and if practical, images of anticipated data screens.
- Establish a SharePoint site that provides EPA access to documents received from OU2 PRPs

Conduct of this task is dependent upon; (1) receipt of all allocation documents and information regarding the site remedy from EPA within 20 business days of approval of the Task Order, and (2) receipt of all information from EPA as individual documents in OCR searchable pdf format to allow loading into the allocation database.

Staffing - Senior Allocation Specialist; Senior Project Manager; Database Designer

Performance Standards/Metrics:
- The CSRA Team submits a written descriptive summary of the initial design for the allocation process, including a database design, within the noted timeframe
- The submitted written descriptive summary of the initial design for the allocation process includes a summary of the basis of and anticipated conduct the allocation process, including preliminary recommendations on data sources to be considered for the allocation, applicable allocation factors, and methodology for determination of shares
- The submitted initial database design provides a written description of the database, including, suggested method for providing OU2 PRPs specific information on the contents of the database, suggestions on methods for resolving data gaps in data regarding OU2 PRPs not available in documents received from EPA, and if practical, images of anticipated data screens

Task 4 Conference Call w EPA on Initial Database Design

Item	Title	Due No Later Than†	Type
4.1	Conference Call with EPA on Initial Allocation Process and Database Design	Within 10 days* of submission of initial allocation process and database design	Activity

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

Task 4.1 – The CSRA Team will prepare for and participate in a conference call with EPA regarding the initial allocation process and database design. The purpose of the call will be to advise and consult with EPA regarding the submitted initial allocation process and database design and to discuss and resolve any EPA comments. Following the conference call, the CSRA Team will edit the initial allocation process and database design based on received EPA comments to create a draft design for submission to the OU2 PRPs.

This task will require the following efforts on the part of the CSRA Team:
- The CSRA Team will supply two (2) senior project staff located in Washington, DC to participate in the conference call
- Conference call assumed to be no more than two (2) hours in length

Public Version

Staffing – Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team participates in the draft Database Design conference call

Task 5 **Meeting with PRPs on Draft Allocation Process ~~and~~ /Database Design, and Initiation of early Settlement Process**

Item	Title	Due No Later Than†	Type
5.***A.***1	Conduct ***two*** Meeting***s*** with PRPs on Draft Allocation Process and Database Design	Within 40 days* of submission of initial allocation process and database design to EPA	Activity
5.***A.***2	Conference Call with EPA on Meeting***s*** with PRPs on Draft Allocation Process and Database Design	Within 10 days* following the Meeting with PRPs on Draft Allocation Process and Database Design	Activity
5.B.1	***Submit guidance on preparation of allocation submissions to EPA and PRPs***	***Within 5 days of Revised Task Order Approval***	***Transmittal***
5.B.2	***Submit recommendation on relevancy of documents provided by OU2 PRPs to EPA and PRPs***	***Within 30 days of Revised Task Order Approval***	***Transmittal***

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

Task 5.***A.***1 - The CSRA Team will plan, schedule, and conduct ~~a meeting~~ ***two meetings*** with the OU2 PRPs as a group regarding the draft design of the allocation process and database. The purpose of the meeting***s*** will be to advise the OU2 PRPs as a group regarding the anticipated conduct of the allocation process and the anticipated organization of data and contents of the database, and to obtain PRP comments regarding the draft allocation process and database design. The CSRA Team will also communicate with the OU2 PRPs individually to obtain the input of OU2 PRPs, including those that did or were unable to attend the outreach meeting***s***, regarding suggestions on the effective design and conduct of the allocation process and database, and to obtain additional records and information, if any, for the allocation database. ~~The CSRA Team will establish a deadline of 60 business days following the meeting with PRPs on draft allocation process and database design for the submission by OU2 PRPs of additional data for inclusion in the allocation database.~~

This task will require the following efforts on the part of the CSRA Team:

- Making arrangements for a meeting in the greater New York City metropolitan area sufficient to accommodate the OU2 PRPs as a group
- Coordination of meeting space and equipment for meetings provided by EPA or OU2 PRPs
- Communication via email with the OU2 PRPs regarding substance, date/time, and location of meeting

- Development of meeting agenda
- Development of participant materials, including a descriptive summary of Site information received from EPA and a description of the draft allocation process and database design
- Travel of two (2) senior staff from Washington, DC to attend meeting
- ~~•~~ Communications by Senior Allocation Specialist via phone, email, or other electronic media as required with OU2 PRPs; ~~Communications will be limited to an average of 20 minutes for each OU2 PRP~~
- ***Communications will be limited to an average of 2 hours for each OU2 PRP***
- Record PRP comments regarding allocation process and database design and conduct, without attribution to individual OU2 PRP comments

Staffing – Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team conducts a meeting with the OU2 PRPs as a group regarding design of the allocation process and database
- A majority of the members of the OU2 PRPs as a group attend the meeting either in person or remotely
- The CSRA Team copies the EPA technical lead on its email communication to the OU2 PRPs regarding substance, date/time, and location of meeting, and provides EPA with a copy of utilized meeting materials

Task 5.***A.***2 - The CSRA Team will schedule and hold, within 10 business days of holding the meeting***s*** with the OU2 PRPs on the draft allocation process and database design, a conference call with EPA regarding the findings of the meeting***s***.

This task will require the following efforts on the part of the CSRA Team:

- Scheduling and participating in ~~a~~ ***two*** conference call***s*** with EPA to provide EPA information on the meeting***s***, including a list of participants at the meeting and summary of suggestions received regarding the allocation process and database design
- Conference call assumed to be no more than two (2) hours in length

Timing of this task is dependent upon the availability of assigned EPA staff to participate in a conference call within noted timeframe.

Staffing – Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team participates in a conference call with EPA regarding the findings of the meeting following the Database Design Outreach Meeting
- In conducting the post-meeting conference call with EPA, the CSRA Team provides a summary of information and suggestions obtained from the OU2 PRPs without attribution to contributions of individual participants

Task 5.B.1 - The CSRA Team will prepare a written guide regarding the format and preparation of written submissions by OU2 PRPs pursuant to the allocation process and submit to EPA and the OU2 PRPs

The preparation guide will be designed based upon information received during consultations with EPA and OU2 PRPs on the allocation process. The preparation guide will include the format and content of required allocation documents, including: (1) initial equitable factors brief; (2) preliminary factual submission; (3) document submission certification; and (4) notification of early settlement eligibility.

This task will require the following efforts on the part of the CSRA Team:

- ***Conduct a conference call with OU2 PRPs to announce and explain modifications to the allocation project, including opportunities for participation of the OU2 PRPs in the development of the allocation process***
- ***Conduct of communications, including a meeting, with OU2 PRPs regarding recommended format and content of above noted required allocation submissions***
- ***Preparation of written guide regarding the format and preparation of written submissions by OU2 PRPs pursuant to the allocation process for review by EPA***
- ***Preparation of written guide based upon EPA comments and suggestions for review by OU2 PRPs.***
- ***Preparation of a final written guide regarding the format and preparation of written submissions by OU2 PRPs pursuant to the allocation process based upon comments and suggestions received from the OU2 PRPS and EPA***

Staffing - Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- ***The CSRA Team conducts a call with OU2 PRPs as a group to announce and explain modifications to the allocation project, including opportunities for participation of the OU2 PRPs in the development of the allocation process***
- ***The CSRA Team submits a written guide regarding the format and preparation of written submissions by OU2 PRPs pursuant to the allocation process to EPA for review within the noted timeframe.***
- ***The CSRA Team submits a written guide to the OU2 PRPs within the noted timeframe***
- ***The submitted written guide includes the format and content of required allocation documents, including: (1) initial equitable factors brief; (2) preliminary factual submission; (3) document submission certification; and (4) notification of early settlement eligibility.***

Task 5.B.2 – The CSRA Team will organize and conduct a review of initial indices of documents proposed for inclusion in the Allocation Document Database by OU2 PRPs to develop a recommendation on the relevancy of proposed documents to the allocation process.

This task will require the following efforts on the part of the CSRA Team:

- ***Conduct an analysis of document information contained in indices received from the OU2 parties to determine if the proposed documents meet established relevancy criteria for inclusion in Allocation Document Repository***
- ***Drafting of a written recommendation indicating which of the recommended documents are deemed to meet the established relevancy criteria for inclusion in Allocation Document Repository, with an explanation of the rationale for the exclusion of any recommended document***

Staffing - Data Analysts; Senior Project Manager; Senior Allocation Specialist

Performance Standards/Metrics

- ***The CSRA Team submits the written recommendation regarding the relevancy of OU2 PRP documents to EPA, with a copy to the OU2 PRPs, within the noted timeframe***
- ***The submitted written recommendation indicates which of the documents recommended by OU2 PRPs are deemed to meet the established relevancy criteria for inclusion in Allocation Document Repository, with an explanation of the rationale for the exclusion of any recommended document***

Task 6 **Final Allocation Design** ***and Early settlement PRP Data Reports***

Item	Title	Due No Later Than†	Type
6.***A*** ~~1~~	Submit Final Allocation Design to EPA and PRPs	Within 50 days* following the Meeting with PRPs on Draft Allocation Process and Database Design	Transmittal
6.B.1	***Submit draft PRP Data Reports regarding Early Settlement PRPs to PRPs and EPA***	***Within 10 days* of EPA final decision regarding additional documents for inclusion in repository***	***Transmittal***
6.B.2	***Submit final PRP Data Reports regarding Early Settlement PRPs to PRPs and EPA***	***Within 15 days of submission of Draft Early Settlement Part Data Reports***	***Transmittal***

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

Task 6.A. - The CSRA Team will complete the design of the allocation process based on input received from EPA and PRPs for submission to the OU2 PRPs and EPA.

This task will require the following efforts on the part of the CSRA Team:

- Conduct coding of data and loading of coded data into database
- Communications by Senior Allocation Specialist via phone, email, or other electronic media as required with OU2 PRPs; Communications will be limited to an average of ***2 hours*** ~~20 minutes~~ for each OU2 PRP
- **Review of factors statements by OU2 PRPs regarding suggestions on protocol and equitable factors for use in allocation**
- Record, compile, and organize suggestions of OU2 PRPs regarding allocation process design and conduct without attribution to individual comments
- ***Conduct a call with EPA to discuss suggestions received from OU2 PRPs regarding allocation process design and conduct without attribution to individual comments***
- Edit draft allocation design based on analysis of received Site data, EPA comments on the draft allocation design, and consideration of input received from OU2 PRPs during meeting and other outreach methods to prepare a written descriptive summary of the final allocation design and submit to EPA and the OU2 PRPs

Staffing - Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team submits a written descriptive summary of the final design for the allocation process within the noted timeframe
- The submitted written descriptive summary of the final design for the allocation process includes a description of the basis of and anticipated conduct of the allocation process, addresses any identified ambiguities in the draft report, and includes a summary of how the comments of EPA and the OU2 PRPs regarding the draft allocation design were, or were not, taken into account in the final allocation design, without attribution.

Task 6.B.1. - The CSRA Team will organize and conduct a technical and scientific evaluation of data in the allocation database to develop individual data reports for each of the OU2 Early Settlement PRPs. The PRP Data Reports will provide selected information regarding each OU2 Early Settlement PRP's relation to OU2 and OU2 contaminants of concern that will be used in conduct of the allocation. The CSRA Team will establish a deadline of 10 business days from receipt of the data report for submission of corrections or suggestions by the OU2 PRPs for improving the quality of the received OU2 Early Settlement PRP's data report.

This task will require the following efforts on the part of the CSRA Team:

- ***Conduct a call with EPA to discuss the Allocation Team recommendation regarding the relevancy to the allocation of documents provided by OU2 Early Settlement PRPs***
- ***Conduct coding of data and loading of coded data into database obtained from OU2 Early Settlement PRPs***
- ***Review preliminary factual submission by OU2 Early Settlement PRPs***
- ***Review Site data loaded into database to determine appropriate organization for allocation***
- ***Compile and organize Site data in database to support allocation analysis and share computations***
- ***Organize data in allocation database and draft individual OU2 Early Settlement PRP data reports***
- ***Provide a copy of the Early Settlement PRP data reports to the OU2 PRPs for review***

Conduct of this task is dependent upon the following:

- ***Access by the CSRA Team to EPA technical data regarding Site conditions and the selected OU2 remedy***
- ***Sufficient data on identified Early Settlement PRPs to allow analysis of associated contaminants of concern and hazardous substance fate and transport at the Site***
- ***Successful establishment of the allocation database***
- ***Receipt of additional data from OU2 Early Settlement PRPs for inclusion in the allocation database***

Staffing - Data Analysts; Senior Scientist; Senior Project Manager; Senior Allocation Specialist

Performance Standards/Metrics

- ***The CSRA Team submits the PRP Data Reports to the OU2 PRPs within the noted timeframe***

- ***The submitted written individual PRP Data Reports include a summary of information in the allocation database that is relevant to a determination regarding the associated OU2 Early Settlement PRP's relation to OU2 and OU2 contaminants of concern for use in conduct of the allocation***
- ***The CSRA Team copies the EPA technical lead on the email communications to the OU2 Early Settlement PRPs providing a copy of their data report***

Task 6.B.2. - The CSRA Team will analyze corrections or suggestions for improving the quality of the data reports received from OU2 PRPs to determine whether modifications of the original data reports are warranted. Based on this analysis, the CSRA Team will modify the data reports, as deemed appropriate. The CSRA Team will then provide a copy of all of the revised data reports to EPA and a revised copy of individual data reports will be uploaded to the document repository for access by all of the OU2 PRPs, with an explanation of how suggested changes were, or were not, incorporated.

This task will require the following efforts on the part of the CSRA Team:

- ***Analyze received suggestions and corrections to data reports in relation to existing Site data and the final allocation design in order to determine appropriate modifications***
- ***Modify the individual data reports, as warranted based on above analysis***
- ***Provide an explanation to the OU2 Early Settlement PRPs regarding whether, and if so how, received suggestions resulting in changes to their individual data report, including a description of why their suggestions and comments were, or were not, taken into account***
- ***Upload final OU2 Settlement PRP data reports to allocation document repository***
- ***As required, the CSRA Team will conduct communications with individual OU2 Early Settlement PRPs to answer questions regarding their final data report***

Timing of this task is dependent upon the following:

- ***Receipt of EPA's determination regarding the relevancy to the allocation of documents provided by OU2 Early Settlement PRPs within established timeframe***
- ***Receipt of comments from OU2 Early Settlement PRPs regarding their data report within established timeframes***

Staffing - Data Analysts; Senior Scientist; Senior Project Manager; Senior Allocation Specialist

Performance Standards/Metrics

- ***The CSRA Team submits the Final PRP Data Reports to EPA and OU2 Early Settlement PRPs within the noted timeframe, and uploads data reports to document repository***
- ***The submitted revised Final PRP Data Reports address any identified ambiguities in the draft reports and includes a summary of how received comments regarding the draft PRP Data Reports were, or were not, taken into account in the final reports***
- ***Certifications regarding the completeness of document/data searches conducted by the OU2 Early Settlement PRPs are uploaded to the Allocation Document Repository***
- ***The CSRA Team copies the EPA technical lead on the email communications to the OU2 Early Settlement PRPs providing a copy of their individual data report***

Task 7 Draft PRP Data Reports

Item	Title	Due No Later Than†	Type
7.A.1	***Submit recommendation on relevancy of documents provided by OU2 PRPs to EPA and PRPs***	***Within 10 days of OU2 Party submission of document indices***	***Submittal***
7.***A.2***	Submit Draft PRP Data Reports to PRPs	Within ~~100~~ ***75*** days* ***of EPA final decision regarding additional documents for inclusion in repository*** ~~following the Meeting with PRPs on Draft Allocation Process and Database Design~~	Transmittal
7.B	***Submit recommendation on eligibility of PRPs for early settlement to EPA***	***Within 20 days of loading of Final Early Settlement Party Data Reports***	***Transmittal***

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

Task 7.A.1 - The CSRA Team will organize and conduct a review of indices of remaining documents proposed for inclusion in the Allocation Document Database by OU2 PRPs to develop a recommendation on the relevancy of proposed documents to the allocation process.

This task will require the following efforts on the part of the CSRA Team:

- ***Conduct an analysis of document information contained in indices received from the OU2 PRPs to determine if the proposed documents meet established relevancy criteria for inclusion in Allocation Document Repository***
- ***Drafting of a written recommendation indicating which of the recommended documents are deemed to meet the established relevancy criteria for inclusion in Allocation Document Repository, with an explanation of the rationale for the exclusion of any recommended document***

Staffing - Data Analysts; Senior Project Manager; Senior Allocation Specialist

Performance Standards/Metrics

- ***The CSRA Team submits the written recommendation regarding the relevancy of remaining OU2 PRP documents to EPA, with a copy to the OU2 PRPs, within the noted timeframe***
- ***The submitted written recommendation indicates which of the documents recommended by OU2 PRPs are deemed to meet the established relevancy criteria for inclusion in Allocation Document Repository, with an explanation of the rationale for the exclusion of any recommended document***

Task 7.A.2 - The CSRA Team will organize and conduct a technical and scientific evaluation of data in the allocation database to develop individual data reports for each of the OU2 PRPs. The PRP Data Reports will provide selected information regarding each OU2 PRP's relation to OU2 and OU2 contaminants of concern that will be used in conduct

of the allocation. The CSRA Team will establish a deadline of 40 business days from receipt of the data report for submission of corrections or suggestions by the OU2 PRPs for improving the quality of the received OU2 PRP's data report.

This task will require the following efforts on the part of the CSRA Team:

- ***Conduct a call with EPA to discuss the Allocation Team recommendation regarding the relevancy to the allocation of documents provided by OU2 PRPs***
- Conduct coding of data and loading of coded data into database obtained from OU2 PRPs
- ~~Review Site data loaded into database to determine appropriate organization for allocation~~
- ~~Compile and organize Site data in database to support allocation analysis and share computations~~
- ***Review preliminary factual submission by OU2 PRPs***
- ***Review Site data loaded into database to determine appropriate organization for allocation***
- ***Compile and organize Site data in database to support allocation analysis and share computations***
- Organize data in allocation database into ***and draft*** individual ***OU2*** PRP data reports
- Provide a copy of the PRP data reports to the OU2 PRPs ***for review***

Timing of this task is dependent upon the following:

- ***Receipt of EPA's determination regarding the relevancy to the allocation of documents provided by OU2 PRPs within established timeframe***
- ***Receipt of comments from OU2 PRPs regarding their data report within established timeframes***

Conduct of this task is dependent upon the following:

- Access by the CSRA Team to EPA technical data regarding Site conditions and the selected OU2 remedy
- Sufficient data on identified PRPs to allow analysis of associated contaminants of concern and hazardous substance fate and transport at the Site
- Successful establishment of the allocation database
- Receipt of additional data from OU2 PRPs for inclusion in the allocation database ***within established timeframes*** ~~by 60 business days following the meeting with PRPs on draft allocation process and database design~~

Staffing - Data Analysts; Senior Scientist; Senior Project Manager; Senior Allocation Specialist

Performance Standards/Metrics

- The CSRA Team submits the PRP Data Reports to the OU2 PRPs within the noted timeframe
- The submitted written individual PRP Data Reports include a summary of information in the allocation database that is relevant to a determination regarding the associated OU2 PRP's relation to OU2 and OU2 contaminants of concern for use in conduct of the allocation
- The CSRA Team copies the EPA technical lead on the email communications to the OU2 PRPs providing a copy of their data report

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Task 7.B - The CSRA Team will organize and conduct an analysis of information regarding the relationship of OU2 Early Settlement PRPs to the Site and Site remedy, including relevant documents in the Allocation Document Repository, PRP Data Reports, and Preliminary Submissions, to develop a recommendation on the eligibility of OU2 Early Settlement PRPs for the opportunity to enter negotiations with EPA regarding a cash-out settlement. The recommendation will be based upon eligibility criteria specified by EPA in its May 17, 2017 to OU2 PRPs on the subject; specifically that "(t)he parties that EPA identified as eligible for an early cash out settlement are those that, based on information reviewed by EPA, are not associated with the release or disposal of any of the COCs for OU2, as identified in the ROD, into the Lower Passaic River.

This task will require the following efforts on the part of the CSRA Team:

- ***Conducting an analysis of documents and other information submitted by OU2 Early Settlement PRPs and contained in the Allocation Document Repository to determine whether the OU2 Early Settlement PRPs meet the eligibility criteria specified by EPA.***
- ***Drafting of a written recommendation indicating which of the OU2 Early Settlement PRPs are deemed to meet the specified eligibility criteria for the opportunity to enter negotiations with EPA regarding a cash-out settlement, with an explanation of the rationale for the exclusion of any OU2 Early Settlement PRP.***

Staffing - Data Analysts; Senior Scientist; Senior Project Manager; Senior Allocation Specialist

Performance Standards/Metrics

- ***The CSRA Team submits the written recommendation on the eligibility of OU2 Early Settlement PRPs for the opportunity to enter negotiations with EPA regarding a cash-out settlement, within the noted timeframe***
- ***The submitted written recommendation indicates which of the OU2 Early Settlement PRPs are deemed to meet the specified eligibility criteria for the opportunity to enter negotiations with EPA regarding a cash-out settlement, with an explanation of the rationale for the exclusion of any OU2 Early Settlement PRP***

Task 8 Final Data Reports

Item	Title	Due No Later Than†	Type
8.1	Submit Final PRP Data Reports to EPA and PRPs	Within 40 days* ~~following the~~ ***of the*** deadline ~~for submission of corrected~~ ***OU2 PRPs corrections to*** PRP data reports	Transmittal
8.2	Provide EPA Access to Allocation Database	Upon ~~submission~~ ***loading*** of corrected PRP data reports	Activity

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

The CSRA Team will analyze corrections or suggestions for improving the quality of the data reports received from OU2 PRPs to determine whether modifications of the original data reports are warranted. Based on this analysis, the CSRA Team will modify the data reports, as deemed appropriate. The CSRA Team will then provide a copy of all of the revised data reports to EPA and a revised copy of their own individual data reports to each

of the OU2 PRPs, with an explanation of how suggested changes were, or were not, incorporated.

This task will require the following efforts on the part of the CSRA Team:

- Analyze received suggestions and corrections to data reports in relation to existing Site data and the final allocation design in order to determine appropriate modifications
- Modify the individual data reports, as warranted based on above analysis
- Provide an explanation to the OU2 PRPs regarding whether, and if so how, received suggestions resulting in changes to their individual data report, including a description of why their suggestions and comments were, or were not, taken into account. ***Upload final OU2 Settlement PRP data reports to allocation document repository***
- As required, the CSRA Team will conduct communications with individual OU2 PRPs to answer questions regarding their final data report

Timing of this task is dependent ***upon the following:***

- Receipt of comments from OU2 PRPs regarding their data report within established timeframes

Staffing - Data Analysts; Senior Scientist; Senior Project Manager; Senior Allocation Specialist

Performance Standards/Metrics

- The CSRA Team submits the Final PRP Data Reports to EPA and OU2 PRPs within the noted timeframe, ***and uploads data reports to document repository***
- The submitted revised Final PRP Data Reports address any identified ambiguities in the draft reports and includes a summary of how received comments regarding the draft PRP Data Reports were, or were not, taken into account in the final reports
- The CSRA Team copies the EPA technical lead on the email communications to the OU2 PRPs providing a copy of their individual data report

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Task 9 Draft Allocation Report

Item	Title	Due No Later Than†	Type
9.1	Submit Draft Allocation Recommendation Report	Within 90 days* following submittal of ***Response Briefs by PRPs*** ~~final PRP Data Reports~~	Transmittal

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

Task 9 - The CSRA Team will prepare a first draft of the allocation recommendation report and submit to the OU2 PRPs and EPA for review. The draft allocation report will designate shares of responsibility among the OU2 PRPs, as appropriate based on the allocation analysis. The draft allocation report will include a recommendation on the possible grouping of the OU2 PRPs into tiers of similar levels of responsibility.

This task will require the following efforts on the part of the CSRA Team:

- ***Conduct of communications, including a conference call, with OU2 PRPs regarding recommendations on and legal/equitable theories pertinent to conduct of the allocation included in Position and Response Briefs received from the OU2 PRPs***
- Review and consideration of input regarding allocation received from the OU2 PRPs and EPA
- Review and understand the basis for EPA's selected remedy for OU2, in consultation with EPA technical and legal personnel
- Review and understand the relative toxicity of identified contaminants of concern relevant to the selection of the OU2 remedy, in consultation with EPA technical and legal personnel
- Analyze the relative toxicity of materials discharged by OU2 PRPs and other differentiating factors, including fate and transport of hazardous substances released by PRPs based on the data contained in the RI/FS, in relation to the selected remedy
- Compilation and analysis of allocation data related to each OU2 PRP, including contaminants of concern, to establish the relative impact of the actions of each OU2 PRP on the conditions that resulted in EPA selecting the OU2 remedy
- Establish appropriate allocation algorithms
- Load compiled PRP data into allocation calculations to determine relative relationships among the OU2 PRPs
- As appropriate, establish appropriate tiers of OU2 PRP responsibility based on calculations and consideration of equitable factors
- Prepare draft allocation recommendation report
- Submission of the draft report to the OU2 PRPs and EPA

Timing of this task is dependent upon receipt of position briefs and reply briefs regarding allocation from OU2 PRPs within established timeframes

Staffing - Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team submits the Draft Allocation Recommendation Report within the noted timeframe

- The submitted written Draft Allocation Recommendation Report includes an overview of the basis for the determinations of shares among the OU2 PRPs, including a description of the use of data sources and application of allocation factors and methodology utilized, and reason for potential vulnerabilities, if any, in the resulting allocation
- The report identifies and explains the rationale, if applicable, for grouping OU2 PRPs into tiers of similar relative responsibility

Task 10 Final Allocation Recommendation Report

Item	Title	Due No Later Than†	Type
10.1	~~Conference Call~~ ***Meeting*** with EPA regarding Draft Allocation Recommendation Report	Within 10 days* of submittal of Draft Allocation Report	Transmittal
10.2	***Conduct Meeting with PRPs on Draft Allocation Report***	***Within 20 days of submittal of Draft Allocation Report***	***Activity***
10.3	***Conference Call with EPA on Meeting with PRPs on Draft Allocation Report***	***Within 10 days* following the Meetings with PRPs on Draft Allocation Report***	***Activity***
10.***4*** ~~2~~	Submit Final Allocation Recommendation Report to OU2 PRPs and EPA	Within 60 days* of submittal of Draft Allocation Report	**Deliverable**

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

Task 10.1 - The CSRA Team will prepare for and participate in a meeting with EPA regarding the submitted draft allocation recommendation report. The purpose of the meeting will be to obtain EPA comments regarding the submitted draft allocation report, including the basis and findings of the draft allocation report and the report format.

This task will require the following efforts on the part of the CSRA Team:

- The CSRA Team will supply one (2) senior staff located in Washington, DC to ***attend the meeting*** ~~participate in the conference call~~
- ~~Conference call assumed to be no more than two (2) hours in length~~
- ***Meeting assumed to be no more than four (4) hours in length***

Staffing - Senior Allocation Specialist; ***Senior Project Manager***

Performance Standards/Metrics:

- The CSRA Team participates in the meeting regarding the submitted draft allocation recommendation report

Task 10.2 – The CSRA Team will plan, schedule, and conduct a meeting with the OU2 PRPs as a group regarding the draft allocation recommendation report. The purpose of the meeting will be to advise the OU2 PRPs as a group regarding the draft allocation recommendation report and to obtain preliminary PRP comments regarding the draft allocation recommendation report. The CSRA Team will also communicate with the OU2 PRPs individually to obtain the input of OU2 PRPs, including those that did or were unable to attend the meeting, regarding draft allocation recommendation report.

This task will require the following efforts on the part of the CSRA Team:

- ***Making arrangements for a meeting in the greater New York City metropolitan area sufficient to accommodate the OU2 PRPs as a group***
- ***Coordination of meeting space and equipment for meetings provided by EPA or OU2 PRPs***
- ***Communication via email with the OU2 PRPs regarding substance, date/time, and location of meeting***
- ***Development of meeting agenda***
- ***Development of participant materials, a needed***
- ***Travel of two (2) senior staff from Washington, DC to attend meeting***
- ***Communications by Senior Allocation Specialist via phone, email, or other electronic media as required with OU2 PRPs***
- ***Recording of PRP comments regarding the draft allocation recommendation report, without attribution to individual OU2 PRP comments***

Staffing – Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- ***The CSRA Team conducts a meeting with the OU2 PRPs as a group regarding the draft allocation recommendation report***
- ***A majority of the members of the OU2 PRPs as a group attend the meeting either in person or remotely***
- ***The CSRA Team copies the EPA technical lead on its email communication to the OU2 PRPs regarding substance, date/time, and location of meeting, and provides EPA with a copy of utilized meeting materials***

Task 10.3 - The CSRA Team will schedule and hold, within 10 business days of holding the meeting with the OU2 PRPs on the draft allocation recommendation report, a conference call with EPA regarding the findings of the meeting.

This task will require the following efforts on the part of the CSRA Team:

- ***Scheduling and participating in a conference call with EPA to provide EPA information on the meeting, including a list of participants at the meeting and summary of suggestions received regarding the draft allocation recommendation report***
- ***Conference call assumed to be no more than two (2) hours in length***

Timing of this task is dependent upon the availability of assigned EPA staff to participate in a conference call within noted timeframe.

Staffing – Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- ***The CSRA Team participates in a conference call with EPA regarding the findings of the meeting with PRPs regarding the draft allocation recommendation report***
- ***In conducting the post-meeting conference call with EPA, the CSRA Team provides a summary of information and suggestions obtained from the OU2 PRPs without attribution to contributions of individual participants***

Task 10.*4* ~~2~~ - The CSRA Team will prepare a Final Allocation Recommendation Report. The Final Allocation Recommendation Report will take into consideration comments on the draft allocation recommendation report received during consultation with EPA and during meetings with and received in position and reply briefs from the OU2 PRPs.

This task will require the following efforts on the part of the CSRA Team:

- Review and consider the comments by OU2 PRPs and EPA regarding the draft allocation recommendation report
- Editing of the draft allocation recommendation report to incorporate appropriate modifications based on OU2 and EPA comments to produce the Final Allocation Recommendation Report

Staffing - Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team submits a Final Allocation Recommendation Report within the noted timeframe
- The submitted Final Allocation Recommendation Report includes the elements of the Draft Allocation Recommendation Report described in Task 17, addresses any identified ambiguities in the draft report, and provides a summary, without attribution to individual comments, of how comments of the OU2 PRPs and EPA regarding the Draft Allocation Recommendation Report were, or were not, taken into account in the final report, without attribution.

Task 11 Final PRP Outreach Report

Item	Title	Due No Later Than†	Type
11.1	Submit Final PRP Outreach Report	Within 10 days* of submittal of Final Allocation Report	Activity

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

The CSRA Team will prepare and provide to EPA a report regarding outreach efforts conducted with the OU2 PRPs, including a list of participants in outreach efforts, a description of topics discussed, and a summary of issues or concerns raised.

This task will require the following efforts on the part of the CSRA Team:

- Review and organize the comments of OU2 PRPs received during conduct of the Task Order, without attribution to individual OU2 PRPs
- Prepare and provide EPA an overview of conducted outreach efforts, including a list of OU2 PRPs that have participated in outreach meetings, conference calls, or individual communications with the CSRA Team and a summary of suggestions received from the OU2 PRPs regarding the allocation process

Staffing - Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team submits a written summary of PRP outreach efforts within the noted timeframe
- The Final PRP Outreach Report includes a summary of conducted PRP outreach efforts, including a list of OU2 PRPs that have participated in outreach meetings,

conference calls, or individual communications with the CSRA Team and a summary of suggestions received from the OU2 PRPs regarding the allocation process
- In drafting the Final PRP Outreach Report, the CSRA Team provides a summary of information and suggestions obtained from the OU2 PRPs without attribution to contributions of individual participants

Task 12 Task Order Closeout Report

Item	Title	Due No Later Than†	Type
12.1	Submit Draft Task Order Closeout Report	Within 10 days* of submittal of Final Allocation Report	Transmittal
12.2	Final Task Order Closeout Report	Within 10 days* of receipt of EPA's comments on Draft Task Order Closeout Report	**Deliverable**

† Or as otherwise directed by the TOCOR
* All references to "days" refer to business days

Task 12.1 - The CSRA Team will design and produce the first draft of a report regarding the conduct of tasks pursuant to the Task Order and submit it for review by EPA. The report will not contain any confidential or sensitive information. The contents of the Draft Task Order Close-Out Report will include:
- A half-page description of the project that describes the nature of the project, the parties, the process, and the outcomes
- If appropriate, a short section reflecting on the process and procedural lessons learned and recommendation for improvements and identification of those activities conducted that contributed to the success of the process
- A brief summary of the final costs of the project broken out by percentage of labor hours and other direct costs

This task will require the following efforts on the part of the CSRA Team:
- Review of project activities and compilation of project summary
- Consideration and compilation of thoughts on lessons learned regarding project
- Compilation of project budget costs
- Preparation of the Draft Task Order Close-out Report

Staffing - Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:
- The CSRA Team submits a Draft Task Order Closeout Report within the noted timeframe
- The submitted Draft Task Order Closeout Report includes the items noted above as contents of the report

Task 12.2 - The CSRA Team will prepare a Final Task Order Closeout Report and submit to EPA. The Final Task Order Closeout Report will take into consideration comments received from EPA regarding the draft of the Task Order closeout report. CSRA will provide one (1) copy of the Final Task Order Closeout Report to the PO and one (1) copy to the TOCOR in electronic format.

This task will require the following efforts on the part of the CSRA Team:

- Review and consideration of comments by EPA regarding the draft Task Order Closeout Report
- Editing, and as required redesign, of the closeout report to incorporate modifications based on EPA comments in order to produce the Final Task Order Closeout Report

Staffing - Senior Allocation Specialist; Senior Project Manager

Performance Standards/Metrics:

- The CSRA Team submits a Final Task Order Closeout Report within the noted timeframe
- The submitted Final Task Order Closeout Report addresses any identified ambiguities in the draft report and includes a summary of how EPA's comments regarding the Draft Allocation Recommendation Report were, or were not, taken into account in the final report

5.0 Reports, Transmittals and Deliverables

CSRA will provide EPA all reports in accordance with the contract. ***If EPA responds with a request for additional information, Subcontractor is required to provide information, as requested.***

Copies of all contract deliverables will be sent to both the PO and the TOCOR. If oral briefings are scheduled for EPA staff, the PO will be notified in time to attend.

Schedule

Item	Title	Due No Later Than†	Type
1	Task Order Kick-Off Meeting	Within 20 days* of Task Order approval	Transmittal
2	EPA Project Public Announcement Meeting	Within 40 days* of Task Order approval	Activity
3	Submit initial allocation process and database design to EPA	Within 100 days* of Task Order approval	Transmittal
4	Conference Call with EPA on Initial Allocation Process and Database Design	Within 10 days* of submission of initial allocation process and database design	Activity
5.***A.***1	Conduct ***two*** Meeting***s*** with PRPs on Draft Allocation Process and Database Design	Within 40 days* of submission of initial allocation process and database design to EPA	Activity
5.***A.***2	Conference Call with EPA on Meeting***s*** with PRPs on Draft Allocation Process and Database Design	Within 10 days* following the Meeting with PRPs on Draft Allocation Process and Database Design	Activity

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Item	Title	Due No Later Than†	Type
5.B.1	***Submit guidance on preparation of allocation submissions to EPA and PRPs***	***Within 5 days of Revised Task Order Approval***	***Transmittal***
5.B.2	***Submit recommendation on relevancy of documents provided by OU2 PRPs to EPA and PRPs***	***Within 30 days of Revised Task Order Approval***	***Transmittal***
6.***A*** ~~1~~	Submit Final Allocation Design to EPA and PRPs	Within 50 days* following the Meeting with PRPs on Draft Allocation Process and Database Design	Transmittal
6.B.1	***Submit draft PRP Data Reports regarding Early Settlement PRPs to PRPs and EPA***	***Within 10 days* of EPA final decision regarding additional documents for inclusion in repository***	***Transmittal***
6.B.2	***Submit final PRP Data Reports regarding Early Settlement PRPs to PRPs and EPA***	***Within 15 days of submission of Draft Early Settlement Part Data Reports***	***Transmittal***
7.A.1	***Submit recommendation on relevancy of documents provided by OU2 PRPs to EPA and PRPs***	***Within 10 days of OU2 Party submission of document indices***	***Submittal***
7.***A.2***	Submit Draft PRP Data Reports to PRPs	Within ~~100~~ ***75*** days* ***of EPA final decision regarding additional documents for inclusion in repository*** ~~following the Meeting with PRPs on Draft Allocation Process and Database Design~~	Transmittal
7.B	***Submit recommendation on eligibility of PRPs for early settlement to EPA***	***Within 20 days of loading of Final Early Settlement Party Data Reports***	***Transmittal***
8.1	Submit Final PRP Data Reports to EPA and PRPs	Within 40 days* ~~following the~~ ***of the*** deadline ~~for submission of corrected~~ ***OU2 PRPs corrections to*** PRP data reports	Transmittal
8.2	Provide EPA Access to Allocation Database	Upon ~~submission~~ ***loading*** of corrected PRP data reports	Activity
9.1	Submit Draft Allocation Recommendation Report	Within 90 days* following submittal of ***Response Briefs by PRPs*** ~~final PRP Data Reports~~	Transmittal
10.1	~~Conference Call~~ ***Meeting*** with EPA regarding Draft Allocation Recommendation Report	Within 10 days* of submittal of Draft Allocation Report	Transmittal

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Item	Title	Due No Later Than†	Type
10.2	***Conduct Meeting with PRPs on Draft Allocation Report***	***Within 20 days of submittal of Draft Allocation Report***	***Activity***
10.3	***Conference Call with EPA on Meeting with PRPs on Draft Allocation Report***	***Within 10 days* following the Meetings with PRPs on Draft Allocation Report***	***Activity***
10.*4* ~~2~~	Submit Final Allocation Recommendation Report to OU2 PRPs and EPA	Within 60 days* of submittal of Draft Allocation Report	**Deliverable**
11	Submit Final PRP Outreach Report	Within 10 days* of submittal of Final Allocation Report	Activity
12.1	Submit Draft Task Order Closeout Report	Within 20 days* of submittal of Final Allocation Report	Transmittal
12.2	Final Task Order Closeout Report	Within 10 days* of receipt of EPA's comments on Draft Task Order Closeout Report	**Deliverable**

** All references to days in this chart refer to business days*

6.0 Staffing Plan

This Task Order will be staffed as follows:

Team Member Name†	Role in the Project
Mary Apostolico CSRA International	Overall Contract Management, Quality Assurance, Task Order Management
Jennifer Cutrona CSRA	Dashboard and Financial Tracking
David Batson TechLaw	Senior Allocation Specialist
Judy Manley TechLaw	Senior Project Manager
Travis Kline TechLaw	Senior Toxicologist
Erman Evcimen TechLaw	Database Designer
Amber Kozacek TechLaw	Researcher

†Other team members than those listed in the above table may work on this task order to complete the required work.

*The task order mainly will be managed by the TOM listed in the above table; however, additional team members may conduct task order management activities to ensure coverage during periods when the TOM is unavailable (e.g., vacation, illness, business travel, time constraints).

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7.0 Quality Management

As part of its quality assurance practices, CSRA TOM will:

- Review this Work Plan with the EPA TOCOR, as requested by the TOCOR;
- Meet or hold conference calls as needed with the TOCOR to review progress; and
- Speak regularly with the subcontractor to receive project status updates.

In addition, all work on this Task Order will be performed in accordance with CSRA's strict quality assurance practices, including but not limited to incorporating quality management principles and processes into the development of the required transmittals, deliverables, and the consulting services offered. Although CSRA will ensure the timely delivery of all transmittals and deliverables, CSRA will not perform a review of these documents prepared by the subcontractor.

8.0 Conflict of Interest

Based on our review and understanding of the legal requirements of this work, CSRA certifies that no real, apparent, or potential organizational or individual conflict of interest exists with this assignment, based on previous or ongoing work, or other potential conflicts.

9.0 Cyber Security

CSRA has interpreted compliance with information assurance / security provisions contained in this contract as a requirement to provide its standard CSRA information system and procedures. CSRA contract pricing does not include or reflect any additional requirements or certification and accreditation for the CSRA information system or procedures, connectivity to the Government system(s), or storage of any Government-provided data or project data, or for stand-alone development or storage environments. Should the Government require increased or specialized information assurance security or other actions beyond those reflected in the standard CSRA information system or procedures, then the Government will notify CSRA and such revisions will be provided in accordance with the “changes” clause of this contract.

10.0 Project Budget

The budget for this task is provided as an Attachment.

11.0 Period of Performance

The task order period of performance runs through June 15, 2019.

Diamond Alkali Superfund Site OU2
Allocation Guide

Attachment E

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 Broadway
New York, NY 10007-1866

MAY 17 2017.

BY EMAIL AND REGULAR MAIL

To: See List of Addressees – Attachment A

Re: Diamond Alkali Superfund Site, Lower 8.3 Miles of Lower Passaic River, Essex and Hudson Counties, New Jersey

Dear Sir/Madam:

On March 30, 2017 the U.S. Environmental Protection Agency (the "EPA") notified 20 parties that EPA had identified them as candidates for an early cash out settlement related to their potential liability for Operable Unit 2 ("OU2") of the Diamond Alkali Superfund Site (the "Site"). On that same date, EPA wrote to all of the potentially responsible parties ("PRPs") for OU2 notifying them of, among other things, EPA's early cash out offer to the 20 parties. Since then, EPA has been contacted by several PRPs requesting information on EPA's proposed early cash out offer and requests to be included in the early cash out settlement.

EPA's decision to offer an early cash out settlement to 20 parties is based on a number of factors, tied to the remedial action selected in the Record of Decision ("ROD") issued for OU2.

Lower 8.3 Miles of the Lower Passaic River – OU2

On March 3, 2016 EPA issued the OU2 ROD to address unacceptable risks to human health and the environment posed by contaminated sediments in the lower 8.3 miles of the Lower Passaic River. While EPA has identified many hazardous substances in the lower 8.3 mile sediments, the ROD explains that eight hazardous substances pose the greatest potential risks to human health and the environment in the lower 8.3 miles. Those eight hazardous substances, namely, polychlorinated dibenzo-*p*-dioxins and furans ("dioxins/furans"), polychlorinated biphenyls ("PCBs"), mercury, dichlorodiphenyltrichloroethane ("DDT") (and its primary breakdown products), copper, dieldrin, lead and polycyclic aromatic hydrocarbons ("PAHs"), are identified in the OU2 ROD as the contaminants of concern ("COCs") for OU2. Accordingly, the objectives of remedial action selected for OU2 (see Section 8 of the OU2 ROD) are to:

- Reduce cancer risks and noncancer health hazards for people eating fish and crab by reducing the concentrations of COCs in the sediments of the lower 8.3 miles.

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- Reduce the risks to ecological receptors by reducing the concentrations of COCs in the sediments of the lower 8.3 miles.

- Reduce the migration of COC-contaminated sediments from the lower 8.3 miles to upstream portions of the Lower Passaic River and to Newark Bay and the New York-New Jersey Harbor Estuary.

Early Cash Out Settlement Recipients

Prior to the issuance of the ROD, EPA received many requests from parties wishing to be considered for cash out settlements, presenting arguments and information in support of such settlements. In particular, certain parties argued that their legal exposure for the Site was such that the transaction costs for them to remain within a group of performing parties were disproportionate to their liability. EPA also received information that the Lower Passaic River Study Area Cooperating Parties Group ("CPG") was unwilling to undertake an allocation.

Based on the above, EPA reached several conclusions. One was that it would be useful for EPA to create a settlement framework to resolve the liability of parties that might be eligible to be cashed out from further OU2 work. Another was that this process would be sufficiently complex that in the interim it would be appropriate to offer a first, early cash out to those parties not associated with a release or disposal of a COC into the Lower Passaic River. The early cash out settlement would allow the parties to pay a sum certain to EPA and in return receive a covenant not to sue from EPA for OU2 as well as contribution protection related to OU2.

The parties that EPA identified as eligible for an early cash out settlement are those that, based on information reviewed by EPA, are not associated with the release or disposal of any of the COCs for OU2, as identified in the ROD, into the Lower Passaic River. Given the scope of the OU2 remedy, a remedial action that is expected to cost close to $1.4 billion dollars, the Agency has taken great care in identifying parties eligible for the settlement. For the proposed settling parties, the documents that EPA relied on are posted on the Diamond Alkali Superfund Site web site[1]. EPA also considered the "Tierra Solutions' Nexus Documents"[2] that were made available as part of the New Jersey Department of Environmental Protection's (NJDEP's) Passaic River Litigation. As proposed by EPA, each of the proposed settling parties would pay the same amount ($280,600). The settlement payment takes into account the cost of the remedial action, and EPA's policy requiring a premium to account for uncertainties associated with the cost of the future work.

EPA's goal in offering this settlement was to remove these 20 parties from the OU2 RD/RA process. It is important to note that EPA's settlement offer is limited to liability associated with releases or disposal from the identified facilities. If EPA learns that a party receiving an early cash out offer is responsible for another facility that released hazardous substances to the Lower Passaic River, potential liability associated with that other facility would not be covered by this cash out settlement. However, it is also important to understand that EPA's goal was not to settle

[1] https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.scs&id=0200613
[2] http://www.nj.gov/dep/passaicdocs/thirdparty-tierra.html

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parties out piece-meal, i.e., one facility at a time, but rather to identify the parties that could be released from OU2 altogether.

Some PRPs that did not receive the cash-out offer have contacted EPA to explain that they are similarly situated to certain proposed cash-out parties, and have argued that by analogy, they too should have received such an offer. If an early cash out settlement has not been offered by EPA to a PRP, it is because EPA could not determine with confidence that the PRP met the criteria for this early cash out settlement. Such PRPs may be considered by EPA for another cash out opportunity.

Moreover, if someone is aware of reasons that a proposed settling party should not have been included, that information should be provided to EPA. If evidence exists connecting a proposed settling party with a release of COCs to the Lower Passaic River, EPA will consider that information and evaluate whether to remove the party in question from the proposed cash out settlement. However, we do not expect to engage in an additional round of document review and negotiations aimed at expanding the parties subject to an early cash out settlement.

Rather, in order to address these complexities, as indicated in EPA's March 30, 2017 "Next Steps" letter to the PRPs, EPA intends to use the services of a third party allocator with the expectation of offering cash out settlements to additional parties. Thus, parties that have not received an early cash out settlement offer from EPA may still be able to participate in a cash out settlement for OU2 with EPA in the future.

Sincerely yours,

Eric J. Wilson
Deputy Director for Enforcement and Homeland Security
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Attachment A - List of Addressees

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Lower 8.3 Miles - Passaic River

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Power Test of New Jersey, Inc. 125 Jericho Turnpike Jericho, NY 11753 now Leemilt's Petroleum, Inc., successor to Power Test of NJ, Inc.	Christine Fitter, Asst Secretary Leemilt's Petroleum, Inc. 125 Jericho Turnpike, Suite 103 Jericho, NY 11753 cfitter@gettyrealty.com Nicole Moshang, Esq. Manko, Gold Katcher & Fox LLP 401 City Avenue, Ste. 500 Bala Cynwyd, PA 19004 484-430-2324 (T) nmoshang@mgkflaw.com	Getty Newark Terminal 86 Doremus Ave. Newark, NJ
PPG Industries, Inc. One PPG Place Pittsburgh, PA 15272	Gary P. Gengel, Esq. Latham & Watkins, LLP 885 Third Avenue New York, NY 10022-4834 gary.gengel@lw.com	29 Riverside Ave. Newark, NJ
PSE&G Corp. P.O. Box 570 Newark, NJ 07101	John F. Doherty, Esq. Associate General Litigation Counsel PSE&G Services Corporation 80 Park Plaza, T5D Post Office Box 570 Newark, NJ 07102 973-430-6478(T) John.doherty@pseg.com Kevin R. Gardner, Esq. Connell Foley 85 Livingston Avenue Roseland, NJ 07068 973-535-0500(T) kgardner@connellfoley.com	155 Raymond Blvd. Newark, NJ & 4th St. Harrison, NJ
Purdue Pharma Technologies, Inc. One Stamford Forum Stamford, CT 06901	James (Jay) Stewart, Esq. Lowenstein Sandler PC 65 Livingston Avenue Roseland, NJ 07068 973-597-2522(T) jstewart@lowenstein.com	Napp Technologies 199 Main St. Lodi, NJ
Quality Distribution, Inc. 150 East Pennsylvania Avenue Suite 450 Downingtown, PA 19335 Quality Carriers, Inc.	Bonni Kaufman, Esq. Holland & Knight, LLP 800 17th Street N.W. Suite 1100 Washington, DC 20006 202-419-2547 Bonni.kaufman@hklaw.com	Chemical Leaman Tank Lines 80 Doremus Avenue Newark, NJ

Roman Asphalt Corporation 14 Ogden Street Newark, NJ 07104	Michael La Morgese, President Roman Asphalt Corporation 14 Ogden St Newark, NJ 07104 973-482-1113(T) Roman@romanasphalt.com	14 Ogden Street Newark, NJ
Royce Associates 366 N. Broadway, Ste. 400 Jericho, NJ 11753	A.J.Royce, President Royce Associates, ALP 35 Carlton Ave East Rutherford, NJ 07073 201-438-5200(T) Ronald Bluestein, Esq. Flamm Walton 794 Penllyn Pike Blue Bell, PA 19422 267-419-1500 (T) rbluestein@flammlaw.com	Royce Chemical Company 17 Carlton Avenue East Rutherford, NJ
RSR Corp. 2777 Stemmons Freeway, Suite 1800 Dallas, TX 75207 now Revere Smelting and Refining Corporation	Jane C. Luxton, Esq. Christopher Clare, Esq. Clark Hill PLC 601 Pennsylvania Avenue NW North Building, Suite 1000 Washington, DC 20004 202-572-8674(T) 703-598-3275(M) jluxton@clarkhill.com cclare@clarkhill.com	Revere Smelting & Refining 387 Avenue P Newark, NJ
RTC Properties, Inc. 79 Fifth Avenue New York, NY 10003	John S. Stolz, Esq. Lowenstein Sandler, PC 65 Livingston Avenue Roseland, NJ 07068 973-597-6228(T) mrodburg@lowenstein.com	AT&T/Western Electric 100 Central Ave. Kearny, NJ
S&A Realty Corp. 55 Passaic Avenue Kearny, NJ 07032	Jeffrey Pollock, Esq. Fox Rothschild P.O. Box 5231 Princeton, NJ 08543 609-896-7660(T) jmpollock@foxrothschild.com	American Modern Metals 44 Passaic Ave. (a/k/a 25 Belgrove Drive) Kearny, NJ
Safety Kleen Envirosystems Co. 1301 Gervais St. Columbia, SC 29201 McKesson Corporation for itself and for Safety-Kleen Envirosystems, Inc.	John Edgcomb, Esq. Edgcomb Law Group, LLP One Post Street, Suite 2100 San Francisco, California 94104-5225 415-399-1555 (T) jedgcomb@edgcomb-law.com	600 Doremus Ave. Newark, NJ

Schiffenhaus Packaging Corp. c/o Rock-Tenn Company 504 Thrasher Street Norcross, GA 30071	Camille V. Otero, Esq. Gibbons, PC One Gateway Center Newark, NJ 07102-5310 cotero@gibbonslaw.com	204 Academy Street 49 Fourth Street 2013 McCarter Highway Newark, NJ
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Seton Company, Inc. 1000 Madison Avenue Norristown, PA 19403\ now Seton Tanning	David M. Kohane, Esq. Cole Schotz, PC PO Box 800 25 Main Street Hackensack, NJ 07601-7015 201-525-6267(T) dkohane@coleschotz.com	Seton Leather Company 849 Broadway Newark, NY 07104
SpectraServ, Inc. 75 Jacobus Avenue Kearny, NJ 07032	Diana Buongiorno, Esq. Chiesa Shahinian & Giantomassi, PC One Boland Dr West Orange, NJ 07052 973-530-2075(T) dbuongiorno@csglaw.com	75 Jacobus Ave. Kearny, NJ
STWB, Inc. c/o Bayer Corporation 100 Bayer Road Pittsburgh, PA 15205	Timothy I. Duffy, Esq. Coughlin Duffy LLP Post Office Box 1917 350 Mount Kemble Avenue Morristown, NJ 07962-1917 973-631-6002(T) tduffy@coughlinduffy.com lhall@coughlinduffy.com (Assistant)	Lehn & Fink Products Corp. 192-194 Bloomfield Avenue Bloomfield, NJ 07003 Thomasett Colors/Sterling 120 Lister Ave. Newark, NJ

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Teval Corporation 99 Cherry Hill Road, Suite 105 Parsippany, NJ 07054	Lee D. Henig-Elona, Esq. Gordon & Rees 18 Columbia Turnpike, Suite 220 Florham Park, NJ 07932 973-549-2520(T direct) 973-549-2500(T office) lhenig-elona@gordonrees.com	Guyon Pipe 900-1000 South 4th Street Harrison, NJ
Teva Pharmaceuticals USA, Inc. 1090 Horsham Road North Wales, PA 19454	Gail Port, Esq. Proskauer Rose LLP 11 Times Square New York, NY 10036-8299 212-969-3243(T) gport@proskauer.com	Biocraft Laboratories 12 Industrial Park Waldwick, NJ
Textron, Inc. 40 Westminster Street Providence, RI 02903	Jamie Schiff, Esq. Textron, Inc. 40 Westminster Street Providence, RI 02903 401-457-2422 (T) jschiff@textron.com Bonni Kaufman, Esq. Holland & Knight 800 17th Street, NW Suite 1100 Washington, DC 20006 202 955-3000 bonni.kaufman@hklaw.com	Spencer Kellogg Division 400 Doremus Avenue Newark, NJ
The Andrew Jergens Co. 2535 Spring Grove Ave. Cincinnati, OH 45214 now KAO U.S.A Inc.	Richard T. La Jeunesse, Esq. Graydon Head & Ritchey LLP 1900 Fifth Third Center 511 Walnut Street Cincinnati, OH 45202 513-629-2702(T) rlajeunesse@graydon.com	1 Franklin Ave. Belleville, NJ

The BOC Group, Inc. 575 Mountain Avenue Murray Hill, NJ 07974 now Linde LLC on behalf of The BOC Group, Inc.	James (Jay) Stewart, Esq. Lowenstein Sandler PC 65 Livingston Avenue Roseland, NJ 07068 973-597-2522(T) jstewart@lowenstein.com	681 Main Street Belleville, NJ
The Hartz Mountain Corporation 400 Plaza Drive Secaucus, NJ 07094 The Hartz Consumer Group, Inc. on behalf of The Hartz Mountain Corporation	Curtis L. Michael, Esq. Horowitz, Rubino & Patton 400 Plaza Drive PO Box 2038 Secaucus, NJ 07094-2038 Curt.michael@hrplaw.com	600/700 South 4th Street Harrison, NJ
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The Sherwin Williams Co. 101 Prospect Ave., N.W. Cleveland, OH 44115	Jason Perdion The Sherwin Williams Co. 101 Prospect Ave, NW Cleveland, OH 44115 216-566-3741(T) 216-515-4400(F) don.j.mcconnell@sherwin.com Herbert (Bart) Bennett, Esq. Sokol, Behot & Fiorenzo 229 Nassau Street Princeton, NJ 08542-4601 609-279-0900(T) hbennett@cullenanddykman.com	60 Lister Ave. Newark, NJ
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Unilever Bestfoods International Plaza Sylvan Avenue Englewood Cliffs, NJ 07632 Conopco, Inc., d/b/a Unilever (as successpr to CPC/Bestfoods, former parent of the Penick Corporation	Joshua Frank, Esq. Baker Botts 1299 Pennsylvania Ave., N.W. Washington, DC 20004-2400 202-639-7710 (T) Joshua.frank@bakerbotts.com Andrew Shakalis, Esq. Associate General Counsel – Environmental & Safety Unilever 700 Sylvan Avenue Englewood Cliffs, NJ 07632 201-894-2763 (T) 201-894-2727 (F) Andrew.shakalis@unilever.com	Penick Corporation 540 New York Avenue Lyndhurst, NJ
Viacom Inc. 11 Stanwix St. Pittsburgh, PA 15222 Now CBS Corporation	Jeffrey B. Groy, Esq. VP, Sr. Counsel/ Environmental CBS Law Department CBS Corporation 2 East Mifflin Street, Suite 200 Madison, WI 53703 262 705-0579(T) Jeff.Groy@cbs.com	Westinghouse Electric 95 Orange St. Newark, NJ

Vulcan Materials Co. 1200 Urban Center Drive Birmingham, AL 35242 Now Legacy Vulcan Corp.	Eva Fromm O'Brien, Esq. Fulbright & Jaworski Fulbright Tower 1301 McKinney Suite 5100 Houston, TX 77010-3095 713-651-5321 (T) 713-651-5246 (F) eobrien@fulbright.com John M. Floyd, Esq. Senior Attorney Vulcan Materials Company 1200 Urban Center Drive Birmingham, AL 35242 205-298-3745 (Direct) 205-492-4219 (Cell) 205-298-2960 (F) floydj@vmcmail.com	600 Doremus Ave. Newark, NJ
Wiggins Plastics Inc. 186 Kingsland Road Clifton, NJ 07014	Glenn Tucker, Esq. Sheryl Reba, Esq. Greenberg Dauber One Gateway Center, Suite 600 Newark, NJ 07102 973-643-3700(T) 973-643-1218(F) gtucker@greenbergdauber.com sreba@greenbergdauber.com	180 Kingsland Road Clifton, NJ
Wyeth 5 Giralda Farms Madison, NJ 07940	Ronald J. Schott, Esq. Corporate Counsel Pfizer 5 Giralda Farms Madison, NJ 07940 973-660-6641(T) 973-660-7176(F) ronald.schott@pfizer.com Seth Kerschner, Esq. White & Case LLP 1155 Avenue of the Americas New York, NY 10036-2787 212-819-8630(T) 212-354-8113(F) Seth.kerschner@whitecase.com	Shulton Inc. and American Cyanamid Co. 697 Route 46 Clifton, NJ

Passaic Valley Sewerage Commission	Gregory A. Tramontozzi, Esq Executive Director Passaic Valley Sewerage Commissioners 600 Wilson Avenue Newark, NJ 07105 Michael Witt, Esq. Chasan Leyner & Lamparello, PC 300 Harmon Meadow Blvd. Secaucus, NJ 07094 201-801-6093 mwitt@chasanlaw.com	
City of Newark	Joanne Vos, Esq. Maraziti Falcon, LLP 150 John F. Kennedy Parkway Short Hills, NJ 07078 973 912-9008 jvos@mfhenlaw.com Angela Foster, Esq. First Assistant Corporation Counsel City of Newark Department of Law Room 316, City Hall 920 Broad Street Newark, NJ 07102 973-733-3880 fostera@ci.newark.nj.us	
Borough of East Newark	Honorable Joseph R. Smith, Mayor Borough of East Newark 34 Sherman Avenue East Newark NJ 07029	
Town of Harrison	Honorable James A. Fife, Mayor Town of Harrison 318 Harrison Avenue Harrison, New Jersey 07029 Mr. Paul J. Zarbetski, Esq. Town of Harrison 318 Harrison Avenue Harrison, New Jersey 07029	
Town of Kearny	Honorable Alberto G. Santos, Mayor Town of Kearny 402 Kearny Avenue Kearny, NJ 07032	

Diamond Alkali Superfund Site OU2
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Attachment F

Common Interest/Joint Defense
Attorney Work Product
DRAFT

Draft List of Relevant Document Categories for Allocation

A. April 13 - Initial Index Submissions - Public documents relating to purchase, maintenance, manufacture of, and disposal of 8 COCs identified in the EPA OU2 ROD

I. ISRA/ECRA Documents and other NJDEP site remediation matters - Identifying 8 COCs referenced in the ROD for OU2
   a. Initial filings identifying areas of concern:
      i. ECRA - Site Evaluation Submission (SES) for process description, materials usage
      ii. ISRA - Preliminary Assessment Report and required reporting form(s)
      iii. Applications for Letters of Non-Applicability (LNA) and issued LNAs/DEP response if LNAs based on absence of COCs.
      iv. Alternative compliance filings and approvals if based on absence of COCs.
   b. Substantive correspondence/report submissions made to and/or received from DEP, including underlying records and data.
      i. Include:
         1. Preliminary assessment reports (Phase 1 Reports)
         2. Site Investigation/Remedial Investigation Reports (Phase 2 Reports)
         3. Remedial Alternative Evaluation or Feasibility Studies (Phase 3 Reports)
         4. Correspondence Between PRP and Agency
            a. Remedy Decision Documents
            b. Notices of Deficiency and Responses
            c. Consent Orders or Agreements
   c. Final Remediation Documents
      i. Remedial Action Reports (Phase 4 Reports)
         1. Include Text, Tables, Figures/Plates
         2. Include Field/Boring/Well Construction Logs
         3. Exclude Other Appendices/Raw Data
      ii. Remedy Completion Reports (Phase 5 Reports)
      iii. Engineering and Institutional Controls (Deed Notice, Classification Exception Area, Well Restriction Area), No Further Action, Negative Declaration, Response Action Outcome.

II. Other Document Categories
   a. Community Right to Know filings (listing 8 COCs)
   b. Spill Plans – DPCC/DCR; SPCC avoid submittal of duplicate plans
   c. Permits and applications – e.g., NPDES/NJPDES, Water and Air Permits
   d. Aerial Photographs
   e. Spill Incident Records
      i. Reports to or notices from PVSC, Coast Guard, NJDEP, EPA/NRC, New Jersey police

f. Site Remediation Documents (e.g., state and federal: SRRA/ARRCS, CERCLA, TSCA, etc.)
    i. Same Assumptions as ISRA/ECRA Documents
g. Discharge Monitoring Reports - Only to the Extent Same Address 8 COCs
h. Demolition Documents/Reports (e.g., detailing material disposal/analysis)
i. Agency Correspondence (e.g., regarding spills, investigations, inspections, etc.) Only to the Extent Same Address 8 COCs
j. Court records or filings related to site contamination involving 8 COCs
k. Industrial Waste Surveys (e.g., to PVSC)

B. June 15 - Allocation parties provide preliminary indices of remaining documents for inclusion, post-finalization of allocation guidelines for sites

C. Expert Report Submissions (citing business confidential documents, periodicals, references relied on, plant/site diagrams depicting operational areas, etc.)

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Attachment G

Template & Instructions for Creation of Allocation Party Data Reports

Review the company's preliminary submission/questionnaire and documents in the repository associated with the company and the facility address to fill out the information noted below.

Remember to:

- *Copy referenced documents into the appropriate company name folder under G:_____/NEXUS REPORTS.*
- *Focus on the COCs.*
- *Include the Bates Numbers located on each document page to reference where the information used in data report comes from. For example: Company X began operations at the 100 ABC Street facility on January 1, 1965 (PAS-00000001).*
- *Make sure to include dates and entities involved. For instance, if there has been sampling conducted, include the date and the entity that conducted the sampling.*
- *Include attributes to note where referenced information has been taken from, such as "According to the 1987 Feasibility Study." Do not make conclusions.*
- *Include maps/drawings in the report using the Snipping tool.*
- *Make sure to incorporate all information from the Questionnaire (including all subsections) in the appropriate section as noted below.*
- Include Allocation Party (company) name at top right of each page.

COMPANY NAME [Questionnaire Section 1.1.1]

Facility Name, Address and Size: List the facility address and acreage. Note if the acreage is not available. [Questionnaire Section 1.1.2 and 1.1.4]

1. **Business Type:** State the general business type (e.g. - metal recycler, manufacturer of X, etc.) [Questionnaire Section 1.1.3]

2. **Significant Findings and Observations:** Summarize the story of how this company is or is not associated with the sediment in the Lower 8.3 miles of the Passaic River. Include materials used, release pathways, evidence of on-site contamination associated with this company's facility ownership or operations. This should be a brief paragraph/executive summary.

3. **Time Period of Ownership/Operations:** Note the time frame the company owned and/or operated at this facility. Distinguish between the two if necessary. Include the following at the beginning of this section. [Questionnaire Section 1.2]

   Operator: XXXX to XXXX [dates]
   Owner: XXXX to XXXX [dates]

   Note if there is a Corporate Successor identified. Also, note if there is a different current owner.

Note if the company did not own, operate, or occupy the Property at the time of a release or disposal of a COC, what their connection or relationship was to the corporate entity or entities that did. [Questionnaire Section 1.3]

4. **Operational History/COC Use and Presence at the Facility** [Questionnaire Section 2]**:** What operations have occurred over time at the facility? What were the facility hazardous materials disposal practices related to the COCs? Are there site layouts showing sewers that received discharges from the facility, or where the operations that used chemicals were located? Where did they store chemicals? Include maps/layouts if available.

5. **Identified COCs** [Questionnaire Section 3]**:** What COCs were used, stored, disposed of, generated, or otherwise handled at the facility. Note each of the following chemicals for which there is evidence of this company's use, generation, or release at the facility and/or detection in on-site sampling. If historic fill is present and contains COCs, describe any activities that would have disturbed the fill and therefore potentially allowed the release of COCs to surface water, groundwater, or sewer systems. At the beginning of the section, for each such COC, note in parenthesis after the chemical name whether the evidence shows use, handling, generation, release or a combination of the foregoing. Evidence of release would include information from inspections/violations, sampling on-site, etc. Only include information for the time-period that this entity owned/operated at the site.

    - Polychlorinated biphenyls (PCBs)
    - Dioxins and Furans
    - Polycyclic aromatic hydrocarbons (PAHs)
    - Dieldrin
    - DDx (DD and its breakdown products)
    - Mercury
    - Copper
    - Lead

    If the facts indicate that the facility is not the source of a COC at the Facility, describe where the COC came from including associated parties and dates.

6. **COC Pathways** [Questionnaire Section 4]**:** Describe all routes through which the COCs discharged at the facility by this company could be released to the Passaic River sediment. Include information on sewer systems (sanitary, storm, CSO), as well as direct release. Include information on the movement of COCs via the natural flow of rainwater and groundwater only to the extent of evidence that substantial action by the Allocation Party (such as a major spill or drum burial) has caused such contamination by COCs of groundwater or rainwater. Include maps/figures if available.

7. **Regulatory History/Enforcement Actions** [Questionnaire Sections 5 and 7]**:** What inspections, violations, permits are associated with this company at this facility pertaining to the COCs? Make sure to include dates and note specific COCs. Also include information on whether the party has been cooperative or uncooperative with the

regulatory agency regarding the prevention of any harm to the public health or the environment specifically related to OU2 and the COCs.

8. **Response Actions** [Questionnaire Section 6]: What sampling/site characterization has occurred on-site? Summarize the various documents such as sampling activities, RI/FS, remedial activities, etc. that indicate potential or known off-site migration of contaminants.

9. **Summary of Asserted Defenses** [Questionnaire Section 8]**:** Summarize the defenses asserted in the questionnaire responses. This summary does not constitute a statement on the merits of the asserted defenses, which will be determined later in the allocation process.

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Attachment H

ADR CONFIDENTIAL

DIAMOND ALKALI SUPERFUND SITE – LOWER 8.3 MILES OF LOWER PASSAIC RIVER ("OU2")

CERTIFICATION OF ALLOCATION PARTY REGARDING NON-CONFIDENTIAL INFORMATION

[Insert Allocation Party Name]

[Insert Facility Site Name/Address]

By signing this Certification, the Allocation Party identified below certifies that, to the best of its knowledge and belief, it:

a. has conducted a thorough, good faith search for documents in its possession or control consistent with guidance set forth in the June 8, 2018 Diamond Alkali OU2 Allocation Guide ("Guide") developed by David C. Batson ("Allocator"), and consistent with the Guide has accurately disclosed to the Allocator non-confidential information identified in such search sufficient for the Allocator's use in preparing a Data Report regarding such Allocation Party's ownership, operation, and/or activities, including those of other persons or entities for which such Allocation Party has responsibility, regarding the above-enumerated facility site that was identified by EPA for inclusion in the Diamond Alkali OU2 allocation.

b. after the receipt of a General Notice Letter from EPA regarding OU2, has not altered, mutilated, discarded, destroyed, or otherwise disposed of or withheld, any records, reports, documents, or other information (including records, reports, documents, or other information in electronic form) (other than identical copies) for which a search consistent with the Guide could have been conducted that (i) supports the Allocation Party's Preliminary Questionnaire submission, or (ii) if available would have resulted in the material modification by the Allocator of a material fact in the Allocation Party's Data Report.

c. Nothing herein shall be deemed to waive any Allocation Party's attorney client, work product, joint defense privilege, or any other applicable protections or rights.

FOR _____:
[Insert Name of Allocation Party]

_____ _____

Dated

[Name]
[Title]
[Company]
[Address]

Diamond Alkali Superfund Site OU2
Allocation Guide

Attachment I

Diamond Alkali OU2
ADR CONFIDENTIAL

ALLOCATION INITIAL SUBMISSION QUESTIONNAIRE

NOTE: This questionnaire is designed and formatted for use as an online form, with drop down menus to facilitate efficiency of data compilation and liberal opportunities for written answers. The online form of this questionnaire will be available for use in mid-June 2018.

GENERAL INSTRUCTIONS

The following general instructions are applicable to all questions unless an individual question indicates otherwise.

You are to provide full and complete answers to all questions. If You believe a "yes" or "no" response by You requires further explanation because, for example, it would be materially misleading in the absence of further explanation, please provide the necessary explanation, including appropriate supporting facts on a separate sheet that references the relevant question.

You may cite to supporting documents where appropriate (e.g., for sample results), but also provide a narrative response for each question.

Unless otherwise indicated, the questions are, and Your responses should be, confined to the Relevant Time Period, as defined below.

DEFINITIONS

"Affiliate" means any entity with which the Allocation Party answering this questionnaire is related to directly or indirectly, whether by common ownership or other means of control, or indemnitees of the Respondent for that facility, or for which Respondent has or may have CERCLA liability for that facility.

"Allocation Party" or "Allocation Parties" means any entity or entities listed as an Allocation Party on the Master List of Allocation Parties.

"COCs" means the eight (8) chemicals defined as Chemicals of Concern (COCs) in Section 2.e. of the Diamond Alkali Superfund Site OU2 Allocation Guide, dated June 11, 2018.

"Disposal" shall have the meaning set forth in CERCLA sec.101 (29).

"Enforcement Action" means any administrative, regulatory, or legal proceeding.

"Facility" means and includes all parcels of land and improvements thereon that, during the Relevant Time Period, formed a part of the Facility that the Allocation Party answering this questionnaire or an Affiliate owned, operated, occupied, or used and that is the subject of this Allocation.

"Historic Fill" on Your Facility shall have the meaning set forth in NJAC:26E-1.8 and the NJDEP Historic Fill Technical Guidance, version 2.0, dated April 29, 2013.

"Release" shall have the meaning set forth in CERCLA se.101 (22).

"Relevant Time Period" means the period the Respondent or an Affiliate owned, operated, occupied, or used all or any portion of the Facility.

"Respondent", "You", or "Your" means the Allocation Party answering this questionnaire and any Affiliate of that party.

Fill out one form per Respondent, per Facility.

1. GENERAL BACKGROUND

1.1. Provide the following information about the Respondent and Facility:

a. Name of the Respondent (include the current name and all prior names, including those of Affiliates during the Relevant Time Period)

b. Facility name (include all names by which the Facility has been known)

c. Type of Business/Industrial Operation

d. Facility address (include all addresses that are part of the Facility and any former address(es) at which the Facility was listed)

e. Facility acreage and changes in acreage over time.

1.2. Provide the following information about the Respondent's connection to the Facility:

a. Dates of ownership.

b. Dates of operation.

c. Dates of occupancy or use, if different from above.

1.3 If You did not own, operate, or occupy the Facility at the time of a release or disposal of a COC, please describe Your connection or relationship to the corporate entity or entities that did.

2. FACILITY OPERATIONS

Describe the operations (e.g. - including without limitations, all chemical processes, manufacturing activities, etc.), that Respondent including Affiliate conducted at the Facility. If the nature of the operations changed or varied over time, identify the years Respondent conducted each operation and explain how the operations varied.

3. COC USE AND PRESENCE AT THE FACILITY

3.1. Have You used, stored, disposed of, generated, or otherwise handled at the Facility any of the following COCs?

Dioxins and furans	Y / N
PCBs	Y / N
Mercury	Y / N
DDx	Y / N
Copper	Y / N
Dieldrin	Y / N
PAHs	Y / N
Lead	Y / N

If so, provide the following information for each Yes.

a. Explain how You used, stored, disposed of, generated or otherwise handled the COC at the Facility.

b. State the time period (or date range) of each use, storage, disposal, generation, or handling of the COC.

c. Identify where at the Facility the COC was used, stored, disposed of, generated, or otherwise handled.

d. Identify the quantities of the COC used, stored, disposed of, generated, or otherwise handled at the Facility.

e. Explain how the COC was transported to and received at the Facility, if applicable.

f. Identify the source(s) from which the COC was obtained, if applicable.

g. Provide the date, quantity, and location of any known disposal of the COC at the Facility.

h. Identify the actions taken to respond to any known disposal of the COC, if applicable

3.2 Did any of the use, storage, disposal of, generation, or handling of COCs noted in response to Section 3.1 result in the placement, deposition, or otherwise result in the location of COCs, on or in the soils or other non-impervious surfaces of the facility? Y/N

3.3 Is Historic Fill present at the Facility? Y/N
If so, provide the following information.

a. What is the evidence that Historic Fill is present?

b. Have COCs been detected in the Historic Fill? Y/N
If so, identify the detected COCs.

c. Is the Historic Fill co-located with any other areas of soil in which COCs have been detected? Y/N

d. Was the Historic Fill area paved? Y/N
If so, provide the dates and specifications of the paving.

e. Is there any evidence that the Historic Fill at the Facility was disturbed (i.e., through on-site construction, grading, or other activities) during Your period of ownership, operation or occupancy of the Facility? Y/N

f. Has a Deed Notice or declaration of environmental restrictions (DER) been placed or proposed to be placed on any portion of the Facility because of the presence of Historic Fill, in whole or in part? Y/N
If so, provide the following information.

(i) all COCs that are subject to the deed notice

(ii) if applicable, the date NJDEP approved the Deed Notice or DER and its book and page number.

3.4. If Your answer to Question 3.2 was Yes and the placement, deposition, or location of a COC could contaminate surface water or groundwater at the Facility that had the potential for release of such contamination to the Passaic River, provide the following information for each occurrence involving a COC.

a. The type and nature of each placement, deposition, location, or disturbance.

b. The amount of COC involved.

c. The location on the facility of each placement, deposition, location or disturbance.

d. The time period of each placement, deposition, location, or disturbance.

e. If testing identified a COC, identify the nature of the sampling and testing, the number of samples taken, and the date and location of any samples tested. You may refer to reports or other documentation in response to this question, but please also provide a narrative summary of the sampling results.

3.5. If Your answer to Question 3.3(e) was Yes and the disturbance was of such a magnitude or nature as to allow for contamination of surface water or groundwater at the Facility that had the potential for release of such contamination to the Passaic River, provide the following information for each occurrence involving a COC.

a. The type and nature of each placement, deposition, location, or disturbance.

b. The amount of COC involved.

c. The location on the facility of each placement, deposition, location or disturbance.

d. The time period of each placement, deposition, location, or disturbance.

e. If testing identified a COC, identify the nature of the sampling and testing, the number of samples taken, and the date and location of any samples tested. You may refer to reports or other documentation in response to this question, but please also provide a narrative summary of the sampling results.

3.6 Regardless of your answers to 3.1 through 3.5, have any of the following COCs ever been detected at your facility?

Dioxins and furans	Y / N
PCBs	Y / N
Mercury	Y / N
DDx	Y / N
Copper	Y / N
Dieldrin	Y / N
PAHs	Y / N
Lead	Y / N

3.7 If You contend that You are not responsible for the presence of a COC at the Facility for which You answered “yes” in response to 3.2,3.3, or 3.6, identify the COC by answering Yes below and provide the following information.

Dioxins and furans	Y / N
PCBs	Y / N
Mercury	Y / N
DDx	Y / N
Copper	Y / N
Dieldrin	Y / N

PAHs	Y / N
Lead	Y / N

a. Provide a brief explanation of how You contend the COC was released, discharged, migrated onto, or was deposited at the Facility.

b. Identify the date(s) You contend the COC was released, discharged, migrated onto, or was deposited at the Facility.

c. Identify the party(ies) You contend are responsible for the release or discharge of the COC.

d. Identify any reports or analyses that support Your contention, providing references to the relevant pages.

4. PATHWAYS AND DISCHARGES TO THE PASSAIC RIVER

4.1. Provide a brief description of how effluent from operations at the Facility has been generated, handled, and discharged, including the dates each distinct process was used and where the industrial effluent was discharged, including a citation, including date, author, title, and location of relevant plans, maps or diagrams depicting the manner in which effluent from operations at the Facility has been generated, handled, or discharged.

4.2. Provide a brief description of how storm water at the Facility has been handled, including the dates each distinct storm water handling method was used and where the storm water was discharged, including a citation, including date, author, title, and location, of relevant plans, maps or diagrams depicting the manner in which storm water at the Facility has been handled.

4.3. Identify all permits issued for the discharge of effluent or storm water at or from the Facility, including in Your description the date of the permit, the issuing authority, the nature of the permit, the permit number, and discharge limitations, and please list any violations of Your permit limitations involving COCs.

4.4. Identify all outfalls or other discharge points from the Facility to the Passaic River.

4.5. If the Facility was connected to the Passaic Valley Sewerage Commission system, provide the following information.

a. Identify the dates the Facility was connected to the PVSC system.

b. Identify the manner in which the Facility was connected to the PVSC system, including the nature and location of where the Facility was connected to the PVSC system.

(i) If the manner of connection varied over time, provide a separate description of each connection, including connection type and the dates the connection was used.

c. Identify any outfalls to the Passaic River between the point at which the Facility connects to the PVSC system and the PVSC treatment plant, if You know.

d. Describe the nature, time periods, discharge rates, discharge volumes and water quality data for all discharges. You may refer to reports in response to this question, but please also provide a narrative summary of the discharges from the Facility.

4.6. If the Facility was connected to any other public or private sewer system (including any storm water system), provide the following information

a. Identify the dates the Facility was connected to the sewer system.

b. Identify the manner in which the Facility was connected to the sewer system, including the nature and location of where the Facility was connected to the sewer system.

(i) If the manner of connection varied over time, provide a separate description of each connection, including connection type and the dates the connection was used.

c. Identify the dates of operation of the sewer system and where effluent or water from the system ultimately was discharged, if You know.

d, Identify any outfalls to the Passaic River between the point at which the Facility connects to the sewer system and its ultimate discharge point.

e. Describe the nature, time periods, discharge rates, discharge volumes and water quality data for all discharges to the sewer system.

4.7. Identify all other known, suspected, or alleged pathways by which COCs from the Facility may have been discharged to the Passaic River.

4.8. If You contend that any of the pathways described above did not result in a discharge or release of COCs to the Passaic River, provide a <u>brief</u> explanation of the factual bases for Your contention. You may supplement this response at a later stage in a position paper and/or expert report.

4.9. If You contend that any of the COCs discharged or released to the Passaic River were removed by navigational dredging, provide a brief description of the factual basis for Your contention. You may supplement this response at a later stage in a position paper and/or expert report.

5. ENFORCEMENT ACTIONS

Identify all enforcement actions taken by any federal, state, or local agency concerning the release or discharge of any COCs at the Facility, including the agency(ies) involved, the date(s) of each action, the COCs involved, and the resolution of the action.

6. RESPONSE ACTIONS

6.1. If You identified any COCs as present or used at the Facility in response to Question 3.1, for each COC state whether any investigation or other response action has been performed at the Facility at any point in time under:

ECRA	Y/N
ISRA	Y/N
NEW JERSEY SPILL ACT	Y/N
CERCLA	Y/N
RCRA	Y/N
TSCA	Y/N
SOLID WASTE MANAGEMENT ACT	Y/N
NEW JERSEY RIGHT TO KNOW ACT	Y/N
SPCC	Y/N
Any other environmental law, rule, or regulation, or for any other reason. (Specify)	Y/N

6.2. For each investigation or other response action listed in response to 6.1, identify:

a. The federal, state, and local agencies involved.

b. The regulations governing the actions taken.

c. How You remediated the COC at the Facility.

d. Where at the Facility the COC was remediated.

e. The quantities of the COC remediated at the Facility.

f. The time period (or date range) of each action taken.

g. All final investigative, remediation, or response action reports related to the action taken.

6.3. Was the Facility subject to spill or release reporting requirements under any of the environmental laws listed in 6.1? Y/N

a. If so, list each report prepared for the Facility that listed, discussed, or otherwise analyzed one or more COC, including the date of the report, the nature of the reporting requirement, the author of the report, the agency the report was submitted to, and the time period covered by the report.

6.4. Has a Classification Exception Area (CEA) been approved or proposed for groundwater beneath and/or emanating from the site? Y/N

a. If so, state (a) any COCs constituents covered by the CEA, (b) the date the CEA was approved and its's duration, and (c) whether any constituents were present because of Historic Fill at the Facility.

6.5. Has the Facility, or any part thereof, been the subject of a "No Further Action" letter (NFA) issued by NJDEP or "Comfort/Status Letter" issued by USEPA and/or a Response Action Outcome (RAO) issued by an LSRP?

a. If yes, state (a) the date of each NFA or RAO, (b) whether the NFA or RAO was issued subject to a "Restricted Use" condition, and (c) if so, the nature and bases for the Restricted Use requirement.

7. COOPERATION AND PASSAIC RIVER RESPONSE ACTION

7.1. Did You receive a general notice letter (GNL) from EPA? Y/N

7.2. Did You participate in the Cooperating Parties Group (CPG)? Y/N
If so, (a) are You a current member, and (b) when did You join?

7.3. If You are not currently a member of the CPG, did You otherwise contribute to the costs of the RI/FS, RM 10.9, or other Passaic-related costs?

7.4. Have You otherwise cooperated with regulatory agencies at the Diamond Alkali Superfund Site to prevent any harm to the public health or the environment? Y/N
If so, please explain.

8. DEFENSES

If You plan to assert that Your allocation should be reduced based on any defense to liability or unique factors related to Your Facility, identify the defense or factors and provide a brief explanation of the factual bases for the defense and/or unique circumstances. Failure to assert a defense at this stage will not result in waiver of the defense or Your ability to assert it at a later stage in the allocation.

9. INFORMATION REVIEWED

9.1. Provide a brief description of Your efforts to collect information about Your potential liability for the release or discharge of COCs to the Passaic River, including but not limited to whether You have searched for and reviewed relevant documents in Your possession, custody or control, whether You have interviewed current and/or former employees, and whether You have submitted information requests under FOIA and/or OPRA.

9.2. Identify the general sources of information reviewed in responding to this questionnaire.

9.3. If You were unable to locate information responsive to any of the questions above, describe the efforts You took to locate responsive information and why You were unable to locate responsive information.

CERTIFICATION

By signing this certification, the Allocation Party identified below certifies that, to the best of its knowledge and belief, the factual information reflected in its responses to this Preliminary Questionnaire are (1) true, correct, and complete, and (2) based on the result of the search for documents pursuant to the Allocation Guide. The Allocation Party further certifies that to the extent it relied on documents in preparing its response to this Preliminary Questionnaire that had not already been submitted to the Allocator, it has submitted such documents to the Allocator for inclusion in the appropriate allocation document repository and use in the Allocation.

FOR _____**:**
[Insert Name of Allocation Party]

_____ _____

Dated [Name]
[Title]
[Company]
[Address]

Diamond Alkali Superfund Site OU2
Allocation Guide

Attachment J

Diamond Alkali Superfund Site OU2 Allocation
Confidentiality Agreement

This Confidentiality Agreement made and entered into by and among the Allocation Neutral and those Participants whose authorized representatives have executed this Agreement (collectively, the "Participants" and individually, a "Participant").

RECITALS

1. The Participants to this Confidentiality Agreement have been offered an opportunity to participate in the design and conduct of an allocation of certain costs associated with remediation of OU2 of the Diamond Alkali Superfund Site (the "Site") as described in the letter from Eric Wilson, Deputy Director for Enforcement and Homeland Security, Emergency and Remedial Response Division, US EPA, dated September 18, 2017. The allocation is intended to establish an impartial third-party expert recommendation that may be considered by the United States and the Participants as the basis of settlements equitably resolving potential liabilities associated with the Site.

2. The Participants have a common interest in working together to consider and establish a fair and reasonable, impartial allocation process for equitably resolving potential liabilities associated with the Site.

3. The Confidentiality Agreement is intended to document the common understanding of the Participants regarding the confidentiality of the allocation process and shall not be construed as an admission of liability or against interest or otherwise cited or used in any way against any Participant in any other dispute or proceeding.

AGREEMENT

1. Confidentiality.

   (a) To promote frank and productive discussion, the Participants agree that the allocation process shall be confidential. All oral and written communications regarding this matter by or between the Participants, including communications at meetings (whether by telephone or in person) with Participants present, or by or to the Allocation Neutral, shall be Dispute Resolution Communications. Such Dispute Resolution Communications are confidential, and shall not be disclosed to third persons by the Allocation Neutral, any Participant, their elected and appointed officials and officers, representatives, employees, agents, financial auditors, insurance carriers, or other persons associated with the Participant, except as provided elsewhere in the agreement, or with the consent of the Participants to this dispute, or as required by law to be made public.

Diamond Alkali Superfund Site OU2
ALLOCATION CONFIDENTIALITY AGREEMENT

(b) The allocation process, including all dispute resolution communications, is confidential pursuant to the Administrative Dispute Resolution Act of 1996, 5 U.S.C. Section 574, ("ADR Act") and all other applicable federal and state laws. The allocation process shall be treated as compromise negotiations under Rule 408 of the Federal Rules of Evidence and applicable state law.

(c) The Allocation Neutral shall not disclose to any Participant or any third party information conveyed to him in confidence by any other Participant, unless authorized to do so by that Participant or as required by law, of which requirement Allocation Neutral shall advise the Participant in writing prior to disclosure. Except as specified in the allocation process design, the Allocation Neutral shall, upon termination of the allocation process, destroy any notes and written records created by or provided to him, unless a Participant requests the return of written records, in which case the Allocation Neutral shall return the original and all copies of the requested materials to the Participant. Allocation meetings and other sessions shall not be recorded verbatim and no formal minutes or transcripts shall be maintained.

(d) Participation in the allocation process, including attendance at meetings, statements made and documents prepared or furnished by any Participant, or other participant, for the purposes of the process shall not be construed as an admission of liability or against interest or otherwise cited or used in any way against any Participant in any other dispute or proceeding. Where a Participant references, discusses, or produces documents or information during settlement discussions, doing so will not render otherwise discoverable documents or information confidential, privileged, non-discoverable, or inadmissible.

(e) The Allocation Neutral shall not be deemed a "necessary or indispensable" party, as defined in Rule 19 of the Federal Rules of Civil Procedure and any equivalent state law, in any pending or future judicial, administrative or arbitral action related to matters discussed in the allocation process. No Participant shall subpoena or otherwise seek from the Allocation Neutral any information provided to him by another Participant that relates to the allocation. In no event shall the Allocation Neutral voluntarily testify on behalf of a Participant, or participate as a consultant or expert, in any pending or future judicial, administrative, or arbitral action related to matters discussed in the allocation.

(f) The Participants and the Allocation Neutral shall remain bound by these confidentiality provisions following termination or expiration of this Agreement without regard to whether any legal actions or issues arising out of the case are settled or concluded by final judgment or otherwise.

2. Expiration. This Confidentiality Agreement will expire upon completion of the allocation process or as otherwise agreed by a consensus of the Participants.

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ALLOCATION CONFIDENTIALITY AGREEMENT

3. Withdrawal. Any Participant may withdraw from the allocation referred to herein upon written notice to the other Participants and Allocation Neutral.

4. Modification. All provisions of this Confidentiality Agreement may be modified by unanimous written consent of all Participants, who have not withdrawn from this Agreement.

5. Counterparts. This Confidentiality Agreement may be executed in multiple counterparts, each of which will be deemed an original, but all of which will constitute one and the same instrument.

6. Entire Agreement. This Confidentiality Agreement constitutes the entire understanding of the Participants with respect to its subject matter.

7. Governing Law. This Confidentiality Agreement is to be construed under and in accordance with the laws of the State of New Jersey.

8. Survival. The respective obligations of the Allocation Neutral and the Participant hereunder shall survive the expiration or sooner termination of this Confidentiality Agreement.

9. Recitals. The recitals to this Confidentiality Agreement are incorporated herein as though set forth in full.

[Signatures follow on succeeding pages]

Diamond Alkali Superfund Site OU2
ALLOCATION CONFIDENTIALITY AGREEMENT

We agree to abide by the terms and conditions of this Confidentiality Agreement and indicate our assent by signing this document below.

Date: _____ By: _____

Title: _____

_____
[Signature]

On Behalf of: _____

Diamond Alkali Superfund Site OU2
ALLOCATION CONFIDENTIALITY AGREEMENT

I agree to abide by the terms and conditions of this Confidentiality Agreement and indicate my assent by signing this document below.

ALLOCATION NEUTRAL:

Date: October 17, 2017 _____

David C. Batson

Diamond Alkali Superfund Site OU2
Allocation Guide

Attachment K

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

RECORD OF DECISION

Lower 8.3 Miles of the Lower Passaic River

Part of the Diamond Alkali Superfund Site

Essex and Hudson Counties, New Jersey

https://semspub.epa.gov/work/02/396055.pdf

ATTACHMENT H

DIAMOND ALKALI SUPERFUND SITE OU2 ALLOCATION PROTOCOL

Diamond Alkali Superfund Site OU2

Allocation Protocol

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ADR CONFIDENTIAL DOCUMENT

This document is a confidential dispute resolution communication provided by a neutral to parties involved in resolving an issue in controversy and, as such, may not be disclosed pursuant to the provisions of the ADR Act of 1996 and all relevant state and federal authorities.
Do Not Release Under FOIA

Diamond Alkali OU2
Allocation Protocol

In furtherance of the Allocation Guide and the Revised Work Plan for the Allocation (Task Order #096, Contract EP-W-14-020), this methodology outlines a process for conducting an allocation to determine the relative shares of responsibility among and between the Allocation Parties for the costs for remedial design and remedial action associated with OU2 of the Diamond Alkali Superfund Site. While neither EPA nor the Allocation Parties are bound by the results of the allocation, EPA has committed to use the Allocator's recommended shares of responsibility among the Allocation Parties as a primary factor in its future negotiations in Phase 2 of the ADR Process with the goal of reaching agreement with the Allocation Parties on future cash-out and work party settlements.

Consistent with judicial precedent and customary allocation practice, this cost allocation methodology appropriately considers an Allocation Party's contribution of each COC in OU2 sediments, as weighted by the relative risk each COC poses to human health and the environment, and other relevant equitable factors, in establishing a share of responsibility for each Allocation Party. As deemed feasible and appropriate, the Allocation Team will also establish appropriate tiers of Allocation Party responsibility (i.e., logical groupings of parties with similar allocation responsibility and shares).

Methodology Attributes:

- The allocation shares recommended by the Allocator shall total 100% of the aggregate responsibility of the Allocation Parties[1] as determined during Phase 2 of the ADR Process.

- The Allocation will determine shares of responsibility only for the period of their actual ownership/operation of their OU2 related facility(ies) and/or any additional period for which they have legal liability for the actions of another entity associated with such facility(ies).

- For purposes of this Allocation, shares of responsibility for any contribution of COCs to the OU2 sediments that cannot be attributed to any of the Allocation Parties are in effect distributed among the Allocation Parties on a pro rata basis according to their respective allocation shares.

[1] Allocation Parties refers to all parties notified by EPA as PRPs for OU2 of the Diamond Alkali Site, but does not include the Passaic Valley Sewerage Commission (PVSC), the Cities of Newark, Harrison, East Newark, and Kearney, or parties that entered into an OU2 cash-out settlement with EPA

Diamond Alkali OU2
Allocation Protocol

The following is an outline to the methodology that will be followed by the Allocation Team in conducting the cost allocation regarding OU2. An algorithm incorporating this methodology will be included in the Final Allocation Recommendation Report. This methodology modifies and expands upon the Diamond Alkali OU2 Allocation and Database Design previously issued by the Allocation Team.

Step 1: Establish COC Relative Risk Values

Assign each of the eight COCs an individual Relative Risk Number (COC RRN) determined through an analysis of the relative risk to human health and the environment posed by each COC.

$$\text{COC RRN} = \frac{\text{RRN}}{\text{Sum of RRNs}} \times 100$$

1. Determine the Relative Risk Number for each COC taking into consideration the human health and ecological risk/harm associated with each COC, based on risk data presented in the RI/FFS and ROD, and consistent with the conclusions presented in the RI, FFS, and ROD. The approach for determining the Relative Risk Number for each COC is described in Attachment A.

2. Once the individual COC Relative Risk Numbers are established, conform the values to sum to 100.

Step 2: Establish Allocation Party COC Relative Contribution

Assign a Relative Contribution for each COC (COC RC) contributed by an Allocation Party to OU2 determined as the quotient of the total mass of a COC in OU2 sediments and the mass of the COC contributed by an Allocation Party to OU2 sediments.

$$\text{COC RC} = \frac{\text{CMass}}{\text{TMass}} = \frac{\text{DMass} \times \text{C\%}}{\text{TMass}}$$

1. Determine the total mass of each COC in OU2 sediment associated with the sediment bed inventory upon which the individual COC Relative Risk Number calculations were based (TMass) in consultation with EPA. The Participating Allocation Parties may provide the Allocator with information they deem relevant to this determination.

Diamond Alkali OU2
Allocation Protocol

2. Determine the mass of each COC contributed by an Allocation Party to OU2 sediments (CMass) as the product of the mass of the COC discharged from an Allocation Party's facility (DMass) and the percentage of COCs discharged from a facility that reached and remain in the OU2 sediments (C%).

   (a) The Allocation Team will determine the percentage of each COC discharged from a facility that reached the OU2 sediments through an analysis of the fate and transport of the COC from the point it discharged from the facility property to reaching OU2 sediments, including consideration of percentage of sewer flow discharged from a CSO or bypass mechanism.

   (b) The Allocation Team will determine the percentage of each COC discharged from a facility that remains in the OU2 sediments through an analysis of the circumstances that affect a COC remaining in OU2 sediment (e.g., navigational dredging, COC solubility).

   (c) Should the Allocation Team determine that the percentage of COCs discharged from an Allocation Party's facility that reached and remain in the OU2 sediments is 0%, or should the Allocation Team determine that the Allocation Party's facility discharges have no nexus to COCs in OU2 sediments, the Allocation Team will forego further analysis of such facility pursuant to this Methodology and assign the Allocation Party a zero share.

   (d) The analysis to determine the mass of a COC discharged from an Allocation Party facility will include consideration of the following factors:

      (1) Nature of the Allocation Party's facility operations

      (2) Facility site-specific features (e.g., location, size, topography, etc.)

      (3) Time period and length of facility operations (e.g., 1932 – 1962 / 30 years)

      (4) Time period and length of any discharges containing a COC (e.g., 1932 – 1962 / 30 years)

      (5) Volume of the discharge and concentration of COCs in discharge

(6) History of facility process waste, sanitary, and stormwater discharges containing any COC, including:

(i) Pre-discharge treatment, if any;
(ii) Direct discharges to the Passaic River (e.g., from pipes, trenches, etc.);
(iii) Discharges to municipal sewers (e.g., the PVSC system, etc.) resulting in discharges to the Passaic River, including via a combined sewer overflow (CSO) or bypass of a sewerage treatment facility;

(7) Concentrations of COCs present in a facility's intake water attributable to municipal water supply or otherwise unrelated to facility operations;

(8) Substantial actions of an Allocation Party that caused migration of COCs in soils of a facility site via groundwater or rainwater (e.g., placement of fill material, a spill, drum burial, disturbance of contaminated soil without appropriate protections, etc.) The migration of COCs deposited with historic fill as designated and/or defined by the State of New Jersey, or as accepted by the State of New Jersey (subject to review for relevancy for the specific facility by the Allocator), in undisturbed soils of a facility site via the natural flow of groundwater or rainwater will not be considered in determining the mass of a COC discharged from an Allocation Party facility; and,

(9) Deductions of amounts of COCs discharged or released that are determined by the Allocation Team to be attributable to releases excluded under CERCLA. The Allocation Team shall make such a determination upon the specific request of an Allocation Party for an evaluation of the probability that the Allocation Party would prevail in the assertion of a legal defense to its liability for certain discharges or releases of COCs from its facility. (e.g., a discharge or release is subject to the petroleum exclusion, the federally-permitted release defense).

(e) Where the Allocator determines that a lack or the nature of available information does not allow an objective determination of the mass of a COC discharged from an Allocation Party facility, the Allocator may take additional measures to obtain relevant information, including requesting additional information from the Allocation Party or requesting the assistance of EPA in obtaining additional data. Should

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these measures, if taken, not resolve the lack or nature of available information, the Allocator may estimate such mass utilizing a set of assumptions established in consensus with the Allocation Parties, which assumptions will be described in the Final Allocation Recommendation Report. If used in recommending an Allocation Party's share, the Allocator will explain which assumptions were relied upon and how they factored into his analysis. Such assumptions may include, but not be limited to:

(1) Standard operations of similar industrial facilities;
(2) Changes in industrial operations over time;
(3) Onsite fate and transport of COCs; and
(4) Strength of available information.

(f) The determination of the Allocator regarding the need to use assumptions to estimate the mass of a COC discharged from an Allocation Party facility will be rebuttable upon an evidentiary showing by an Allocation Party to the satisfaction of the Allocator.

3. Divide the mass of the corresponding COC contributed by an Allocation Party to OU2 sediments by the total mass of each COC in OU2 sediment to determine the RC for each COC contributed by an Allocation Party to OU2.

Step 3: Establish Allocation Party Base Scores

Assign a Base Score to each Allocation Party (AP BS) determined as the sum of the products of the COC Relative Risk Number and COC RC for each COC discharged from the Allocation Party's facility.

COC BS = COC RRN x COC RC
AP BS = Sum of AP COC BS^s

1. For each COC discharged by an Allocation Party facility, multiply the COC Relative Risk Number and the COC RC to determine the COC-specific Base Score of that COC (COC BS).

2. Add all of the Base Scores for each of the COCs discharged by the Allocation Party to determine the Allocation Party's Base Score.

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Allocation Protocol

Step 4: Establish Adjusted Allocation Party Base Scores

Assign an Adjusted Base Score to each Allocation Party (AP ABS) determined as the sum of the Allocation Party's Base Score and the factors for culpability and cooperation established for the Allocation Party.

$$\text{AP ABS} = \text{AP BS} + \text{CUF} + \text{COF}$$

1. Establish for each Allocation Party a Culpability Factor (CUF) that addresses the level to which the Allocation Party's contribution of COCs to OU2 sediments were the result of culpable conduct.

    a. Culpable conduct refers to the release or discharge of COCs in contravention of prevailing industrial standards and practices, either (i) knowingly and with intent to skirt environmental regulatory obligations, and/or (ii) with conscious awareness that the release or discharge of COCs were illegal or posed substantial risk to human health or the environment.

    b. Depending on the nature, extent and/or impact of an Allocation Party's culpable conduct, each Allocation Party will be assigned a numerical Culpability Factor equivalent to 0% to 100% of its Base Score, escalating with the level of culpability.

2. Establish for each Allocation Party a Cooperation Factor (COF) that indicates the level to which the Allocation Party cooperated with or failed to cooperate with federal and state authorities in addressing the contamination of OU2.

    a. An Allocation Party's cooperation or failure to cooperate with federal and state authorities in addressing the contamination of OU2 shall be determined through consideration of actions by the Allocation Party, including but not limited to, the following:

        (i) Response to request from a federal or state authority to undertake or fund remedial activities; or
        (ii) Response to request from other Allocation Parties to join in an effort to undertake or fund remedial activities.

    b. Depending on the nature, extent and/or impact of an Allocation Party's cooperation or failure to cooperate, each Allocation Party will be assigned a positive or negative numerical Cooperation Factor

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equivalent to plus or minus 0% to 20% of its Base Score, depending upon the level of cooperation or noncooperation.

3. For each Allocation Party, add the Allocation Party's Base Score to its Culpability Factor and Cooperation Factor to determine the Allocation Party's Adjusted Base Score.

Step 5: Establish the Allocation Share of each Allocation Party

The Allocation Share (AS) of each Allocation Party will be determined as the product of 100 and a value equal to the quotient of the Allocation Party's Adjusted Base Score and the sum of all Allocation Party Adjusted Base Scores.

$$\text{AP AS} = \frac{\text{AP ABS}}{\text{Sum of ABSs}} \times 100$$

1. Total the Adjusted Base Scores of all Allocation Parties (Sum of ABSs).

2. For each Allocation Party, divide the Allocation Party's Adjusted Base Score by the Sum of ABSs and then multiple by 100 to determine the Allocation Party's Allocation Share.

Step 6: Establish Allocation Tiers

Assign each Allocation Party to an Allocation Tier that reflects the similarity of its relative responsibility to that of other Allocation Parties.

As deemed feasible and appropriate by the Allocation Team, establish appropriate tiers of Allocation Party responsibility based on a consideration of the relative relationship and natural grouping of the Allocation Parties' Allocation Shares.

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Diamond Alkali OU2
Allocation Protocol

List of Acronyms

AP ABS - Adjusted Base Score assigned to each Allocation Party
AP BS - Base Score assigned to each Allocation Party
AS - Allocation Share assigned to each Allocation Party
CMass - Mass of each COC contributed by an Allocation Party to OU2 sediments
COC BS – Base Share assigned each COC discharged from a facility
COC RC - Relative Contribution of each discharged COC to OU2 sediments
COC RRN - COC Relative Risk Number
COF – The Cooperation Factor assigned to each Allocation Party
CUF – The Culpability Factor assigned to each Allocation Party
DMass - Mass of each COC discharged from an Allocation Party's facility
TMass - Total mass of each COC in OU2 sediments

Attachments

Attachment A – Methodology for Determination of the Relative Rank of OU2 Contaminants of Concern for the Purpose of the Allocation

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

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Diamond Alkali Superfund Site
OU2 Allocation

Methodology for Determination of the Relative Rank of OU2 Contaminants of Concern for the Purpose of Allocation

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ACRONYMS AND ABBREVIATIONS

2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
BMI	Benthic macroinvertebrates
CBR	Critical Body Residue
CSM	Conceptual Site Model
COCs	Contaminants of Concern
CTE	Central Tendency Exposure
DDT	Dichlorodiphenyltrichloroethane
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDx	Includes six isomers of DDT and its breakdown products DDD and DDE
ERA	Ecological Risk Assessment
FFS	Focused Feasibility Study
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
HI	Hazard Index
HPAHs	High molecular weight polycyclic aromatic hydrocarbons
LPRSA	Lower Passaic River Study Area
LOE	Line of Evidence
LPAHs	Low molecular weight polycyclic aromatic hydrocarbons

LOAEL	Lowest Observed Adverse Effect Level
NOAEL	No Observed Adverse Effect Level
PCBs	Polychlorinated biphenyls
RME	Reasonable Maximum Exposure
ROD	Record of Decision
TEQ	Toxicity Equivalent Quotient
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

This document presents an approach to relatively rank contaminants of concern (COCs) based on their contribution to total Environmental Harm ("Percent Contribution to Environmental Harm"). The approach aggregates the endpoints for human health (carcinogenic risk and noncarcinogenic hazard) together with ecological hazard within the lower 8.3 miles of the Lower Passaic River Study Area (LPRSA) (Operable Unit 2 or [OU2] of the Diamond Alkali Superfund Site). This approach incorporates the lines of evidence (LOEs) used to characterize human health and ecological risk and hazard as presented within the U.S. Environmental Protection Agency's (USEPA's) Remedial Investigation and Focused Feasibility Study (RI/FFS) for OU2 (Louis Berger et al., 2014), as well as in the 2016 Record of Decision for OU2 (OU2 ROD) (USEPA, 2016). This approach to rank COCs based on their contribution to total Environmental Harm is only for the OU2 allocation. While this approach relies on the human health and ecological risk assessments performed for OU2 of the Site, it is not a risk assessment itself. The relative risk each COC poses to human health and the environment, along with an Allocation Party's contribution of each COC in OU2 sediments and other relevant equitable factors, will be used to establish a share of responsibility for each Allocation Party in the OU2 allocation.

Human health is represented here by the receptor/exposure combinations that drove risk in the Human Health Risk Assessment (HHRA) in Appendix D of the RI/FFS (Louis Berger et al, 2014); specifically, the exposure of adults and children (e.g., anglers) via ingestion of self-caught fish and crab muscle and hepatopancreas tissue. These calculations are based on site-specific COC exposure data and regulator-approved toxicity values.

Ecological health implications are predicated on the consideration of RI/FFS Ecological Risk Assessment (ERA) endpoints (Appendix D of the RI/FFS). ERA endpoints (survival, growth, and reproduction effects on fish, crab, benthic invertebrate, and wildlife species) provide separate preliminary LOEs for the allocation process and incorporate a complete assessment of ecological hazard to important components and organisms of a functioning tidal riverine ecosystem. The range of ecological LOEs reflects the unique attributes and types of COC sensitivities among a diverse assemblage of organisms assessed in the RI/FFS ERA. Ecological LOEs are supported by a complete set of site-specific COC exposure data and toxicity benchmarks associated with sustainability of the LPRSA riverine ecosystem.

1.1 Framework

An allocation that accounts for both human and ecological harm requires an evaluation of the relative contribution of each COC to the need for, and scope of, remedial action. There are inherent challenges in developing a methodology that aggregates the disparate endpoints of risk and hazard into a single value for each individual COC. The human health endpoints (carcinogenic risk and noncarcinogenic hazard) and ecological endpoints are not cumulative and represent very different health effects bases and potential outcomes. The overall framework the Allocator has chosen to represent the human health and ecological implications of site-related contamination is to develop indicators of Percent Contribution to overall Environmental Harm reflecting both human and

ecological receptors. These calculations are explained in more detail below and in Sections 3 and 4 of this document. The overall Environmental Harm framework is intended to incorporate the RI/FFS human health and ecological risk assessments, which drove remediation plans for OU2. However, a small number of modifications were made where necessary to strengthen the foundation of the Environmental Harm approach. In any of these instances, the analysis attempts to conform to the RI/FFS approach to the greatest extent possible. For example, additional USEPA-approved background data and updated exposure and toxicity values that reflect current scientific knowledge were used. For transparency, any deviations from the RI/FFS are clearly spelled out in this text and/or in attached tables.

Much of this document discusses the details of the human health and ecological inputs to "Percent Contribution to Environmental Harm". Interim calculated values include "percent contribution to human health hazard" or percent contribution to human health risk" (two distinct human health indicators) and "percent contribution to ecological harm or hazard" (a single indicator), which are mathematically distinct from, and component inputs to, "Percent Contribution to Environmental Harm".

In the context of traditional human health risk assessment, individual risks or hazard quotients (HQs) may be summed to develop estimates of cumulative risk and a hazard index (HI). However, this allocation must go beyond EPA risk assessments and account for the overall "Environmental Harm" associated with three separate indicators, namely human health risk, human health hazard and ecological hazard. This document presents a model for accomplishing this aggregation. To do this, individual contaminant-specific quantitative point estimates of risk and hazard are viewed in light of their percent contribution to human health hazard or risk or ecological harm or hazard as an indicator of influence on gross health and environmental effect, herein characterized as Environmental Harm.

To aggregate the three indicators (i.e., human health risk, human health hazard and ecological hazard) and develop the final Percent Contributions to Environmental Harm for each COC, the following step-wise process was used:

1. Percent contributions to human health risk for each COC were developed, as were percent contributions to human health hazard for each COC;

2. COC-specific percent contributions to ecological hazards from seven lines of evidence were averaged across all LOEs to produce percent contribution to ecological harm; and then

3. For each COC, percent contribution to human health cancer risk, percent contribution to human health hazard and percent contribution to ecological harm were averaged, yielding Percent Contributions to Environmental Harm.

This three-input approach is consistent with that taken in the ROD to develop the remedy for the LPRSA. The Percent Contribution to Environmental Harm for each COC provides a relative

ranking for allocation purposes based on percent contribution to human health cancer risk, percent contribution to human health hazard and percent contribution to ecological harm for all relevant lines of evidence. The decision to average the contribution of each COC across the three indicators is based on the foundational assumption that human health cancer risk, human health hazard, and ecological hazard are equally important considerations in EPA's remedial decision-making process and this allocation.

Throughout the calculations, where a component value is zero (0), that zero is used directly in the averaging process. For example, for a chemical that is a COC for ecological receptors but not for human health, that chemical's percent contribution for human health is zero. To fairly represent the overall Percent Contribution to Environmental Harm for that chemical, the human health and ecological components (zero and a non-zero value) are averaged. This approach is predicated on the notion that actual risks for non-COCs might be infinitesimally small and zero represents a fair measure of respective contaminant contributions to overall Environmental Harm. This approach is also faithful to the foundational assumption of equivalency in social value and importance between human health and ecological harm and recognizes differences in sensitivity to the COCs among the human and ecological receptors.

1.2 Contaminants of Concern

Contribution to Percent Contribution to Environmental Harm is based on the percent contribution of each of nine COCs to risk characterization totals, based on selected human health exposure scenarios and ecological receptor functional groups presented in the RI/FFS. The COCs that are relatively ranked in this model were identified in Section 5.2 of the ROD as posing "the greatest potential risks to human health and the environment" and ultimately used to select the remedy to address contaminated sediments in OU2 (USEPA 2016). Respective COCs are listed below:

- Copper – ecological COC
- DDx – human health and ecological COC (includes six isomers of dichlorodiphenyltrichloroethane (DDT) and its breakdown products dichlorodiphenyldichloroethane (DDD) and dichlorodiphenyldichloroethylene (DDE). For human health, only 4,4-DDD, 4,4-DDE, and 4,4-DDT are COCs.)
- Dieldrin – human health and ecological COC
- Dioxins and furans (2,3,7,8-TCDD or TCDD toxicity equivalents) – human health and ecological COC
- High-molecular-weight polycyclic aromatic hydrocarbons (HPAHs) – ecological COCs
- Lead – ecological COC
- Low molecular weight polycyclic aromatic hydrocarbons (LPAHs) – ecological COCs

- Mercury – human health and ecological COC
- Polychlorinated biphenyls (PCBs) – human health and ecological COC

The ROD presents human health risk and hazard calculations for three COCs for which human health preliminary remediation goals (PRGs) were derived: TCDD-TEQ, total PCBs, and methyl mercury] (USEPA 2016). For the COCs DDx and dieldrin, which were presented as human health risks and hazards in the FFS HHHRA but not in the ROD, human health risks and hazards were calculated by the Allocator using the updated ROD exposure assumptions. Copper, lead, and PAHs were not included as COPCs in the HHRA for the FFS Study Area, and therefore no human health risks are associated with these constituents for the purpose of the Allocation.

During review of data used for the ERA, it was discovered that one sediment sample that USEPA intended to remove from the sediment exposure dataset was inadvertently included. This sample (LPRT03G) was collected from the Lister Ave Phase I Dredge Area. At the time during OU2 ROD development when the anomaly was discovered, the Louis Berger et al. (2014) RI/FFs was already finalized. USEPA determined that inclusion of the LPRT03G sample results would have had minimal effect on the exposures evaluated in the BERA and would not have affected overall risk conclusions sufficiently to warrant revising RI/FFS risk assessments. To ensure use of the most relevant and current data, the LPRT03G sample results were removed from respective exposure estimates for the purposes of the current evaluation. This revision only affects the site DDx sediment exposure estimate concentration, resulting in a change from 260 mg/kg to 180 mg/kg.

1.3 Background Exposure Considerations

Risk and hazard estimates, as presented in this approach, represent OU2 (non-background) and incremental quantitative point estimates. Incremental quantitative point estimates represent adjusted values based on the site-related contribution to the system, where relevant, and negate contributions from naturally-occurring and anthropogenic background sources. The Passaic River, above Dundee Dam, has been identified by the USEPA as indicative of background conditions for OU2. The background environmental media included in the calculations for percent contribution are fish tissue, crab tissue, and sediment. Where background concentrations for a specific COC in a specific medium exceed site-related concentrations (e.g., dieldrin in fish tissue for human health), that COC is assumed to have site-related HI and cancer risk of zero and therefore a percent contribution to human health harm of 0%.

Fish Tissue Concentrations: In the absence of actual background fish tissue data, USEPA's RI/FFS estimated background contributions by modeling tissue concentrations in fish based on USEPA's estimated background concentrations of COCs in sediment (Appendix A, Data Evaluation Report No. 6 of the RI/FFS). Since that time, additional background data have been collected as part of the remedial investigation and feasibility study for OU4 of the Site, including fish tissue data suitable for inclusion in human health risk-related calculations. These new background fish tissue data are used in the percent contribution to human health and ecological

harm calculations, because empirical (measured) data for fish tissue is more accurate than would be a calculated estimate. Furthermore, the RI/FFS developed estimated tissue concentrations for a limited number of fish species. The more recent, empirical dataset included measured tissue concentrations for a greater number of species, including species that were part of the mixed fish diet evaluated in the RI/FFS HHRA and the generic fish evaluated in the RI/FFS ERA. The same risk models used in the RI/FFS were used to calculate risk from background in this model, with the exception that the empirical fish data were substituted for the modeled values.

Crab Tissue Concentrations: Similar to background fish tissue estimates, the RI/FFS estimated concentrations of COCs in blue crab tissue (see Appendix A, Data Evaluation Report No. 6 in the RI/FFS). The geographic area (above Dundee Dam) used to collect newer background samples does not include habitat suitable for blue crabs. Because it was not possible to obtain empirical crab background crab tissue data, modeled crab data from the RI/FFS were used in percent contribution calculations.

Sediment Concentrations: The RI/FFS used and reported background surficial sediment data collected in fall 2008 (AECOM, 2014). Additional background sediment data were collected for the remedial investigation and feasibility study for OU4 of the Site in fall 2012. Fall 2012 and fall 2008 surficial sediment sampling were conducted using the same methods. Therefore, both datasets can be reasonably combined which substantially increases the number of background samples (18 samples vs. 58 total samples) available for this analysis. The combined 2008/2012 dataset has been approved for use by USEPA and is currently being used to evaluate Operable Units upriver from OU2. The combined 2018/2012 background sediment dataset is used to derive background exposure estimates herein.

Incorporation of Background: The human health and ecological calculations of percent contribution to both human health and ecological overall Environmental Harm are adjusted for background contamination exposure risks and hazards. For both human health and ecological evaluations and for each COC in each environmental medium (fish tissue, crab tissue, and sediment) both OU2-related and background human health hazard and cancer risk and ecological hazard were calculated. Background hazard and risk results were subtracted from OU2 results, yielding incremental (site-related) LOE results (human health hazard indices and cancer risks, and ecological hazards). These incremental (site-related) results were used to develop LOE-specific percent contributions to human health hazard and risk and percent contributions to ecological hazard. For transparency, supporting tables provide OU2-specific, background-specific, and incremental risk/hazard calculations and results.

2.0 HUMAN HEALTH ASSESSMENT

This section describes the human health inputs to develop Percent Contribution to Environmental Harm. The goal of this human health assessment is to objectively evaluate LOEs used to characterize risks to humans associated with site-related contamination. Percent contribution to human health risk and hazard calculations are provided in Attachment A Supporting Tables A-1 through A-5, herein.

Our primary evaluation objective is to incorporate results of a complete and defensible assessment of the human health risks associated with the human health COCs (see Section 1.2) that is consistent with OU2 RI/FFS and ROD remedy selection methodology.

While the Conceptual Site Model (CSM) for the RI/FFS HHRA (Louis Berger et al., 2014) considered current and future conditions in the lower 8.3 miles of the LPRSA to describe the magnitude and range of exposure by various receptors and age ranges (i.e., adults, adolescents and children), the only pathways of exposure evaluated quantitatively in the RI/FFS HHRA were the consumption of self-caught fish or crab from OU2 by an adult angler/sportsman and other family members. Consistent with USEPA guidance, the RI/FFS HHRA evaluated risks using both a reasonable maximum exposure (RME) and a central tendency exposure (CTE) condition to describe the magnitude and range of exposure that might be experienced by the aforementioned receptors (i.e., angler and family members).

Cancer risk and noncancer hazard estimates associated with an angler's ingestion of self-caught fish and crab formed the basis for the human health risk characterization. Only those estimates associated with the RME condition were used in this model as inputs to Percent Contribution to Environmental Harm.

Consistent with USEPA HHRA Guidance, the RI/FFS HHRA uses mathematical equations to incorporate information and assumptions about:

- COC concentration in the exposure medium (edible fish and crab tissue)
- COC toxicity (Cancer slope factors and noncancer reference doses)
- Receptors (such as age and body weight of adults and children who consume self-caught fish and crab)
- Intake of the exposure medium (quantity of self-caught fish and crab tissue ingested by children and adults)

This mathematical equation results in two indicators of the potential for adverse health effects to occur in humans as a result of the specific exposure to specific COCs. The two indices are the hazard quotient (one COC and exposure pathway) or HI (multiple COCs and exposure pathways), and the excess lifetime cancer risk or risk. HIs or risks can be summed across chemicals and exposure routes (although in this case ingestion is the only exposure route considered). It should be noted that these indicators of toxicity are not summed with each other in traditional risk assessment because in that context they are not commensurable. For the purposes of the allocation, the cancer risks and hazard indices (HIs) are used to develop two separate indicators: percent contribution to human health risk and percent contribution to human health hazard for each COC. The allocation requires an evaluation of the relative contribution of each COC to overall Environmental Harm and in that respect must go beyond the objectives of a traditional risk assessment in which hazard and risk are considered separately from each other. Thus, in the next

step of the risk methodology process for this allocation, the percent contributions from hazard index and cancer risk are combined with percent contribution to ecological harm (Section 3) in a three-way average for each COC to produce Percent Contribution to Environmental Harm for each COC.

For human health, consistent with evaluations conducted in the RI/FFS and the ROD, PCBs are evaluated as total PCBs, using the cancer and non-cancer toxicity factors used in the FFS HHRA to evaluate non-dioxin-like PCBs. USEPA made the decision in the RI/FFS and ROD to develop PRGs based on total PCBs only.

Most toxicity values are the same as those in the HHRA (Tables 4-11 and 4-12 of Attachment 4 to Appendix D of (Louis Berger et al., 2014). However, with the passage of time since the HHRA was completed, the toxicity values for DDD and DDE have been updated by USEPA (2017a, b), and those are included in our calculations and can be identified through footnotes in the attached calculation tables. Similarly, as footnoted in the calculation tables, adult body weight and exposure duration are updated herein to reflect current USEPA (2014) guidance.

3.0 ECOLOGICAL ASSESSMENT

This section describes the ecological inputs to develop Percent Contribution to Environmental Harm. This includes a description of each ERA LOE used to support the allocation procedure. Percent contribution to ecological hazard calculations are provided in Attachment A Supporting Tables A-6 through A-13, herein.

Our primary evaluation objective is to base Percent Contribution to Environmental Harm OU2 on ecological community risks from exposure to nine COCs (see Section 1.1). The ecological community approach is consistent with the problem formulation analysis presented in Section 7.2.1 of the OU2 ROD (USEPA, 2016). The final assessment approach considers risk contributions for representative ecological receptors from low trophic-level foundational prey species to high trophic-level predatory species. This approach recognizes that a functioning ecosystem is comprised of a diverse assemblage of organisms that are dependent on one another to transfer energy and production of ecological benefits up the riverine food chain. This approach also accounts for the differences in the range of sensitivity or toxicity to COC exposures among different ecological receptors, while assuming that each representative receptor is of equal value and importance to the ecosystem.

Similar to the human health assessment described in Section 2.0 above, the current ecological assessment of PCB risks are evaluated as total PCBs and not as separate total PCB and coplanar PCB risks. This methodology is consistent with the treatment of and separation of PCB risks from dioxin/furan or TCDD toxicity equivalents risks during OU2 remedy selection (USEPA, 2016). Assessment of total PCBs risks also increases the comparability of LOEs in which coplanar PCB risks cannot be evaluated; e.g. invertebrate sediment exposure.

The primary source of ERA information is the *Lower Eight Miles of the Lower Passaic River Risk Assessment* found in Appendix D in Louis Berger et al. (2014) RI/FFS; hereby referred to as the RI/FFS ERA. As described in Section 1.3 of this report, additional background fish tissue and sediment data not used in the RI/FFS ERA are used to derive incremental risks herein. The current evaluation uses additional ERA methods to refine RI/FFS ERA LOEs. These methods are consistent with those currently being used to conduct ERAs in OUs upriver from OU2 and use of ERA results during remedy selection in the OU2 ROD (USEPA, 2016). Specific methodology refinements are described in subsequent sections of this document and identified in attached calculation tables.

3.1 Ecological Risk Lines of Evidence

The RI/FFS ERA evaluates COC exposure risks to the OU2 ecological community using seven separate assessment LOEs. The LOEs are based on risk characterization results for species or groups of species that contribute to key ecological functions in the OU2 ecological community. Seven LOEs are available to determine if OU2 habitats can support survival, growth, and reproduction and are specific to benthic macroinvertebrates (BMIs), crab, detritivorous, insectivorous, and piscivorous fish, and aquatic birds and associated riverine system mammals. We describe each of the seven RI/FFS ERA LOEs in the following summaries.

3.1.1 Sediment-based direct exposure macroinvertebrate assessment

BMIs are small aquatic insects, crustaceans, and worms that play a key role in nutrient and energy transfer in riverine ecosystems. They also process and assimilate organic material, feed on other invertebrates, and are themselves consumed by fish and wildlife. BMIs reside and forage in and on in-river substrates, including contaminated sediments. As such they are in direct contact and have high exposure potential to sediment-based contamination. Oysters are also considered for this LOE. Oysters provide forage and reef habitat for other invertebrates and many fish species. They are exposed to sediment-based contamination when filtering suspended sediments from the water column. If great enough, contamination can have direct negative consequences to BMI communities. These consequences include eradication of sensitive taxon, formation of a community dominated by pollution tolerant taxon that readily bioaccumulate contaminants, and reduction of prey for dependent species. Inclusion of macroinvertebrate risks into this allocation procedure provides an ecological metric representing localized risks from OU2 sediments to a foundational component of the riverine ecosystem.

Given their exposure potential and sensitivity to a wide range of contaminants, BMIs are often used to assess ecological health. As such, there is a large base of toxicity information available to support BMI risk characterization based on direct exposure to contaminated sediments. The RI/FFS ERA compares site-specific and literature-based, direct sediment exposure toxicity benchmarks to site sediment concentrations to evaluate risks to BMIs. This is done for each of the nine COCs evaluated in the ERA (TCDD, total PCBs, mercury, total DDx, copper, dieldrin, HPAHs, LPAHs, and lead). Sediment exposure estimates were obtained from a relatively large dataset of contaminants measured in OU2 surficial sediments. With exception of TCDD, toxicity

values evaluated herein represent upper bound or lowest observed adverse effect levels (LOAELs). The RI/FFS ERA uses a lower bound toxicity sediment benchmark for TCDD to evaluate BMI risks. This TCDD benchmark is specific to oysters which are an important foundational invertebrate species in the region. The current analysis uses this same toxicity benchmark when characterizing BMI risks from sediment-based TCDD exposure.

3.1.2 Tissue-based crab assessment

Blue crab are locally abundant macroinvertebrates that are considered keystone species in eastern seaboard bay and estuarian habitats. Benthic juveniles and adults consume and cycle energy from bivalves, other crustaceans, fish, marine worms, plants, and detritus to higher trophic-level organisms such as predatory fish and humans. Crab larvae are planktonic and provide prey for many important fish species, especially early life stage fish that are dependent on them for subsistence. In addition to bioaccumulating contaminants from water and sediment, all life-stages of blue crabs can be sensitive to contamination.

Inclusion of blue crab risks into this allocation procedure provides an ecological metric representing a mobile, ecologically and commercially important species that has high potential to assimilate contaminants from LPRSA habitats.

The RI/FFS ERA evaluates crab risks using a crab tissue-based critical body residue (CBR) approach. This approach is focused on measuring contaminants in crab tissues and comparing results to tissue-based toxicity benchmarks obtained from a toxicity literature base. This approach assumes that contaminants accumulated in crab tissue can be directly toxic to a crab or detrimental to young when maternally transferred into eggs. The RI/FFS ERA selected CBRs for each of the nine COCs that are associated with adverse effects to survivorship, growth, and reproduction to crab. CBRs are directly compared to COC concentrations measured in blue crab tissues collected throughout OU2. The current analysis uses this same approach to assess risks to crab.

3.1.3 Tissue-based forage fish assessment

Forage fish is a term used to describe small minnow-like fish that provide an important prey base to piscivorous fish and riverine wildlife. Forage fish are important primary consumers in the aquatic food chain that transfer energy from small invertebrates, plant material, and plankton to higher-level consumers. Mummichog is a small killifish that is native to and locally abundant in the LPRSA. Forage fish can be exposed to site contamination via direct contact with water and sediments and consumption of contaminated sediment and prey, such as benthic invertebrates that have accumulated contaminants from the environment. Forage fish can also assimilate contaminants in their tissues, often at levels above those in their diet. This is especially relevant when fish are exposed to lipophilic organic contaminants with high bioaccumulation potential. Accumulated contaminants can be directly toxic to the individual fish or developing embryos and young when maternally transferred.

Inclusion of forage fish risks into this allocation procedure provides an ecological metric representing a locally abundant and ecologically important species that has high potential to accumulate contaminants from LPRSA contaminated habitats. Reduced populations of forage fish can impact higher trophic-level species such as larger predatory fish and piscivorous birds that rely on them for subsistence. Their absence can also unbalance the riverine ecosystem and result in hazardous conditions to humans if macroinvertebrate prey items such as mosquitoes are left unchecked.

The RI/FFS ERA evaluates risks to forage fish using COC concentrations measured in site-collected mummichog whole-body tissue samples. Similar to crab, these whole-body contaminant concentrations were compared to tissue-based CBR toxicity benchmarks obtained from the toxicity literature base. Selected tissue-based toxicity benchmarks relate to contaminant concentrations that reduce growth, survival, and reproduction in exposed fish. Tissue concentrations and toxicity benchmarks are available and used to assess forage fish risks for all nine COCs. However, application of CBR-based risk characterization potentially produces overly conservative results for fish exposed to non-organic contaminants such as copper and lead because of the wide range of strategies used by fish species to store, detoxify, and excrete bioaccumulated metals (Adams et al. 2011). As such, the current analysis of harm caused by the two metal COCs (copper and lead) is not based on tissue-based CBR approach. Instead, harm to fish from these two metals is evaluated using a dietary modeling-based exposure approach. This is the same approach used to evaluate fish risks for OU4 located upriver from OU2.

Fish dietary modeling involves estimating exposure using dietary exposure parameters (food intake rates and incidental sediment intake rates), diet composition (fraction of each dietary item/prey type such as invertebrates and fish), and concentrations of COCs (copper and lead) in each dietary item. Estimated doses (mg of COC/kg fish body weight/day) are then compared to toxicity benchmarks associated with adverse effects in fish from consumption of metals contaminated diets. Upper (no observed adverse effect level [NOAEL]) and lower bound (LOAEL) toxicity values are available for copper but only one acceptable NOAEL is available for lead. The current analysis uses the dietary exposure NOAEL value when evaluating LPRSA lead exposure risks for forage fish which results in a very low HQ of 0.01 (Table A-11). Given the lack of a LOAEL toxicity benchmark, low LPRSA NOAEL-based HQ, and relative insensitivity of dietary lead exposure in fish, the final percent contribution of lead uses a LOAEL-based HQ of zero for this LOE. This application is also supported by the fact that the background lead sediment concentration (382 mg/kg) is greater than the LPRSA concentration (240 mg/kg) which would likely result on an incremental contribution of 0% for this COC as derived for BMIs (Table A-6).

The dietary exposure scenario assumes that forage fish are exposed to sediment dwelling worms and incidental sediment ingestion. Concentrations of copper and lead in OU2-collected worm tissues and mudflat sediments are available and used to estimate OU2 forage fish exposure. Background (above Dundee Dam) worm tissue sampling has not been conducted. Therefore, concentrations were estimated using average ratio of copper measured in OU2 worms and co-located OU2 sediments which is then applied to background sediment concentrations. Forage

fish dietary modeling calculations are provided in a series of attached tables (Tables A-11 through A-13). Again, the dietary-based risk characterization methods and results were only applied to the two metal COCs (copper and lead) and all other COCs were evaluated using the CBR approach as done in the OU2 RI/FFS ERA.

3.1.4 Tissue-based generic fish assessment

The RI/FFS ERA uses the term "generic fish" to describe all other fish types other than forage fish. We note here that some supporting ERA documents describe this LOE as "piscivorous fish", but this is a misnomer since not all the fish species evaluated are piscivorous. For example, species represented in this LOE include; white perch, American eel, catfish ssp., carp, smallmouth bass, largemouth bass, white sucker, and northern pike. All these fish species occur/could occur in the LPRSA ecosystem. These species fill unique ecological niches and are ecologically, recreationally, and commercially important. For example, white perch and bass are resident, predatory species that keep invertebrate and small fish populations in check and are popular sportfish in the area. Other species such as American eel were once commercially important species that use tidal river habitats and resources for part of their life history cycle.

Bottom feeding detritivores, such as carp and sucker, can be detrimental in large numbers but do play an ecological role in cycling energy from lower to higher trophic level food chains. This diverse assemblage of generic fish species can be exposed to site contamination from direct exposure to water, sediments, and prey that have accumulated contaminants from the environment. Like forage fish, contamination can adversely affect generic fish via direct toxicity and/or be toxic to developing embryos and young when contaminants are maternally transferred. Reductions in generic fish populations can adversely impact energy cycling, fishing opportunities, and piscivorous wildlife species and populations that rely on them as a food source.

Inclusion of generic fish risks into this allocation procedure provides an ecological metric for relevant and locally important fish species in the study area. When analyzed with forage fish, generic fish also provide a complete assessment of the LPRSA fish community.

The RI/FFS ERA evaluates risks to generic fish using COC concentrations measured in site-collected fish tissues. Similar to other tissue-based assessments, whole-body contaminant concentrations were compared to tissue-based toxicity benchmarks obtained from the toxicity literature base. Selected benchmarks relate to contaminant concentrations that reduce growth, survival, and reproduction in exposed fish.

The CBR approach is an integrated and valid assessment technique to characterize reproductive toxicity in fish exposed to site-specific toxic bioaccumulative contaminants. However, as described above, the CBR approach potentially produces overly conservative results for metal COCs (copper and lead). Therefore, dietary-based exposure modeling and toxicity assessments are used to characterize risks to generic fish species exposed to copper and lead. This assessment models exposures for nine fish species so that a wide range of dietary exposure regimes are characterized. Species-specific hazard quotients (HQs) are averaged to obtain a single set of

generic fish HQs for copper and lead for this ERA LOE. Like forage fish assessment for lead exposure, LOAEL-based HQs for lead were assumed to be zero in OU2 and background risk calculations. Again, the dietary-based risk characterization methods and results were only applied to the two metal COCs (copper and lead) and all other COCs were evaluated using the CBR approach.

3.1.5 Dietary-based exposure heron assessment

Blue heron are large wading birds that forage for small fish and invertebrates in shallow waters. In the LPRSA, they can be seasonal or permanent residents. Heron can be exposed to site contaminants via dietary exposure routes; the most important of which include incidental ingestion of sediments and consumption of aquatic prey items, such as forage fish and invertebrates that have accumulated contaminants into their tissues. Aquatic birds, such as heron, can be sensitive to environmental contaminants that can impact reproductive functions. These functions include eggshell thinning and biochemical processes that can lead to underdeveloped offspring, poor egg hatchability, and reduced fledgling fitness and fledging success. All of which can be detrimental to the health and sustainability of local heron populations.

Blue heron is a common assessment species in ERAs. They are often identified as a species that has high exposure to bioaccumulative contaminants. As such, they have a substantial literature base from which to model food chain dietary exposures and estimate toxicity. The RI/FFS ERA estimates heron exposure using readily acceptable food chain model parameters for each of the nine COCs. This includes concentrations of COCs measured in site sediments and tissues of heron prey items, specifically, generic fish collected within OU2. Dietary exposure estimates are compared to COCs concentrations that impact hatchability of bird eggs and survivability of offspring under experimental conditions. Respective toxicity reference values were obtained from a large literature base of readily available sources. Many of these sources are also included in USEPA-approved guidance documents that have been subject to a rigorous screening process to ensure high quality experimental results and subsequent toxicity values. We also note that the RI/FFS ERA evaluates heron risks for a series of exposure scenarios. These scenarios consider whether heron are seasonal or permanent residents; fed on forage fish, generic fish, or crab; and, whether they incidentally ingest sand bar-specific or surface sediments throughout the LPRSA. Risk estimates from the resident heron, generic fish consumption, and site-wide surface sediment exposure scenario are considered herein. This scenario results in the highest heron exposure and risk estimates to all nine COCs. However, all heron exposure scenarios evaluated in the RI/FFS ERA result in relatively similar risk estimates.

Inclusion of blue heron risks into this allocation procedure provides an ecological metric representing a highly exposed, sensitive avian receptor at the top of the aquatic food chain. In addition, heron risks are based on well-established dietary exposure parameters and toxicity reference values and site-specific sediment and fish tissue sample COC concentrations.

3.1.6 Tissue-based herring gull embryo assessment

Herring gull are relatively common aquatic bird species along the Atlantic coast and are often referred to as seagulls. They are omnivorous, opportunistic scavengers and can thrive in a wide variety of aquatic and terrestrial habitats. Gull can have a large foraging range and can travel tens of miles from breeding colonies to find food; although, ranges of over 100 miles have been observed. Like heron, gull can be exposed to site contaminants via ingestion of sediments and aquatic prey that have bioaccumulated site contaminants. Also similar to heron, gull can be sensitive to environmental contaminants which, at great enough concentrations, can elicit similar toxicological responses.

The RI/FFS ERA evaluates herring gull risks using an embryo tissue-based analysis. Since site-specific gull embryo/egg data were not available, a series of biomagnification modeling steps are conducted to estimate embryo/egg COC concentrations. This consisted of obtaining biomagnification information from a cited source for Lake Ontario gull and assumed Passaic River gull would have the same biomagnification potential. Briefly, COC concentrations in Lake Ontario gull fish diet (alewife) and gull eggs are used to derive fish diet-to-gull egg biomagnification factors. These fish diet-to-gull egg biomagnification factors are then applied to OU2-collected forage fish tissue COC concentrations to estimate concentrations of COCs in Lower Passaic River gull eggs. These estimated concentrations are then compared to literature-based, egg tissue toxicity reference values that correspond to reduced reproduction in various bird species. The RI/FFS ERA evaluates four of the nine COCs for this line of evidence: dieldrin, total DDx, total PCBs, and TCDD (dioxins and furans only). Addition of remaining COCs is not possible because underlying data needed to derive respective fish diet-to-gull egg biomagnification factors are not available.

Risks from the RI/FFS ERA tissue-based herring gull embryo assessment are included in the current allocation procedure. Gull are identified as an important ecological receptor in the beginning problem formulation step of the RI/FFS ERA. Gull embryo assessment results are also specifically considered in the OU2 ROD problem formulation assessment (Section 7.2.1) to assess exposures to sensitive early life stage receptors and when developing the sediment-based preliminary remediation goal for DDT (Table 20 in USEPA, 2016). It is important to note that both heron and herring gull are included as separate LOEs in the RI/FFS ERA and herein. The two avian wildlife species occupy unique ecological niches and respective reproductive risks are evaluated using two very different assessment methods. Therefore, inclusion of gull embryo risks in this allocation procedure does not constitute double counting of risks associated with aquatic bird COC exposures and is somewhat analogous to use of forage vs. generic fish LOEs.

3.1.7 Dietary-based exposure mink assessment

Mink are small, semiaquatic carnivorous mammals. They prey upon small mammals, crustaceans (such as crab), amphibians, and birds, but fish are often their most important source of food in riverine habitats. They have relatively small forage ranges for most of the year and are considered residents in locations where they occur. Therefore, mink are expected to forage throughout the

year in the LPRSA. Laboratory and field studies have shown that mink can be quite sensitive to environmental contamination. Being a top predator with small forage areas, mink also have great potential to be highly exposed to bioaccumulative contaminants that biomagnify within local aquatic food chains. These attributes make mink an ideal species to monitor and assess environmental contamination. As such, they are a common laboratory toxicity test species and are often included in ERAs.

Mink are included in the RI/FFS ERA to represent a sensitive aquatic mammal. Like blue heron, mink dietary exposure risks are assessed using a food chain analysis. The RI/FFS ERA estimates mink exposure using readily acceptable food chain model parameters for each of the nine COCs. This includes concentrations of COCs measured in site sediments (incidental ingestion) and tissues of mink prey items; specifically, forage fish (80% of total diet) and crab (20% of total diet) tissue data collected within OU2. Dietary exposure estimates are compared to toxicity reference value COC concentrations that impact mink reproduction under experimental conditions.

Inclusion of mink risks into this allocation procedure provides an ecological metric representing a sensitive mammalian receptor at the top of the food chain that is expected to be highly exposed to site-specific COCs. In addition, risks estimates are based on well-established dietary exposure parameters, toxicity reference values, and site-specific sediment, fish tissue, and crab tissue sample contaminant concentrations.

4.0 RESULTS

This section presents the Percent Contribution to Environmental Harm results for human health and ecological components. Results of the final, aggregated (human health with ecological) Percent Contribution to Environmental Harm are also summarized. All supporting calculations are provided in tables attached to this document.

4.1 Percent Contribution to Human Health Hazard and Risk

Table 1 (Attachment A) presents site-related risk and hazard point estimates associated with fish and crab tissue ingestion, together with each COC's percent contribution to human health risk and hazard. Hazard estimates reflect potential elicitation of non-cancer effects, based on exposure of a child. Risk estimates reflect probabilities of cancer development, based on age-adjusted exposures, accounting for childhood and adult exposures.

It is important to note that for dieldrin, newer sediment background concentration exceeded concentration in site sediment (background > OU2). However, the modeled background dieldrin concentration in crab was lower than site measured crab tissue concentration (background < OU2). This may be an artifact of not remodeling background crab dieldrin concentration using new sediment background data. The model used to estimate crab tissue concentrations from sediment requires inputs for sediment organic carbon content; these data are unavailable.

As seen in Table 1, dioxin (represented as TCDD TEQ, dioxins/furans) drives both the fish ingestion- and crab ingestion-based incremental hazard estimates. Fish diet-based incremental hazard (107.85) represents 75% of the pathway-specific hazard (percent contribution to human health hazard) and crab diet-based hazard (49.61) represents 89 percent contribution to human health hazard. These values are averaged to develop the percent contribution to human health incremental hazard for dioxins of 81.99. Dioxins are the biggest contributor to the human health component of Percent Contribution to Environmental Harm. Averaged incremental percent contributions to human health hazard are as follows:

- Dioxin: 81.99%
- Total PCBs: 16.79%
- Mercury: 0.63%
- DDx: 0.55%
- Dieldrin: 0.03%

Likewise, dioxin drives the incremental percent contribution to human health risk for both the fish and crab diet-based LOEs. Fish diet-based risk (2.80E-03) represents 89% of the pathway-specific percent contribution to human health risk and crab diet-based risk (1.29E-03) represents 96% of the pathway-specific percent contribution to human health risk. These values are averaged to develop the overall percent contribution to human health risk for dioxins of 92.24%. Averaged percent contributions to human health risk are:

- Dioxin: 92.24%
- Total PCBs: 7.40%
- Dieldrin: 0.26%
- DDx: 0.10%

From a purely pragmatic perspective, and to judge whether one LOE is eliciting a greater influence on the expression of magnitude of impact, one can consider the hazard and risk point estimates associated with the major contributor, dioxin. The hazard quotient associated with dioxin from ingestion of fish is 108, which is roughly two orders of magnitude above unity, the traditional EPA criterion for acceptability. The risk estimate associated with dioxin from fish ingestion is 2.80E-03. This value is approximately two orders of magnitude above the mid-point of the National Oil and Hazardous Substances Pollution Contingency Plan Relative Risk Range of 1E-05. While risk is the probability of incurring a carcinogenic response and is presumed to be linear, there is no linear relationship between hazard quotient and effect. In spite of this, there is reasonable agreement between the magnitudes associated with potential health impact based on both data lines.

4.2 Percent Contribution to Ecological Hazard

Table 2 (Attachment A) presents site-related ecological hazard quotient point estimates associated with the seven LOEs, together with each COC's percent contribution to cumulative ecological hazard.

As may be seen in Table 2, dioxin (represented as TCDD TEQ) drives ecological harm when averaged across each of the seven data LOEs. Averages for the nine COCs across all ecological LOEs result in the following associated percentage contributions to incremental ecological harm:

- Dioxin: 77.52%
- Total PCBs: 14.42%
- Total DDx: 3.45%
- Mercury: 2.23%
- Copper: 2.07%
- HPAHs: 0.15%
- Dieldrin: 0.09%
- LPAHs: 0.04%
- Lead: 0.03%

4.3 Cumulative Percent Contribution to Environmental Harm

Table 3 (Attachment A) presents the aggregated Percent Contributions to Environmental Harm by averaging two sets of values representative of human health LOEs (one for cancer and one for noncancer) from Section 4.1 with a third set of values representative of all ecological LOEs from Section 4.2. Consistent with the human health and ecological components discussed above, dioxin continues to exert the most significant influence on the overall estimates of Percent Contribution to Environmental Harm. The following percentages are presented within Table 3:

- Dioxin: 83.92%
- Total PCBs: 12.87%
- Total DDx: 1.37%
- Mercury: 0.95%
- Copper: 0.69%

- Dieldrin: 0.13%
- HPAHs: 0.05%
- LPAHs: 0.01%
- Lead: 0.01%

These Percent Contribution to Environmental Harm values are intended to establish the relative risk each OU2 COC poses to human health and the environment for purposes of the multi-faceted allocation.

Several factors are notable. First, copper, lead, and the PAHs confer no additional risk or hazard to the human health pathways based on screening and the consideration of background. Dieldrin confers low levels of risk and hazard to human health only via the ingestion of crab pathway, which uses tissue concentrations that were modeled from sediment even though site-related sediment concentrations are lower than newer background concentrations. Mercury confers only hazard, as it is presumed to have no carcinogenic potential.

5.0 SUMMARY

This document describes the approach taken to relatively rank nine COCs based on their Percent Contribution to Environmental Harm for purposes of the Allocation. This approach aggregates the human health and ecological risk LOEs results generated using environmental data collected in OU2. The primary sources of information that were used to derive Percent Contribution to Environmental Harm (via percent contribution to human health hazard or risk and percent contribution to ecological hazard) of each COC were the HHRA and ERA in Appendix D of the RI/FFS (Berger et al. 2014).

The percent contribution from human health model is based on risk and hazard point estimates associated with fish and crab tissue ingestion. Percent contribution to human health risk and percent contribution to human health hazard were both aggregated with percent contribution to ecological hazard results. The human health Percent Contributions to human health cancer risk and to human health hazard for each COC are provided in Table 1.

The percent contribution to ecological hazard model is based on HQs from seven RI/FFS ERA LOEs. These LOEs provide a complete assessment of ecological hazard to important components and organisms of a functioning tidal riverine ecosystem. Risk estimates from these seven LOEs were averaged before being aggregated with percent contribution to human health results. The percent Contribution to ecological hazard results for the nine COCs are provided in Table 2.

Table 3 provides the aggregated Percent Contribution to Environmental Harm results for each of the nine COCs. These ranked COCs, predicated on COC-specific contributions to total Environmental Harm, along with an Allocation Party's contribution of each COC in OU2

sediments and other relevant equitable factors, will be used to recommend a share of responsibility for each Allocation Party in the OU2 allocation.

6.0 REFERENCES

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For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

ATTACHMENT A

TABLES 1 – 3

SUPPORTING TABLES A1 – A13

Table 1 Human Health Hazard and Risk Results for Child and Adult Angler Exposed to Lower Passaic River Study Area Fish and Crab

COC	Human Health (OU2 Risks/Hazards)									
	Non-Cancer Hazard (Child)					Cancer Risk (Adult/Child)				
	Fish Diet Hazard	% Contribution	Crab Diet Hazard	% Contribution	Noncancer Hazard % Contribution[a]	Fish Diet Risk	% Contribution	Crab Diet Risk	% Contribution	Cancer Risk % Contribution[a]
Copper	--	0.00	--	0.00	0.00	--	0.00	--	0.00	0.00
Lead	--	0.00	--	0.00	0.00	--	0.00	--	0.00	0.00
Mercury	2.76	1.50	0.79	1.29	1.40	NC	0.00	NC	0.00	0.00
LPAHs	--	0.00	--	0.00	0.00	--	0.00	--	0.00	0.00
HPAHs	--	0.00	--	0.00	0.00	--	0.00	--	0.00	0.00
Dieldrin	0.38	0.21	0.08	0.13	0.17	7.57E-05	2.10	1.54E-05	1.10	1.60
DDx	2.10	1.14	0.43	0.71	0.93	1.18E-05	0.33	2.96E-06	0.21	0.27
Total PCBs	69.00	37.55	9.99	16.36	26.95	6.81E-04	18.89	9.84E-05	7.01	12.95
TCDD TEQ (D/F)	109.52	59.60	49.79	81.51	70.56	2.84E-03	78.69	1.29E-03	91.69	85.19
Totals =	**184**	**100**	**61**	**100**	**100**	**3.61E-03**	**100**	**1.40E-03**	**100**	**100**
COC	**Human Health (Incremental Risks/Hazards)**									
	Non-Cancer Hazard (Child)					**Cancer Risk (Adult/Child)**				
	Fish Diet Hazard	% Contribution	Crab Diet Hazard	% Contribution	Noncancer Hazard % Contribution[a]	Fish Diet Risk	% Contribution	Crab Diet Risk	% Contribution	Cancer Risk % Contribution[a]
Copper	--	0.00	--	0.00	0.00	--	0.00	--	0.00	0.00
Lead	--	0.00	--	0.00	0.00	--	0.00	--	0.00	0.00
Mercury	0.62	0.43	0.46	0.84	0.63	NC	0.00	NC	0.00	0.00
LPAHs	--	0.00	--	0.00	0.00	--	0.00	--	0.00	0.00
HPAHs	--	0.00	--	0.00	0.00	--	0.00	--	0.00	0.00
Dieldrin	Bkgd>LPRSA	0.00	0.04	0.06	0.03	Bkgd>LPRSA	0.00	6.96E-06	0.52	0.26
DDx	0.53	0.37	0.41	0.74	0.55	1.58E-06	0.05	2.10E-06	0.16	0.10
Total PCBs	35.18	24.40	5.11	9.19	16.79	3.47E-04	11.05	5.04E-05	3.75	7.40
TCDD TEQ (D/F)	107.85	74.80	49.61	89.17	81.99	2.80E-03	88.90	1.28E-03	95.57	92.24
Totals =	**144**	**100**	**56**	**100**	**100**	**3.14E-03**	**100**	**1.34E-03**	**100**	**100**

Footnotes:
a = Average of fish and crab diet risks/hazards
b = Average percent contributions for noncancer and cancer human LOEs

Acronyms:
COC = contaminant of concern
D/F = dioxin/furan congeners
DDx = DDx is sum of risks/hazards of DDD, DDE, and DDT.
FFS = focused feasibility study
HPAHs = high-molecular polycyclic aromatic hydrocarbons
LOE = line of evidence
LPAHs = low-molecular polycyclic aromatic hydrocarbons
LPRSA = lower Passaic River study area
NC = not calculated
PCB = polychlorinated biphenyls
TEQ = toxicity equivalent quotient

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Table 2 Hazard Results for Ecological Receptors Exposed to Lower Passaic River Study Area Fish, Crab, and Sediments

COC	Ecological (OU2 Hazards)							
	Tissue-Based LOEs				Sediment-Based LOE	Dietary-Based LOEs		Average % Contribution All Eco LOEs
	Forage fish (Mummichog)	Piscivorous Fish (Generic Fish)	Blue crab	Herring gull (Embryo)	Benthic Invertebrates	Mink Diet	Heron Diet	
Copper	1.69	0.21	3.11	0.00	0.48	1.69	8.32	2.21
Lead	0.00	0.00	0.22	0.00	0.67	0.44	11.34	1.81
Mercury	0.93	0.65	2.45	0.00	1.42	6.55	24.05	5.15
LPAHs	0.13	0.06	0.22	0.00	1.97	0.00	0.36	0.39
HPAHs	0.34	0.04	0.85	0.00	1.23	0.20	8.56	1.60
Dieldrin	0.78	0.67	1.42	0.03	1.36	0.71	0.34	0.76
DDx	0.60	0.58	0.85	3.52	1.03	0.05	19.11	3.68
Total PCBs	4.36	3.98	21.5	68.2	1.42	20.19	9.56	18.46
TCDD TEQ (D/F)	91.2	93.8	69.4	28.3	90.4	70.17	18.36	65.94
Totals =	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

COC	Ecological (Incremental Hazards)							
	Tissue-Based LOEs				Sediment-Based LOE	Dietary-Based LOEs		Average % Contribution All Eco LOEs
	Forage fish (Mummichog)	Piscivorous Fish (Generic Fish)	Blue crab	Herring gull (Embryo)	Benthic Invertebrates	Mink Diet	Heron Diet	
Copper	1.41	0.14	2.56	0.00	0.10	1.09	9.17	2.07
Lead	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.03
Mercury	0.00	0.08	1.57	0.00	0.45	1.50	12.03	2.23
LPAHs	0.05	0.01	0.22	0.00	0.00	0.00	0.00	0.04
HPAHs	0.22	0.01	0.81	0.00	0.00	0.00	0.00	0.15
Dieldrin	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.09
DDx	0.00	0.26	0.70	1.56	0.93	0.02	20.69	3.45
Total PCBs	0.00	2.57	10.7	57.16	1.27	14.76	14.44	14.42
TCDD TEQ (D/F)	98.3	96.9	82.6	41.28	97.2	82.63	43.66	77.52
Totals =	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Acronyms:
COC = contaminant of concern
D/F = dioxin/furan congeners
DDx = DDx is sum of risks/hazards of DDD, DDE, and DDT.
HPAHs = high-molecular polycyclic aromatic hydrocarbons
LOE = line of evidence
LPAHs = low-molecular polycyclic aromatic hydrocarbons
LPRSA = lower Passaic River study area
PCB = polychlorinated biphenyls
TEQ = toxicity equivalent quotient

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Table 3 Aggregated Lower Passaic River Study Area OU2 Percent Contributions to Overall Environmental Harm

COC	Non Incremental				Incremental			
	Noncancer Hazard % Contribution[a]	Cancer Risk % Contribution[b]	Average % Contribution All Eco LOEs[c]	% Contribution to Environmental Harm[d]	Noncancer Hazard % Contribution[a]	Cancer Risk % Contribution[b]	Average % Contribution All Eco LOEs[c]	% Contribution to Environmental Harm[d]
Copper	0.00	0.00	2.21	0.74	0.00	0.00	2.07	0.69
Lead	0.00	0.00	1.81	0.60	0.00	0.00	0.03	0.01
Mercury	1.40	0.00	5.15	2.18	0.63	0.00	2.23	0.95
LPAHs	0.00	0.00	0.39	0.13	0.00	0.00	0.04	0.01
HPAHs	0.00	0.00	1.60	0.53	0.00	0.00	0.15	0.05
Dieldrin	0.17	1.60	0.76	0.84	0.03	0.26	0.09	0.13
DDx	0.93	0.27	3.68	1.62	0.55	0.10	3.45	1.37
Total PCBs	26.95	12.95	18.46	19.45	16.79	7.40	14.42	12.87
TCDD TEQ (D/F)	70.56	85.19	65.94	73.89	81.99	92.24	77.52	83.92
Totals =	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Footnotes:
a = Percent contributions for noncancer LOE
b = Percent contributions for cancer LOE
c = Average percent contributions for all seven ecological LOEs
d = Cumulative average percent contributions for human noncancer hazard and cancer risk and ecological hazard LOEs

Acronyms:
COC = contaminant of concern
D/F = dioxin/furan congeners
DDx = DDx is sum of risks/hazards of DDD, DDE, and DDT.
HPAHs = high-molecular polycyclic aromatic hydrocarbons
LOE = line of evidence
LPAHs = low-molecular polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyls
TEQ = toxicity equivalent quotient

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Table A-1 Human Health Risk Assessment Exposure Point Concentrations and Toxicity Factors for Lower Passaic River Contaminants of Concern

Lower 8 Mile ROD COC	OU2 Fish EPC (mg/kg)[a]	OU2 Crab EPC (mg/kg)[b]	Background Fish EPC (mg/kg)[c]	Modeled Background Crab EPC (mg/kg)[d]	Oral RfD (mg/kg-day)[e]	CSF (1/mg/kg-day)[f]
4,4'-DDD	0.069	0.022	0.04957	incl w/ DDT	3.00E-05	0.24
4,4'-DDE	0.13	0.057	0.1145	incl w/ DDT	3.00E-04	0.34
4,4'-DDT	0.0046	0.0034	0.009239	0.022	5.00E-04	0.34
Dieldrin	0.025	0.0084	0.03274	0.0046	5.00E-05	16
Mercury[g]	0.36	0.17	0.2795	0.07	1.00E-04	NA
Total PCBs	1.8	0.43	0.882229	0.21	2.00E-05	2
TCDD TEQ (D/F)	0.0001	0.000075	0.000001527	0.00000027	7.00E-10	150000

Footnotes/data sources:

a = Table 3-2 Exposure Point Concentrations for the Human Health Risk Assessment in Louis Berger et al. (2014) Appendix D Risk Assessment; Lower 8 Mile Fish EPCs are 95% UCLs based on data from 39 fish fillet samples collected from the FFS Study Area for six species: American eel, common carp, smallmouth bass, white catfish, white perch, and white sucker. Note that Table 3-2 total PCBs represents the sum of nondioxin-like PCB congeners. Total PCBs value reported herein represent the sum of all 209 PCB congeners.

b = Table 3-2 Exposure Point Concentrations for the Human Health Risk Assessment in Louis Berger et al. (2014) Appendix D Risk Assessment; Lower 8 Crab EPCs are 95% UCLs based on data from 22 samples of blue crab (muscle and hepatopancreas tissue) collected from the FFS Study Area. Note that Table 3-2 total PCBs represent the sum of nondioxin-like PCB congeners. Total PCBs value reported herein represents the sum of all 209 PCB congeners.

c = Background Fish EPCs are 95% UCLs based on data from 47 background fish fillet samples collected from the Passaic River above Dundee Dam during the 17-Mile RI/FS for 8 species: brown bullhead, American eel, largemouth/smallmouth bass, common carp, channel catfish, white perch, white sucker, northern pike.

d = Table 3-3 Summary of Estimated Whole Body Tissue Concentrations(a) for Ecological COPECs Associated with Background Conditions in Louis Berger et al. (2014) Appendix E Development of PRGs

e = Attachment 4, Table 4-11 (RAGS Part D Table 5.1) Non-Cancer Toxicity Data - Oral/Dermal Lower Passaic River in Louis Berger et al. (2014) Appendix D Risk Assessment; Note that Table 4-12 did not provide RfDs for 4,4'-DDD or 4,4"DDE; These RfDs were obtained from the following USEPA reference documents:

4,4'-DDD, Provisional Peer-Reviewed Toxicity Values for p,p'-Dichlorodiphenyldichloroethane (p,p'-DDD), EPA/690/R-17/006, dated September 20, 2017.

4,4' -DDE, Provisional Peer-Reviewed Toxicity Values for p,p'-Dichlorodiphenyldichloroethylene (p,p'-DDE), EPA/690/R-17/007, dated September 26, 2017.

f = Attachment 4, Table 4-12 (RAGS Part D Table 6.1) Cancer Toxicity Data - Oral/Dermal Lower Passaic River in Louis Berger et al. (2014) Appendix D Risk Assessment

g = Oral reference dose for methylmercury

Acronyms:

COC = contaminant of concern
CSF = cancer slope factor
EPC = exposure point concentration
RfD = reference dose
ROD = Record of Decision
UCL = upper confidence limit
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
PCB = polychlorinated biphenyl
TEQ = toxicity equivalent quotient
NA = not available (mercury not carcinogenic)
RAGS = risk assessment guidance for superfund
D/F = dioxin/furan congeners
USEPA = United States Environmental Protection Agency
PRGs = preliminary remediation goals
COPEC = contaminant of potential ecological concern

References:

The Louis Berger Group. 2014 Focused Feasibility Study Report for the Lower Eight Miles of the Lower Passaic River. Produced in conjunction with Battelle, HDR, and HydroQual. Prepared for the U.S. Environmental Protection Agency, Region 2 and U.S. Army Corps of Engineers, Kansas City Division.

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Table A-2 Human Health Risk Assessment Noncancer and Cancer Exposure Assumptions for Ingestion of Fish or Crab

Metric	Receptor	Fish			Crab		
		Assumed Value[a,b]	Units	Calculated Value	Assumed Value[c,d]	Units	Calculated Value
Ingestion Rate	Young Child	11.5	(g fish/day)	--	6.97	(g fish/day)	--
Ingestion Rate	Adult	34.6	(g fish/day)	--	20.9	(g fish/day)	--
Body Weight	Young Child	15	(kg)	--	15	(kg)	--
Body Weight	Adult	80	(kg)	--	80	(kg)	--
Exposure Frequency	Young Child	365	days/year	--	365	days/year	--
Exposure Frequency	Adult	365	days/ year	--	365	days/year	--
Exposure Duration (cancer)	Young Child	6	yr	--	6	yr	--
Exposure Duration (cancer)	Adult	20	yr	--	20	yr	--
Exposure Duration (noncancer)	Young Child	6	yr	--	6	yr	--
Exposure Duration (noncancer)	Adult	20	yr	--	20	yr	--
Averaging Time (Cancer)	Adult	--	days	2.56E+04	--	days	2.56E+04
Averaging Time (Non Cancer)	Adult	--	days	7.30E+03	--	days	7.30E+03
Averaging Time (Cancer)	Young Child	--	days	2.56E+04	--	days	2.56E+04
Averaging Time (Non Cancer)	Young Child	--	days	2.19E+03	--	days	2.19E+03
Conversion factor		0.001	kg/g		0.001	kg/g	

Intake Factors[e]	Cancer	Noncancer	Cancer	Noncancer
Intake Factor Child [kg-fish]/[kg bw-day]	6.57E-05	7.67E-04	--	--
Intake Factor_Adult [kg-fish]/[kg bw-day]	1.24E-04	4.33E-04	--	--
Intake Factor Child [kg-crab]/[kg bw-day]	--	--	3.98E-05	4.65E-04
Intake Factor_Adult [kg-crab]/[kg bw-day]	--	--	7.46E-05	2.61E-04

Data sources:

a = Attachment 4, Table 4-5 (RAGS Part D Table 4.1) Values Used for Daily Intake Calculations Lower Passaic River in Louis Berger et al. (2014) Appendix D Risk Assessment; Child BW from the USEPA (2016) ROD, Section 7.1.2

b = Attachment 4, Table 4-7 (RAGS Part D Table 4.1) Values Used for Daily Intake Calculations Lower Passaic River in Louis Berger et al. (2014) Appendix D Risk Assessment

c = Attachment 4, Table 4-8 (RAGS Part D Table 4.1) Values Used for Daily Intake Calculations Lower Passaic River in Louis Berger et al. (2014) Appendix D Risk Assessment; Child BW from the USEPA (2016) ROD, Section 7.1.2

d = Attachment 4, Table 4-10 (RAGS Part D Table 4.1) Values Used for Daily Intake Calculations Lower Passaic River in Louis Berger et al. (2014) Appendix D Risk Assessment

e = Intake Factors calculated using the following equations:

Intake Factor Child [kg-crab]/[kg bw-day] = FIR x EF x ED x CF x 1/bw x 1/AT

Intake Factor Adult [kg-crab]/[kg bw-day] = FIR x EF x ED x CF x 1/bw x 1/AT

Notes:

The adult body weight (80kg) and adult cancer exposure duration (20 years) were updated from the original source to more recent/revised values obtained from USEPA (2014)

Acronyms:

AT = averaging time
bw = body weight
CF = conversion factor
ED = exposure duration
EF = exposure frequency
FIR = food ingestion rate
ROD = Record of Decision
USEPA = United States Environmental Protection Agency

References:

The Louis Berger Group. 2014 Focused Feasibility Study Report for the Lower Eight Miles of the Lower Passaic River. Produced in conjunction with Battelle, HDR, and HydroQual. Prepared for the U.S. Environmental Protection Agency, Region 2 and U.S. Army Corps of Engineers, Kansas City Division.

U.S. Environmental Protection Agency. 2014. Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6.

U.S. Environmental Protection Agency. 2016. Record of Decision Lower 8.3 Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site Essex and Hudson Counties, New Jersey. March 3.

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Table A-3 Calculations of Cancer Risks and Non-Cancer Hazards for a Child Angler (1 to <7 Years Old) Consuming Lower Passaic River Study Area and Background (Above Dundee Dam) Fish or Crab

Lower Passaic River Study Area OU2

Medium	Exposure Point	COC	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
			Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units		Value	Units	Value	Units	
Fish Ingestion	LPRSA Study Area	4,4'-DDD	6.90E-02	mg/kg	4.53E-06	mg/kg-day	2.40E-01	mg/kg-day $^{-1}$	1.E-06	5.E-05	mg/kg-day	3.00E-05	mg/kg-day	1.76E+00
		4,4'-DDE	1.30E-01	mg/kg	8.54E-06	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	3.E-06	1.E-04	mg/kg-day	3.00E-04	mg/kg-day	3.32E-01
		4,4'-DDT	4.60E-03	mg/kg	3.02E-07	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	1.E-07	4.E-06	mg/kg-day	5.00E-04	mg/kg-day	7.05E-03
		Dieldrin	2.50E-02	mg/kg	1.64E-06	mg/kg-day	1.60E+01	mg/kg-day $^{-1}$	3.E-05	2.E-05	mg/kg-day	5.00E-05	mg/kg-day	3.83E-01
		Mercury	3.60E-01	mg/kg	2.37E-05	mg/kg-day	NA	mg/kg-day $^{-1}$	NC	3.E-04	mg/kg-day	1.00E-04	mg/kg-day	2.76E+00
		Total PCBs	1.80E+00	mg/kg	1.18E-04	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-04	1.E-03	mg/kg-day	2.00E-05	mg/kg-day	6.90E+01
		TCDD TEQ (D/F)	1.00E-04	mg/kg	6.57E-09	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.E-03	8.E-08	mg/kg-day	7.00E-10	mg/kg-day	1.10E+02
Crab Ingestion	LPRSA Study Area	4,4'-DDD	2.E-02	mg/kg	9.E-07	mg/kg-day	2.40E-01	mg/kg-day $^{-1}$	2.10E-07	1.02E-05	mg/kg-day	3.00E-05	mg/kg-day	3.41E-01
		4,4'-DDE	6.E-02	mg/kg	2.E-06	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	7.72E-07	2.65E-05	mg/kg-day	3.00E-04	mg/kg-day	8.83E-02
		4,4'-DDT	3.E-03	mg/kg	1.E-07	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	4.60E-08	1.58E-06	mg/kg-day	5.00E-04	mg/kg-day	3.16E-03
		Dieldrin	8.E-03	mg/kg	3.E-07	mg/kg-day	1.60E+01	mg/kg-day $^{-1}$	5.35E-06	3.90E-06	mg/kg-day	5.00E-05	mg/kg-day	7.81E-02
		Mercury	2.E-01	mg/kg	7.E-06	mg/kg-day	NA	mg/kg-day $^{-1}$	NC	7.90E-05	mg/kg-day	1.00E-04	mg/kg-day	7.90E-01
		Total PCBs	4.E-01	mg/kg	2.E-05	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.43E-05	2.00E-04	mg/kg-day	2.00E-05	mg/kg-day	9.99E+00
		TCDD TEQ (D/F)	8.E-05	mg/kg	3.E-09	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	4.48E-04	3.49E-08	mg/kg-day	7.00E-10	mg/kg-day	4.98E+01

Background (Above Dundee Dam)

Medium	Exposure Point	COC	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
			Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units		Value	Units	Value	Units	
Fish Ingestion	Passaic River Above Dundee Dam (empirical)	4,4'-DDD	4.96E-02	mg/kg	3.26E-06	mg/kg-day	2.40E-01	mg/kg-day $^{-1}$	7.82E-07	3.80E-05	mg/kg-day	3.00E-05	mg/kg-day	1.27E+00
		4,4'-DDE	1.15E-01	mg/kg	7.52E-06	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	2.56E-06	8.78E-05	mg/kg-day	3.00E-04	mg/kg-day	2.93E-01
		4,4'-DDT	9.24E-03	mg/kg	6.07E-07	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	2.06E-07	7.08E-06	mg/kg-day	5.00E-04	mg/kg-day	1.42E-02
		Dieldrin	3.27E-02	mg/kg	2.15E-06	mg/kg-day	1.60E+01	mg/kg-day $^{-1}$	3.44E-05	2.51E-05	mg/kg-day	5.00E-05	mg/kg-day	5.02E-01
		Mercury	2.80E-01	mg/kg	1.84E-05	mg/kg-day	NA	mg/kg-day $^{-1}$	NC	2.14E-04	mg/kg-day	1.00E-04	mg/kg-day	2.14E+00
		Total PCBs	8.82E-01	mg/kg	5.80E-05	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.16E-04	6.76E-04	mg/kg-day	2.00E-05	mg/kg-day	3.38E+01
		TCDD TEQ (D/F)	1.53E-06	mg/kg	1.00E-10	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.51E-05	1.17E-09	mg/kg-day	7.00E-10	mg/kg-day	1.67E+00
Crab Ingestion	Passaic River Above Dundee Dam (modeled from sediment)	4,4'-DDD	incl w/ DDT	mg/kg	--	NA	2.40E-01	mg/kg-day $^{-1}$	NC	--	mg/kg-day	3.00E-05	mg/kg-day	NA
		4,4'-DDE	incl w/ DDT	mg/kg	--	NA	3.40E-01	mg/kg-day $^{-1}$	NC	--	mg/kg-day	3.00E-04	mg/kg-day	NA
		4,4'-DDT	2.20E-02	mg/kg	8.76E-07	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	2.98E-07	1.02E-05	mg/kg-day	5.00E-04	mg/kg-day	2.04E-02
		Dieldrin	4.60E-03	mg/kg	1.83E-07	mg/kg-day	1.60E+01	mg/kg-day $^{-1}$	2.93E-06	2.14E-06	mg/kg-day	5.00E-05	mg/kg-day	4.27E-02
		Mercury	7.00E-02	mg/kg	2.79E-06	mg/kg-day	NA	mg/kg-day $^{-1}$	NC	3.25E-05	mg/kg-day	1.00E-04	mg/kg-day	3.25E-01
		Total PCBs	2.10E-01	mg/kg	8.36E-06	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.67E-05	9.76E-05	mg/kg-day	2.00E-05	mg/kg-day	4.88E+00
		TCDD TEQ (D/F)	2.70E-07	mg/kg	1.08E-11	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.61E-06	1.25E-10	mg/kg-day	7.00E-10	mg/kg-day	1.79E-01

Intake Factor Child	Fish	Crab	Units
Cancer	6.57E-05	3.98E-05	[kg-crab]/[kg bw-day]
Noncancer	7.67E-04	4.65E-04	[kg-crab]/[kg bw-day]

Acronyms:

bw = body weight
COC = contaminant of concern
CSF = cancer slope factor
D/F = dioxin/furan congeners
EPC = exposure point concentration
LPRSA = lower Passaic River study area
NA = not available
NC = not calculated
PCB = polychlorinated biphenyls
RfD = reference dose
TEQ = toxicity equivalent quotient

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Table A-4 Calculations of Cancer Risks and Non-Cancer Hazards for an Adult Angler Consuming Lower Passaic River Study Area and Background (Above Dundee Dam) Fish or Crab

Lower Passaic River Study Area OU2

Medium	Exposure Point	COC	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
			Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units		Value	Units	Value	Units	
Fish Ingestion	LPRSA Study Area	4,4'-DDD	0.069	mg/kg	8.53E-06	mg/kg-day	2.40E-01	mg/kg-day $^{-1}$	2.E-06	2.98E-05	mg/kg-day	3.00E-05	mg/kg-day	0.995
		4,4'-DDE	0.130	mg/kg	1.61E-05	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	5.E-06	5.62E-05	mg/kg-day	3.00E-04	mg/kg-day	0.187
		4,4'-DDT	0.005	mg/kg	5.68E-07	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	2.E-07	1.99E-06	mg/kg-day	5.00E-04	mg/kg-day	0.004
		Dieldrin	0.025	mg/kg	3.09E-06	mg/kg-day	1.60E+01	mg/kg-day $^{-1}$	5.E-05	1.08E-05	mg/kg-day	5.00E-05	mg/kg-day	0.216
		Mercury	0.36	mg/kg	4.45E-05	mg/kg-day	NA	mg/kg-day $^{-1}$	NC	1.56E-04	mg/kg-day	1.00E-04	mg/kg-day	1.557
		Total PCBs	1.80	mg/kg	2.22E-04	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-04	7.79E-04	mg/kg-day	2.00E-05	mg/kg-day	38.925
		TCDD TEQ (D/F)	0.0001	mg/kg	1.2E-08	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-03	4.33E-08	mg/kg-day	7.00E-10	mg/kg-day	61.786
Crab Ingestion	LPRSA Study Area	4,4'-DDD	0.022	mg/kg	1.6E-06	mg/kg-day	2.40E-01	mg/kg-day $^{-1}$	4.E-07	5.75E-06	mg/kg-day	3.00E-05	mg/kg-day	0.192
		4,4'-DDE	0.057	mg/kg	4.3E-06	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	1.E-06	1.49E-05	mg/kg-day	3.00E-04	mg/kg-day	0.050
		4,4'-DDT	0.0034	mg/kg	2.5E-07	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	9.E-08	8.88E-07	mg/kg-day	5.00E-04	mg/kg-day	0.002
		Dieldrin	0.0084	mg/kg	6.3E-07	mg/kg-day	1.60E+01	mg/kg-day $^{-1}$	1.E-05	2.19E-06	mg/kg-day	5.00E-05	mg/kg-day	0.044
		Mercury	0.17	mg/kg	1.3E-05	mg/kg-day	NA	mg/kg-day $^{-1}$	NC	4.44E-05	mg/kg-day	1.00E-04	mg/kg-day	0.444
		Total PCBs	0.43	mg/kg	3.2E-05	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-05	1.12E-04	mg/kg-day	2.00E-05	mg/kg-day	5.617
		TCDD TEQ (D/F)	0.0001	mg/kg	5.6E-09	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	8.E-04	1.96E-08	mg/kg-day	7.00E-10	mg/kg-day	27.991

Background (Above Dundee Dam)

Medium	Exposure Point	COC	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
			Value	Units	Intake/Exposure		CSF		Cancer Risk	Intake/Exposure		RfD		Hazard Quotient
					Value	Units	Value	Units		Value	Units	Value	Units	
Fish Ingestion	Passaic River Above Dundee Dam (empirical)	4,4'-DDD	0.0496	mg/kg	6.13E-06	mg/kg-day	2.40E-01	mg/kg-day $^{-1}$	1.47E-06	2.14E-05	mg/kg-day	3.00E-05	mg/kg-day	0.71
		4,4'-DDE	0.1145	mg/kg	1.41E-05	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	4.81E-06	4.95E-05	mg/kg-day	3.00E-04	mg/kg-day	0.17
		4,4'-DDT	0.0092	mg/kg	1.14E-06	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	3.88E-07	4.00E-06	mg/kg-day	5.00E-04	mg/kg-day	0.01
		Dieldrin	0.0327	mg/kg	4.05E-06	mg/kg-day	1.60E+01	mg/kg-day $^{-1}$	6.47E-05	1.42E-05	mg/kg-day	5.00E-05	mg/kg-day	0.28
		Mercury	0.2795	mg/kg	3.45E-05	mg/kg-day	NA	mg/kg-day $^{-1}$	NC	1.21E-04	mg/kg-day	1.00E-04	mg/kg-day	1.21
		Total PCBs	0.8822	mg/kg	1.09E-04	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.18E-04	3.82E-04	mg/kg-day	2.00E-05	mg/kg-day	19.08
		TCDD TEQ (D/F)	0.00000153	mg/kg	1.89E-10	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.83E-05	6.60E-10	mg/kg-day	7.00E-10	mg/kg-day	0.94
Crab Ingestion	Passaic River Above Dundee Dam (modeled from sediment)	4,4'-DDD	incl w/ DDT	mg/kg	--	NA	2.40E-01	mg/kg-day $^{-1}$	NC	--	mg/kg-day	3.00E-05	mg/kg-day	NA
		4,4'-DDE	incl w/ DDT	mg/kg	--	NA	3.40E-01	mg/kg-day $^{-1}$	NC	--	mg/kg-day	3.00E-04	mg/kg-day	NA
		4,4'-DDT	2.20E-02	mg/kg	1.64E-06	mg/kg-day	3.40E-01	mg/kg-day $^{-1}$	5.6E-07	5.75E-06	mg/kg-day	5.00E-04	mg/kg-day	0.01
		Dieldrin	4.60E-03	mg/kg	3.43E-07	mg/kg-day	1.60E+01	mg/kg-day $^{-1}$	5.5E-06	1.20E-06	mg/kg-day	5.00E-05	mg/kg-day	0.02
		Mercury	7.00E-02	mg/kg	5.23E-06	mg/kg-day	NA	mg/kg-day $^{-1}$	NC	1.83E-05	mg/kg-day	1.00E-04	mg/kg-day	0.18
		Total PCBs	2.10E-01	mg/kg	1.57E-05	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.1E-05	5.49E-05	mg/kg-day	2.00E-05	mg/kg-day	2.74
		TCDD TEQ (D/F)	2.70E-07	mg/kg	2.02E-11	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	3.0E-06	7.05E-11	mg/kg-day	7.00E-10	mg/kg-day	0.10

Intake Factor Adult	Fish	Crab	Units
Cancer	1.24E-04	7.46E-05	[kg-crab]/[kg bw-day]
Noncancer	4.33E-04	2.61E-04	[kg-crab]/[kg bw-day]

Acronyms:

bw = body weight
COC = contaminant of concern
CSF = cancer slope factor
D/F = dioxin/furan congeners
EPC = exposure point concentration
LPRSA = lower Passaic River study area
NA = not available
NC = not calculated
PCB = polychlorinated biphenyls
RfD = reference dose
TEQ = toxicity equivalent quotient

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Table A-5 Calculation of Human Health Incremental Hazard and Risk Results for Child and Adult Angler Exposed to Lower Passaic River Study Area Fish and Crab

Lower Passaic River Study Area OU2								
COC	Noncancer Hazard		Cancer					
	Fish	Crab	Fish			Crab		
	Child	Child	Adult	Child	Adult/Child	Adult	Child	Adult/Child
4,4'-DDD	1.76	0.34	2.05E-06	1.09E-06	3.13E-06	3.94E-07	2.10E-07	6.04E-07
4,4'-DDE	0.33	0.09	5.46E-06	2.90E-06	8.37E-06	1.45E-06	7.72E-07	2.22E-06
4,4'-DDT	0.01	0.003	1.93E-07	1.03E-07	2.96E-07	8.63E-08	4.60E-08	1.32E-07
Dieldrin	0.38	0.08	4.94E-05	2.63E-05	7.57E-05	1.00E-05	5.35E-06	1.54E-05
Mercury	2.76	0.79	NC	NC	NC	NC	NC	NC
Total PCBs	69.00	9.99	4.45E-04	2.37E-04	6.81E-04	6.42E-05	3.43E-05	9.84E-05
TCDD TEQ (D/F)	109.52	49.8	1.85E-03	9.86E-04	2.84E-03	8.40E-04	4.48E-04	1.29E-03
Totals =	**183.8**	**61.1**	**2.36E-03**	**1.25E-03**	**3.61E-03**	**9.16E-04**	**4.89E-04**	**1.40E-03**
Background (Above Dundee Dam)								
COC	Noncancer Hazard		Cancer					
	Fish	Crab	Fish			Crab		
	Child	Child	Adult	Child	Adult/Child	Adult	Child	Adult/Child
4,4'-DDD	1.27	NA	1.47E-06	7.82E-07	2.25E-06	NC	NC	NC
4,4'-DDE	0.29	NA	4.81E-06	2.56E-06	7.37E-06	NC	NC	NC
4,4'-DDT	0.01	0.02	3.88E-07	2.06E-07	5.95E-07	5.58E-07	2.98E-07	8.56E-07
Dieldrin	0.50	0.04	6.47E-05	3.44E-05	9.92E-05	5.49E-06	2.93E-06	8.43E-06
Mercury	2.14	0.33	NC	NC	NC	NC	NC	NC
Total PCBs	33.82	4.88	2.18E-04	1.16E-04	3.34E-04	3.14E-05	1.67E-05	4.81E-05
TCDD TEQ (D/F)	1.67	0.18	2.83E-05	1.51E-05	4.34E-05	3.02E-06	1.61E-06	4.64E-06
Totals =	**39.7**	**5.45**	**3.18E-04**	**1.69E-04**	**4.87E-04**	**4.04E-05**	**2.16E-05**	**6.20E-05**
Incremental (LPRSA minus Background)[a]								
COC	Noncancer Hazard		Cancer					
	Fish	Crab	Fish			Crab		
	Child	Child	Adult	Child	Adult/Child	Adult	Child	Adult/Child
DDx[b]	0.53	0.41	1.03E-06	5.49E-07	1.58E-06	1.37E-06	7.30E-07	2.10E-06
Dieldrin	Bkgd>LPRSA	0.04	Bkgd>LPRSA			4.54E-06	2.42E-06	6.96E-06
Mercury	0.62	0.46	NC	NC	NC	NC	NC	NC
Total PCBs	35.18	5.11	2.27E-04	1.21E-04	3.47E-04	3.28E-05	1.75E-05	5.04E-05
TCDD TEQ (D/F)	107.85	49.61	1.83E-03	9.71E-04	2.80E-03	8.37E-04	4.46E-04	1.28E-03
Totals =	**144.2**	**55.6**	**2.05E-03**	**1.09E-03**	**3.14E-03**	**8.75E-04**	**4.67E-04**	**1.34E-03**

Footnotes:
a = Incremental risk/hazard calculated by subtracting background risk/hazard from LPRSA risk/hazard.
b = DDx is sum of risks/hazards of DDD, DDE, and DDT.

Acronyms:
COC = contaminant of concern
D/F = dioxin/furan congeners
LPRSA = lower Passaic River study area
NC = not calculated
PCB = polychlorinated biphenyls

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Table A-6 Benthic Invertebrate Ecological Risk Assessment Exposure Modeling, Risk Characterization, and Percent Contribution Calculations

COC	Units	Sediment Benchmarks		OU2 Sediment EPC			Background EPC		Incremental	
		Upper Bound (LOAEL)[a]	Source	EPC[b]	LOAEL HQ	% LOAEL Contribution	Empirical EPC[c]	LOAEL HQ	LOAEL HQ	% LOAEL Contribution
Copper	mg/kg	94.0	USEPA, 2005	170	1.81	0.48	136	1.45	0.36	0.10
Lead	mg/kg	94.0	USEPA, 2005	240	2.55	0.67	382	4.06	-1.51	0.00
Mercury	ug/kg	480	USEPA, 2005	2600	5.42	1.42	1833	3.82	1.60	0.45
Total LPAHs	ug/kg	3200	Long et al., 1995	24000	7.50	1.97	168521	52.7	-45.2	0.00
Total HPAHs	ug/kg	9600	Long et al., 1995	45000	4.69	1.23	217481	22.7	-18.0	0.00
Dieldrin	ug/kg	2.90	USEPA, 2005	15.0	5.17	1.36	17.1	5.88	-0.71	0.00
Total DDx	ug/kg	46.0	Long et al., 1995	180	3.91	1.03	28.8	0.63	3.29	0.93
Total PCB Congeners	ug/kg	370	USEPA, 2005	2000	5.41	1.42	337	0.91	4.49	1.27
2,3,7,8-TCDD	ng/kg	3.2	Kubiac et al., 2007[d]	1100	343.75	90.41	1.13	0.35	343.40	97.24
				HI =	**380.2**	**100**		**HI =**	**353.1**	**100.00**

Data Sources:

a = Table 4-12 Sediment Benchmark Values in Louis Berger et al. (2014) Appendix D Risk Assessment; except for 2,3,7,8-TCDD (see footnote d)

b = Table 4-1 Exposure Point Concentrations (EPCs) Used in the BERA in Louis Berger et al. (2014) Appendix D Risk Assessment. Note that OU2 DDx value represents the revised sediment dataset with the Terra removal area sample removed. See report text for more details

c = Background EPCs based on empirical data (includes all surface sediment data above Dundee Dam (AECOM 2014). Values are 95UCL EPCs calculated using ProUCL.

d = 2,3,7,8-TCDD sediment benchmark is a lower bound value; Louis Berger et al. (2004) did not report an upper bound sediment benchmark for 2,3,7,8-TCDD

Notes:

Negative values for Incremental HQs mean that background > LPRSA

Acronyms:

BERA = baseline ecological risk assessment
COC = contaminant of concern
DDx = sum of DDD, DDE, and DDT.
EPC = exposure point concentration
HI = hazard index
HPAHs = high-molecular polycyclic aromatic hydrocarbons
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
LPAHs = low-molecular polycyclic aromatic hydrocarbons
NOAEL = no observed adverse effect level
PCB = polychlorinated biphenyl
UCL = upper confidence limit

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Table A-7 Fish and Crab Tissue-Based Ecological Risk Assessment Exposure Modeling, Risk Characterization, and Percent Contribution Calculations

COC	Units	CBRs		OU2 Fish and Crab Tissues			Background Fish and Crab Tissues		Incremental	
		LOAEL[a]	Source	EPC[b]	LOAEL HQ	% contribution LOAEL HQ to HI	Empirical EPC[c]	LOAEL HQ	LOAEL HQ	% contribution LOAEL HQ to HI
Forage fish (Mummichog)										
Copper[d]	mg/kg	See fish dietary exposure risk tables		--	0.45	1.69	--	0.12	0.33	1.41
Lead[d]	mg/kg	See fish dietary exposure risk tables		--	0.00	0.00	--	0.00	0.00	0.00
Mercury	ug/kg	260	Beckvar et al., 2005	65.0	0.25	0.93	125	0.48	-0.23	0.00
Total LPAHs	ug/kg	2600	Hall and Oris, 1991	93.0	0.036	0.13	60.1	0.02	0.01	0.05
Total HPAHs	ug/kg	2100	Hose et al., 1982	190	0.090	0.34	82.4	0.04	0.05	0.22
Dieldrin	ug/kg	40	Shubat and Curtis, 1986	8.40	0.21	0.78	22.0	0.55	-0.34	0.00
Total DDx	ug/kg	390	Beckvar et al., 2005	63.0	0.16	0.60	120	0.31	-0.15	0.00
Total PCBs	ug/kg	530	Lerner et al., 2007	620	1.17	4.36	853	1.61	-0.44	0.00
TCDD TEQ-Fish	ng/kg	1.8	Couillard et al., 2011	44.0	24.4	91.2	2.50	1.39	23.1	98.3
				HI =	**26.8**	**100**		**HI =**	**23.5**	**100.0**
Piscivorous Fish (Generic Fish)										
Copper[d]	mg/kg	See fish dietary exposure risk tables		--	0.30	0.21	--	0.11	0.19	0.14
Lead[d]	mg/kg	See fish dietary exposure risk tables		--	0.00	0.00	--	0.00	0.00	0.00
Mercury	ug/kg	260	Beckvar et al., 2005	240	0.92	0.65	213	0.82	0.10	0.08
Total LPAHs	ug/kg	2600	Hall and Oris, 1991	230	0.09	0.06	185	0.07	0.02	0.01
Total HPAHs	ug/kg	2100	Hose et al., 1982	130	0.06	0.04	101	0.05	0.01	0.01
Dieldrin	ug/kg	40	Shubat and Curtis, 1986	38.0	0.95	0.67	39.7	0.99	-0.04	0.00
Total DDx	ug/kg	390	Beckvar et al., 2005	320	0.82	0.58	185	0.47	0.35	0.26
Total PCBs	ug/kg	530	Lerner et al., 2007	3000	5.66	3.98	1153	2.18	3.48	2.57
TCDD TEQ-Fish	ng/kg	1.8	Couillard et al., 2011	240	133	93.8	3.24	1.80	132	96.94
				HI =	**142**	**100**		**HI =**	**136**	**100**
Blue crab										
Copper	mg/kg	12	Absil et al., 1996	24.0	2.00	3.1	7.50	0.63	1.38	2.56
Lead	mg/kg	2.6	Borgmann and Norwood, 1999	0.37	0.14	0.2	0.12	0.05	0.10	0.18
Mercury	ug/kg	95	Hook and Fisher, 2002	150	1.58	2.5	70.0	0.74	0.84	1.57
Total LPAHs	ug/kg	780	Emery and Dillon, 1996	110	0.14	0.2	17.0	0.02	0.12	0.22
Total HPAHs	ug/kg	220	Eertman et al., 1995	120	0.55	0.8	24.0	0.11	0.44	0.81
Dieldrin	ug/kg	8.0	Parrish et al., 1973	7.3	0.91	1.4	4.60	0.58	0.34	0.63
Total DDx	ug/kg	130	Nimmo et al., 1970	71.0	0.55	0.8	22.0	0.17	0.38	0.70
Total PCBs	ug/kg	26	Chu et al., 2000; 2003	360	13.8	21.5	210	8.08	5.77	10.73
2,3,7,8-TCDD	ng/kg	1.3	Wintermyer and Cooper, 2003	58.0	44.6	69.4	0.27	0.21	44.4	82.60
				HI =	**64.3**	**100**		**HI =**	**53.8**	**100**

Data Sources:

a = Table 4-13 Summary of Critical Body Residue Threshold Values for Various Ecological Receptors in Louis Berger et al. (2014) Appendix D Risk Assessment

b = Table 7-6: Exposure Point Concentrations for Baseline Conditions for the BERA in Louis Berger et al. (2014) Lower Passaic River Remedial Investigation Report

c = Fish tissue background values are based on empirical data for fish above Dundee Dam; values are 95UCL or maximum (when 95UCLs could not be calculated) EPCs calculated using ProUCL. Crab values are from Table 3-3 Summary of Estimated Whole Body Tissue Concentrations(a) for Ecological COPECs Associated with Background Conditions Louis Berger et al. (2014) Appendix E Development of PRGs.

d = Copper and lead risks evaluated using dietary modeling; see Tables A-11, A-12, and A-13 for HQ derivation information

Notes:

Background EPCs based on empirical data for fish; background EPCs are based on modeled background data from FFS (no empirical crab data above Dundee Dam)

Background EPCs for small forage fish are maximum values from n=3 samples (banded killifish, pumpkinseed, and silver shiner)

Background EPC calculated EPCs using ProUCL for data for generic fish (American eel, brown bullhead, carp, channel catfish, northern pike, smallmouth bass, white perch, and white sucker)

All concentrations are based on wet weight

LPRSA mummichog and generic fish tissues dioxin TEQ-fish values are based on 2,3,7,8-TCDD; Inspection of co-reported mammal TCDD TEQ data (Table 7-9 in the RI) indicate that incorporation of additional isomers would little effect on total fish-based dioxin TEQ

Negative values for Incremental HQs mean that background > LPRSA

Acronyms:

CBR = critical body residue
COC = contaminant of concern
COPEC = contaminant of potential ecological concern
DDx = sum of DDD, DDE, and DDT.
EPC = exposure point concentration
FFS = focused feasibility study
HI = hazard index
HPAHs = high-molecular polycyclic aromatic hydrocarbons
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
LPAHs = low-molecular polycyclic aromatic hydrocarbons
PRG = preliminary remediation goal
PCB = polychlorinated biphenyl
RI = remedial investigation
RM = river mile
TEQ = toxic equivalent
UCL = upper confidence limit

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Table A-8 Mink Ecological Risk Assessment Exposure Modeling, Risk Characterization, and Percent Contribution Calculations

Lower Passaic River Study Area OU2

COC	Generic fish		Blue crab		Sediment		Dose		Dietary TRVs			LOAEL HQ	% Contribution of LOAEL HQ to HI
	$C_{prey1, ww}$ [a]	Units	$C_{prey2, ww}$ [a]	Units	$C_{sed,dw}$ [a]	Units	C_{dose} [b]	Units	Mammal diet LOAEL [c]	Units	TRV source		
Copper	12	mg/kg	24.0	mg/kg	170	mg/kg	4.93	mg/kg bw/day	6.80	mg/kg bw/day	Aulerich et al., 1982	0.73	1.69
Lead	0.5	mg/kg	0.37	mg/kg	240	mg/kg	1.33	mg/kg bw/day	7.00	mg/kg bw/day	Grant et al., 1980	0.19	0.44
Mercury	240	ug/kg	150	ug/kg	2600	ug/kg	75.9	µg/kg bw/day	27.0	µg/kg bw/day	Wobeser et al., 1976a,b as derived in USEPA, 1995	2.81	6.55
Total LPAHs	230	ug/kg	110	ug/kg	24000	ug/kg	178	µg/kg bw/day	150000	µg/kg bw/day	Navarro et al., 1991a,b	0.0012	0.00
Total HPAHs	130	ug/kg	120	ug/kg	45000	ug/kg	261	µg/kg bw/day	3100	µg/kg bw/day	Culp et al., 2000	0.084	0.20
Dieldrin	38	ug/kg	7.30	ug/kg	15.0	ug/kg	9.10	µg/kg bw/day	30.0	µg/kg bw/day	Harr et al., 1970	0.30	0.71
Total DDx	320	ug/kg	71.0	ug/kg	180	ug/kg	77.5	µg/kg bw/day	4000	µg/kg bw/day	Fitzhugh, 1948	0.019	0.05
Total PCB Congeners	3000	ug/kg	360	ug/kg	2000	ug/kg	710	µg/kg bw/day	82.0	µg/kg bw/day	Chapman, 2003	8.66	20.19
Dioxin TEQ-Mammal	250	ng/kg	63.0	ng/kg	1200	ng/kg	66.2	ng/kg bw/day	2.20	ng/kg bw/day	Tillitt et al., 1996	30.1	70.17
											HI =	**42.91**	**100.0**

Background (Above Dundee Dam)

COC	Generic fish		Blue crab		Sediment		Dose		Dietary TRVs			LOAEL HQ	% Contribution of LOAEL HQ to HI
	$C_{prey1, ww}$ [d]	Units	$C_{prey2, ww}$ [e]	Units	$C_{sed,dw}$ [f]	Units	C_{dose} [b]	Units	Mammal diet LOAEL [c]	Units	TRV source		
Copper	5.10	mg/kg	7.50	mg/kg	136	mg/kg	2.26	mg/kg bw/day	6.80	mg/kg bw/day	Aulerich et al., 1982	0.33	4.55
Lead	0.61	mg/kg	0.12	mg/kg	382	mg/kg	2.05	mg/kg bw/day	7.00	mg/kg bw/day	Grant et al., 1980	0.29	4.02
Mercury	213	ug/kg	70.0	ug/kg	1833	ug/kg	61.4	µg/kg bw/day	27.0	µg/kg bw/day	Wobeser et al., 1976a,b as derived in USEPA, 1995	2.27	31.11
Total LPAHs	185	ug/kg	17.0	ug/kg	168521	ug/kg	885	µg/kg bw/day	150000	µg/kg bw/day	Navarro et al., 1991a,b	0.01	0.08
Total HPAHs	101	ug/kg	24.0	ug/kg	217481	ug/kg	1112	µg/kg bw/day	3100	µg/kg bw/day	Culp et al., 2000	0.36	4.91
Dieldrin	39.7	ug/kg	4.60	ug/kg	17.1	ug/kg	9.35	µg/kg bw/day	30.0	µg/kg bw/day	Harr et al., 1970	0.31	4.27
Total DDx	185	ug/kg	22.0	ug/kg	28.8	ug/kg	43.3	µg/kg bw/day	4000	µg/kg bw/day	Fitzhugh, 1948	0.01	0.15
Total PCB Congeners	1153	ug/kg	210	ug/kg	337	ug/kg	275	µg/kg bw/day	82.0	µg/kg bw/day	Chapman, 2003	3.35	45.89
Dioxin TEQ-Mammal	3.06	ng/kg	0.27	ng/kg	20.2	ng/kg	0.81	ng/kg bw/day	2.20	ng/kg bw/day	Tillitt et al., 1996	0.37	5.03
											HI =	**7.31**	**100.0**

Incremental (Background Adjusted)

COC	Incremental (Using Modeled Crab)	
	LOAEL HQ	% Contribution LOAEL HQ to HI
Copper	0.39	1.09
Lead	-0.1	0.00
Mercury	0.54	1.50
Total LPAHs	-0.005	0.00
Total HPAHs	-0.3	0.00
Dieldrin	-0.01	0.00
Total DDx	0.0085	0.024
Total PCBs	5.3	14.8
Dioxin TEQ-Mammal	29.74	82.6
HI =	**36**	**2.6**

Data Sources:

a = Table 4-1 Exposure Point Concentrations (EPCs) Used in the BERA in Louis Berger et al. (2014) Appendix D Risk Assessment. Note that OU2 DDx value represents the revised sediment dataset with the Terra removal area sample removed. See report text for more details.

b = Dietary dose (mg/kg bw/d) = (([Csw*WIR] + [Cprey*FIR] + [Csed*SIR])/bw) *SUF

FIR	0.17	kg ww/day
SIR	0.003	kg dw/day
BW	0.6	kg
SUF	1	unitless

c = Table 4-14 Summary of Toxicity Reference Values for Avian and Mammalian Wildlife Receptors in Louis Berger et al. (2014) Appendix D Risk Assessment

d = Background EPCs based on empirical data for fish above Dundee Dam. Values are 95UCL EPCs calculated using ProUCL. Background generic fish include American eel, brown bullhead, carp, channel catfish, northern pike, smallmouth bass, white perch, and white sucker

e = Table 3-3 Summary of Estimated Whole Body Tissue Concentrations(a) for Ecological COPECs Associated with Background Conditions in Louis Berger et al. (2014) Appendix E Development of PRGs; Note that the dioxin TEQ value is for 2,3,7,8-TCDD only

f = Values represent 95%UCL background surface sediment data from AECOM (2014) derived using ProUCL 5.1 software

Notes:

Diet is 80% fish and 20% crab in FFS (Louis Berger et al., 2014)

Negative values for Incremental HQs mean that background > LPRSA

Acronyms:

BERA = baseline ecological risk assessment
bw = body weight
COC = contaminant of concern
DDx = sum of DDD, DDE, and DDT.
dw =dry weight
EPC = exposure point concentration
FFS = Focused Feasibility Study
FIR = food ingestion rate
HI = hazard index
HPAHs = high-molecular polycyclic aromatic hydrocarbons
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
LPAHs = low-molecular polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SIR = sediment ingestion rate
SUF = site use factor
TEQ = toxic equivalent
TRV = toxicity reference value
UCL = upper confidence limit
WIR = water ingestion rate
ww = wet weight

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Table A-9 Heron Ecological Risk Assessment Exposure Modeling, Risk Characterization, and Percent Contribution Calculations

Lower Passaic River Study Area OU2

COC	Generic fish		Blue crab		Sediment		Dose		Dietary TRVs			LOAEL HQ	% Contribution of LOAEL HQ to HI
	$C_{prey1, ww}$ [a]	Units	$C_{prey2, ww}$ [a]	Units	$C_{sed,dw}$ [a]	Units	C_{dose} [b]	Units	Heron Resident Piscivorous Fish (Generic fish) Diet LOAEL [c]	Units	TRV source		
Copper	12.0	mg/kg	24.0	mg/kg	170	mg/kg	3.91	mg/kg bw/day	4.70	mg/kg bw/day	Kashani et al., 1986	0.83	8.32
Lead	0.50	mg/kg	0.37	mg/kg	240	mg/kg	2.16	mg/kg bw/day	1.90	mg/kg bw/day	Edens and Garlich, 1983	1.14	11.34
Mercury	240	ug/kg	150	ug/kg	2600	ug/kg	62.6	µg/kg bw/day	26.0	µg/kg bw/day	Heinz, 1974, 1976, 1979	2.41	24.05
Total LPAHs	230	ug/kg	110	ug/kg	24000	ug/kg	245	µg/kg bw/day	6700	µg/kg bw/day	Schafer et al., 1983	0.04	0.36
Total HPAHs	130	ug/kg	120	ug/kg	45000	ug/kg	411	µg/kg bw/day	480	µg/kg bw/day	Hough et al., 1993	0.86	8.56
Dieldrin	38.0	ug/kg	7.30	ug/kg	15	ug/kg	6.05	µg/kg bw/day	180	µg/kg bw/day	Wiese et al., 1969	0.03	0.34
Total DDx	320	ug/kg	71.0	ug/kg	180	ug/kg	51.7	µg/kg bw/day	27.0	µg/kg bw/day	Anderson et al., 1975	1.91	19.11
Total PCBs	3000	ug/kg	360	ug/kg	2000	ug/kg	479	µg/kg bw/day	500	µg/kg bw/day	Chapman, 2003	0.96	9.56
Dioxin TEQ-Bird	260	ng/kg	73.0	ng/kg	1200	ng/kg	51.5	ng/kg bw/day	28.0	ng/kg bw/day	Nosek et al., 1992a, 1992b	1.84	18.36
											HI =	**10.01**	**100.0**

Background (Above Dundee Dam)

COC	Generic fish		Blue crab		Sediment		Dose		Dietary TRVs			LOAEL HQ	% Contribution of LOAEL HQ to HI
	$C_{prey1, ww}$ [d]	Units	$C_{prey2, ww}$ [e]	Units	$C_{sed,dw}$ [f]	Units	C_{dose} [b]	Units	Heron Resident Piscivorous Fish (Generic fish) Diet LOAEL [c]	Units	TRV source		
Copper	5.10	mg/kg	7.50	mg/kg	136	mg/kg	2.14	mg/kg bw/day	4.70	mg/kg bw/day	Kashani et al., 1986	0.46	4.64
Lead	0.61	mg/kg	0.12	mg/kg	382	mg/kg	3.39	mg/kg bw/day	1.90	mg/kg bw/day	Edens and Garlich, 1983	1.79	18.17
Mercury	213	ug/kg	70.0	ug/kg	1833	ug/kg	49.8	µg/kg bw/day	26.0	µg/kg bw/day	Heinz, 1974, 1976, 1979	1.91	19.46
Total LPAHs	185	ug/kg	17.0	ug/kg	168521	ug/kg	1484	µg/kg bw/day	6700	µg/kg bw/day	Schafer et al., 1983	0.22	2.25
Total HPAHs	101	ug/kg	24.0	ug/kg	217481	ug/kg	1894	µg/kg bw/day	480	µg/kg bw/day	Hough et al., 1993	3.95	40.13
Dieldrin	39.7	ug/kg	4.60	ug/kg	17.1	ug/kg	6.25	µg/kg bw/day	180	µg/kg bw/day	Wiese et al., 1969	0.03	0.35
Total DDx	185	ug/kg	22.0	ug/kg	28.8	ug/kg	28.7	µg/kg bw/day	27.0	µg/kg bw/day	Anderson et al., 1975	1.06	10.82
Total PCBs	1153	ug/kg	210	ug/kg	337	ug/kg	182	µg/kg bw/day	500	µg/kg bw/day	Chapman, 2003	0.36	3.71
Dioxin TEQ-Bird	6.21	ng/kg	0.27	ng/kg	37.6	ng/kg	1.27	ng/kg bw/day	28.0	ng/kg bw/day	Nosek et al., 1992a, 1992b	0.05	0.46
											HI =	**9.83**	**100.0**

Incremental (Background adjusted)

COC	Incremental (Using Modeled Crab)	
	LOAEL HQ	% Contribution LOAEL HQ to HI
Copper	0.38	9.17
Lead	-0.65	0.00
Mercury	0.49	12.0
Total LPAHs	-0.18	0.00
Total HPAHs	-3.09	0.00
Dieldrin	-0.001	0.00
Total DDx	0.85	20.69
Total PCBs	0.59	14.44
Dioxin TEQ-Bird	1.79	43.66
HI =	**4.11**	**100**

Data Sources:

a = Table 4-1 Exposure Point Concentrations (EPCs) Used in the BERA in Louis Berger et al. (2014) Appendix D Risk Assessment. Note that OU2 DDx value represents the revised sediment dataset with the Terra removal area sample removed. See report text for more details.

b = Dietary dose (mg/kg bw/d) = (([Csw*WIR] + [Cprey*FIR] + [Csed*SIR])/BW) *SUF

FIR	0.39	kg ww/day
SIR	0.019	kg dw/day
BW	2.2	kg
SUF	1	unitless

c = Table 4-14 Summary of Toxicity Reference Values for Avian and Mammalian Wildlife Receptors in Louis Berger et al. (2014) Appendix D Risk Assessment

d = Background EPCs based on empirical data for fish above Dundee Dam. Values are 95UCL EPCs calculated using ProUCL. Background generic fish include American eel, brown bullhead, carp, channel catfish, northern pike, smallmouth bass, white perch, and white sucker

e = Table 3-3 Summary of Estimated Whole Body Tissue Concentrations(a) for Ecological COPECs Associated with Background Conditions in Louis Berger et al. (2014) Appendix E Development of PRGs

f = Values represent 95%UCL background surface sediment data from AECOM (2014) derived using ProUCL 5.1 software

Notes:

Diet is 85% fish and 15% crab in FFS (Louis Berger et al., 2014)

Modeled background blue crab EPCs as presented in Table 9-226 in Appendix D of the FFS (Louis Berger et al. 2014); note no dioxin TEQ value (value is 2,3,7,8-TCDD)

Negative values for Incremental HQs mean that background > LPRSA

Acronyms:

BERA = baseline ecological risk assessment
bw = body weight
COC = contaminant of concern
DDx = sum of DDD, DDE, and DDT.
dw =dry weight
EPC = exposure point concentration
FFS = Focused Feasibility Study
FIR = food ingestion rate
HI = hazard index
HPAHs = high-molecular polycyclic aromatic hydrocarbons
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
LPAHs = low-molecular polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SIR = sediment ingestion rate
SUF = site use factor
TEQ = toxic equivalent
TRV = toxicity reference value
UCL = upper confidence limit
WIR = water ingestion rate
ww = wet weight

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Table A-9 Herring Gull Embryo Ecological Risk Assessment Exposure Modeling, Risk Characterization, and Percent Contribution Calculations

COC	Lower Passaic River Study Area OU2										
	Prey		Dose					TRV			
	C_{prey} (Generic fish)[a]	C_{prey} (units)	BMF[b]	Diet Concentration (µg/g ww)	Dioxin TEF (avian)[c]	Lipid (g/g)[d]	C_{egg} (ug/g ww)	Bird egg LOAEL[e]	TRV units	LOAEL HQ	% Contribution of LOAEL HQ to HI
Dioxin/Furans											
2,3,7,8-TCDD	2.40E-04	ug/g ww	7.0	0.001680	1	1.305	0.002193	0.00015	ug/g ww		
1,2,3,7,8-PeCDD	2.70E-06	ug/g ww	3.3	0.000009	1	1.305	0.000012	0.00015	ug/g ww		
2,3,4,7,8-PeCDF	1.30E-05	ug/g ww	1.6	0.000021	1	1.305	0.000027	0.00015	ug/g ww		
1,2,3,6,7,8-HxCDD	5.10E-06	ug/g ww	6.0	0.000031	0.01	1.305	0.000000	0.00015	ug/g ww		
Total Dioxin/Furan TEQ							0.002232	0.00015	ug/g ww	14.88	28.29
Coplanar PCBs (not used, see total PCBs):											
PCB-77	2.90E-03	ug/g ww	6.0	0.017400	0.05	1.305	0.001135	0.00015	ug/g ww		
PCB-81	1.90E-04	ug/g ww	6.0	0.001140	0.1	1.305	0.000149	0.00015	ug/g ww		
PCB-126	2.70E-04	ug/g ww	8.0	0.002160	0.1	1.305	0.000282	0.00015	ug/g ww		
PCB-118	1.30E-01	ug/g ww	11.2	1.456000	0.00001	1.305	0.000019	0.00015	ug/g ww		
PCB-114	3.40E-03	ug/g ww	8.0	0.027200	0.0001	1.305	0.000004	0.00015	ug/g ww		
PCB-123	2.60E-03	ug/g ww	8.0	0.020800	0.00001	1.305	0.000000	0.00015	ug/g ww		
PCB-167	9.00E-03	ug/g ww	13.3	0.119700	0.00001	1.305	0.000002	0.00015	ug/g ww		
PCB-105	4.90E-02	ug/g ww	6.1	0.298900	0.0001	1.305	0.000039	0.00015	ug/g ww		
PCB-156	2.20E-02	ug/g ww	13.3	0.292600	0.0001	1.305	0.000038	0.00015	ug/g ww		
PCB-189	2.70E-03	ug/g ww	12.8	0.034560	0.00001	1.305	0.000000	0.00015	ug/g ww		
PCB TEQ							0.001668	0.00015	ug/g ww	11.12	Not used
Total PCBs	3.00	ug/g ww	11.9	35.70		1.305	46.59	1.3	ug/g ww	35.84	68.15
Dieldrin	0.04	ug/g ww	2.8	0.11		1.305	0.14	8.1	ug/g ww	0.02	0.03
Total DDx	0.32	ug/g ww	13.3	4.26		1.305	5.55	3.0	ug/g ww	1.85	3.52
									HI =	**52.59**	**100.0**

COC	Background (Above Dundee Dam)										
	Prey		Dose					TRV			
	C_{prey} (Generic fish)[f]	C_{prey} (units)	BMF[b]	Diet Concentration (µg/g ww)	Dioxin TEF (avian)[c]	Lipid (g/g)[g]	C_{egg} (ug/g ww)	Bird egg LOAEL[e]	TRV units	LOAEL HQ	% Contribution of LOAEL HQ to HI
Dioxin/Furans											
2,3,7,8-TCDD	1.188	ng/kg ww	7	0.000083	1	1.640	0.000136	0.00015	ug/g ww		
1,2,3,7,8-PeCDD	0.951	ng/kg ww	3.3	0.000031	1	1.640	0.000051	0.00015	ug/g ww		
2,3,4,7,8-PeCDF	1.329	ng/kg ww	1.6	0.000021	1	1.640	0.000035	0.00015	ug/g ww		
1,2,3,6,7,8-HxCDD	1.685	ng/kg ww	6	0.000101	0.01	1.640	0.000002	0.00015	ug/g ww		
Total Dioxin/Furan TEQ							0.000224	0.00015	ug/g ww	1.50	7.42
Coplanar PCBs (Not used, see total PCBs):											
PCB-77	1.171	µg/kg ww	6.0	0.007026	0.05	1.640	0.000576	0.00015	ug/g ww		
PCB-81	0.0673	µg/kg ww	6.0	0.000404	0.1	1.640	0.000066	0.00015	ug/g ww		
PCB-126	0.191	µg/kg ww	8.0	0.001528	0.1	1.640	0.000251	0.00015	ug/g ww		
PCB-118	62.49	µg/kg ww	11.2	0.699888	0.00001	1.640	0.000011	0.00015	ug/g ww		
PCB-114	1.492	µg/kg ww	8.0	0.011936	0.0001	1.640	0.000002	0.00015	ug/g ww		
PCB-123	1.281	µg/kg ww	8.0	0.010248	0.00001	1.640	0.000000	0.00015	ug/g ww		
PCB-167	4.144	µg/kg ww	13.3	0.055115	0.00001	1.640	0.000001	0.00015	ug/g ww		
PCB-105	23.38	µg/kg ww	6.1	0.142618	0.0001	1.640	0.000023	0.00015	ug/g ww		
PCB-156	9.903	µg/kg ww	13.3	0.131710	0.0001	1.640	0.000022	0.00015	ug/g ww		
PCB-189	0.794	µg/kg ww	12.8	0.010163	0.00001	1.640	0.000000	0.00015	ug/g ww		
PCB TEQ							0.000953	0.00015	ug/g ww	6.35	Not used
Total PCBs	1153	µg/kg ww	11.9	13.72		1.640	22.50	1.3	ug/g ww	17.31	85.81
Dieldrin	39.72	µg/kg ww	2.8	0.11		1.640	0.18	8.1	ug/g ww	0.02	0.11
Total DDx	185	µg/kg ww	13.3	2.46		1.640	4.04	3.0	ug/g ww	1.35	6.67
									HI =	**20.17**	**100.0**

Incremental (Background adjusted)

COC	Incremental	
	LOAEL HQ	% Contribution LOAEL HQ to HI
Copper	NC	--
Lead	NC	--
Mercury	NC	--
Total LPAHs	NC	--
Total HPAHs	NC	--
Dieldrin	-0.005	0.00
Total DDx	0.506	1.56
Total PCBs	18.53	57.16
Dioxin TEQ-Bird	13.38	41.28
HI =	**32.42**	**100.0**

Data Sources:

a = Table 5-1 CBR-Based Hazard Quotients for Estimated Fish Embryo Tissue - Generic Fish in Attachment 5 of the Louis Berger et al. (2014) Appendix D Risk Assessment

b = Table 5-3 Summary of Biomagnification Factors for Gull Embryo Tissue in Attachment 5 of the Louis Berger et al. (2014) Appendix D Risk Assessment

c = Table 4-4 TEQ Factors for Dioxin/Furans and Dioxin-like PCB Congeners in the BERA in Attachment 5 of the Louis Berger et al. (2014) Appendix D Risk Assessment

d = Lipids obtained from average American eel/white perch percent lipid in Lower Passaic River samples

e = TRVs from Table 6-1 Summary of Selected Critical Body Residue Values for Estuarine Macroinvertebrate, Fish and Avian Embryo Tissue in Attachment 6 of the Louis Berger et al. (2014) Appendix D Risk Assessment

f = Background EPCs based on empirical data for generic fish that include American eel, brown bullhead, carp, channel catfish, northern pike, smallmouth bass, white perch, and white sucker

g = Average lipid value for the generic fish collected above Dundee Dam

Notes:

Calculations based on approach used in in Attachment 5, Table 5-4 of Appendix D of the FFS (Louis Berger et al. 2014).
Negative values for Incremental HQs mean that background > Site

Acronyms:

COC = contaminant of interest
BERA - Baseline Ecological Risk Assessment
BMF - biomagnication factor
DDx = sum of DDD, DDE, and DDT.
FFS - Focused Feasibility Study
HI - hazard index
HPAHs = high-molecular polycyclic aromatic hydrocarbons
HQ - hazard quotient
LOAEL - Lowest observed adverse effect level
LPAHs = low-molecular polycyclic aromatic hydrocarbons
NC = not calculated
PCB = polychlorinated biphenyl
RM - River Mile
TEF - toxic equivalency factor
TEQ - toxic equivalent
TRV = toxicity reference value
ww = wet weight

References:

The Louis Berger Group. 2014 Focused Feasibility Study Report for the Lower Eight Miles of the Lower Passaic River. Produced in conjunction with Battelle, HDR, and HydroQual. Prepared for the U.S. Environmental Protection Agency, Region 2 and U.S. Army Corps of Engineers, Kansas City Division.

Table A-11 Lower Passaic River Study Area OU2 Fish Dietary Exposure Modeling Parameters, Calculations, and Results.

COC	Prey					Sediment		Dose		TRV			HQ	
	$C_{prey\ 1}$	$C_{prey\ 2}$	$C_{prey\ 3}$	Final $C_{prey,ww}$	Units	$C_{sed,dw}$	Units	Dose	Units	NOAEL	LOAEL	Units	NOAEL	LOAEL
Mummichog/forage fish	Worms (all)	NA	NA			Sediment, mudflats (all)								
Copper	11.00	-	-	11.0	mg/kg	220	mg/kg	0.908	mg/kg bw/day	1	2	mg/kg bw/day	0.91	0.45
Lead	10.2	-	-	10.2	mg/kg	320	mg/kg	0.976	mg/kg bw/day	134	--	mg/kg bw/day	0.0073	NC
White perch	Worms (all)	Blue crab	Fish (≤ 11 cm)			Sediment, sitewide								
Copper	11.00	24.00	3.1	11.8	mg/kg	170	mg/kg	0.969	mg/kg bw/day	1	2	mg/kg bw/day	0.97	0.48
Lead	10.2	0.37	2.2	7.53	mg/kg	240	mg/kg	0.714	mg/kg bw/day	134	--	mg/kg bw/day	0.005	NC
Channel catfish	Worms (all)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	11.00	24.00	3.3	8.57	mg/kg	170	mg/kg	0.585	mg/kg bw/day	1	2	mg/kg bw/day	0.6	0.29
Lead	10.2	0.37	2.8	6.75	mg/kg	240	mg/kg	0.565	mg/kg bw/day	134	--	mg/kg bw/day	0.004	NC
American eel - Small (< 50 cm)	Worms (all)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	11.00	24.00	3.3	11.5	mg/kg	170	mg/kg	1.034	mg/kg bw/day	1	2	mg/kg bw/day	**1.03**	0.52
Lead	10.2	0.37	2.8	8.48	mg/kg	240	mg/kg	0.850	mg/kg bw/day	134	--	mg/kg bw/day	0.006	NC
American eel - Large (> 50 cm)	Worms (all)	Blue crab	Fish (≤ 20 cm)			Sediment, sitewide								
Copper	11.00	24.00	4.8	11.8	mg/kg	170	mg/kg	0.718	mg/kg bw/day	1	2	mg/kg bw/day	0.7	0.36
Lead	10.2	0.37	2.1	4.50	mg/kg	240	mg/kg	0.368	mg/kg bw/day	134	--	mg/kg bw/day	0.003	NC
Largemouth bass	Worms (all)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	11.00	24.00	3.3	6.14	mg/kg	170	mg/kg	0.449	mg/kg bw/day	1	2	mg/kg bw/day	0.4	0.22
Lead	10.2	0.37	2.8	3.30	mg/kg	240	mg/kg	0.262	mg/kg bw/day	134	--	mg/kg bw/day	0.002	NC
Common Carp	Worms (FW sp. >RM4)	Blue crab	Fish (≤ 11 cm)			Sediment, sitewide								
Copper	11.00	24.00	3.1	13.1	mg/kg	170	mg/kg	0.743	mg/kg bw/day	1	2	mg/kg bw/day	0.7	0.37
Lead	10.2	0.37	2.2	8.45	mg/kg	240	mg/kg	0.638	mg/kg bw/day	134	--	mg/kg bw/day	0.005	NC
White Sucker	Worms (all)	Blue crab	na			Sediment, sitewide								
Copper	11.00	24.00	-	12.3	mg/kg	170	mg/kg	0.773	mg/kg bw/day	1	2	mg/kg bw/day	0.8	0.39
Lead	10.2	0.37	-	9.22	mg/kg	240	mg/kg	0.689	mg/kg bw/day	134	--	mg/kg bw/day	0.005	NC
White Catfish	Worms (all)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	11.00	24.00	3.3	8.57	mg/kg	170	mg/kg	0.591	mg/kg bw/day	1	2	mg/kg bw/day	0.6	0.30
Lead	10.2	0.37	2.8	6.75	mg/kg	240	mg/kg	0.570	mg/kg bw/day	134	--	mg/kg bw/day	0.004	NC
Smallmouth Bass	Worms (FW sp. >RM4)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	11.00	24.00	3.3	6.14	mg/kg	170	mg/kg	0.412	mg/kg bw/day	1	2	mg/kg bw/day	0.4	0.21
Lead	10.2	0.37	2.8	3.30	mg/kg	240	mg/kg	0.240	mg/kg bw/day	134	--	mg/kg bw/day	0.002	NC
Northern Pike	NA	Blue crab	Fish (≤ 20 cm)			Sediment, sitewide								
Copper	-	24.00	4.8	6.72	mg/kg	170	mg/kg	0.278	mg/kg bw/day	1	2	mg/kg bw/day	0.3	0.14
Lead	-	0.37	2.1	1.93	mg/kg	240	mg/kg	0.095	mg/kg bw/day	134	--	mg/kg bw/day	0.001	NC

Average HQs

COC	NOAEL	LOAEL
Mummichog/forage fish		
Copper	0.91	0.45
Lead	0.01	0.00
Generic Fish		
Copper	0.60	0.30
Lead	0.003	0.00

Dietary dose (mg/kg bw/d) = ((([Cprey*FIR] + [Csed*SIR])/bw)*SUF

Mummichog				
FIR (kg ww/day)	0.00019	Worms (all)		100%
SIR (kg dw/day)	0.0000037	na		-
BW (kg)	0.0032	na		-
SUF	1	Sediment, mudflats (all)		
White Perch				
FIR (kg ww/day)	0.0041	Worms (all)		70%
SIR (kg dw/day)	0.000041	Blue crab		0.15
BW (kg)	0.057	Fish (≤ 11 cm)		0.15
SUF	1	Sediment, sitewide		
Channel Catfish				
FIR (kg ww/day)	0.036	Worms (freshwater sp. >RM4)		0.55
SIR (kg dw/day)	0.00073	Blue crab		0.05
BW (kg)	0.74	Fish (≤ 13 cm, above RM 4)		0.4
SUF	1	Sediment, sitewide		
American eel - Small (< 50 cm)				
FIR (kg ww/day)	0.0025	Worms (all)		0.8
SIR (kg dw/day)	0.000025	Blue crab		0.1
BW (kg)	0.032	Fish (≤ 13 cm)		0.1
SUF	1	Sediment, sitewide		
American eel - Large (> 50cm)				
FIR (kg ww/day)	0.024	Worms (all)		0.35
SIR (kg dw/day)	0.00024	Blue crab		0.25
BW (kg)	0.45	Fish (≤ 20 cm)		0.4
SUF	1	Sediment, sitewide		
Largemouth bass				
FIR (kg ww/day)	0.0054	Worms (freshwater sp. >RM4)		0.1
SIR (kg dw/day)	0.000011	Blue crab		0.1
BW (kg)	0.078	Fish (≤ 13 cm, above RM 4)		0.8
SUF	1	Sediment, sitewide		
Common Carp				
FIR (kg ww/day)	0.11	Worms (freshwater sp. >RM4)		0.82
SIR (kg dw/day)	0.0033	Blue crab		0.17
BW (kg)	2.7	Fish (≤ 11 cm, above RM 4)		0.01
SUF	1	Sediment, sitewide		
White Sucker				
FIR (kg ww/day)	0.039	Worms (freshwater sp. >RM4)		0.9
SIR (kg dw/day)	0.00077	Blue crab		0.1
BW (kg)	0.79	na		-
SUF	1	Sediment, sitewide		
White Catfish				
FIR (kg ww/day)	0.037	Worms (all)		0.55
SIR (kg dw/day)	0.00074	Blue crab		0.05
BW (kg)	0.75	Fish (≤ 13 cm)		0.4
SUF	1	Sediment, sitewide		
Smallmouth Bass				
FIR (kg ww/day)	0.0089	Worms (freshwater sp. >RM4)		0.1
SIR (kg dw/day)	0.000018	Blue crab		0.1
BW (kg)	0.14	Fish (≤ 13 cm, above RM 4)		0.8
SUF	1	Sediment, sitewide		
Northern Pike				
FIR (kg ww/day)	0.11	na		-
SIR (kg dw/day)	0.00023	Blue crab		0.1
BW (kg)	2.8	Fish (≤ 20 cm , above RM 4)		0.9
SUF	1	Sediment, sitewide		

Notes:
Sediment EPCs are from Table 4-1 in Berger et al. (2014) Appendix D Risk Assessment
Prey and sediment EPCs were calculated from Site tissue data in Windward (in press-a,-b)
EPCs are 95UCLs calculated using ProUCL

Acronyms:
BW = body weight
COC = contaminant of concern
EPC = exposure point concentration
FIR = food ingestion rate
FW = freshwater
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
NA = not available
NC = not calculated
NOAEL = no observed adverse effect level
RM = river mile
SIR = sediment ingestion rate
SUF = site use factor
TRV = toxicity reference value

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Table A-12 Background Fish Dietary Exposure Modeling Parameters, Calculations, and Results.

COC	Prey					Sediment		Dose		TRV			HQ	
	$C_{prey\ 1}$	$C_{prey\ 2}$	$C_{prey\ 3}$	Final $C_{prey,ww}$	Units	$C_{sed,dw}$	Units	Dose	Units	NOAEL	LOAEL	Units	NOAEL	LOAEL
Mummichog/forage fish	Worms (all)	NA	NA			Sediment, sitewide								
Copper	1.47	-	-	1.47	mg/kg	136.3	mg/kg	0.245	mg/kg bw/day	1	2	mg/kg bw/day	0.245	0.123
White perch	Worms (all)	Blue crab	Fish (≤ 11 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	2.38	mg/kg	136.3	mg/kg	0.269	mg/kg bw/day	1	2	mg/kg bw/day	0.269	0.135
Channel catfish	Worms (all)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	1.78	mg/kg	136.3	mg/kg	0.221	mg/kg bw/day	1	2	mg/kg bw/day	0.221	0.111
American eel - Small (< 50 cm)	Worms (all)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	2.08	mg/kg	136.3	mg/kg	0.269	mg/kg bw/day	1	2	mg/kg bw/day	0.269	0.134
American eel - Large (> 50 cm)	Worms (all)	Blue crab	Fish (≤ 20 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	2.99	mg/kg	136.3	mg/kg	0.232	mg/kg bw/day	1	2	mg/kg bw/day	0.232	0.116
Largemouth bass	Worms (all)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	2.09	mg/kg	136.3	mg/kg	0.164	mg/kg bw/day	1	2	mg/kg bw/day	0.164	0.082
Common Carp	Worms (FW sp. >RM4)	Blue crab	Fish (≤ 11 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	2.50	mg/kg	136.3	mg/kg	0.268	mg/kg bw/day	1	2	mg/kg bw/day	0.268	0.134
White Sucker	Worms (all)	Blue crab	na			Sediment, sitewide								
Copper	1.47	7.5	1.49	2.08	mg/kg	136.3	mg/kg	0.235	mg/kg bw/day	1	2	mg/kg bw/day	0.235	0.118
White Catfish	Worms (all)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	1.78	mg/kg	136.3	mg/kg	0.222	mg/kg bw/day	1	2	mg/kg bw/day	0.222	0.111
Smallmouth Bass	Worms (FW sp. >RM4)	Blue crab	Fish (≤ 13 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	2.09	mg/kg	136.3	mg/kg	0.150	mg/kg bw/day	1	2	mg/kg bw/day	0.150	0.075
Northern Pike	NA	Blue crab	Fish (≤ 20 cm)			Sediment, sitewide								
Copper	1.47	7.5	1.49	2.09	mg/kg	136.3	mg/kg	0.093	mg/kg bw/day	1	2	mg/kg bw/day	0.093	0.047

Average HQs

COC	NOAEL	LOAEL
Mummichog/forage fish		
Copper	0.25	0.12
Generic Fish		
Copper	0.21	0.11

Dietary dose (mg/kg bw/d) = (([Cprey*FIR] + [Csed*SIR])/bw)*SUF

Mummichog			
FIR (kg ww/day)	0.00019	Worms (all)	1
SIR (kg dw/day)	0.0000037	na	-
BW (kg)	0.0032	na	-
SUF	1		
American eel - Large (> 50cm)			
FIR (kg ww/day)	0.024	Worms (all)	0.35
SIR (kg dw/day)	0.00024	Blue crab	0.25
BW (kg)	0.45	Fish (≤ 20 cm)	0.4
SUF	1		
White Catfish			
FIR (kg ww/day)	0.037	Worms (all)	0.55
SIR (kg dw/day)	0.00074	Blue crab	0.05
BW (kg)	0.75	Fish (≤ 13 cm)	0.4
SUF	1		
White Perch			
FIR (kg ww/day)	0.0041	Worms (all)	0.7
SIR (kg dw/day)	0.000041	Blue crab	0.15
BW (kg)	0.057	Fish (≤ 11 cm)	0.15
SUF	1		
Largemouth Bass			
FIR (kg ww/day)	0.0054	Worms (freshwa	0.1
SIR (kg dw/day)	0.000011	Blue crab	0.1
BW (kg)	0.078	Fish (≤ 13 cm, a	0.8
SUF	1		
Smallmouth Bass			
FIR (kg ww/day)	0.0089	Worms (freshwa	0.1
SIR (kg dw/day)	0.000018	Blue crab	0.1
BW (kg)	0.14	Fish (≤ 13 cm, a	0.8
SUF	1		
Channel Catfish			
FIR (kg ww/day)	0.036	Worms (freshwa	0.55
SIR (kg dw/day)	0.00073	Blue crab	0.05
BW (kg)	0.74	Fish (≤ 13 cm, a	0.4
SUF	1		
Common Carp			
FIR (kg ww/day)	0.11	Worms (freshwa	0.82
SIR (kg dw/day)	0.0033	Blue crab	0.17
BW (kg)	2.7	Fish (≤ 11 cm, a	0.01
SUF	1		
Northern Pike			
FIR (kg ww/day)	0.11	na	-
SIR (kg dw/day)	0.00023	Blue crab	0.1
BW (kg)	2.8	Fish (≤ 20 cm , a	0.9
SUF	1		
American eel - Small (< 50 cm)			
FIR (kg ww/day)	0.0025	Worms (all)	0.8
SIR (kg dw/day)	0.000025	Blue crab	0.1
BW (kg)	0.032	Fish (≤ 13 cm)	0.1
SUF	1	Sediment, sitewide	
White Sucker			
FIR (kg ww/day)	0.039	Worms (freshwa	0.9
SIR (kg dw/day)	0.00077	Blue crab	0.1
BW (kg)	0.79	na	-
SUF	1	Sediment ≥ RM 4	

Notes:

Sediment EPCs are from Table 4-1 in Berger et al. (2014) Appendix D Risk Assessment

Prey and sediment EPCs were calculated from Site tissue data in Windward (in press-a,-b)

EPCs are 95UCLs calculated using ProUCL

Acronyms:

BW = body weight
COC = contaminant of concern
EPC = exposure point concentration
FIR = food ingestion rate
FW = freshwater
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
NA = not available
NC = not calculated
NOAEL = no observed adverse effect level
RM = river mile
SIR = sediment ingestion rate
SUF = site use factor
TRV = toxicity reference value

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Table A-13 Benthic Worm Bioaccumulation Model Development for Use in Estimating Background Worm Tissue Concentrations

Species	Tissue SampleID	Sediment SampleID	Parameter	Detected Pair	Worm				Sediment				Ratio
					Result (ww)	Unit (ww)	Qual	Detect	Result (dw)	Unit (dw)	Qual	Detect	Tissue/Sediment
Estuarine worm	LPRT01A-NV	LPRT01A	Copper	Yes	1.6	mg/kg	J	Yes	122	mg/kg	J	Yes	0.013
Estuarine worm	LPRT01F-NV	LPRT01F	Copper	Yes	1.3	mg/kg	J	Yes	123	mg/kg	J	Yes	0.011
Estuarine worm	LPRT02E-NV	LPRT02E	Copper	Yes	1.2	mg/kg	J	Yes	163	mg/kg	J	Yes	0.007
Estuarine worm	LPRT04B-NV	LPRT04B	Copper	Yes	1.2	mg/kg	J	Yes	165	mg/kg	J	Yes	0.007
Estuarine worm	LPRT06C-NV	LPRT06C	Copper	Yes	1.5	mg/kg	J	Yes	95.2	mg/kg		Yes	0.016
Average Copper Tissue/Sediment Ratio for Estuarine Species located RM 0 to RM 8.3 =													0.011

Predicting background worm tissue concentrations

Description	Copper (mg/kg)	Ratio
Sediment 95UCL (background)	136.3	-
Ratio ave worm/sed (co-located) by sample	-	0.011
Predicted bkg worm using site co-located ratio	1.47	-

Summary of background fish prey EPCs

Description	Copper (mg/kg)
Max value for fish < 11 cm (empirical - silver shiner max)	1.49
Max value for fish < 13 cm (empirical - silver shiner max))	1.49
Max value for fish < 20 cm (empirical - silver shiner max))	1.49

Notes:
Ratio of estuarine worm tissue concentrations to co-located tissue from < RM 8.3 used to develop relationship between invertebrate tissue and sediment; ratio applied to empirical background data for sediment
Co-located worm and tissue data; used estuarine worm tissue data from RM 0 to RM 8.3
Empirical background sediment data co-located with worm data from LPRSA BERA (includes all surface sediment data above Dundee Dam; EPCs calculated using ProUCL
Background surface sediment data derived using ProUCL 5.1 software
Three background fish (silver shiner, banded killifish, and silver shiner) met the criteria of < 20 cm, < 13 cm, and < 11cm
Background EPCs for prey fish are maximum values for that size category (silver shiner) from Windward (in prep-a); limited data therefore could not calculate UCL and maximum concentration used

Acronyms:
dw = dry weight
EPC = exposure point concentration
Qual = qualifier
RM = river mile
UCL = upper confidence limit
ww = wet weight

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Addendum to Allocation Protocol

Prepared by Allocator in Consultation with Participating Allocation Parties
May 20, 2019

Principles to be used by the Allocation Team in estimating the mass of a COC discharged from an Allocation Party facility in absence of credible information

As noted in Step 2, Section 2(e) of the Allocation Protocol:

> "Where the Allocator determines that a lack or the nature of available information does not allow an objective determination of the mass of a COC discharged from an Allocation Party facility, the Allocator may take additional measures to obtain relevant information, including requesting additional information from the Allocation Party or requesting the assistance of EPA in obtaining additional data. Should these measures, if taken, not resolve the lack or nature of available information, the Allocator may estimate such mass utilizing a set of assumptions established in consensus with the Participating Allocation Parties, which assumptions will be described in the Final Allocation Recommendation Report. If used in recommending an Allocation Party's share, the Allocator will explain which assumptions were relied upon and how they factored into his analysis. Such assumptions may include, but not be limited to:
>
> (1) Standard operations of similar industrial facilities;
> (2) Changes in industrial operations over time;
> (3) Onsite fate and transport of COCs; and
> (4) Strength of available information."

The following is an overview of the additional measures, established in consensus with the Participating Allocation Parties (PAPs), which will be taken by the Allocation Team to obtain additional relevant information to resolve the lack or nature of available information necessary for conduct of the Allocation. These measures can be applied to determine the use, discharge, and/or mass of a COC discharged from an Allocation Party facility for purposes of the Allocation.

The Allocation Team will adhere to the following principles in seeking and utilizing such additional relevant information:

- The Allocator will make a determination on the need for additional information to resolve deficiencies due to the lack or nature of available information at or near the time that the Preliminary Facility Data Reports are made available for review by PAPs;

- Additional information determined by the Allocator as beneficial to resolving the lack or nature of available information may, at the sole discretion of the Allocator, be requested of a PAP, either by (1) a request for voluntary submission or

commitment to provide information with the PAP's expert report(s), or (2) through request to EPA for issuance of a 104(e) requiring submission of information – The Allocation Team will not undertake independent efforts to obtain such additional information;

- PAPs requested to conduct a search for additional information will adhere to a reasonable due diligence standard and schedule for information gathering in support of the Allocation as specified in the Allocation Guide;

- Any such request for additional information will include an explanation of how such information will be utilized to resolve the lack or nature of available information, including as relevant the nature of reasonable inferences to be drawn through use of the obtained information;

- The Allocator will rely on the most reliable analytical approaches in establishing inferences for use in determining an appropriate equitable allocated share - For example, if a facility has data for some but not all years of operation, such data may be more reliable to fill data gaps than relying on inferences based on the operations of other similar facilities;

- The Allocator will ensure consistency in his application of inferences – For example, if an inference is drawn regarding the fate and transport of a COC based on the nature of the COC or waterway via which it is transported, the same inference will be applied for other facilities discharging the same COC or transporting via the same waterway; and

- The Allocator will provide a succinct explanation of what inferences, if any, were utilized in the determination of an Allocation Party's allocated share as early as possible, but no later than issuance of the Preliminary Allocation Recommendation Report.

Sources of additional data requested to resolve the lack or nature of available information may include, but are not limited to, the following sources.

1. Aerial photographs
2. Sanborn Fire Insurance Maps
3. The following program files may be useful where it is clear that a party is regulated by an NJDEP program but has not provided documents related to such regulation:
    a. Site Remediation Program Files
    b. Solid and Hazardous Waste Files
    c. Water Quality/NJPDES Files
    d. Pollution Prevention – Right to Know & Release and Pollution Prevention Reports
    e. Air Quality Reports

4. Similarly, it may be that the following EPA program files may assist in determining how to fill data gaps about facility operations:
    a. Toxic Release Inventory
    b. Enforcement and Compliance History Online (ECHO)
    c. RCRAInfo
5. Passaic Valley Sewerage Commission Source Determination Reports
6. Other resources that may be useful in addressing data gaps include:
    a. Interstate Sanitation Commission Historic Reports (www.iec.nynjct.org/archive.htm)
    b. Office of Patents and Trademarks (www.uspto.gov/trademarks/index.jsp)
    c. EPA Industry Sector Notebook (archive.epa.gov/compliance/resources/publications/assistance/sectors/web/html/index-3.html)
    d. National archives (www.archives.gov/index.html)
    e. War Production Database (www.archives.gov/index.html)
    f. Hoovers Online (www.hoovers.com)
    g. National Response Center (www.nrc.uscg.mil)
    h. Securities and Exchange Commission (www.sec.gov/edgar/searchedgar/companysearch.html)
7. Kirk-Othmer Encyclopedia of Chemical Technology
8. Trade Literature
9. Killam's Heavy Metal Study from 1978

ATTACHMENT I

LIST OF PARTICIPATING ALLOCATION PARTIES

Diamond Alkali Superfund Site – Operable Unit 2
Participating Allocation Parties

1. Alliance Chemical, Inc.
2. Arkema, Inc. (Legacy Site Services)
3. Ashland Inc.
4. Atlantic Richfield Company
5. Atlas Refining, Inc.
6. BASF Catalysts LLC
7. BASF Corporation
8. Benjamin Moore & Company
9. Berol Corporation
10. Campbell Foundry Company
11. Canning Gumm LLC (c/o MacDermid, Inc.)
12. CBS Corporation (n/k/a ViacomCBS Inc.)
13. Celanese Ltd. (CNA Holdings LLC) – Doremus Ave
14. Chevron Environmental Management Company for itself and on behalf of Texaco Inc. and TRMI-H LLC.
15. Coats & Clark, Inc.
16. Congoleum Corporation
17. Conopco, Inc., d/b/a Unilever (as successor to CPC/Bestfoods, former parent of Penick Corporation)
18. Cooper Industries LLC
19. Covanta Essex Company
20. Curtiss-Wright Corporation
21. DII Industries, LLC (c/o Haliburton)
22. Elan Chemical Co., Inc.
23. El Paso (EPEC Polymers, Inc. on behalf of itself and EPEC Oil Co. Liquidating Trust)
24. EnPro Holdings, Inc. (successor by merger to Coltec Industries Inc.)
25. Essex Chemical Corporation
26. Everett Smith Group
27. Franklin-Burlington Plastics, Inc.
28. Garfield Molding Company, Inc.
29. General Electric Company
30. Givaudan Fragrances Corporation
31. Goodrich Corp. for itself and for Kalama Specialty Chemicals, Inc.
32. Goody Products, Inc. on behalf of itself and Newell Brands Inc. (f/k/a Newell Rubbermaid Inc.)
33. Hexcel Corporation
34. Hoffmann-LaRoche, Inc.
35. Honeywell International, Inc.

36. ISP Chemicals LLC
37. Kearny Smelting
38. L3Harris Technologies, Inc., successor in interest to Exelis Inc., successor in interest to the defense business of ITT Corporation
39. Leemilt's Petroleum, Inc. (successor to Power Test of New Jersey, Inc.), on its behalf and on behalf of Power Test Realty Company Limited Partnership and Getty Properties Corp., the General Partner of Power Test Realty Company Limited Partnership
40. Legacy Vulcan Corporation (f/k/a Vulcan Materials Company)
41. National Standard LLC
42. Neu Holdings (Eden Wood Corporation)
43. Newark Morning Ledger Co.
44. Nokia of America Corporation (Lucent Technologies Inc. / Alcatel-Lucent USA Inc.)
45. Okonite Company, Inc.
46. Otis Elevator Company
47. Pabst Brewing Company, LLC
48. Passaic Pioneer Properties Co.
49. Pharmacia Corporation (f/k/a Monsanto Company)
50. Pitt-Consol Chemical Company
51. PPG Industries, Inc.
52. Public Service Electric and Gas Company
53. Purdue Pharma Technologies, Inc.
54. Quality Carriers, Inc. as successor to Chemical Leaman Tank Lines, Inc. and Quality Carriers, Inc.'s corporate affiliates and parents
55. Revere Smelting and Refining Corporation
56. Safety-Kleen Envirosystems Company by McKesson, and McKesson Corporation
57. Sequa Corporation
58. Spectraserv, Inc.
59. Stanley Black & Decker, Inc. (f/k/a The Stanley Works)
60. STWB Inc. (c/o Bayer Corporation)
61. Sun Chemical Corporation
62. Tate & Lyle Ingredients Americas, Inc.
63. Teval Corporation
64. Textron Inc.
65. TFCF America, Inc. (f/k/a 21st Century Fox America, Inc.)
66. The Hartz Consumer Group, Inc., for the Hartz Mountain Corporation
67. The Newark Group, Inc.
68. The Sherwin-Williams Company
69. Tiffany and Company

ATTACHMENT J

ALLOCATION PARTY FACILITY DATA REPORTS

TFCFA America, Inc.

Diamond Alkali OU2 Allocation
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Facility Data Report

TFCF AMERICA, INC.

Facility Name, Address and Size: TFCF America, Inc. (TFCFA) formerly known as 21st Century Fox America, Inc. (21CFA), Former Montrose Chemical Company; 100 Lister Avenue, Newark, New Jersey (in some instances listed as 120 Lister Avenue, but always a physically separate property from the Diamond Alkali facility [which was adjacent to the Passaic River but not adjacent to Lister Avenue] referred to as 80-120 Lister Avenue) (PAS-00075329). The facility consisted of 2.8 acres of land comprising Lot 19 and Lot 31 (PAS-00107021; PAS-00107037). The company employed 50 employees covering three shifts (PAP-00027746).

1. **Business Type:** Initially oil refining, organic chemical production (PAS-00107038); and during certain years in the 1940s – 50s the manufacture of agricultural and chemical products such as DDT, lindane, benzene hexachloride, benzene and chloral (PAS-00057943).

2. **Time Period of Ownership/Operations**

Operator: Lot 31, between 1939 – 1972;
Lot 19, between 1952 – 1972
(PAS-00107037-38; PAP-00026385)

Owner: 1939 – 1974 (PAP-00026385)

1900s: Lister Agricultural Chemical Works developed the land between Lister Avenue and the Passaic River that included the 100 Lister Avenue site (PAP-00026384).

1930: On March 26, 1930, American Agricultural Chemical Company deeded a portion of the property (Lot 19) to Peerless Oil Company of Delaware (PAS-00123322; PAS-00123316). According to a deed from 1952, Peerless Oil Company changed their name to Richfield Oil Corporation of New Jersey (PAS-00123322).

1939: Montrose Refining Company (a predecessor of Montrose Chemical Company) acquired Lot 31 in August 1939 and began producing organic chemicals on that portion of the property (PAP-00026358-59; PAP-00026384-88).

1943: On September 30, 1943, Montrose Chemical Company of New Jersey transferred a portion of the property (Lot 31) to Montrose Chemical Company, a limited Partnership (PAP-00026357-59).

1952: Celia Bersohn deeded Lot 19 that she purchased from Richfield Oil a month earlier to Montrose Chemical Company, Inc. (PAP-00027697-98). Montrose Chemical Company, Inc. subsequently occupied both parcels.

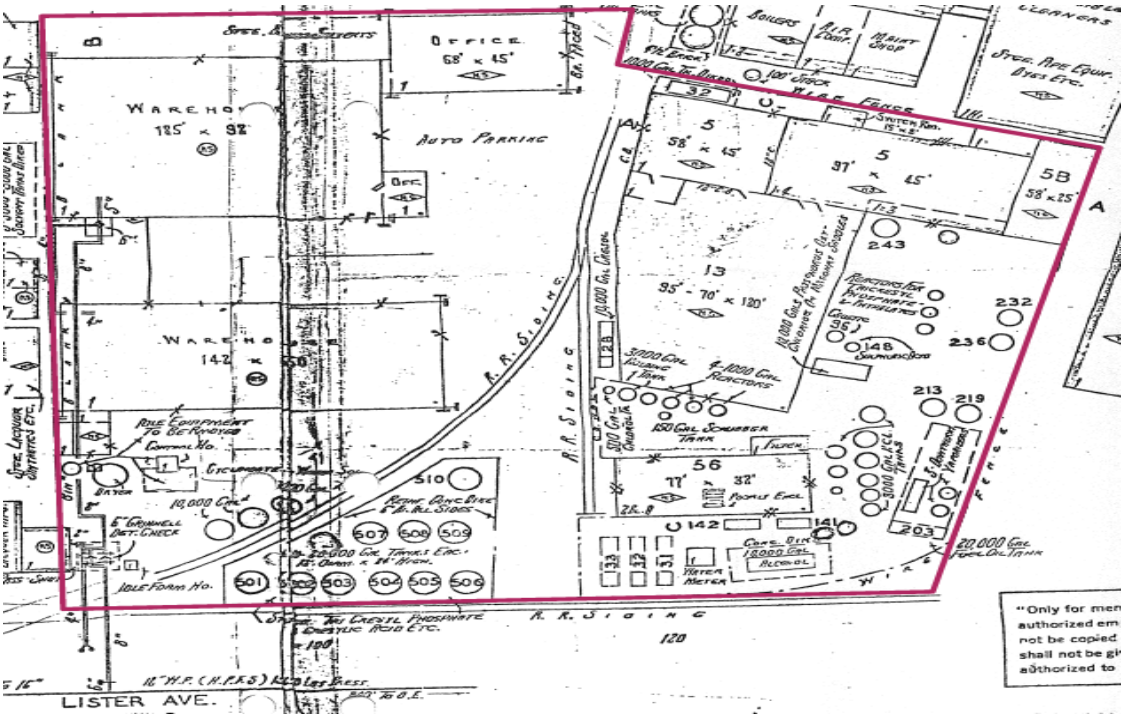
1961: Montrose Chemical Company, Inc. merged with Baldwin Rubber Company into Baldwin-Montrose Chemical Company, Inc. (PAS-00075329). Baldwin-Montrose Chemical Co. became the corporate successor of Montrose Chemical Company in 1961 (PAP-00027588). Operations proceeded over the next seven years (PAP-00026384-88).

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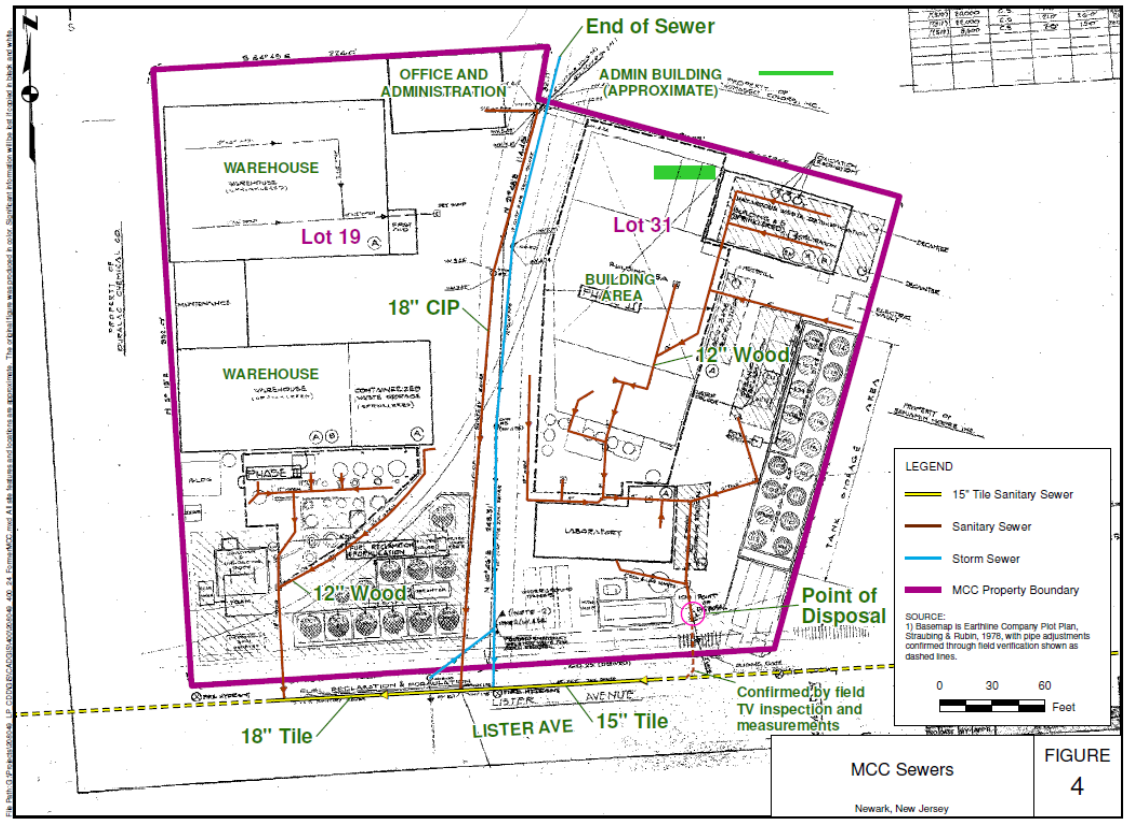
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(PAP-00027686)



(PAP-00027688)

1968: Baldwin-Montrose Chemical Company merged with Chris-Craft (PAS-00057950; PAP-00026385).

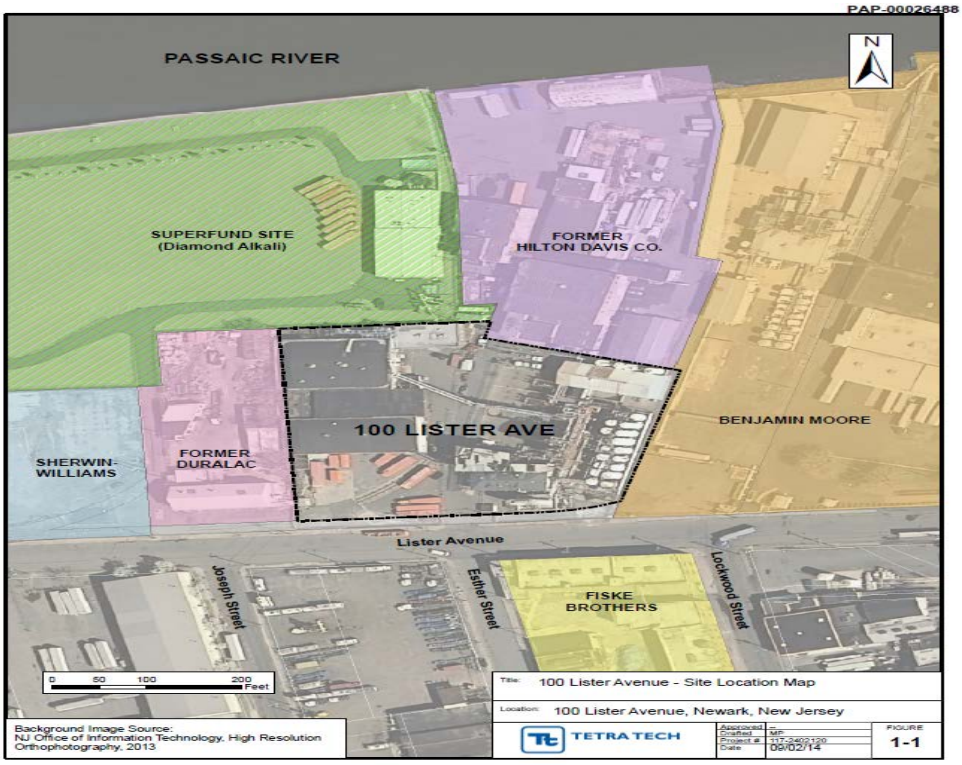
1972: Chris-Craft leased the property in 1972 to Sobin Chemicals, Inc. (PAP-00027701) and sold the property to them in 1974 (PAP-00027706). Chris-Craft ceased operations at the property in 1972 and Sobin Chemicals, Inc. operated the facility through early 1977. Between 1974 and 1977, IMC Chemical Group, Inc. became the corporate successor to Sobin, and the Newark facility operated as its Organic Chemicals Division. Operations did not significantly change, as reported by former employees (PAS-00075329).

1977: In December 1977, SCA Services of Passaic Inc. (SCA) received an interim permit from the NJDEP to construct and operate a RCRA hazardous waste facility (PAP-00026385).

1978: SCA occupied the Site in April 1978 under a lease agreement (PAP-00026385).

1984: In September 1984, SCA Services, Inc., parent company to SCA, was acquired by Chemical Waste Management (CWM) until approximately 1995 when active waste operations ended (PAP-00026385). During these years, the property housed a drum storage and decant building, liquid waste tank farms and a chemical treatment unit (PAP-0026388).

1992: Since 1992, CWM has been conducting remedial investigation and response actions under the supervision of NJDEP (PAS-00012947, 51).



3. Operational History/COC Use and Presence at the Facility

According to a June 1995 *Draft Supplemental Remedial Investigation Report*, prepared for successor site owner Chemical Waste Management of New Jersey, Inc. (CWM NJ), dated June 1995, Montrose Chemical Company's finished products consisted of pesticides, solid rocket fuel, salisaldehydes, tear gas, suntan lotion, dimethyl isophthalates, and other products (PAS-00107041). According to former Montrose Chemical Company employee Kelsey Brown, the facility produced benzene hexachloride, chloral hydrate, DDVP (Vapon, an insecticide), dimethyl-isophthalate, dioctyl-phthalate, hexachlorobenzene, tricresyl phosphate, and triphenyl phosphate. He reported Montrose began to produce malonitriles after he left in 1963 (PAS-00075288-90).

According to the June 1995 *Draft Supplemental Remedial Investigation Report*, the total plant capacity was 400,000 gallons (PAS-00107043). The majority of chemical manufacturing took place on the eastern portion of the site (Lot 31). Reaction tanks/vessels were present throughout the eastern parcel both indoors and outdoors. Warehouses and office space were located on Lot 19. A building doubling as office space and a laboratory was located in the southern portion of the eastern parcel (PAP-00026387).

DDT Production

According to the affidavit of Benjamin Rothberg, a former employee of Montrose Chemical, between 1945 and 1950 Montrose Chemical Company produced the insecticide DDT (PAP-00027863). According to an October 13, 1949 New Jersey Sales Agreement, for the period from November 1, 1949 to November 1, 1954, unless this period is extended or shortened, Montrose agrees to purchase from Montrose of California all of Montrose's requirements of technical dichlor diphenyl trichloroethane (DDT) not over 3,000,000 pounds in any twelve month period or more than 250,000 pounds of DDT in any calendar month (PAP-0035346).

According to the February 2, 1994 EPA interview of Mr. Kelsey Brown, DDT was not produced when he began working at Montrose in March 1951, although he was told by other employees that it had been made there in the 1940's. He was told that chlorination of phenols associated with DDT production caused explosions at the facility. Note: "production caused explosions at the facility" was corrected to were conducted (PAS-00075288).

According to the March 24, 1994, deposition of former employee Solomon H. Koved, who worked for Montrose Chemical Company between 1943 and 1971 (PAS-0003924), DDT production began by producing chloral from ethyl alcohol in lead and steel barrels (PAS-00004046-47; PAS-00004013-14). Chloral was used in both DDT production and 2,4 dichlorophenoxyacetic acid (2,4-D) production (PAS-00004046-49). Once produced, chloral required the removal of water and alcohol, so it had to be dried. To do so, it was placed in a 700-gallon still with a vapor line and agitated. A condenser received approximately 400-500 gallons of crude chloral that was moved to another still (PAS-00004047-48). Spent sulfuric acid was added to the still, and the mixture was agitated

and subjected to distillation temperatures estimated by Koved to be between 90 and 110 degrees centigrade. A receiver collected the relatively pure, solid chloral that was mixed with monochlorobenzene to turn it into a liquid. The mixture was sent to the back of the plant to make DDT in two or three reactors (PAS-00004048-49).

According to the March 24, 1994, deposition of former employee Solomon H. Koved, DDT is a result of a reaction between two monochlorinated benzene molecules. The purified chloral was placed into a 2,000-gallon reactor to which a "large quantity" of chlorobenzene was added (PAS-00004049). The mixture was cooled to between 5 and 15 degrees centigrade with a brine circulation jacket, 20% oleum (100% sulfuric acid and 12% SO3) was added (PAS-00004050-51). Oleum removed the water produced during the reaction. According to Koved, in an ideal situation, it would result in DDT and water, but byproducts included sulfonated benzenes (detergents) and excess spent acid that was reused (PAS-00004051-53). The spent acid was drawn off the bottom of the reactor leaving DDT in solution with monochlorobenzene. Monochlorobenzene was distilled off, and then as a solid ran into panels containing 2,000 pounds of DDT. The panels were approximately 6 feet by 10 feet, and the molten DDT cooled into a big block. DDT purity was between 95 and 98%, assessed by its melting point of 89 degrees centigrade (PAS-00004054-55). DDT was then chipped off and either sold as a powder, or it went to a tank and was turned into solution for further treatment for customers like the military (PAS-00004055-56).

According to the March 24, 1994, deposition of former employee Solomon H. Koved, grinding the DDT was very rudimentary and scattered powder. There were no containment efforts for grinding (PAS-00004069). The DDT adhered to the concrete floors, and it would be scraped off the floors and washed down into troughs (PAS-00004069). Chris-Craft believed production of DDT took place between 1945 and 1950, and at the end of the period production yielded approximately three million pounds per year (PAS-00106736-37).

Tricresyl Phosphate (TCP) Production

According to the 2017 Expert Report of Eric L. Butler, Ph.D., TCP and TPP are high-volume chemicals widely used as a plasticizer in polyvinyl chloride; as a solvent and thinner in lacquers and varnishes; as a flame retardant additive in plastics, rubbers, and hydraulic fuels; as an additive in heat exchange media; and as a lead scavenger in gasoline (PAP-00027614). According to the March 24, 1994, deposition of former employee Solomon H. Koved, TCP is made from phosphorus oxychloride and cresol that were mixed in a reactor with a catalyst (zinc chloride or aluminum chloride) and heated between 180 and 225 degrees centigrade to make a 500-gallon batch (PAS-00003959-60; PAS-00003972-73). Phosphorus oxychloride was a clear, colorless liquid that was stored in the yard on-site in sealed tanks. It was extremely corrosive and dangerous to handle (PAS-00003968-69).

According to Koved, cresol would frequently arrive in drums by tank cars or tank wagons. The drums were occasionally stored on-site for long periods of time. Intermittently the drums corroded to the point of leaking (PAS-00003967-68). Cresol was measured in a "charge tank" which was approximately 500 to 800 gallons with a line

on an observation glass for measurements. Phosphorus oxychloride was treated very cautiously due to its corrosiveness. The two storage tanks were connected to a blow case – a small underground steel vessel with a vent on the roof to release pressure (PAS-00003970). The 3-4-hour reaction produced hydrochloric acid gas in lead pipes that contained water to dilute the solution to an approximate concentration of 32% (PAS-00003974; PAS-00003959-60).

According to Koved, Montrose had a crew to replace the “chewed up” lead pipes caused by the hydrochloric acid. The solution contained traces of cresol and possibly traces of phosphorus oxychloride, as well as metals from the pipes. Approximately 1200 to 1500-gallons of spent hydrochloric acid solution was believed to be sold at a time to a trucker for further use, what did not sell and was excess byproduct production that reportedly went to the sewer (PAS-00003974-75; PAS-00003978-79).

Once the tricresyl phosphate crude was produced, it would fall to the bottom of the tank and be removed. It was then mixed with water and placed in 1,000 gallon open-topped wash tanks. There were four wash tanks made of mild steel. The operator would add equal amounts of water and wash the acid until it was neutral. Then the mixture was washed with two or three washes of alkali to remove unreacted cresol. The next step would be an oxidizing wash that used either sodium peroxide or potassium permanganate. The process took place in an aqueous medium to reduce the color that was initially lemon yellow. There were additional water washes and alkali washes in order to achieve the lightest color (PAS-00003960-61).

According to an interview summary, dated January 25, 1994, former Montrose Chemical employee Oscar Randall reported the floors were always sticky and spills occurred regularly. At times the floor was washed with caustic to remove the product (PAS-00003916). According to a RI interview summary, dated June 8, 1994, former Montrose Chemical employee Thelbert Cameron stated that “The floor of the facility was comparatively clean. There was some spillage from broken lines but we cleaned the floor at the end of each shift. The floor was pitched toward the floor drains. There were ditches in the floor that were concrete. The liquid that ran through the drains was grey, grey brown, dark grey or dark to light brown. The drains went to a holding tank at the front of the plant” (PAS-00075286). Benjamin Rothberg also stated that the floors at the facility were kept clean: “[i]n other words, any time there was any leakage, we would take care of it. And some of the leakage was not the kind of thing you could tolerate, for instance chlorine leakage is very unpleasant and so is hydrochloric acid leakage.” He stated the floors were generally just cleaned with a broom (PAP-00027766-67).

According to Koved, approximately up to 5% excess of the cheapest raw material in the wash water being discharged into the sewer (PAS-00003976). The wash water would discharge to the sewer and converge on a sewer box, which was a four-foot diameter wooden containment sunk into the ground to receive sewage or process water. The sewer box was located approximately ten feet from the north margin of Lister Avenue, and it went in the direction of Lister Avenue. Storm water could also go into the open conduits used throughout the facility to manage process water (PAS-00003962-63).

Koved also stated that during his years of employment, Montrose produced tricresyl phosphate at the facility in a thousand-gallon copper reactor that was three to four feet in diameter and about eight feet long. The reaction would decompose the copper reactor until it would spring a leak and Montrose would either repair or purchase a new one (PAS-0003979). About one and a half batches were produced per 24 hours. A batch was composed of 500 gallons of product and 500 gallons of wastewater (PAS-00003986).

2,4 Dichlorophenoxyacetic acid (2,4-D) and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) Production

According to the affidavit of Benjamin Rothberg, for about two or three years in the late 1940s or early 1950s Montrose Chemical Company produced 2,4-D (PAP-00027863). According to the March 24, 1994, deposition of former employee Solomon H. Koved, production of 2,4-D required phenol, chlorine and chloroacetic acid (PAS-00003990). Approximately 500 gallons of phenol was put into a reactor and heated to an estimated temperature of 100 degrees centigrade and chlorine was introduced until 2,4-dichlorophenol was produced (PAS-00003991-92). Koved believed at this point that dichlorophenol was treated with sodium hydroxide to create a sodium salt in solution. Chloroacetic acid was dissolved in water and the two solutions were mixed and heated to less than 100 degrees centigrade. The chlorine of the chloroacetic acid would react with the sodium of 2,4-dichlorophenylate and form sodium chloride. Sodium chloride and 2,4-dichlorphenylate would then join to form 2,4-D (PAS0003995-96). Koved explained 2,4-D was insoluble in water and was filtered from the water phase. Following the filtration process, impurities were “discarded to the sewer” (PAS-00003996). The composition of the impurities was undefined (PAS-00003966).

Mr. Koved stated that 2,4,5-T was manufactured for six months or less in the early 1950s (PAP-00027757). According to the 2017 Expert Report of Eric L. Butler, Ph.D., “ the production of 2,4,5-T has been strongly disputed by Montrose’s former Production Manager and Technical Director, Benjamin Rothberg, who worked at Montrose from the late 1930s until approximately 1966. Mr. Rothberg, a chemist, was intimately familiar with all of Montrose’s operations and production processes, and has stated that Montrose did not ever commercially produce 2,4,5-T (PAP-00027612).

According to the Expert Report, Rothberg stated:

> “I understand it has been claimed that MCC may briefly have manufactured the herbicide 2,4,5-T for a few months around 1950. I am confident, however, that we never produced 2,4,5-T. I have good recollection of the pesticides we produced, and 2,4,5-T was not among them. My recollection is corroborated by the reports prepared by the United States Tariff Commission for 1949-1951 documenting the products we have manufactured and sold. These reports were based on information Montrose provided to the Tariff Commission, and demonstrate that Montrose informed the Tariff Commission that it has produced a number of chemical products -- including TCP, DDT, 2,4-D and Lindane -- but made no mention of 2,4,5-T.” (PAP-00027612).

The Expert Report continued, "As stated by Mr. Rothberg, contemporaneous US Government reports reflect that MCC [Montrose] never manufactured 2,4,5-T. Specifically, MCC and other chemical manufacturers reported to the US Tariff Commission the chemicals they produced, and the Commission prepared an annual Report on Synthetic Organic Chemicals compiling that information…. MCC reported that it had produced chemicals pointed to by Maxus as theoretically associated with dioxins. MCC never reported having produced 2,4,5-T, in any year. On the other hand, MCC did report having produced a number of chemical products --, including TCP, DDT, 2,4-D and lindane-- but made no mention of 2,4,5-T"(PAP-00027612).

However, according to the March 24, 1994, deposition of former employee Solomon H. Koved, 2,4,5-T was produced with sodium chloride and 2,4,5-trichlorphenoxyacetic acid. The reaction and filtration processes were identical with 2,4-D (PAS-00004035-37). According to Dr. Butler, even if Montrose did briefly produce 2,4,5-T, the pesticide manufacturing process as described by Koved would have not produced dioxins and Montrose could not have produced commercial quantities of 2,4,5-T by direct chlorination of phenol. This process produces 2,4,6-TCP and not 2,4,5-TCP. Furthermore, unlike 2,4,5-TCP, 2,4,6-TCP is not associated with the formation of 2,3,7,8-TCDD (PAP-00027612-13).

Benzene Hexachloride (BHC) Production

According to Benjamin Rothberg, Montrose Chemical Company produced benzene hexachloride (BHC) for approximately three years in the early 1950s. Some of the benzene hexachloride was sold as lindane, (an isomer of BHC), some was sold as is, and other isomers underwent additional processing (PAP-00027863). According to an interview with former Montrose Chemical Company employee and research chemist, George Radan, dated April 27, 1995, the facility produced benzene hexachloride and its gamma isomer for at least ten years (PAS-00075282).

According to former employee Kelsey Brown, during the production of benzene hexachloride, alpha isomers were separated from the compound as a waste solid and stored outdoors, uncovered, on a concrete pad for a year. They were later used in the development of trichlorobenzene. Benzene used in the wash process was distilled off and stored in barrels (PAS-00075289).

4. Identified COCs

- PCBs (detected)
- Dioxins (detected)
- PAHs (generated, detected)
- Dieldrin (detected)
- DDx (generated, detected)
- Copper (detected)
- Lead (used)
- Mercury (detected)

PCBs

According to the June 1995 *Draft Supplemental Remedial Investigation Report*, a soil sample collected in 1995 from the center of the facility found Aroclor 1248. In addition, the facility had several transformers (PAS-00107118).

According to the December 18, 2001 *Potential PCB Sources to Passaic River Study Area* prepared for Chemical Land Holdings, Inc., PCB concentrations at the facility were as follows (PAS-00124566).

PCBs Concentrations (ppm)	
PCB	**Concentration**
Aroclor 1248 (service road soil)	25
Aroclor 1260 (tank of site operator)	210
Aroclor 1260 (sump system)	50

According to the 2017 Expert Report, prepared by Eric L. Butler, the service road sample was collected on May 28, 1993 from 1-3 ft bgs (PAP-00027623). According to an April 6, 1983 from SCA Chemical Services Company to NJDEP, the Tank (704) and sump system samples were collected from a Aroclor 1260 spill in 1983 (PAP-00353131-32).

Benjamin Rothberg testified that Montrose did not use or discharge PCBs at the facility (PAP-00027759; PAP-00027863). According to the December 2015 *Remedial Investigation Report*, CMI owned and operated the property as a hazardous waste treatment, storage and transfer facility from 1978 to 1995 (PAP-00026384-85). The CMI facility was known to have handled PCB-containing liquids based on the 1983 spill (PAP-00353131-33); and handled waste oils (PAP-00353059; PAP-00353117).

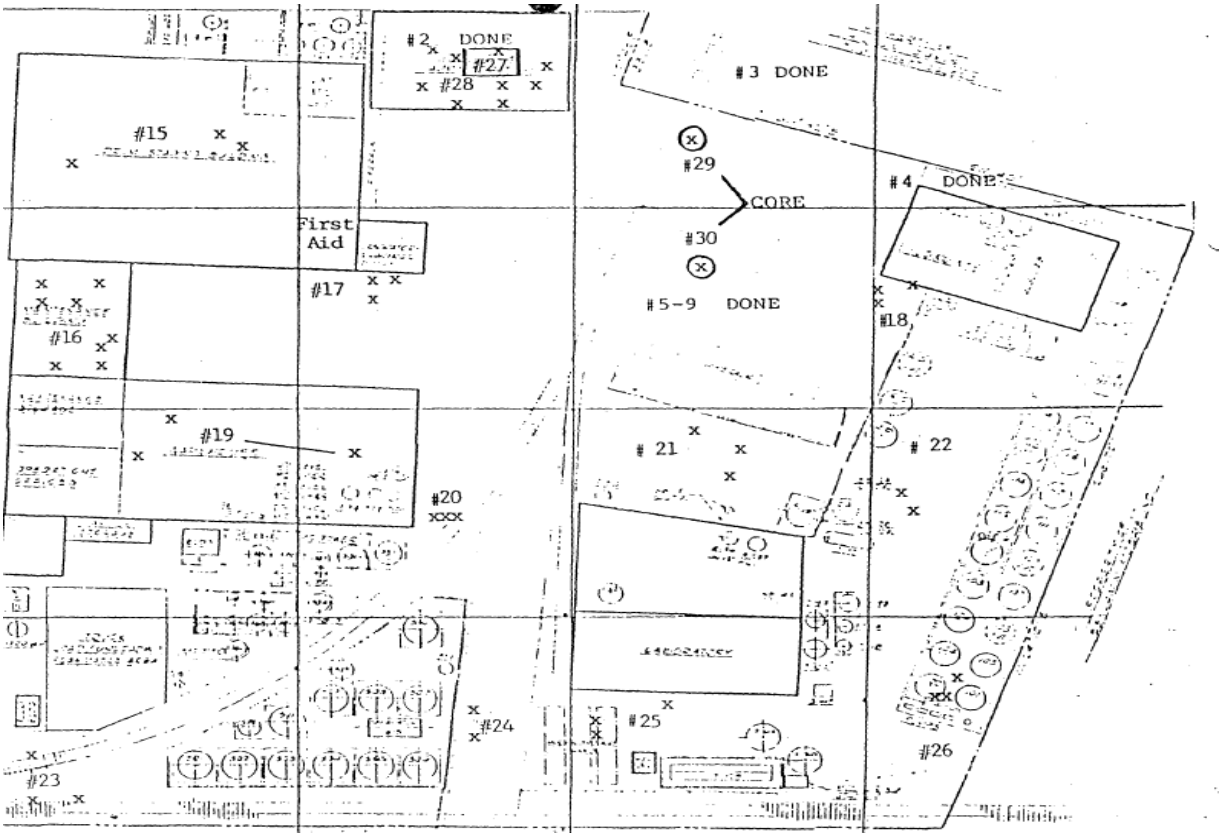
According to a document titled *The Former Montrose Chemical Company Property (100 Lister Ave.) Did Not Release or Discharge Dioxins, Furans, or PCBs to the Passaic River*, dated August 1, 2017, 50 soil and sediment samples from the property have been tested for PCBs, and only one, collected from a roadway area, tested positive. All of the sampling points closer to the Passaic River were non-detect, as were 10 sediment samples collected from on-site sumps, where run-off or waste material from operations would have concentrated (PAP-00027596). The December 2015 *Remedial Investigation Report* also reported no use of PCBs at the site and pursued no further sampling (PAP-00026459). On July 18, 2016 NJDEP reviewed and approved the *Remedial Investigation Report* (PAP-00027171; PAP-00027174) concluded that PCBs are not a site COC (PAP-00026459).

Dioxin

The December 2015 *Remedial Investigation Report* stated the herbicide 2,4-dichlorophenoxyacetic acid (2,4-D) was manufactured onsite for a period of two years in the late 1940s to approximately 1950. The herbicide 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) may have been produced as a test product only in the late 1940s. These chemicals are relevant because production of 2,4,5-T under certain conditions has been linked to the formation of dioxins. . However, the report concluded that because Montrose did not use stills, utilized different reagents, and chemistries were conducted at lower temperatures, it was not expected dioxins would be formed (PAP-00026458).

According the 2017 Expert Report prepared by Eric L. Butler, Ph. D, current 2,4-D production methods are not associated with dioxin byproducts. In light of the similarity in today's manufacturing methods and those used by Montrose, Montrose's manufacture of 2,4-D would not have produced dioxin (PAP-00027613).

A November 7, 1983, Technical Report for SCA Chemical Services prepared by Environmental Testing identified a range of 0.23 micrograms per kilogram (µg/kg) - 1.6 (µg/kg) tetrachlorodibenzo-p-dioxin in samples collected from SCA 25 (front of Lab cracks and walkway 3 spots) and SCA 22 (crack in the cement in the east drive ramp from the new pad) (PAS-00107213-14). In addition, a range of 0.36 µg/kg - 4.2 µg/kg dioxin was detected in soils collected near the SCA Office building A/C compressor (PAS-00107212). A map of sampling activities is provided below.



(PAS-00107211)

According to the December 2015 *Remedial Investigation Report*, historical sampling stated that dioxin contamination was not present in soils at the site and that dioxins detected in historical dust and sweep samples were comparable in concentration and distribution to those detected throughout the area, resulting from dispersion related to the adjacent Diamond Alkali site. In addition, it was reported that historical manufacturing processes at 100 Lister Avenue would not be expected to have resulted in generation of dioxins. Therefore, dioxins and dioxin-like compounds were not considered site COCs (PAP-00026459). On July 18, 2016 NJDEP reviewed and approved the *Remedial Investigation Report* (PAP-00027171; PAP-00027174).

According to the report of Eric L. Butler, Ph.D. dated August 1, 2017, 41 samples were collected for dioxin between 1983 and 1993 (PAP-00027604). Concentrations of dioxins were not found in soil samples, but in dust samples and ranged from 0.23 µg/kg to 15 µg/kg in 14 of the samples. All others were non-detect (PAP-00027621-22). Samples where dioxins were detected were close to the Diamond Alkali Site (PAP-00027604).

PAHs

Sampling in May and July 2001 for the *Additional Remedial Investigation* identified soil sample GP12-S1 to contain the following PAHs (PAS-00106903).

PAHs Concentrations (mg/kg)	
PAH	**Concentration**
benzo(a)anthracene	6.2
benzo(a)pyrene	9.1
benzo(b)fluoranthene	6.9
benzo(k)fluoranthene	5.8
Dibenzo(a,h)anthracene	2.7J
Indeno(1,2,3-cd)pyrene	5.9

According to the December 2015 *Remedial Investigation Report*, sample GP12 is located in the center of the facility, and the sample appears to have been collected from between 5.5-6 feet bgs (PAP-00026497).

According to the December 2015 *Remedial Investigation Report*, soil sample DUP-CWM-1-2 collected between 4.5-5 feet bgs on July 12, 2013 contained the following (PAP-00026528).

PAHs Concentrations (mg/kg)	
PAH	**Concentration**
benzo(a)anthracene	25
benzo(a)pyrene	23
benzo(b)fluoranthene	31
benzo(k)fluoranthene	13
Dibenzo(a,h)anthracene	2.2
Indeno(1,2,3-cd)pyrene	6.7

According to the June 1995 *Draft Supplemental Remedial Investigation Report*, PAHs in Historic Fill resulted from commercial production from coal tar in the 1800s at coal gasification plants active at the time. The concentration of PAHs in surficial fill material was found at concentrations “mostly below standards,” but their collective existence reportedly proved that coal-related materials used as fill are a common source of PAH contamination (PAS-00107110-11).

The December 2015 *Remedial Investigation Report* confirmed benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and other PAHs were considered to be due to Historic Fill at the site. These PAHs were to be addressed in a Deed Notice for soils (PAP-00026451).

The site lies atop Lister's Agricultural Chemical Works, which occupied all the land between Lister Avenue and the Passaic River prior to 1900. It is reported that a site plan map of the company shows an asphaltum plant active in 1914. Asphaltic compounds may be responsible for PAHs at the facility (PAS-00107111).

Dieldrin

Soil samples collected in 1995 for the June 1995 *Draft Supplemental Remedial Investigation Report* showed an estimated concentration of 0.23 mg/kg dieldrin was found in soil sample 100S83RE (PAS-00107171). This sample was collected between 8 and 10 feet below ground surface (bgs) from Area of Concern C (PAS-00107144). Area of Concern C was the truck loading/unloading area on the eastern side of the facility (PAS-00107058).

Soil sampling conducted in 1993, prior to the 2015 *Remedial Investigation Report* found 40 mg/kg dieldrin in sample ABUST S1 collected between 0.5-2.5 feet bgs in the southeastern corner of the site (PAP-00026610, 6495).

According to the June 2017 *Remedial Action Selection Report/Remedial Action Work Plan*, dieldrin was not detected in any monitoring well in 2016; therefore, its extent was delineated (PAP-00027223).

DDx

According to the affidavit of Benjamin Rothberg, a former employee of Montrose Chemical, between 1945 and 1950 Montrose Chemical Company produced the insecticide DDT (PAP-00027863).

Soil samples collected in January and February 1995 for the June 1995 *Draft Supplemental Remedial Investigation Report* showed the following DDx concentrations (PAS-00107170).

DDx Concentrations (mg/kg)								
COC	**S8-1**	**S8-1 DL**	**S8-1 RE**	**S8-1 RE DL**	**S8-2**	**S8-2 DL**	**S8-2 RE**	**S8-2 RE DL**
4,4'- DDD	250	280	510	700	0.043		0.57	0.76
4,4'- DDE	130	130	220	260	0.019		0.32	0.31
4,4'- DDT	9,100	9,200	11,000	15,000	0.95	0.84	19	24

The samples came from Area of Concern A (east-southeast portion of the site) comprised of the Laboratory, Aboveground Storage Tank, and the 100 Series Tank Farm. Surficial fill material was collected in sample 100-S8-1 at an interval of 10 feet bgs and sample 100-S8-R was collected at 8 feet bgs (PAS-00107084, 148).

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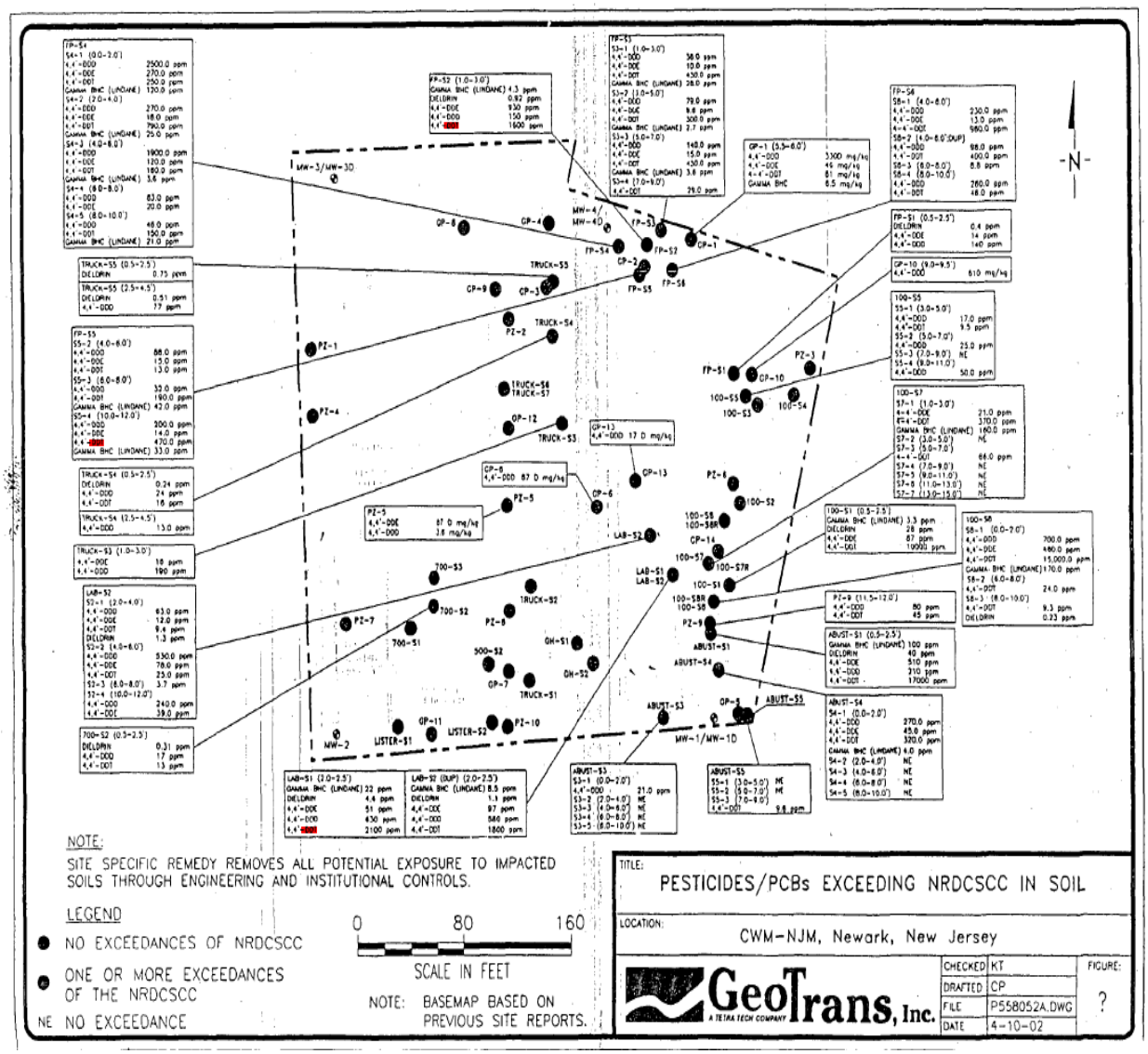
Soil samples collected for the *Additional Remedial Investigation and Remedial Action Selection Report* revealed the following DDx concentrations (PAS-00106906-09).

DDx Concentrations (mg/kg)						
COC	**PZ-05**	**PZ-05 DL**	**PZ-09**	**PZ-09 DL**	**GP1-S1**	**GP1-S1 DL**
4,4'- DDD	35E	67D	80	66J	360E	330D
4,4'- DDE	3.6	3.4 DJ	5.7J	5.9J	46	37J
4,4'- DDT	0.23J	ND	45	47J	61	47J

J: Indicates and Estimated Value for TICS

E: Estimated Value- Analyte concentration exceeds the calibration range

Soil sample locations are provided below (PAS-00106954).



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Soil samples collected for the December 2015 *Remedial Investigation Report* detected the following max pesticide soil concentrations (PAP-00026613):

DDx Concentrations (mg/kg)				
COC	**Affected Media**	**Max Detection**	**Sample**	**Date**
4,4'- DDD	Soil/ GW	2,500	FP-S4 (0.5'-2')	Feb. 1995
4,4'- DDE	Soil/ GW	510	ABUST-S1 (0.5'-2.5')	May 1993
4,4'- DDT	Soil/ GW	17,000	ABUST-S1 (0.5'-2.5')	May 1993

According to the maps at the end of this section sample FP-S4 was collected in the northeastern part of the facility and ABUST-S1 was collected from the southeastern corner (PAS-00027128).



The 2015 *Remedial Investigation Report* states that impacts to soil above applicable standards are generally limited to the shallow (0-4 feet bgs) unsaturated zone and from there to just above the Meadow Mat or the upper portion of the Meadow Mat zone (PAP-00026462).

Metals – Copper Lead and Mercury

Lead piping was utilized in TCP production (PAS-00003974; PAS-00003959-60). According to the March 24, 1994, deposition of former employee Solomon H. Koved, Montrose had a crew to replace the "chewed up" lead pipes caused by the hydrochloric acid. The solution contained traces of cresol and possibly traces of phosphorus oxychloride, as well as metals from the pipes (PAS-00003974-75; PAS-00003978-79).

According to the June 1995 *Draft Supplemental Remedial Investigation Report,* copper was detected in the Rail Containment Excavation (Area 1 & 2) in 1990 (48 mg/kg), in the Trench Excavation Project 6A/6B (east-southeast portion of the site) (281 mg/kg) and in the center storm drain composite sample (136 mg/kg) (PAS-00107134).

The maximum mercury concentration in surficial fill shown in the June 1995 *Draft Supplemental Remedial Investigation Report* was 3.6 mg/kg in sample S-1 collected from the Trench Excavation Project 6A/6B (PAS-00107134).

According to the June 1995 *Draft Supplemental Remedial Investigation Report,* lead was detected in the Rail Containment Excavation (Area 1 & 2) in 1990 (671 mg/kg), in the Trench Excavation Project 6A/6B (east-southeast portion of the site) (378 mg/kg) and in the center storm drain composite sample (102 mg/kg) (PAS-00107134).

The 2015 *Remedial Investigation Report* cited an NJDEP letter, dated November 29, 1994 from the New Jersey Department of Environmental Protection (NJDEP) that confirmed metals contamination at the site is most likely due to fill material from local coal gasification plants that were placed in the original marshlands and was not a focus of subsequent RI activities (PAP-00026408). Sampling results generally showed the highest concentrations of contamination on the eastern half of the site (PAP-00026387).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the Environmental Protection Agency (EPA) Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00107134; PAP-00026528; PAS-00106903).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	671 mg/kg
Mercury	281 mg/kg
Benzo(a)anthracene	3.6 mg/kg
Benzo(a)pyrene	25 mg/kg
Benzo(b)fluoranthene	23 mg/kg
Benzo(k)fluoranthene	31 mg/kg
Dibenzo(a,h)anthracene	13 mg/kg
Indeno(1,2,3-cd)pyrene	2.2 mg/kg

According to the December 2015 *Remedial Investigation Report*, the surficial fill at the site consists of a mixture of coal ash, construction debris, and soil that was used to stabilize and raise the topographic grade of the marshlands along the Passaic River to allow for development in the late 1800s. It was reported that this regional imported Historic Fill material is the source of several site contaminants including certain PAHs and metals (PAP-00026450).

The fill is typically present from the surface (immediately beneath any impervious site cover) to a depth of seven to ten feet bgs, though fill has been observed as deep as 14.5 feet bgs. The fill is characterized as silt, sand, and gravel, dark brown to black in color, with concrete debris, red brick debris, wood chips/pieces, and slag variously present; olive green-stained gravel and concrete have also been identified in samples. Local groundwater is also impacted as a result of the presence of these Historic Fill contaminants (PAP-00026450).

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Combined Sanitary and Storm Sewer

According to the deposition of Benjamin Rothberg dated February 23, 2011, material remaining after the washing processes flowed into two tanks located between the office building (Building 56) and the railroad tracks. The tanks further separated material with an agitation/settling process before discharging it to the city sewer. He also stated that building floor troughs flowed into the two separators or trap tanks (PAP-00027761-62, 771, 778). Rothberg described floor washings that occurred once a week in some areas and possibly every four to five hours in other areas were flushed into acid-proof brick or ceramic tile lined trap tanks (PAP-00027771, 802). Although most of the troughs were located inside production buildings in the tricresyl area, there was an outdoor trench (PAP-00027828-29).

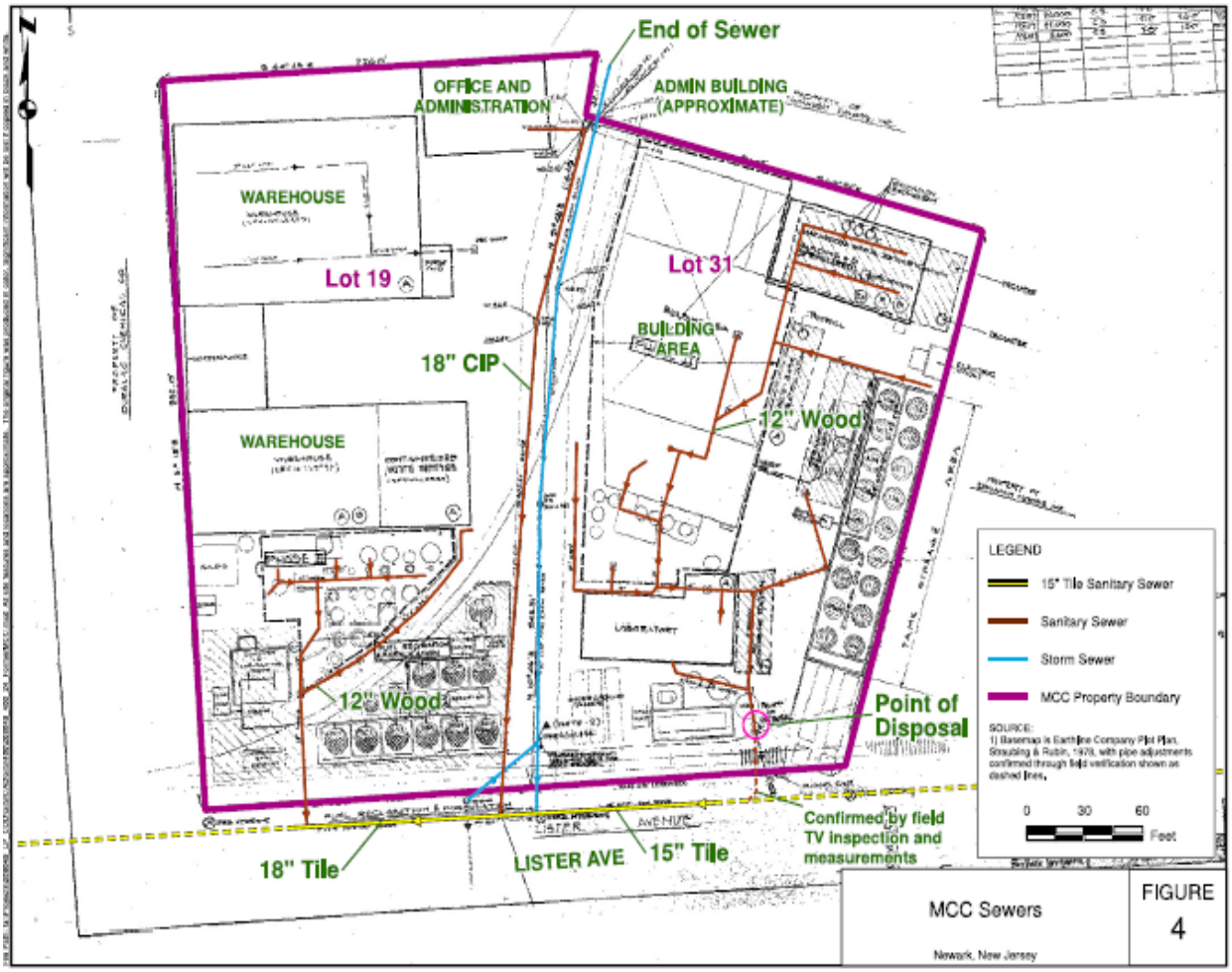
According to the deposition of Solomon Koved dated March 24, 1994, cement floor troughs in process areas exited the building underground. The troughs carried process water, spills, cooling water from condensers or cooling reactors, steam condensation, and other liquid (PAS-00004073). The troughs ran underground at the building's boundary approximately 25 feet to a 4-foot diameter sewer box. The sewer then ran toward Lister Avenue (PAS-00003962; PAS-00004076). Koved further explained that two lines entered the sewer box underground (i.e., the sanitary sewer and the process waste) (PAS-00004083).

Koved stated he discovered the convergence of the sewer with the sewer box when the ground started sinking, and they excavated to find the sewer line had deteriorated. He described the sewer line as likely a 10-inch line that required replacement as the ground continued to sink due to material deteriorating the pipes. Finally, a wooden pipe was manufactured that never deteriorated (PAS-00004085).

According to the report of Michael F. Domenica, P.E, dated August 1, 2017, the sanitary sewer line under Lister Avenue flowed westward and connected directly to the PVSC Newark Bay Waste Water Treatment Plant (NBWWTP) via the Brown Street Branch Interceptor (BSBI). The BSBI was constructed in 1921 and conveyed all its flow to the NBWWTP. Sewage in the BSBI did not discharge to the Passaic River, even during storm events. There was no hydraulic connection that would allow flow from the BSBI to discharge to the Brown Street Combined Sewer Overflow (CSO) (PAP-00027671).

According to a letter from the EPA to Chris-Craft, dated March 13, 1996, when Earthline Company (which occupied the facility in 1977) applied for a sewer connection permit in 1977, one of the stipulations was that the "known illegal cross connection between the storm sewer and sanitary sewer on Lister Avenue…be eliminated prior to commencing operations" (PAS-00003913). The application itself documented the stipulation that Earthline shall provide sanitary sewerage and storm drainage facilities that prevents spilled material from entering municipal sewers. The design required the installation of a special valve to remain closed during dry weather and opened only to allow drainage of storm water runoff (PAS-00106777). According to the Export Report of Michael F. Domenica, P.E., dated August 1, 2017, although the available evidence is incomplete, it

implies that the “cross connection” was the storm sewer under the service road between Lots 31 and 19 and was connected to the 1970 sanitary sewer under Lister Avenue. The result of such a connection would have been to direct stormwater from the service road to the BSBI and Newark Bay Waste Water Treatment Plant, not to the Passaic River (PAP-00027672). This storm sewer line is available below.

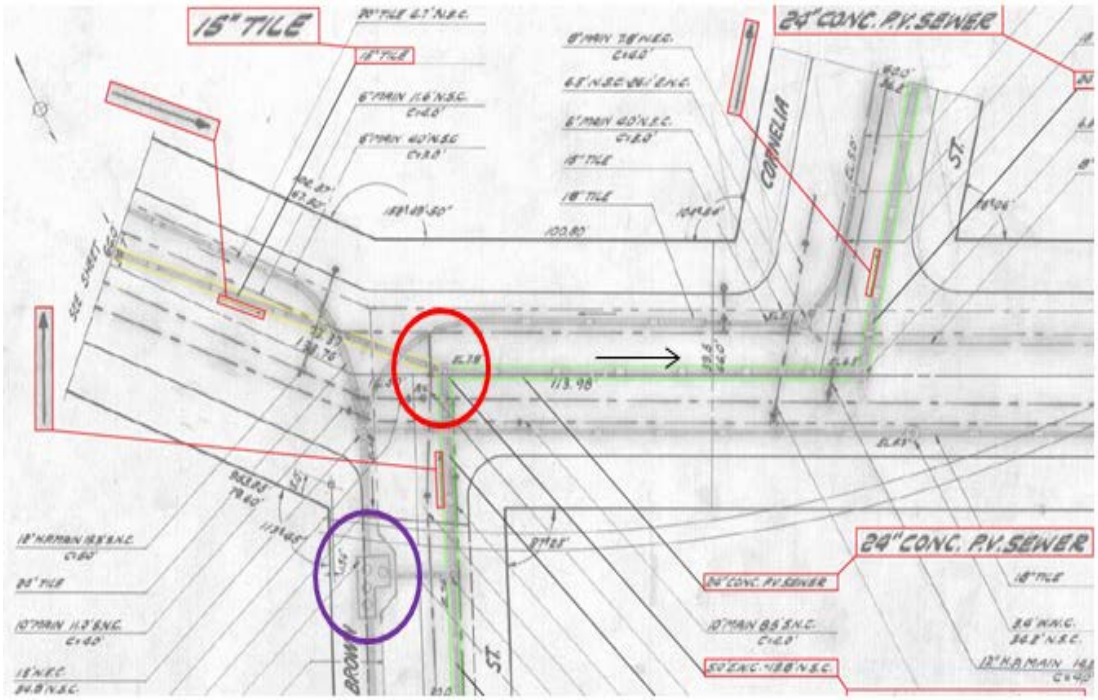


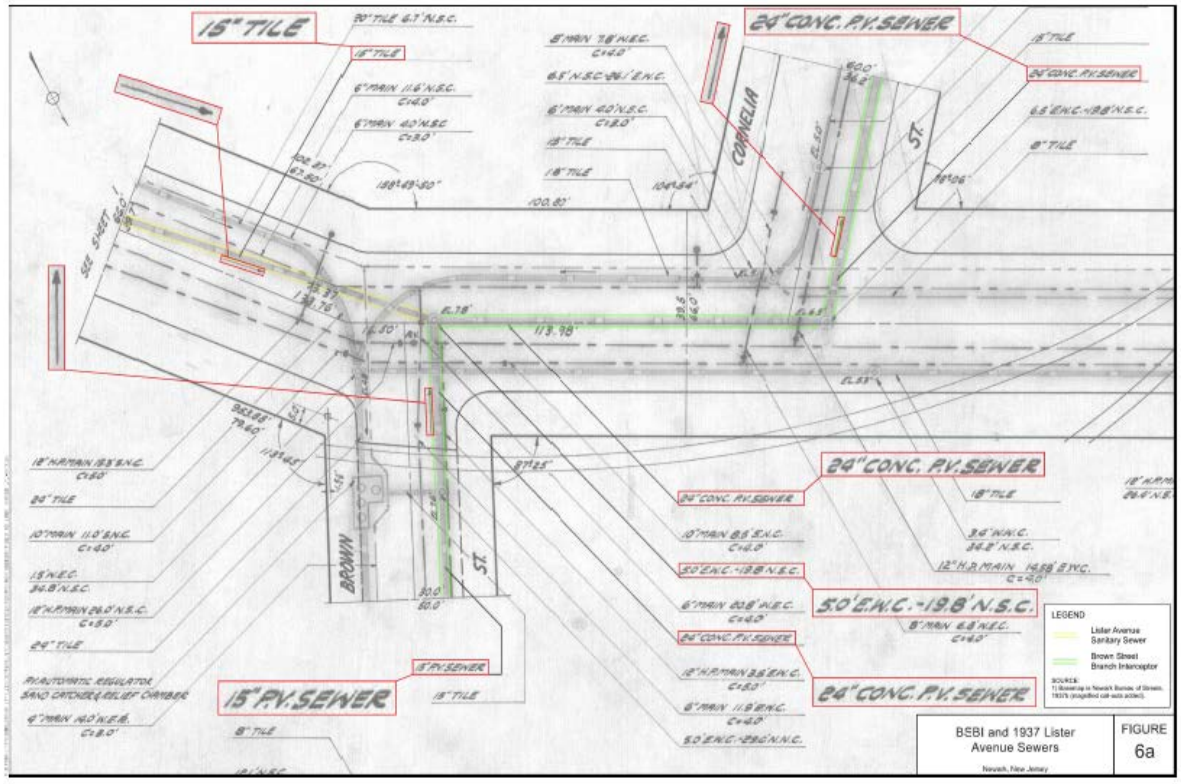
(PAP-00027688)

According to the Brown Street Branch Interceptor Evaluation, dated July 1981, and prepared by Clinton Bogert Associates for PVSC, the combined discharge system in the area bounded by Chapel, Lister, Lockwood Streets and Raymond Boulevard discharged into a 24-inch section of the Brown Street Branch Interceptor. The Evaluation states that “When the interceptor was completed, a regulator was constructed at the Brown Street to permit bypassing of excessive wet weather flows” (PAP-00056472).

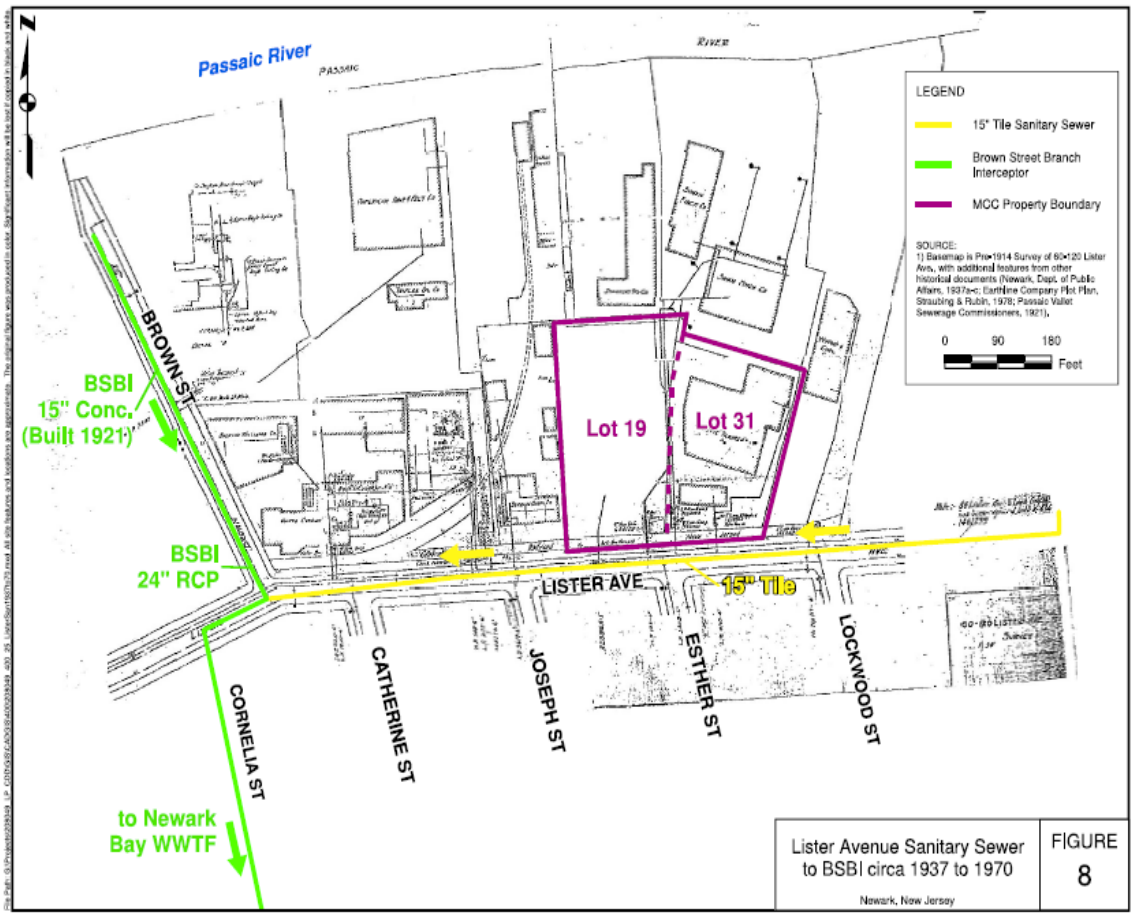
TFCFA America, Inc.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report





(PAP-00027691)



(PAP-00027693)

According to the December 18, 2001 *Potential PCB Sources to Passaic River Study Area Volume 1,* prepared for Chemical Land Holdings, Inc. by EI Group, Inc., during wet weather, overflow discharged through the Brown Street regulator to the Passaic River until the regulator was sealed in approximately 1970 (PAS-00124570). According to the Brown Street Branch Interceptor Evaluation, separating the storm from sanitary sewer systems was completed between the 1930s and 1970s (PAP-00056472).

The Expert Report of Michael F. Domenica, P.E. dated August 1, 2017, stated that the detailed historical engineering drawings published in 1937 by the Newark Department of Public Affairs, show that when MCC commenced operations in 1939, a single 15-inch sanitary sewer existed under Lister Avenue in front of the Property, and flowed to the west. This is the sanitary sewer line to which Montrose's process wastewaters were discharged from 1939 until the line was replaced in 1970. The sanitary sewer line beneath Lister Avenue (to which the facility discharged) was connected to the BSBI (PAP-00027677).

The BSBI eliminated discharges of sanitary sewage to the Passaic River at Brown Street during dry weather. During storm events, overflows from remaining combined sewers continued to occur at the Brown Street CSO until the full-scale sewer separation project

completed in 1970 eliminated all overflows to the Brown Street CSO. However, as shown above, the sanitary sewer on Lister Avenue serving the MCC operations at the Property discharged to the BSBI beginning in or before 1937, and did not connect to any combined sewers and, thus, did not contribute sanitary wastewater to the Passaic River (PAP-00027678).

The Expert Report of Michael F. Domenic stated that the BSBI was separate from the Brown Street CSO. Although, the 15-inch sanitary sewer line under the northern side of Lister Avenue (to which Montrose discharged its process wastewaters) was connected directly to the BSBI (and then to the Newark Bay Waste Water Treatment Plant), a second combined sewer line ran under a portion of the southern side of Lister Avenue and connected to the Brown Street CSO. In particular, the 1937 drawings show that, under a portion of the southern side of Lister Avenue, beginning just west of Lot 31, a 15-inch tile sewer line was located to the south of the 15-inch sanitary sewer. This second sewer line was a combined sanitary and storm sewer that drained the area south of Lister Avenue (but not the area north of Lister Avenue, where the Property was located). This combined sewer line connected to the Brown Street CSO, via the Brown Street Regulator. The regulator is shown on the east side of Brown Street, just north of the intersection with Lister Avenue. All dry weather wastewater flows and combined wastewater and stormwater from small rain storms were directed by the Brown Street Regulator to the BSBI. Due to high flows during large storms, a portion of the combined sewer flows would overflow the regulator and be released to the Brown Street CSO. However, there was no opportunity for flow from the 15-inch sanitary line under Lister Avenue, to which Montrose discharged, to be released to the Brown Street CSO because the sanitary sewer under Lister Avenue connected directly to the BSBI downstream of the connection to the Brown Street Regulator (PAP-00027679).

Direct Discharge

According to a summary of an interview with Oscar Randell who worked for Montrose Chemical Company at Lister Avenue between 1951 and 1977, a 4-inch outflow pipe ran directly to the Passaic River. He personally observed tricresyl phosphate wash water discharge into the outfall pipe that discharged directly into the Passaic River. At one time in 1957/58, he saw the entire run of product (approximately 2,000 gallons) discharge into the Passaic River. No incident report was made, but the worker was fired (PAS-00003915-16).

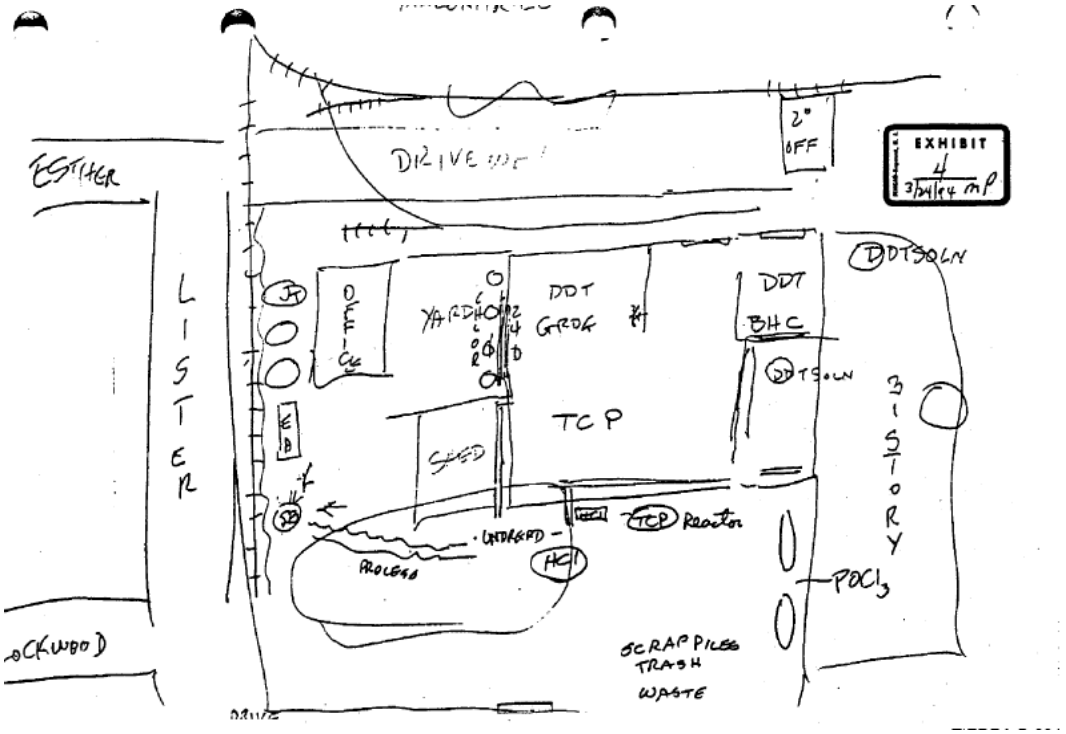
Randell also signed an affidavit dated July 21, 1993, stating that the sewer lines discharged into the Passaic River between 1952 and 1977 or 1978 at the end of the facility driveway on the former Thomasett property. Process water batches would discharge in volumes of 5,000 to 10,000 gallons at a time, and it was reported that they would have to meter the flow so it would not cause back-ups into other sewer trenches on the facility. The discharge lines to the river were sealed after the facility was acquired by IMC Chemicals Group in 1978 (PAS-00106689). The Montrose Chemical Company Facility was located 650 feet south of the Passaic River (PAS-00107021).

According to the interview of Randell dated January 25, 1994, he and other workers would routinely dump five-gallon pails of waste cresol into the Passaic River (PAS-00003917).

According to Benjamin Rothberg's February 21, 2006 Affidavit, there were no pipes discharging from the facility to the river and it made no sense for employees to hand carry buckets of process waste to the river. He never observed nor had any other knowledge of any employees carrying buckets of waste from the facility across the neighboring properties to the river. Employees were not instructed to dump wastes into the river, which was not visible from the plant, and he never saw or heard about anyone having done so (PAP-00027867-68). "I cannot conceive of any reason that anyone would have done such a thing, when the troughs and other disposal areas at the facility provided a ready means for waste disposal and were within approximately fifteen feet of any location within the facility. Nor was waste cresol, which Mr. Randell said was in the buckets, generated at the Newark Plant." (PAP-00027868).

According to the deposition of Benjamin Rothberg dated February 21, 2006, process wastewater was directed to the pre-existing sanitary sewer line with had been installed beneath Lister Avenue long before MCC [Montrose] began using the facility (PAP-00027865). Any spills from production operations, to the extent they could not be recovered and processed, would have been directed to tile-lined troughs in the floor. These troughs were connected to recovery trap tanks, and only after passing through these tanks did the effluent go to the PVSC (PAP-00027866). Rothberg also stated in his February 23, 2011 deposition that there was no accident in the 1950s in which TCP was discharged to the river, and that any such accidental discharge "would have wound up in the ditch –not – acid-lined trenches and eventually wound up in two separator tanks and eventually into the sewer" (PAP-00027770). In addition, Rothberg reported rainwater wound up just overflowing the property and going to Lister Avenue where it would go down the storm drain, or it would go into ditches and wind up in trap tanks by the Office Building before it went to the sewer (PAP-00027767, 771).

According to the March 24, 1994 Solomon Koved Deposition, Mr. Koved, who worked in production according to Mr. Radan (PAS-00075281), "our sewers came together -- most of them were surface troughs, so if there was any spillage, it could be squeegeed into the trough, and so was the process water conducted to the troughs. And there were -- there was a network of troughs around the plant, and they all -- they didn't all come together. They would join one another, and I know in a general way the configuration of the troughs, but eventually, went underground -- and for a short distance and emerged in what we refer to as a sewer box, which was a four-foot diameter wooden containment that was sunk into the ground to receive sewage or process water, and it included -- the sanitary waste from the office building all joined in the sewer box, which was approximately ten feet from the north margin of Lister Avenue, and it went in the direction of Lister Avenue" (PAS-00003962-63). The "sewer line would have to take a u-turn not to go to Lister Avenue, which was very unlikely" (PAP-00004091).



(PAS-0004113)

Mr. Koved additionally stated “All process waste went to the sewer if it was liquid and to a waste pile if it was solid.” (PAS-00004041) and that there were no troughs or pipes running along the driveway that ran to the river, and that he had “no knowledge whatsoever” of any “lines that ran directly from the plant directly to the river.” (PAS-00004086). Koved also reported that there was a driveway from the Baldwin facility that extended to the river, but he never went there, and to his knowledge no one else – “I never saw any of our employees go there. There was no motivation for going there of a business nature” and that “breaks were too short to make that walk” (PAS-00003928).

According to the February 2, 1994 Summary of interview with Kelsey Brown, who worked for Montrose from 1951 to 1963, primarily as a shift supervisor, reported he never went to the river and therefore did not observe outfall pipes or drains at that location, and that all plant sewers went to the city sewer system (PAS-00075289).

According to the June 8, 1994 Summary of Interview with Thelbert Cameron, who worked for Montrose from 1957 to 1972, primarily as a foreman, also reported that the drains at the plant went to a holding tank located at the front of the facility (PAS-0075286).

According to the June 8, 1994 Summary of Interview with Peter Lewesky, who worked for Montrose from 1949 to 1972, primarily as a foreman, stating that “The drainage system consisted of collection troughs. They were connected to the city system in front of the facility on Lister Avenue”. He did not “recall any connections directly to the Passaic River, however, the river would overflow periodically and our plant would be flooded” (PAS-00075284).

According to the April 27, 1995 Interview with George Radan, Mr. Radan did not recall employees walking to the Passaic River during meals or breaks on a regular basis, but he did remember going there himself on occasion (PAS-00075282).

According to a March 2018 Documentation of Environmental Indicator Determination, prepared by Tetra Tech and approved by EPA and NJDEP on May 30, 2018, there are no current or known historical Site-related surface or waste water conveyances and / or discharge pipes which discharge to the Passaic River (PAP-00353349, 62).

According to a letter dated October 25, 1991, from Chemical Waste Management, in 1991 while upgrading the facility, construction efforts discovered a floor sump near the laboratory area that did not have a bottom and appeared to have been constructed that way (PAS-00107012). There is no date or information on when the sump was installed based on file material provided. Available references did not state what was discharged to the sump.

According to the December 18, 2001 *Potential PCB Sources to Passaic River Study Area Volume 1,* prepared for Chemical Land Holdings, Inc. by EI Group, Inc., a 1977 letter noted that the facility property contained four sewers: two 12-inch wooden sewers, one 12-inch clay pipe and one 24-inch cast iron sewer. A portion of the surface water drainage was routed to two 12-inch wooden sewers by open channels, and inspection in 1977 after 21CFA's predecessors had vacated the property in 1972 identified "polluting material" in the 12-inch storm line (PAS-00124569-70).

According to the December 18, 2001 *Potential PCB Sources to Passaic River Study Area Volume 1,* prepared for Chemical Land Holdings, Inc. by EI Group, Inc. storm sewers near Montrose would flow east and through the Benjamin Moore property and then directly to the Passaic River. Prior to 1972, storm sewers flowed in the opposite direction to the Brown Street outfall at the Passaic River on Sherwin Williams' property (PAS-00124570).

According to the report of Michael F. Domenica, P.E. dated August 1, 2017: (i) "process wastewater and spilled liquids were directed through a network of lined troughs to a network of sewer piping that discharged to a sanitary sewer line under Lister Avenue" (PAP-00027671-72) and then directly to the PVSC treatment plant without opportunity to be diverted to the Passaic River via combined sewer outfall (CSO) or other bypass (PAP-00027674-76); and (ii) "surface stormwater runoff from [Montrose]'s production areas flowed to the network of lined troughs that discharged through the sanitary sewers described above to the [PVSC treatment plant] (and not to the Passaic River)" (PAP-00027672). Mr. Domenica also explained that a storm sewer line that drained storm flows from the service road that bisects the property was connected to the sanitary sewer line under Lister Avenue, such that these storm water flows also would have been conveyed to the PVSC treatment plant (not to the Passaic River) (PAP-00027681-82).

Flooding

In his 1994 interview, former employee Oscar Randall reported he experienced flooding of the plant by the Passaic River "sometime between 1958 and 1960" (PAS-00003917).

Randall noted in a 1993 Affidavit that when he was first employed at the facility, much of the property was unpaved and the unpaved area was heavily contaminated with spilled substances. The soil was jet black and smelled strongly of cresol, and the groundwater was discolored and smelled. Often during periods of high tide the facility would flood, and water runoff from the facility drained to the river (PAS-00106689).

According to the June 6, 1994 Summary of interview with Thelbert Cameron, he remembered in winter (unknown year) "having to leave the plant because of flooding. The plant was completely flooded with water from the Passaic River" (PAS-00075287).

According to the April 27, 1995 Interview with George Radan, Mr. Radan did not recall any significant flooding at the facility. He did mention that on occasion the sewers would back up causing some small scale flooding at the facility (PAS-00075282).

According to the February 23, 2011 Deposition of Benjamin Rothberg, there was a flood, one year, in all the years he was there, but the flow was toward Lister Avenue (PAP-00027771).

According to the March 24, 1994 Solomon Koved Deposition, there was one incident of flooding that occurred around 1950 when there was a hurricane, and probably in the fall, all of the plant from the river to halfway up Esther or Lockwood Street was under a substantial amount of water (PAS-00004091).

According to the *2015 Remedial Investigation Report* by Tetra Tech, "floods have occurred at the Site, including major flooding caused by Hurricane Sandy, which occurred between October 22 and October 31, 2012. It is important to note that off-Site soil delineation sampling associated with the recent RI activities all occurred after Hurricane Sandy, and the limited off-Site impacts observed in that sampling indicates that the major flooding during Hurricane Sandy did not cause substantial off-Site contaminant migration, and likewise indicates that any previous floods did not cause substantial off-Site contaminant migration." (PAP-00026474).

Spills

Randall noted in his Affidavit that when he was first employed at the facility, much of the property was unpaved and the unpaved area was heavily contaminated with spilled substances. The soil was jet black and smelled strongly of cresol, and the groundwater was discolored and smelled (PAS-00106689).

According to the *June 1995 Draft Supplemental Remedial Investigation Report*, between 1914 or earlier through the mid-1980s, several rail lines crossed the facility. Spills may have occurred and contributed contamination. The rail lines were paved over when their use was discontinued. Buried ballast and ties contained wood preservative and heavy oils, and surficial fill material was found to contain semi-volatile contamination likely from rail lines through the area (PAS-00107038).

6. Regulatory History/Enforcement Actions

Inspections

No information on site inspections was identified in the available file materials.

Violations

No information on violations was identified in the available file materials.

Permits

No information on permits was identified in the available file materials.

7. Response Actions

Characterization Activities

According to a March 2018 *Documentation of Environmental Indicator Determination for 100 Lister Avenue* by Tetra Tech, the following characterization activities have taken place at the facility (PAP-00353338-40):

- *Remedial Investigation Report*, December 1993
- *Draft Supplemental Remedial Investigation Report*, June 1995
- *Draft Supplemental Remedial Investigation Report*, June 1996
- *Additional Sample Event Reports*, May 1999 and August 2000
- *Additional Remedial Investigation and Remedial Action Selection*, November 2001
- *Remedial Action Work Plan*, November 2002
- *Supplemental Remedial Investigation Report*, April 2009
- *Remedial Investigation Report*, December 2015
- *December 2015 Remedial Investigation Report Addendum*, June 2016
- *Remedial Action Selection Report / Remedial Action Work Plan*, June 2017

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

The December 1993 *Remedial Investigation Report* results of the sampling activities stated that the principal constituents detected in soils were volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and trace metals. A letter from NJDEP dated November 29, 1994 regarding a work plan for subsequent remedial investigation (RI) efforts stated that “the Department agrees that the metals contamination at the site is most likely due to fill material from local coal gasification

plants that was placed in the original marshlands." Therefore, metals were not a focus of subsequent RI activities (PAP-00353338).

The June 1995 *Draft Supplemental Remedial Investigation Report* was conducted in response to NJDEP comments letters circa 1994. The scope included surficial fill sampling, laboratory analysis for target compound list/target analyte list VOCs and pesticides. Soil analytical results supported that the surficial fill was impacted by VOCs and pesticides, and that in some locations the observed impacts were within the saturated zone, indicating that the impacted soils were in direct contact with the groundwater (PAP-00353338). The investigation recommended engineering controls to limit future land use and construct a barrier to prevent direct contact with surficial fill materials. The recommendations included a deed restriction to protect the integrity of impervious surfaces (PAS-00107125).

The May 1999 and August 2000 *Additional Sampling Event Report* was conducted in response to NJDEP comments. Soil samples were collected for VOCs, SVOCs, pesticides/PCBs in 1999. The 1999 report stated that impacts to saturated soil were detected in the southeast corner of the site (PAP-00353339).

The November 2001 *Additional Remedial Investigation and Remedial Action Selection Report* concluded based on discussions with NJDEP that complete remediation of soil at the site would be technically impracticable, given the large extent of soil impacts horizontally and vertically and the potential presence of residual product. Thus, remediation objectives were developed to prevent human and ecological exposure to impacted soils and groundwater (engineering and institutional controls); and to reduce peak concentrations of contaminants leaving the Site to concentrations that reduce risks to potential down-gradient receptors (PAP-00353339).

According to the December 2015 *Remedial Investigation Report,* previously detected PAHs were considered to be Historic Fill contaminants of concern at the site (PAP-00026451). Copper and mercury were ruled out as contaminants of concern because concentrations were only detected above groundwater water quality standards in 1996 sampling events and not in subsequent sampling events (PAP-00026455). Dioxins were ruled out as contaminants of concern, as there was no evidence of "gross" contamination. Dioxin contamination above 1 part per billion was found related to wind dispersion and traffic from known hot spots on the Diamond Alkali property (PAP-00026457). Two confirmation samples collected in 1993 from the northwest corner of the site detected no polychlorinated dibenzofurans or dioxins (PAP-00026458). The highest concentrations in soil were typically located in the eastern parcel. Soil impacts above applicable standards were generally limited to above and within the Meadow Mat. Historic Fill was considered the source of PAHs and metals (PAP-00026475).

According to the Remedial Action Selection Report / Remedial Action Work Plan, dated June 2017, 4,4'-DDT and dieldrin were not detected in any groundwater sampling conducted in 2016 (PAP00027209). In response to NJDEP's requirement for pesticide delineation, the following was noted: Dieldrin was not detected in any monitoring well in 2016; therefore, its extent was delineated (PAP-00027223). 4,4'-DDT, 4,4'-DDE and 4,4'-DDD were believed to be vertically delineated (PAP-00027223).

Remedial Activities

According to a March 2018 *Documentation of Environmental Indicator Determination for 100 Lister Avenue* by Tetra Tech, soil delineation has been completed in a manner consistent with NJDEP's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil. Soil sampling at the site for delineation was focused at the perimeter and off-site soil sampling locations, as the entire site was considered one contaminated AOC and delineation of individual parameters within the site boundaries was considered impracticable (PAP-00353348). An Ecological Evaluation concluded that no complete pathways exist between site contaminants and surface water or sediment (PAP-00353349).

According to a March 2018 *Documentation of Environmental Indicator Determination for 100 Lister Avenue* by Tetra Tech, all contaminants in surficial fill groundwater were sufficiently delineated. Site-related COCs have been detected in groundwater on adjacent properties to the north, east, and west at concentrations above "groundwater quality standards" (GWQS), though groundwater delineation efforts conducted during remedial investigation activities showed that the highest concentrations of these COCs in the surficial fill were detected in on-site groundwater and that attenuation to concentrations below GWQS would occur within 100 yards of the site boundary (PAP-00353350).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

ALDEN LEEDS, INC.

Facility Name, Address and Size: Alden Leeds, Inc., 100 Hackensack Avenue, South Kearny, New Jersey (PAS-00000007; PAS-00000045). Site acreage not available. In 1994, the facility had 20 full time and 6 part time employees working 250 work days per year at the 100 Hackensack Avenue location (PAS-00000007-9).

1. **Business Type:** Repackaging of swimming pool chemicals (PAS-00000009).

2. **Time Period of Ownership/Operations**

   Operator: September 1993 – December 2005
   Owner: Not Provided (PAS-00000007-8; PAS-00020963)

   According to a letter prepared by Whitman Breed Abbott & Morgan, on behalf of Alden Leeds, dated August 9, 1996, Alden Leeds has been owned by Leeds Terminal, Inc. and operated by Q-Pak "since the early 1960s" (PAS-00000028). Based on review of available file material, it is unclear if Alden Leeds is still owned and operated by these entities.

   Alden Leeds incorporated in New York on July 25, 1959 (PAP-00087883-6). The facility has operated at 100 Hackensack Avenue; however, based on review of available file material, periods of operation are unclear (PAS-00000007; PAS-00000045).

3. **Operational History/ COC Use and Presence at the Facility**

   In September 1993, it was reported in a NJDEP Investigation Memoranda that Alden Leeds received at the 100 Hackensack Avenue address "bulk product from outside vendors and presses this material into various sized tablets and granules. The finished product was then packaged into one quart to five gallon containers. The only hazardous waste that this facility would generate is from floor sweepings of the chlorinating agents." (PAS-00000045).

   A July 1994 *PVSC Application for a Sewer Connection Permit* for the 100 Hackensack Avenue address, stated that raw materials were reported to be trichloro-s-triazine trione, soda ash, and dichloro-s-triazine trione. At that time the facility had 20 full time and 6 part time employees working 250 work days per year at the 100 Hackensack Avenue location (PAS-00000007-9).

4. **Identified COCs**

   - PAHs (possible use)

   PAHs

   According to a 2017 C*ertification of Lindsay A. Brown, Esquire in Support of Occidental Chemical Corporation's Opposition to Repsol S.A.'s Motion for Summary Judgment on its Spill Act Contribution Counterclaim Against Occidental Chemical Corporation*, Alden

Leeds utilized, stored, and/or handled Hazardous Substances and other compounds at the Alden Leeds Kearny Site (100 Hackensack) including, but not limited to copper-based pesticides (PAP-00165183; PAP-00165236). No documentation was found in the available files to support this assertion.

There is no information regarding soil-sampling data in the available file material.

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

There is no information regarding soil-sampling data in the available file material. No information is available regarding when fill materials were placed on the facility site.

5. COC Pathways

Combined Storm and Sanitary Sewer

According to a memorandum prepared by the NJDEP, dated September 9, 1993, floor sweepings of chlorinated agents were added to the facility waste water treatment system and discharged to the combined sewer system approximately once a week (PAS-00000045).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

In 1994, Alden Leeds applied for a Passaic Valley Sewer Commission (PVSC) Sewer Connection Permit for the 100 Hackensack Avenue location which indicated that cooling water was discharged to the "storm sewer/river/ditch" and sanitary and process wastewater was discharged to the sanitary/combined sewer (PAS-00000007-08).

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Permits

In 1994, Alden Leeds applied for a Passaic River Valley Commission Sewer Connection Permit for the 100 Hackensack Avenue location. It was reported in the application that the facility did not have a NPDES permit. Cooling water was reported to be discharged to the "storm sewer/river/ditch." Water usage included an estimated 300,000 gallons of process waste water released to the sanitary/combined sewer and an estimated 1,100,000 gallons of cooling water released to the storm sewer/river/ditch. The daily flow to Outfall 1 was estimated to be 1,250-2,500 gallons and 300-600 gallons to Outfall 2 (PAS-00000007-08, 11). Available references did not include information on discharge monitoring requirements.

Violations

PVSC presented an Award of Excellence to Alden Leeds-Hackensack Ave. for operations from January 1, 2002 through December 31, 2005 without incurring a reporting or effluent violation (PAP-00097620; PAS-00020963).

7. Response Actions

There is no information regarding response actions in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

ALDEN LEEDS, INC.

Facility Name, Address and Size: Alden Leeds, Inc., 55 Jacobus Avenue, Kearny, New Jersey (PAS-00000007; PAS-00000045).

1. **Business Type:** Repackaging of swimming pool chemicals (PAS-00000009).

2. **Time Period of Ownership/Operations**

   Operator: September 1993 – December 2005
   Owner: Not Provided (PAS-00000007-8; PAS-00020963)

   According to a letter prepared by Whitman Breed Abbott & Morgan, on behalf of Alden Leeds, dated August 9, 1996, Alden Leeds has been owned by Leeds Terminal, Inc. and operated by Q-Pak "since the early 1960s" (PAS-00000028). Based on review of available file material, it is unclear if Alden Leeds is still owned and operated by these entities.

   Alden Leeds incorporated in New York on July 25, 1959 (PAP-00087883-6). The facility has operated at 55 Jacobus Avenue; however, based on review of available file material, periods of operation unclear (PAS-00000007; PAS-00000045).

3. **Operational History/ COC Use and Presence at the Facility**

   In September 1993, it was reported in a NJDEP Investigation Memoranda that Alden Leeds 55 Jacobus Avenue address was visited and it was used for office space and storage of raw materials and finished products, and no hazardous waste was generated at this facility (PAS-00000045).

4. **Identified COCs**

   - PAHs (possible use)

   PAHs

   There is no information regarding soil-sampling data in the available file material.

   Historic Fill

   The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

There is no information regarding soil-sampling data in the available file material. No information is available regarding when fill materials were placed on the facility site.

5. COC Pathways

Combined Storm and Sanitary Sewer

There is no information regarding COC pathways in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

According to a "Field Investigation" form prepared by the Hudson Regional Health Commission, dated April 21, 1987, a "violation order" would be issued to Alden Leeds for the connection of a septic holding tank to the storm drain system at the 55 Jacobus Avenue facility (PAS-00000047).

Permits

There is no information regarding permits in the available file material.

Violations

There is no information regarding violations in the available file material.

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[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

7. Response Actions

No information on response actions at the Alden Leeds facilities was documented in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Alden Leeds, Inc.

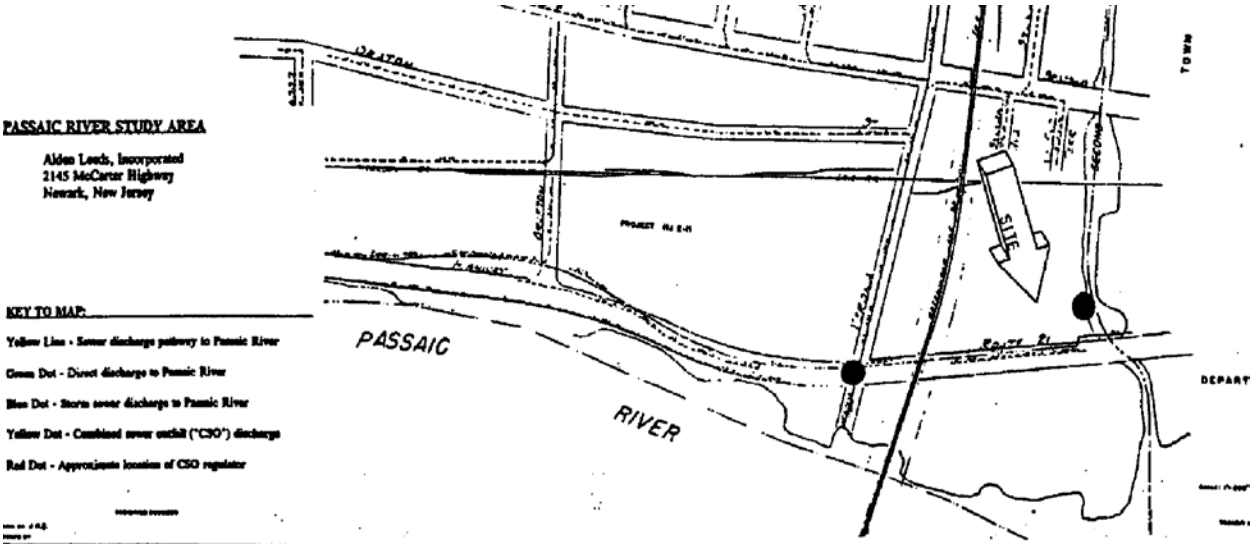
Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

ALDEN LEEDS, INC.

Facility Name, Address and Size: Alden Leeds, Inc., 2145 McCarter Highway, Newark, New Jersey (PAS-00000022)



1. **Business Type:** Repackaging of swimming pool chemicals (PAS-00000009).

2. **Time Period of Ownership/Operations**

   Operator: July 1964 – July 1971
   Owner: July 1961 – July 1971(PAP-00087876)

   According to a letter prepared by Whitman Breed Abbott & Morgan, on behalf of Alden Leeds, dated August 9, 1996, Alden Leeds has been owned by Leeds Terminal, Inc. and operated by Q-Pak “since the early 1960s” (PAS-00000028). Based on review of available file material, it is unclear if Alden Leeds is still owned and operated by these entities.

   Alden Leeds incorporated in New York on July 25, 1959 (PAP-00087883-6). Alden Leeds operated at 2145 McCarter Highway from approximately July 1961 to July 1971 when a fire destroyed the facility (PAS-00000025).

3. **Operational History/ COC Use and Presence at the Facility**

   Alden Leeds operations included the repackaging of swimming pool chemicals (PAS-00000009). In a 1996 104(e) response letter, it was reported that operations at the 2145 McCarter facility were limited to “pressing chlorine tablets and the packaging of cyanuric acid, soda ash, sodium carbonate, sodium bisulfate and trichloroisocyanuric acid for use in the treatment of swimming pool water” (PAS-00000025).

4. Identified COCs

- PAHs (possible use)

PAHs

According to a memorandum prepared by the NJDEP, dated September 9, 1993, "The only hazardous waste that this facility would generate is from floor sweepings of the chlorinating agents (D003 - reactivity). Other hazardous waste that were shipped off site were generated due to a clean-up of soil contaminated with chromium and oil in 1989 and 1992" (PAS-00000045). Based on review of available file material, the source of soil contamination is unclear. However, PAHs are a component of oils.

There is no information regarding soil-sampling data in the available file material.

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

There is no information regarding soil-sampling data in the available file material. No information is available regarding when fill materials were placed on the facility site.

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Combined Storm and Sanitary Sewer

According to a memorandum prepared by the NJDEP, dated September 9, 1993, floor sweepings of chlorinated agents were added to the facility waste water treatment system and discharged to the combined sewer system approximately once a week (PAS-00000045).

There is no information regarding COC pathways in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

On July 26, 1971, a fire destroyed the Alden Leeds building at the 2145 McCarter Highway site, and resulted in the release of “a large quantity” of chlorinated cyanuric acid into the Second River (PAS-00000022). According to Alden Leeds, the fire resulted from the spontaneous decomposition of trichloroisocyanuric acid used at the facility (PAS-00000027).

Permits

There is no information regarding permits in the available file material.

Violations

There is no information regarding violations in the available file material.

7. Response Actions:

There is no information regarding violations in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

ALLIANCE CHEMICAL, INC.

Facility Name, Address and Size: Alliance Chemical, Inc. (Alliance), 339-355 Avenue P, Newark, New Jersey (previously referred to as 309-327 Avenue P) (PAS-00129641); Block 5020, Lots 3, 6, 8, 12 and 136 (PAP-00065688). In 2002, the site was approximately 7 acres in size (PAP-00065689); however, in 1990 it was described as encompassing 8.4 acres (PAP-00066461). A 1972 Waste Effluent Survey noted the facility employed 45 people working five days per week and three shifts per day (PAP-00066087). According to a January 24, 1990, *General Information and Site History* document, the site was operational 24 hours per day (PAS-00049995).

1. **Business Type:** Manufacturer of specialty organic intermediates (such as dyes, pigments and diazo compounds (PAS-00129646) for use in the textile, paper and pigment industries (PAS-00050252).

2. **Time Period of Ownership/Operations**

Operator: 1945 or 1958 – 2001 (PAS-00129641)
Owner: 1965 – March 23, 2006 (PAP-00216720)

1945: Sun Chemical first began developing the facility site (PAP-00066461).

1946: Leases to the facility were executed with Tiffany Chemical Company and Security Paint and Varnish, both companies manufactured paints, varnishes, lacquers, dyes and oils (PAS-00129641).

1958: Plum Point Realty conveyed Lot 8 (in 1958) and Block 5020 (in 1957) to Alliance Color and Chemical Company (PAS-00129641).

1964: Sun Chemical Corp. purchased Block 5020, Lot 6 from Union Carbide (PAS-00129641).

1965: Alliance became a wholly owned subsidiary of Pfister Chemical, Inc. (Pfister), In 1965 Pfister acquired the stock of Alliance, Alliance Color & Chemical Co. and Plum Point Realty Corp., which owned and operated the facility site located at 309-327 Avenue P (33 Avenue P) (PAS-00000080-81). In 1965, Alliance Color and Chemical purchased the site from Sun Chemical Company (PAP-00066461; PAS-00049990).

1968: Alliance Chemical Co. and Plum Point Realty were merged into Alliance Color and Chemical, Co., and the name was changed to Alliance Chemical, Inc. (PAS-00000093).

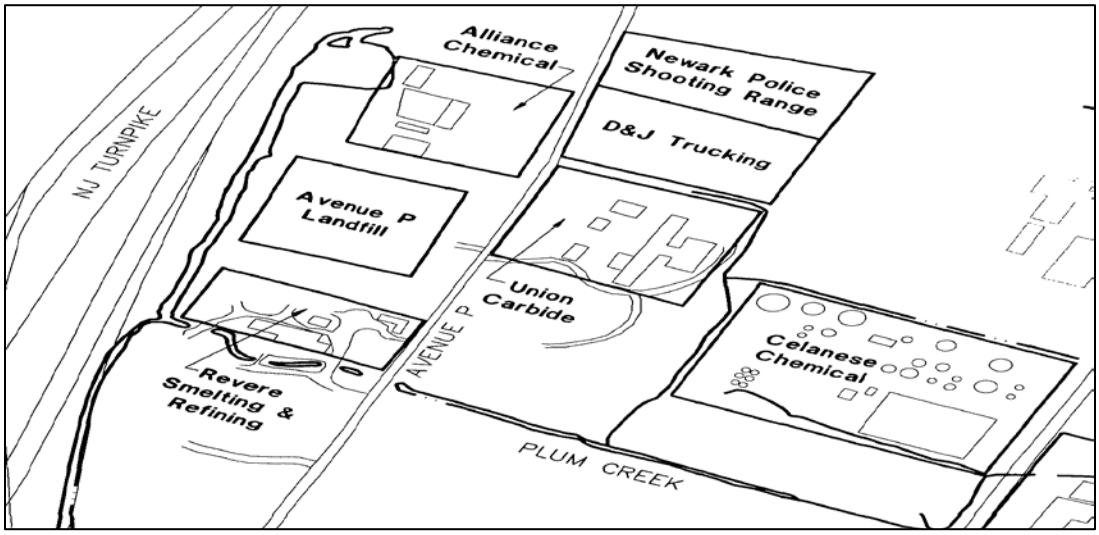
1974: D&J Trucking purchased Block 5020, Lot 6 of the facility from Sun Chemical Corp. and conveyed it to the Housing Authority in 1978 (PAS-00129641).

1990: According to a January 24, 1990, *General Information and Site History* document, lot ownership was as follows: Lot 3 owned by Pfister Chemical Inc.; Lots 6 and 136 owned by Pfister Urban Renewal; Lot 8 owned by Plum Point Realty Corporation; and Lot 12 owned by Alliance Chemical and Color, Inc. (PAP-00066461).

2001: Pfister notified NJDEP that Alliance Chemical, Inc. closed. The site was undergoing remedial investigation, and site security was maintained (PAP-00065965).

2003: According to the June 2018 *Remedial Action Report / Remedial Action Work Plan* by Matrix, in Fall 2003, the majority of buildings and structures at the site were demolished, and tanks, drainage trenches, the neutralization pit, pipes and other operating facilities were cleaned and removed from service. Tanks and processing equipment were removed from the site for off-site disposal or recycling. The former shipping and receiving building and the former warehouse were left at the site for future use. The site was then leveled, covered with geotextile fabric and covered with approximately 6-8 inches of crushed rock and asphalt millings (PAP-00216677).

2006: Alliance sold the site to Apollo Development Corp on March 23, 2006 (PAP-00216720).



(PAS-00123111)

3. Operational History/COC Use and Presence at the Facility

In Alliance Chemical, Inc.'s Response to Request for Information, Alliance stated it manufactured organic intermediates that included:

5-chloro-2,4-dimethoxyaniline between 1976 and 1987
2-chloro-1,4-dimethoxy-5-nitrobenzene between 1965 and 1985 (PAS-00050023).

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

According to the 1990 *Avenue P Landfill Investigative Summary* (the Avenue P Landfill is adjacent to the south side of Alliance), production of these two products (dioxin precursors) involved mixing muratic acid, water and organic chemical reagents in a large vessel. The intermediate was filtered and washed. The process generates two wash streams: 1) filter cake (containing copper, lead and mercury) and 2) acid process water. The cake was stored in drums and a sludge box at the rear of the facility, adjacent to the landfill. Approximately 200 drums were observed, inspected (PAS-00129646) and hauled off as needed (PAP-00065690). Process water was discharged to a trench that led to an unlined neutralization pit. PCBs were detected in sludge samples obtained from the trench. PCBs, lead, and mercury were found in soil, sediment and surface water obtained from the site (PAS-000129646).

In Alliance's response to an EPA Second Request for Information, it was reported that between 1965 and 1970, acidic effluent water, neutralized in tanks, was discharged to an equalization pond, and non-acidic effluent was discharged directly to the equalization pond. After 1970, process water discharged to the equalization pond and then was neutralized with 25% caustic soda or dilute ammonia. The equalization pond closed after 1979 (PAS-00049633).

As stated in Alliance's Response to Request for Information, other dyes, pigments, and diazo compounds manufactured at the site included:

- 2-methoxy-5-nitro benzenamine between 1965 and 1980. This compound was manufactured at Alliance in the same manner as 5-chloro-2,4-dimethoxyhaniline, except the starting material was 2,4-dinitro chlorobenzene (PAS-00050025).

- 3,3'-dimethoxy benzidine between 1965 and 1970. Manufacturing started with o-nitro anisole, and via an alkaline zinc reduction a hydrazo compound resulted followed by a benzidine rearrangement which then created the desired compound (PAS-00050025).

- 3,3'-dimethyl benzidine between 1965 and 1970. This intermediate started with o-nitro toluene that underwent an alkaline zinc reduction resulting in a hydrazo compound. The new compound underwent a benzidine rearrangement that produced the desired compound (PAS-00050025).

- 2,5-diethoxy-4-(4-morpholinyl)-benzenediazonium tetrachlorozincate (2-)(2:1) between 1965 and 1970. Alliance manufactured light-sensitive diazo compounds that were stabilized by a zinc salt. 2-chloro-1,4-diethoxy-5-nitro benzene was condensed with morpholine to produce 2,5-diethoxy-4-morpholino nitro benzene. This compound reduced in hydrochloric acid to an amine with zinc dust. The amine was then diazotized with sodium nitrite and the zinc stabilized diazo compound precipitated. A dibutoxy compound was produced the same way (PAS-00050025-6). Zinc carbonate and zinc hydroxide were produced in the recovery processes as a precipitate from the effluent at an alkaline pH with caustic soda or soda ash (PAS-00050026).

All products, except for zinc carbonate, zinc hydroxide and 2-chloro-1,4-diethoxy-5-nitro benzene were purified by dissolving the product in acid and treating the solution with activated carbon to remove color and then re-preciptating the product. The process resulted in carbon clarification press cakes that contained small amounts of carbon. The press cakes were disposed as a solid waste. The two benzidine processes produced a zinc oxide slurry that was recovered and sent for recycling (PAS-00050026).

The average annual production is provide below (PAS-00050031).

2-Chloro-1,4-diethoxy-5-nitro benzene	(product) '65-'85	130,000	lbs/yr
5-Chloro-2,4-dimethoxyaniline	(product) '76-'87	15,000	lbs/yr
2-Methoxy-5-nitro benzenamine	(product) '65-'85	80,000	lbs/yr
3,3'-Dimethoxy benzidine	(product) '65-'70	200,000	lbs/yr
3,3'-Dimethyl benzidine	(product) '65-'70	20,000	lbs/yr
Zinc Compounds (light-sensitiv diazos)	(product) '65-'90	105,000	lbs/yr
Zinc Compounds (Fast Color Salts)	(product) '65-'87	160,000	lbs/yr
Zinc Carbonate-zinc hydroxide	1992-on	25	tons/year
Zinc oxide slurry	1965-1971	120	tons/year
Non-hazardous press cakes	1965-on	50	tons/year
Hazardous press cakes	1989-1991	125	tons/year
Waste oil		5-10	drums/year

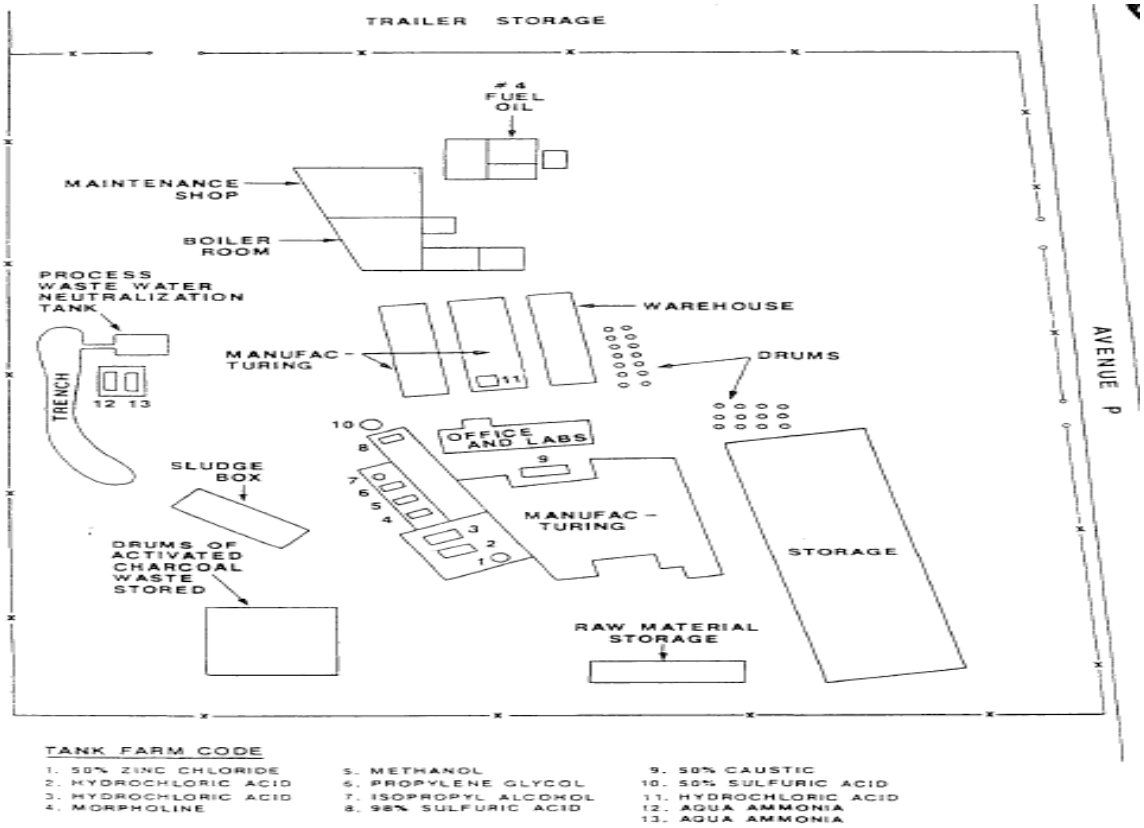
According to a 1990 *Avenue P Landfill Investigative Summary*, 1972 aerial photographs identified an extensive drum storage area on the southwestern side of the Alliance plant (PAS-00129646), and a Preliminary Assessment aerial photograph survey described an outside drum storage area in the south-central portion of the site (PAP-00065691).

The 1990 *Avenue P Landfill Investigative Summary* noted that a 1974 aerial photograph identified a road entering the northwestern portion of the Avenue P Landfill from Alliance, and the number of drums on the Alliance premises was significantly reduced. Most of the drums were discovered in the northwest portion of the landfill (PAS-00129646-47).

According to a January 24, 1990, *General Information and Site History* document, Alliance had 16 bulk aboveground storage tanks. The tanks and contents are summarized below. Reportedly, Alliance officials, in their contingency plan, maintained that there was a sufficient dike at each tank to contain a spill (PAS-00049992).

Three 3,000 gallon #4 fuel oil tanks,
One 10,000 gallon #4 fuel oil tank,
One 4,000 gallon 98% sulfuric acid tank,
One 3,000 gallon 50% sulfuric acid tank,
One 15,000 gallon 38% hydrochloric acid tank,
One 3,000 gallon 38% hydrochloric acid tank,
One 10,000 gallon 38% hydrochloric acid tank,
One 4,800 gallon 50% zinc chloride solution tank,
One 7,600 gallon 50% caustic (sodium hydroxide solution) tank,
Two 9,000 gallon 20% aqua ammonia tanks,
One 5,600 gallon methanol tank,
One 4,000 gallon isopropyl alcohol tank,
One 5,600 gallon morpholine tank.

The site layout is depicted below.



(PAS-00109491)

4. Identified COC's

- PCBs (detected)
- Dioxin (not detected)
- PAHs (detected)
- Dieldrin/Aldrin (detected)
- Cooper (used, detected)
- Lead (used, detected)
- Mercury (detected)

PCBs

According to a January 24, 1990, *General Information and Site History* document, soil sampling conducted by NJDEP on November 25, 1980, and collected in the area of a lagoon resulted in PCB (Aroclor 1254) concentrations of 2,300 parts per billion (ppb) and 2,700 ppb (PAS-00049994).

According to the *1990 Avenue P Landfill Investigative Summary*, drums removed from the adjacent Avenue P landfill site contained PCBs (PAS-00076994). Available references state that the drums were from the Alliance site. In addition, facility process water discharged into a trench that led to an unlined neutralization pit. Sludge samples collected from the trench in 1981 contained PCBs (PAS-00129646). Note: concentrations were not provided in the report.

A 1989 data report from AnalytiKEM prepared for NJDEP reported soil samples collected on October 19, 1989, at the Alliance facility contained PCBs at concentrations between 4,900 and 16,000 (Aroclor-1248) in samples S-1 and S-9, respectively, and 4,900 (Aroclor-1254) in sample S-7 (the concentration units were not reported) (PAS-0049941). Sample S-1 was collected from the northwest corner of the facility near the border and S-9 was collected from the south central portion of the site as referenced in the map at the end of this section.

According to Exhibit B-2, a summary table of contaminant concentrations from previous investigations, from the October 24, 2019, Deed Notice, Aroclors were detected in the following subsurface soil samples:

PCB Detections			
Compound	**Concentration (µg/kg)**	**Sample**	**Depth (ft bgs)**
Aroclor-1242	80,000	A-12	3-3.5
	14,000	A-14	2-2.5
Aroclor-1248	850	ACAS-2A	6-7.5
	970	A-10	8-8.5
	1,500	A-15	2.5-3
Aroclor-1254	2,200	ACAS_9	5-6
	2,600	A-10	8-8.5
	850	A-10B	14.5-15
	73,000	A-12	3-3.5
	630	A-15	2.5-3

Dates on which the samples were collected were not included in the table, but the deed notice states that soils were remediated by Pfister, and that the remaining contamination was described by the data in Exhibit B (PAP-00487839, 53-8).[1]

Per the Appendix A of a November 18, 2002 Preliminary Assessment, there were no electrical transformers or capacitors at the Alliance site (PAP-00065692).

Dioxin / Furans

According to January 24, 1990, *General Information and Site History* document of Alliance, on August 3, 1983 an inspection of Alliance by the Industrial Investigation Unit of NJDEP raised the question of dioxin contamination at the site from the manufacture of Class II dioxin precursor chemicals 2-chloro-1,4-diethoxy-5-nitrobenzene (1975–1980) and 5-chloro-2,4-dimethoxyaniline (1965–1983). Sampling conducted on May 10, 1985 revealed “no traces” of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) (PAS-00049991; PAS-00129646).

[1] This Report was revised to include documents received on March 19, 2020. The additional documents did not change Alliance Chemical’s previous certification.

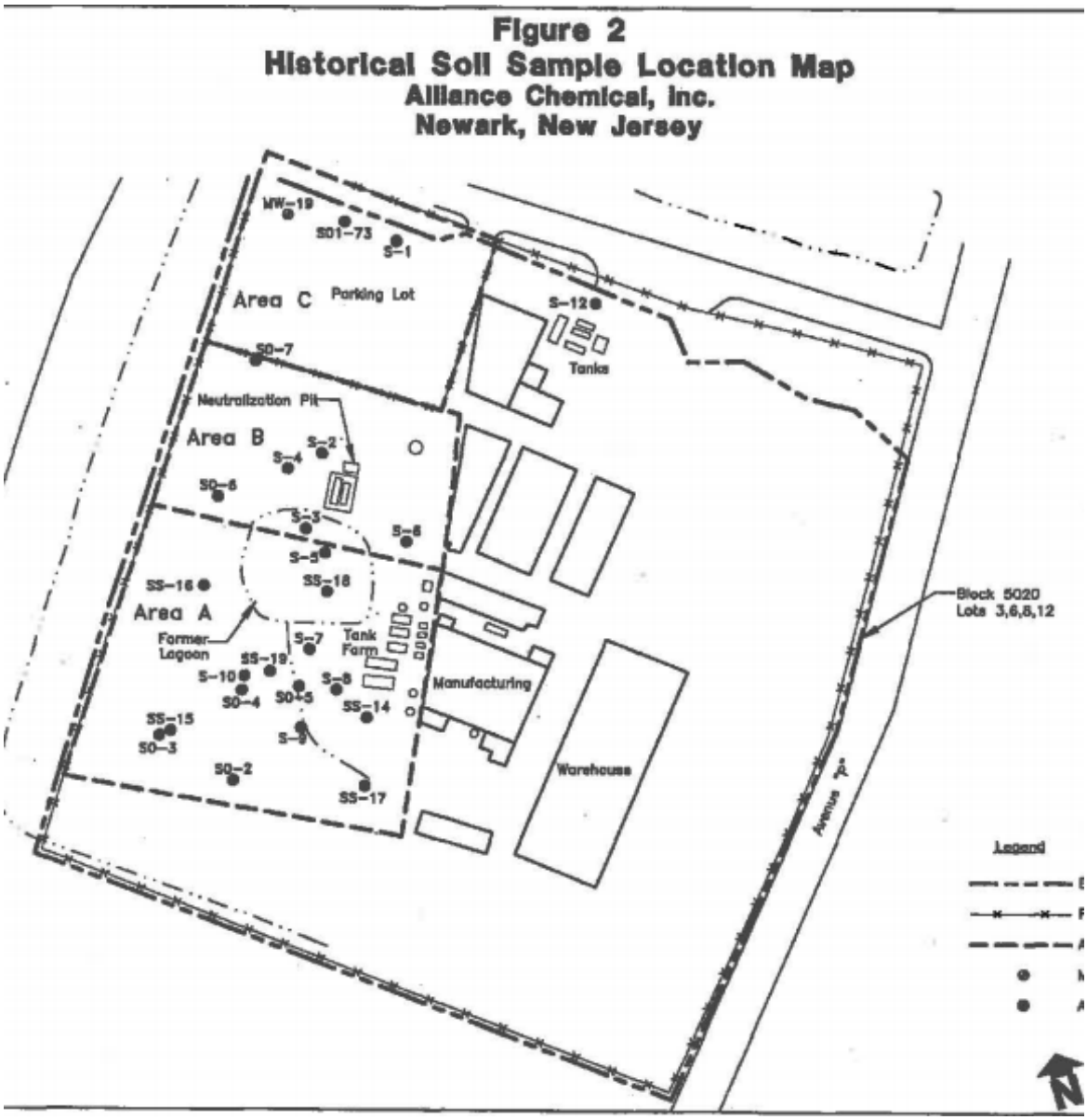
PAHs

Soil sample concentrations of PAHs presented in the *Summary of Sampling Data*, dated October 19, 1989 are provided below (PAS-00049935-38; PAS-00109553-63).

PAH Concentrations (mg/kg)		
Contaminant	**Minimum**	**Maximum**
Benzo(a)anthracene	1,400	1,000,000
Benzo(b)fluoranthene	2,300	4,400
Benzo(a)pyrene	980	2,700
Benzo(g,h,i)perylene	690	2,800
Chrysene	1,500	31,000
Dibenzo(a,h)anthracene	110	660
Fluorene	240	630
Fluoranthene	4,500	28,000
Indeno(1,2,3-cd)pyrene	790	4,000
Naphthalene	1,300	25,000
Pyrene	2,400	4,800
2-Methylnaphthalene	1,000	2,000

Sampling results contained in the December 2000 *Remedial Investigation Work Plan* showed sample S-5 contained 3,500 ug/kg benzo(a)anthracene; 3,700 ug/kg benzo(a)pyrene; 2,800 ug/kg benzo(g,h,i)perylene and 4,400 ug/kg benzo(k)fluoranthene at 2.5 feet bgs (PAP-00065653-54). Sample S-5 originated in the central western portion of the facility in Area B. The only structure within Area B was the neutralization pit from the wastewater discharge system. The location of the wastewater lagoon is partially within Area A and Area B (PAP-00065655).

According to an ERM letter, dated December 28, 1998, benzo(a)pyrene was associated with older asphalt paving areas, and they claimed it was never used in Alliance manufacturing (PAP-00065909-10).



(PAP-00065652)

According to the June 2018 *Remedial Action Report / Remedial Action Work Plan* by Matrix, in order to support the planning and implementation of the initial investigation activities at the site, the site was previously divided into four separate areas, referred to as Areas A, B, C, and the Plant Area. Area B is located in the central-western portion of the facility and was an open area, formerly covered with vegetation. The western edge of Area B borders the New Jersey Turnpike. The northern boundary of Area B is adjacent to Area C, which was an asphalt parking lot, while the eastern boundary of Area B borders the former Alliance Plant area. The southern perimeter of Area B adjoins Area A. The only structure in Area B was the neutralization pit from the wastewater discharge system. These areas have since been grouped back together and the site is currently considered as a whole for the purposes of remediation (PAP-00216680).

According to Exhibit B-2, a summary table of contaminant concentrations from previous investigations, from the October 24, 2019, Deed Notice, PAHs were detected in subsurface soil samples in the following ranges:

PAH Concentrations (µg/kg)			
Contaminant	**Minimum**	**Maximum**	**Sample Location/ Depth of Max**
Benzo(a)anthracene	1,200	1,100,000	A-14 / 2-2.5 ft bgs
Benzo(b)fluoranthene	940	54,000	A-14 / 2-2.5 ft bgs
Benzo(k)fluoranthene	1,400	19,000	A-14 / 2-2.5 ft bgs
Benzo(a)pyrene	670	4,200	A-2 / 3.75-4.25 ft bgs
Indeno(1,2,3-cd)pyrene	1,100	1,600	ACBS-3A / 5-5.75 ft bgs
Naphthalene	360,000	730,000	A-14 / 2-2.5 ft bgs

Dates on which the samples were collected were not included in the table, but the deed notice states that soils were remediated by Pfister, and that the remaining contamination was described by the data in Exhibit B (PAP-00487839, 53-8).[2]

Dieldrin / Aldrin

Exhibit B-2 from the October 24, 2019, Deed Notice, a summary table of contaminant concentrations, has one detection of 1,800 µg/kg Aldrin in sample ACAS-3A at a depth of 3.5-4', located near the southwest corner of the property. Dates on which the samples were collected were not included in the table, but the deed notice states that soils were remediated by Pfister, and that the remaining contamination was described by the data in Exhibit B (PAP-00487839, 54).[2]

Metals – Cooper, Lead and Mercury

According to a 1970 *Selected Substance Report*, copper was used as a raw material complexing agent in the production of specialty organic chemicals. Alliance brought 1,600 pounds per year onto the site and discharged 100 pounds per year to the local publicly owned treatment works (POTW) (PAS-00049906).

According to a January 24, 1990, *General Information and Site History* document, the filter cake manufactured in the wash stream was found to contain copper, lead and mercury (PAP-00066462). The cake was stored in drums and a sludge box at the rear of the facility. The *Avenue P Landfill Investigative Summary* noted that approximately 200 drums were located in the rear storage facility (PAS-000129646).

Alliance Chemical effluent sampled on December 12, 1979, identified 17.31 milligrams per liter (mg/L) copper, 1.043 mg/L lead and 0.005 mg/L mercury (PAS-00049636). According to sampling results in a 2000 *Remedial Investigation Work Plan* prepared by Environmental Resources Management (ERM), copper concentrations ranged between 86.8 mg/kg in soil sample S07B/77E collected in September 1988 at 3-3.5 feet below

[2] This Report was revised to include documents received on March 19, 2020. The additional documents did not change Alliance Chemical's previous certification.

ground surface (bgs) and 456 mg/kg in soil sample S06B/77E at 3-3.5 feet bgs collected in September 1988. Lead ranged between 320 mg/kg in S07B/77E collected between 3-3.5 feet bgs and 84,200 mg/kg in soil sample S07/A77E. Mercury concentrations ranged between 0.4 mg/kg in soil sample S06A77E at 0-0.5 feet bgs collected in September 1988 and 5.3 mg/kg in sample S07B77E at 3-3.5 feet bgs (PAP-00065653). All samples originated from the west central area of the facility as referenced in the map at the end of this section.

According to Exhibit B-2, a summary table of contaminant concentrations from previous investigations, from the October 24, 2019, Deed Notice, metals were detected in subsurface soil samples in the following ranges:

Metals Concentrations (mg/kg)			
Consitituent	**Minimum**	**Maximum**	**Sample Location/Depth of Max**
Copper	1,100	2,200	SB-208 / 2.5-3 ft bgs
Lead	534	3,600	ACLS-1 / 6-6.5 ft bgs
Mercury	33.9	106	A-14 / 2-2.5 ft bgs

Dates on which the samples were collected were not included in the table, but the deed notice states that soils were remediated by Pfister, and that the remaining contamination was described by the data in Exhibit B (PAP-00487839, 53-8).[3]

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[4]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[5] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[6] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[7]

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[3] This Report was revised to include documents received on March 19, 2020. The additional documents did not change Alliance Chemical's previous certification.
[4] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[5] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[6] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[7] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that

The levels of PAHs, lead, copper and mercury detected at the site in soils are presented in the table below (PAP-00066475; PAP-00065653; PAP-00065653-54; PAP-00487855-8).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	84,200 mg/kg
Copper	2,200 mg/kg
Mercury	106 mg/kg
Benzo(a)anthracene	1,100 mg/kg
Benzo(a)pyrene	4.2 mg/kg
Benzo(b)fluoranthene	54 mg/kg
Benzo(k)fluoranthene	19 mg/kg
Dibenzo(a,h)anthracene	0.66 mg/kg
Indeno(1,2,3-cd)pyrene	6.0 mg/kg

There is insufficient information in available references to determine whether referenced soil samples were taken in an area of the site that contained Historic Fill.

According to a letter dated July 12, 1993, NJDEP approved Alliance's reuse of excavated on-site soils, provided there was no other regulation prohibiting its use. The soil was excavated from an area near the sewer line and placed near an on-site tank and vat (PAP-00065884).

According to a January 24, 1990, *General Information and Site History* document, a Pre-sampling Assessment by NJDEP on October 3, 1989, revealed the soil contained numerous pieces of building material, such as bricks. It was believed that some of this fill came from the building, which was destroyed in a January 1980 explosion and fire (PAS-00049994). According to the June 2018 *Remedial Action Report / Remedial Action Work Plan* by Matrix, soil boring logs identified historic fill on the site to contain dark brown, silty sand with trace gravel, brick and concrete to an approximated depth of 13 feet bgs (PAP-00216679).

According to a December 23, 1998, letter to NJDEP from ERM, lead concentrations in surface soil samples are likely associated with historic fill placed in the early 19th century in Northern New Jersey along Avenue P, and that lead was never used as a manufacturing component (PAP-00065910). A 2005 Classification Exception Area (CEA) Information document noted that historic fill was present in the upper 8 to 11 feet of materials below the ground surface, and historic fill coincides with site boundaries (PAP-00066065-67). The 2000 Remedial Investigation Work Plan states that the site was underlain by approximately 6 to 7 feet of historic fill (PAP-00065655).

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the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a June 2005 *Classification Exception Area Information Document for the Former Alliance Chemical, Inc. Site*, the entire site was included in a CEA with a well restriction area (PAP-00066062). The groundwater at the site is contaminated with several constituents resulting from historic fill, migration onto the site from off-site areas and historic on-site activities with elevated concentrations of metals and PAHs that are common to historic fill materials. Many of these constituents were detected in excess of the NJDEP Ground Water Quality Standards (GWQS) across the entire sire or portions of the site (PAP-00066063-64). The CEA would encompass the entire site, along with minor areas off-site migration to the north and west (PAP-00066066).

A Deed Notice dated October 24, 2019 specified restricted land uses and the placement of engineering controls in the form of a geotextile fabric and aggregate cap and existing building slab (PAP-00403645-79, PAP-00487383-72).[8]

5. COC Pathways

Direct Discharge

A January 24, 1990, *General Information and Site History* document, reported the nearest downslope surface water is the Passaic River, approximately 0.5 miles from Alliance. There is also a tidal basin located at the rear of Alliance that flows in an easterly direction. Reportedly, an aerial map identified a trench running from Alliance to the tidal basin. The trench ran from the processing area parallel to another trench. One trench ran into the lagoon while the other ran into the tidal basin. The basin is located on property belonging to the New Jersey Turnpike Authority and is less than 100 feet from Alliance property (PAS-00049993). According to a January 24, 1990, *General Information and Site History* document, Alliance's past practice of discharging into the tidal basin at the rear of their property may have led to off-site contamination (PAS-00049995).

A 1997 *Supplemental Investigative Activities Report and Proposed Soil Sampling Plan* described a drainage channel for surface water runoff located along the western border running north and south (PAP-00066491). The Appendix A of a November 18, 2002 Preliminary Assessment confirmed a drainage ditch historically located beyond the western boundary of the site, along the embankment for the turnpike (PAP-00065692).

Plum Creek

According to a *Plum Creek PRP Investigation* dated December 18, 2001, Plum Creek is approximately 0.5 miles in length, has several connecting branches, and discharges to the Passaic River immediately south of its confluence with Newark Bay (PAS-00123102).

[8] This Report was revised to include documents received on March 19, 2020. The additional documents did not change Alliance Chemical's previous certification.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

As early as 1948, Passaic Valley Sewerage Commissioners (PVSC) reported that the Alliance site location was discharging a yellow-colored discharge via storm ditch to Plum Creek (PAS-00049842, 814, 820). As a result of flooding and discharges to the creek, Alliance was connected to the sewer system in 1970; however, the on-site lagoon reportedly continued to part of the discharge system until 1979. Sludge samples collected in 1980 from the lagoon identified PCBs (PAS-00123103, 114). Lead was found in Plum Creek West at 1,550 mg/kg and on-site at 1,430 mg/kg. Mercury was found at Plum Creek West at 1.56 mg/kg and on-site at 96.3 mg/kg. Copper was found in Plum Creek West at 296 mg/kg and on-site at 1,050 mg/kg. Aroclor 1254 was found on-site at 2.7 mg/kg and in the Plum Creek West sample at 5.8 mg/kg (PAS-00123103-04,113-14; PAS-00109554-55). Note specific sampling locations were not provided in the report but are reportedly on file with the NJDEP, Division of Waste Management (PAS-00109551-52).

In 1966, the U.S. Army Corps of Engineers (Corps) sent a letter to Alliance Color & Chemical Company informing them that on several occasions commencing on June 26, 1965, and subsequent to that date, a discoloration has been observed in the tidal waters of Newark Bay. Investigation disclosed that at least a portion of the pollutant originated the Alliance site. Samples collected in June 1965 were analyzed by the U.S. Customs Laboratory. Sampling results showed compatible content with material found in tidal waters off Newark Bay with those stored and discharged from Alliance (PAS-00049849-50). A 1966 interoffice memo stated, “everything (except strong acid from Building 7) goes to the brook” (PAS-00049852). The Corps returned and found Alliance’s effluent pipe discharging a red acidic waste traced to “press drippage on PDC chlorsulfination filtration” from Buildings 4 and 7 into the brook (PAS-00049864).

According to an Alliance Plant – Sewerage Discharge Letter dated February 7, 1969, the wastewater discharge flow rate to Plum Creek ranged between 70 gallons per minute (gpm) and 112 gpm and the pH was alkaline for long periods and acidic for long periods. (PAS-00049878). Flow rate survey data collected at Plum Creek is provided below.

SURVEY DATA FROM CREEK

Date	Time	GPM	pH
1-23	3 PM	29	9.9
1-23	4 PM	29	11.3
1-23	8 PM	29	2.6
1-23	12 PM	80	7.7
1-24	4 AM	80	9.8
1-24	9 AM	71	7.7
1-24	1 PM	100	
1-24	4 PM	71	11.6
1-24	8 PM	90	8.0
1-24	12 PM	71	12.0
1-25	4 AM	112	5.6
1-25	8 AM	71	4.0
1-27	8 AM	20	6.0
1-27	12 AM	71	9.5
1-27	4 PM	71	1.0
1-27	8 PM	124	1.0
1-27	12 PM	100	1.0
1-28	4 AM	90	3.0
1-28	8 AM	80	3.0
1-28	9 AM	112	5.0
1-28	12 AM	100	1.0
1-28	4 PM	100	1.5
1-28	5 PM	41	8.0
1-28	8 PM	112	8.0
1-28	12 PM	136	8.0
1-29	4 AM	80	1.0
1-29	8 AM	71	11.0
1-29	12 AM	71	5.5
1-29	4 PM	112	5.5
1-29	8 PM	150	
1-29	12 PM	164	5.5
1-30	4 AM	112	1.0
1-30	8 AM	100	1.0
1-30	1 PM	71	1.0
1-30	4 PM	71	9.0
1-31	8 AM	112	2.0
1-31	4 PM	112	5.0
1-31	8 PM	212	5.0
1-31	12 PM	112	5.0

According to a PVSC letter regarding Plum Creek dated December 18, 1969, a sample taken from the plant discharge to Plum Creek on December 10, 1969, was found to be flammable and had an explosimeter reading of 80%. PVSC reported that this discharge would not be allowed when Alliance completed their connection to PVSC (PAS-00049887).

According to a 1993 *Passaic River Study Area* report, in 1981 cleanup of a drainage ditch on Avenue P Landfill property resulted in several barrels in the ditch being hit with an excavation shovel. Runoff from the drums entered Plum Creek (PAS-00076955).

Per a 2001 *Plum Creek PRP Investigation*, Plum Creek borders Alliance and the site's effluent discharged to Plum Creek until 1970 through an unlined lagoon and trench (PAS-00123102-03). The Appendix A of a November 18, 2002, *Preliminary Assessment* for Alliance noted that the former wastewater lagoon was found to serve as a former discharge point, and sludge residuals were believed to be buried within the extent of the lagoon (PAP-00065692).

Flooding

Alliance is located on a 100 year flood plain (PAS-00049993). In 1967, Pfister Chemical Works sent a memo to George Shulman regarding drainage problems caused by heavy rains. The memo reported that the twelve-inch diameter drain line was backing up into plant buildings to a level of 12-18 inches during heavy rains. Of note was that flooding from Sun Chemical east of the property raised the water table, and water percolated up through holes in the asphalt concrete immediately north of the warehouse to as much as four inches above the top of the concrete (PAS-00049909-10).

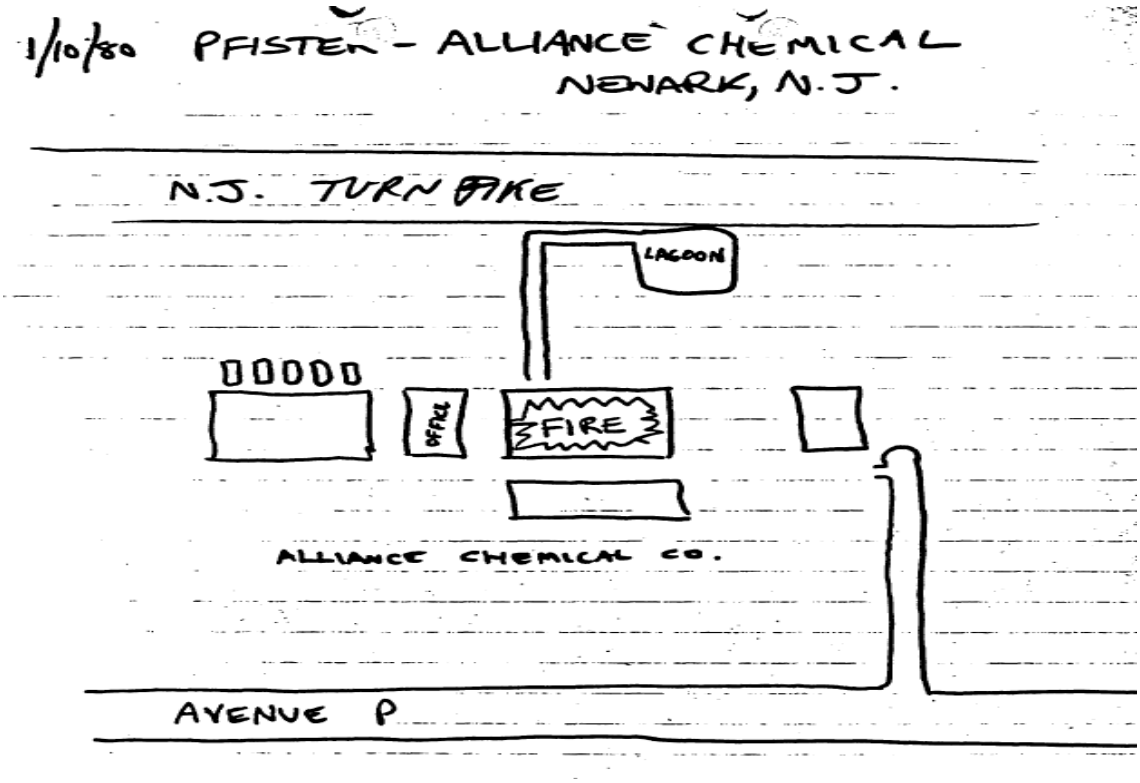
In 1972 Alliance sent a letter to the Mayor of Newark informing him that in 1971 Alliance was shut down three times due to flooding from Plum Creek (PAS-00050252). In March 1972, the Alliance Plant Manager communicated with the Director of Public Works about obstructions in Plum Creek that created flooding conditions (PAS-00050255).

In July 1975, Alliance wrote a letter to the City of Newark Department of Sewers notifying them that they were shut down under two feet of water, due to flooding from Plum Creek. Again in September 1975, Alliance wrote a letter to the Department of Sewers telling them operations were shut down due to their being inundated by 8 inches of water from Plum Creek (PAS-00050252).

Combined Sanitary and Storm Sewer

Appendix A of a November 18, 2002 *Preliminary Assessment* stated that between the early 1950s and late 1970s, industrial discharge flowed into on-site lagoons. A lagoon, originally located in the northern portion of the property, discharged to the public sewer system after the solids were settled in the lagoon and liquid passed through the neutralization pit in the north central portion of the site. The lagoon was backfilled prior to 1986 (PAP-00065690-91).

The January 24, 1990, *General Information and Site History* document reported Alliance Chemical used open unlined trenches to run liquid wastes to an unlined lagoon. Reportedly, aerial photographs identify a trench in 1961 that remains visible until 1972. In 1974, a lagoon appears in aerial photographs, and in 1978, the lagoon appears to contain water and the trench appears to be running into both the lagoon and a tidal basin. Aerial photographs also helped determine that the lagoon was backfilled without notifying NJDEP (PAP-00066461). Note: copies of aerial photographs were not submitted in the available references.

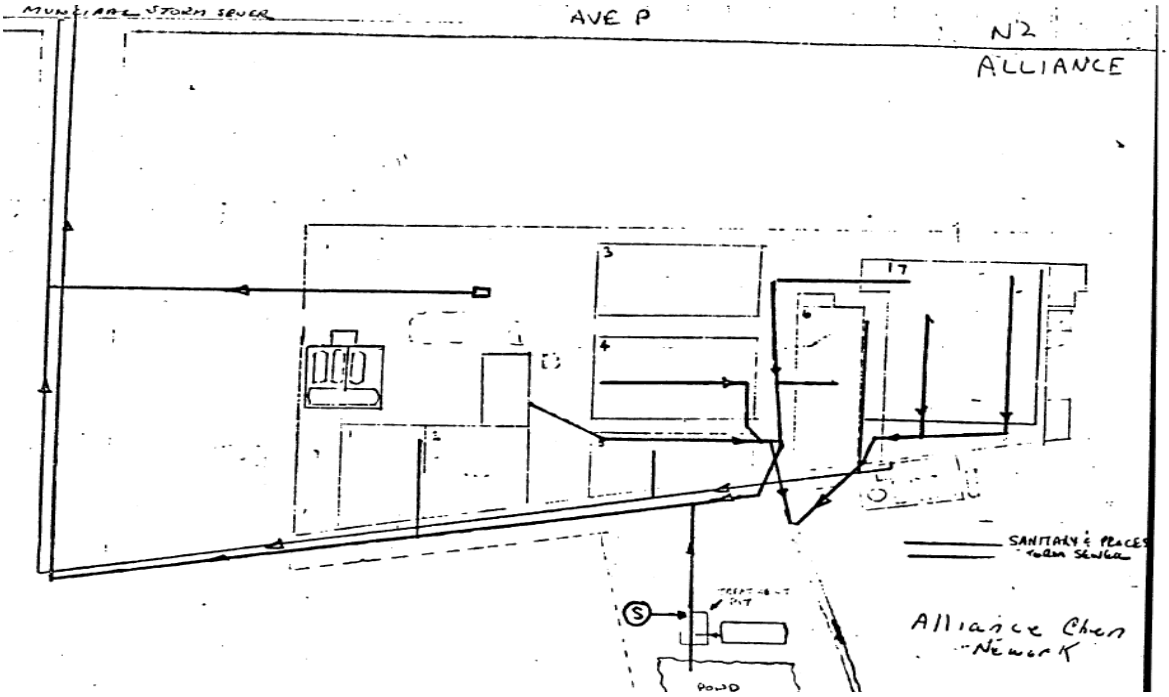


(PAS-00049999)

According to a 1997 letter to EPA, in 1970, Alliance Chemical connected into the Roanoke Avenue Combined Sewer Outfall (CSO). In a 1978 *Newark Feasibility Study "Pollution Abatement Program" Report*, it was reported that the Avenue P regulator and Roanoke Outfall Sewer had malfunctioned between 1978 and into the 1980s; therefore, both wet and dry weather discharges occurred (PAS-00053972-73). Approximately 0.5 feet of granular sediment containing organic contaminants was found in the combined sewer above the regulator that flushed during relatively small rainfall events. In addition, water from the Passaic River may enter the sewer with incoming tides and dilute pollutant concentrations (PAS-00049794, 96).

The discharge mechanism was found to be a catch basin that led to a storm drain that in turn led to the Roanoke Avenue CSO, and then to the Passaic River through the Avenue P Regulator (PAS-00053973). The Appendix A of a November 18, 2002 Preliminary Assessment reported underground piping associated with floor drains, sumps and the

on-site stormwater collection system connected the sewer line with a neutralization pit that was in the north-central portion of the site (PAP-00065691-92). Below is an image of the Combined Sanitary and Storm Sewer Outfall Connection (PAS-00072901).



According to a 1970 *Selected Substance Report*, Alliance discharged on average 100,000 gallons of wastewater per day to the POTW serviced by PVSC, and utilized neutralization in their pretreatment methods. The wastewater consisted of process water, contaminated stormwater, washdown water and scrubber water (PAS-00049903).

According to a 1972 Waste Effluent Survey, 29,228,900 gallons of water was purchased in 1971, of which 29,200,000 gallons went to the sanitary sewer, which is tied into the Avenue P Sewer System, with an average discharge rate of about 100 gpm (PAS-00049895-96).

According to a PVSC Sewer Connection Application, industrial waste samples collected in 1979 identified 17.31 mg/L copper, 1.043 mg/L lead and 0.005 mg/L mercury. Daily flow was reportedly 105,000 gallons through a 15-inch sewer connection (PAS-00072898-900). In 1979, the facility sewer system was tied into the Avenue P sewer system with a continuous discharge of 24 hours per day at an average rate of about 100 gpm (PAS-00049641-42). Samples collected on August 20, 1985, and analyzed by Garden State Laboratories, Inc. contained 1.32 mg/L lead, 0.68 mg/L copper and 0.003 mg/L mercury (PAP-00066325). PVSC samples collected on September 12, 1989, contained 1.09 mg/L lead (PAP-000663557) and PVSC samples collected on March 7, 1990 contained 0.7500 mg/L lead (PAP-00066353).

Pretreatment Monitoring Reports from 1991, 1994 and 1995 showed lead discharges were within permitted limits (listed in 0.18153 average pounds) (PAS-00049754, PAS-00049705, and PAS-00049649). PAH sampling results for September 1991 and October 1995 were non-detect (PAS-00049760, PAS-00049664-65).

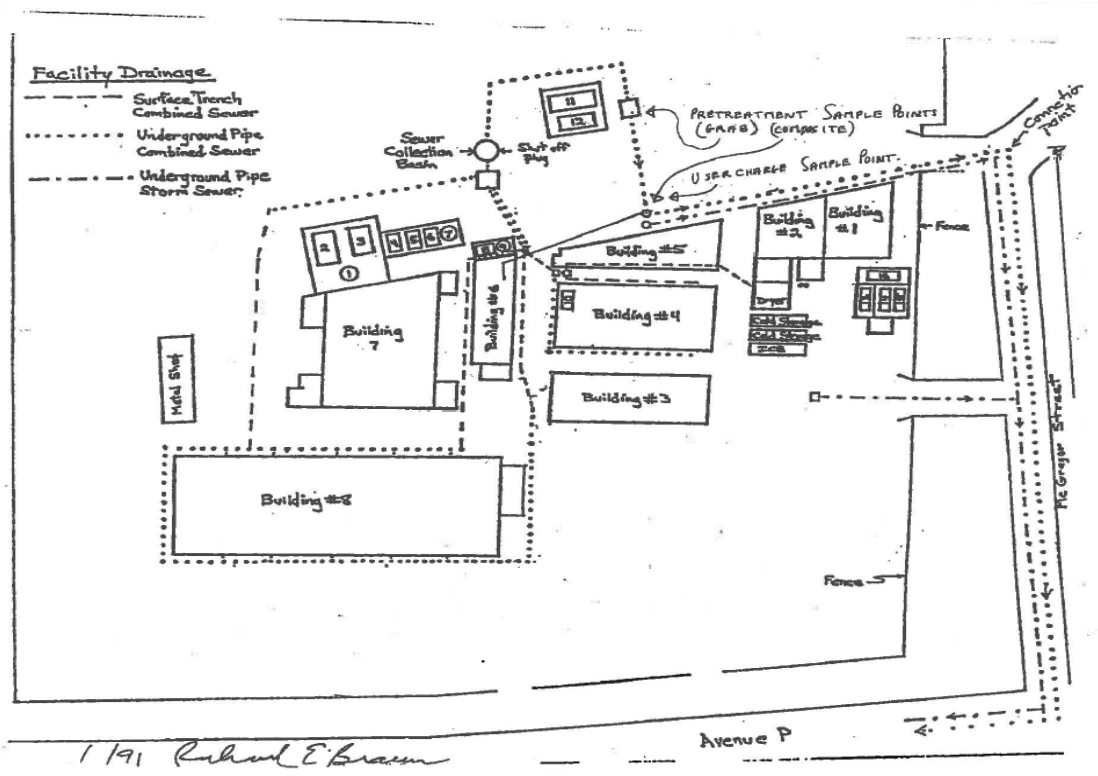
In a Sewer Connection Permit No. 20401080 renewal, industrial waste was reported to contain 0.31 mg/L copper; 1.07 mg/L lead and 0.002 mg/L mercury (PAP-00066374).

PVSC received a letter from Alliance, dated April 28, 1993, that identified an average discharge flow of 24,752,000 gallons through a single point to PVSC with a high of 33,685,000 gallons to a low of 17,100,000 gallons from 1971 to 1980. The average flow between 1981 and 1990 was 16,261,000 gallons with a high of 19,600,000 and low of 13,828,000 (PAP-00066450).

Alliance's Waste Effluent Survey and PVSC applications document the following water usage and daily flow (PAS-00049895-96; PAS-00072896).

Alliance Water Discharge and Usage (in gallons)		
Reporting Year	**Sanitary Discharge**	**Total Water Use**
1971	29,200,000	29,228,900
1979	26,696,250	26,696,250

Below is an image of Alliance's Facility Drainage (PAS-00066422).



Spills

According to a January 24, 1990, *General Information and Site History* document, a Pre Sampling Assessment by NJDEP on October 3, 1989, revealed numerous areas of soil staining throughout the site. During the inspection, puddles were observed with a sheen at several locations. Further, concrete areas around the wastewater trenches were stained with multi-colored substances (PAS-00049994).

6. Regulatory History/Enforcement Actions

Inspections

According to a letter from Corps of Engineers, Supervisor of New York Harbor, illegal discharge of acid into Newark Bay was in violation of Federal Statutes (U.S.C Title 33, Section 407) and on several occasions during the month of February 1966, inspections revealed that acid was still being deposited into the bay and although Alliance was attempting to correct the situation their actions had not completely negated the pollution (PAS-00049870).

According to an January 24, 1990, *General Information and Site History* document of Alliance, on August 3, 1983, an inspection of Alliance by the Industrial Investigation Unit of NJDEP raised the question of dioxin contamination at the site from the manufacture of Class II dioxin precursor chemicals 2-chloro-1,4-diethoxy-5-nitrobenzene (1975–1980) and 5-chloro-2,4-dimethoxyaniline (1965–1983). Sampling conducted on May 10, 1985, revealed no traces of 2,3,7,8-TCDD (PAS-00049991; PAS-00129646).

According to a January 24, 1990, *General Information and Site History* document, a Pre Sampling Assessment by NJDEP on October 3, 1989, revealed numerous areas of soil staining throughout the site. During the inspection, puddles were observed with a sheen at several locations. Further, concrete areas around the wastewater trenches were stained with multi-colored substances (PAS-00049994).

Violations

According to a letter from Corps of Engineers, Supervisor of New York Harbor, illegal discharge of acid into Newark Bay was in violation of Federal Statutes (U.S.C Title 33, Section 407) and on several occasions during the month of February 1966, inspections revealed that acid was still being deposited into the bay and although Alliance was attempting to correct the situation their actions had not completely negated the pollution (PAS-00049870). The effluent was discharging through a minor leak that was shut down and repaired (PAS-00049871-72). It is unclear if OU2 COCs were associated with this discharge.

A letter from the City of Newark, dated April 27, 1973 reported that Newark's Department of Public Works issued Alliance a Violation of Title 21 Chapter 3-4(b) and 3-6(a) Ordinance for exceedances of biochemical oxygen demand, suspended solids and greasy material in effluent discharge (PAS-00049898). It is unclear if OU2 COCs were associated with this discharge.

The January 24, 1990, *General Information and Site History* document contained a note that on June 6, 1977 Alliance Chemical was issued a Notice of Prosecution for emitting visible smoke from a standby boiler (PAP-00066465). It is unclear if OU2 COCs were associated with this discharge.

According to an January 24, 1990, *General Information and Site History* document, Alliance was cited by NJDEP for the following violations on May 29, 1987, failure to document training, failure to submit a current lay out of the facility, failure to document fire inspections, contingency plan failure to describe actions in emergencies (PAS-00049996).

PVSC gave Alliance Chemical a Notice of Violation for Permit No. 20401088 for discharging corrosive waste that could damage the sewer system between the period of September 6, 1988 and October 6, 1988 (PAP-00066341). It is unclear if OU2 COCs were associated with these discharges.

PVSC issued a Notice of Violation pertaining to Permit No. 20401080 on December 28, 1990 due to sampling analysis identifying exceedances of lead (0.34 mg/L and 0.71 mg/L) in samples collected in November 1990. The permitted daily average was 0.32 mg/L average for lead (PAP-00066412).

On March 17, 1991, PVSC issued Alliance a Sewer Connection Permit No. 20401080 that allowed discharges with pH between 5 and 10.5. In 1988, they violated their permit twice due to pH discharges that were below or exceeded permitted limits (PAP-00066462, PAP-00066417).

NJDEP issued a Notice of Violation on September 6, 1991 for discharge of hazardous materials and failure to notify NJDEP (PAP-00065863). It is unclear if OU2 COCs were associated with these discharges.

PVSC issued Alliance a Notice of Violation on January 28, 1992 for pH exceedances (PAP-00066435).

According to an Administrative Action, on October 1, 1993, NJDEP issued Administrative Orders and Notices of Civil Administrative Penalty Assessments against Alliance alleging violations of the Spill Compensation and Control Act resulting from Alliance's failure to conduct initial integrity testing for twenty aboveground storage tanks (PAP-00216751-52).

According to a PVSC Complaint date December 17, 1993, PVSC monitored Alliance's discharges to the PVSC system to determine its compliance with the Categorical Pretreatment Standards for zinc and cyanide. PVSC advised Alliance to take immediate steps to prevent continued violation of Permit No.20401080 and had failed to comply. Since it was likely to continue to exceed its discharge limitations and adversely affect public health or safety or the operations of the PVSC system, PVSC demanded revoking the sewerage connection permit (PAP-00216733-36).

According to a Settlement Agreement dated August 10, 1994, Alliance agreed to resolve all matters between itself and the PVSC in the December 17, 1993, Complaint (PAP-00216744).

According to a 2006-2007 Natural Resource Damages Settlement Agreement for Groundwater Only, discharges occurred at the Alliance facility and Alliance agreed to pay the balance of any damages for groundwater (PAP-00216790-91). The document does not identify the contaminants discharged to groundwater.

Permits

Alliance filled a RCRA Part- A Hazardous Waste application and received Permit Number NJD045794971 for neutralization of acid waste. They were permitted to store and treat 10,000 gallons of acid waste per day. In 1983, Alliance applied to be delisted as a treatment, storage and disposal facility. The request was granted in 1986 (PAP-00066471).

PVSC received a renewal application of sewer connection permit 20401080 for discharge into a separate sanitary sewer (PAP-00066320-29).

NJDEP Division of Water Resources informed Alliance that a NJDPES permit was not required since their neutralization tank qualified as an Industrial Wastewater Management Facility (PAS-00049992).

On September 17, 1990, Alliance renewed their Sewer Connection Permit 20401080 (PAP-00066368-78).

On March 17, 1991, PVSC issued Alliance Sewer Connection Permit 20401080 that allowed discharges with pH between 5 and 10.5 (PAP-00066462, PAP-00066417).

According to a May 12, 2000 Memorandum of Agreement for Non-Residential Properties, Alliance had a PVSC effluent discharge permit and NJDEP air permits associated with air scrubbers (PAP-00066505).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Preliminary Assessment (1989)
- Phase 1 Preliminary Remedial Investigation (1991)
- Supplemental Investigative Activities & Proposed Soil Sampling Plan (1997)
- Remedial Investigation (2001)
- Preliminary Assessment (2002)
- Remedial Action Selection Report and Remedial Action Work Plan (2005–2012)

Remedial Activities

Sewer

There is no information regarding sewer sampling data in the available file material.

Soil

According to the June 2018 *Remedial Action Report / Remedial Action Work Plan* by Matrix, in September 1988, the New Jersey Turnpike Authority conducted a soil and groundwater investigation at the western portion of the site as part of a planned widening project for the Turnpike. The soil and groundwater sampling results showed elevated levels of several volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and pesticides. Additional sampling conducted by the Turnpike Authority in October 1989 showed similar results (PAP-00216680). Sampling data are provided above in Section 4 by respective COCs.

According to the *Phase I Preliminary Remedial Investigation* dated October 4, 1991, a total of nine shallow soil borings were collected between September 7 and 15, 1988 (PAP-00066472). "Unknown PAHs" were detected in 5 of 18 soil samples with an estimated concentration of 1,024 mg/kg at a depth of 0 to 6-inches and 30 to 36-inches. Lead was found in almost every sample with concentrations in excess of NJDEP recommended action levels. Lead ranged between 112 mg/kg to 84,200 mg/kg with an average concentration of 5,398 mg/kg. Copper was found in almost every sample at a depth of 0 to 6-inches and 30 to 36-inches (PAP-00066475). Note: copper concentrations were not provided.

According to the June 2018 *Remedial Action Report / Remedial Action Work Plan* by Matrix, in September 1992, Alliance entered into a Memorandum of Agreement (MOA) with the NJDEP to conduct supplemental soil sampling at the site. The sampling results revealed concentrations of benzo(a)pyrene, 2,4-dinitrophenol, 3,3-dichlorobenzidine, lead and zinc at concentrations in excess of the then applicable NJDEP restricted use direct contact soil cleanup criteria (SCC). A Supplemental Soil Sampling Work Plan for Area A was submitted to the NJDEP in January 2001 to provide for the additional delineation of contamination detected during the 1998 investigation (PAP-00216680). Note: the MOA and concentrations were not provided in documents.

According to a letter dated February 29, 2000, NJDEP notified Alliance that they had not received any response to the September 24, 1992, MOA where NJDEP offered oversight of remedial activities under the Voluntary Cleanup Program. Alliance was notified that NJDEP assumed Alliance no longer wished to participate in the Voluntary Cleanup Program. The 1992 MOA was terminated (PAP-00065911).

According to the 2005 *Remedial Action Selection Report and Remedial Action Work Plan* prepared by ARM Group, in 2003, the majority of the buildings were demolished; the site was leveled, and the majority of the site was covered with geotextile fabric (PAP-00065772). The drainage trenches, neutralization pit, tanks, etc. were cleaned and removed. The site was covered with approximately 6-8 inches of crushed rock and

asphalt millings (PAP-00065779). Elevated contaminant concentrations were found to be generally consistent with that expected from historic site operations primarily in the western half of the site. Impacts were largely related to operation of the wastewater lagoon and neutralization pit (PAP-00065773, PAP-00065788). Site-related constituents were delineated to unrestricted use soil cleanup standards with some minor gaps along the western and northern boundaries. Samples were not collected in these areas due to off-site restrictions posed by the New Jersey Department of Transportation and the turnpike embankment posed logistical constraints (PAP-00065788). The selected remedial approach included: 1) engineering and institutional controls to prevent removal of the cap or residential use, 2) a CEA and well restriction area and 3) hot-spot soil treatment in the western portion of the site and monitoring (PAP-00065795-97).

The 2008–2012 *Remedial Action Progress Reports* showed soil mixing and chemical treatment activities. Follow-up soil and groundwater sampling noted a reduction in soil constituent concentrations to 80% on average (PAP-00066000). Site-related constituents of concern were still present in 2009 in the central portion of the site, but additional chemical injection within this area addressed contaminant mass removal (PAP-00066021). In 2010, ARM Group, Inc. conducted in-situ chemical oxidation via soil mixing in the central portion of the site that resulted in a significant contaminant mass removal. Sampling results are not provided (PAP-00066036). The 2011 Progress Report states constituents of concern were still present in the central portion of the site (PAP-00066051).

A Deed Notice dated October 24, 2019 stated that soil contamination was remediated by Pfister Chemical and that contamination remained, resulting in restricted land uses and the placement of engineering controls in the form of a geotextile fabric and aggregate cap and existing building slab (PAP-00403645-79, PAP-00487838-39).[9]

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

[9] This Report was revised to include documents received on March 19, 2020. The additional documents did not change Alliance Chemical's previous certification.

Arkema, Inc.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

ARKEMA, INC. (f/k/a Pennwalt Corporation. Elf Atochem North America Inc., Atochem North America Inc., and Atofina Inc.)

Facility Name, Address and Size: Arkema, Inc. /Wallace and Tiernan, Inc./Elf Atochem North America Inc./Pennwalt Corporation; 25 and 67 Main Street, Belleville, New Jersey (PAP-00009350). A third parcel located at 2120-2156 McCarter Highway, Newark, NJ (approximately one block away from the 25 and 67 Main Street parcels) was purchased by Wallace and Tiernan in 1950 and was utilized primarily for employee parking and equipment storage. 25 Main Street was approximately 7 acres and 67 Main Street was approximately 0.5 acres (PAP-00009330); numbers of employees varied over time depending on production but in 1988 were 802 employees, operating two shifts, five days per week (PAP-00351386; PAS-00102665).

1. **Business Type:** Manufacturing of measurement and control equipment, including chlorinators, pressure instruments, flow meters, dry chemical feed systems, and cathodic protection systems (PAS-00102626).

2. **Time Period of Ownership/Operations**

25 Main Street

Operator: 1921-1989
Owner: 1921- May 25, 1989 (PAS-00102557; PAS-00049222; PAS-00352822)

67 Main Street

Operator: 1964- May 25, 1989
Owner: 1964- May 25, 1989 (PAS-00102626; PAS-00352822)

1920s: According to a 1990 *ECRA Sampling Report* and *Phase II Sampling Plan*, the facility at 25 Main Street was purchased by Wallace and Tiernan (W&T) in 1918 (PAS-00102618-26); however, a January 29, 1999, *Supplemental Remedial Investigation Report/Remedial Action Work Plan Addendum* states that the site was the location of the W&T manufacturing facility from approximately 1920 to 1997 (PAS-00102554-7). In addition, the date that operations began vary in the available references. A 1994 *Generator Inspection Report* created by a subsequent owner/operator after the 1989 sale states that the operations began on site in 1915 (PAS-00102665). A May 30, 2017, letter written by Glenn A. Harris, counsel for Arkema, states that operations began in approximately 1921 (PAS-00049222). The *History of Wallace & Tiernan* states that the W&T business was started in New York and did not move to New Jersey until the purchase of a single building on Mill Street in Belleville in 1921 (PAP-00352822).

1964: The 67 Main Street parcel, a former gasoline service station located adjacent to the northeast comer of the site, was purchased by W&T in 1964 (PAS-00102626).

Arkema, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

1969: The May 30, 2017, letter written by Glenn A. Harris, counsel for Arkema states that W&T was merged into Arkema in 1969, following which the site was operated as W&T, Division of Arkema (PAS-00049222).

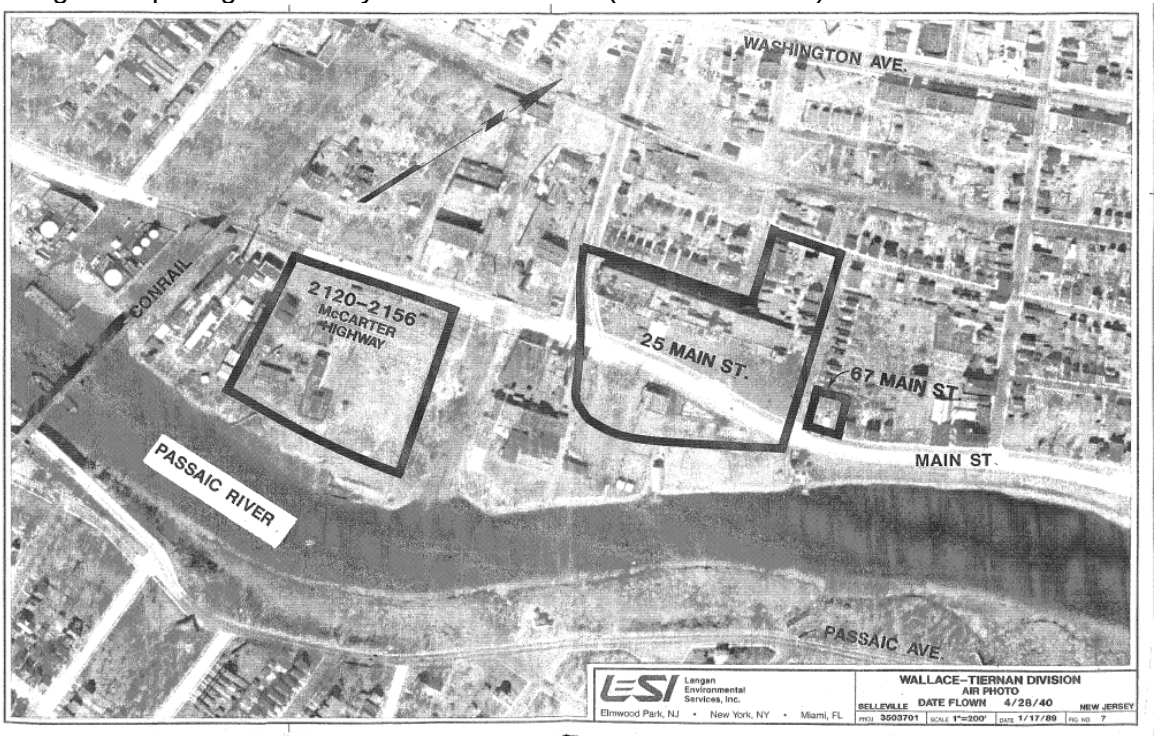
1989: Arkema sold all three parcels of the site on May 25, 1989 (PAS-00049222; PAP-00402422; 28). A 2002 *Remedial Action Report* states that in 1989, the property was sold by Pennwalt Corporation (now ATOFINA and formerly Elf Atochem North America, Inc.) to W&T (PAP-00009182). The 1990 *ECRA Sampling Report,* states that the ownership of the property was transferred to W&T when it became a separate company from the former Pennwalt Corporation (PAS-00102623; PAP-00402422-26; 28).

1989-1991: The facility was owned / operated by the W&T management buyout group (PAS-00102623; PAP-00402422-26; 28; PAP-00351375).

1991: According to the February 15, 2006 letter written by Paula A. Martin of Counsel to Arkema Inc., the facility was acquired via a stock purchase agreement by Northwest Water Group PLC (NWW), NWW's name was later changed to United Utilities PLC, they operated the Facility until the Facility closed in 1995 (PAP-00351375).

1998: On November 17, 1998, Belleville Industrial Properties, L.L.C. was deeded ownership of the former W&T facility located at 25 Main Street and 67 Main Street (PAP-00351356-60).

A figure depicting the facility location is below (PAP-00351570):



3. Operational History/COC Use and Presence at the Facility

25 Main Street

According to the 1990 *ECRA Sampling Report and Phase II Sampling Plan*, since 1918 the 25 Main Street site has been used to manufacture chlorinators, pressure instruments, flow meters, dry chemical feed systems, and cathodic protection systems. For the manufacture of these products, a variety of industrial operations were performed on-site, including milling and lathing in a machine shop, plastic molding, plating, heat-treating, painting, assembly, testing and packaging (PAS-00102626). The facility used a variety of hazardous substances including, but not limited to, solvents, cutting oils, chemicals, coolants, paints, petroleum products, primers, thinners, and lubricants (PAP-00351360).

In addition, W&T manufactured potable water and wastewater treatment equipment such as pumps, flowmeters, and controls. To accomplish this process, the facility took in raw materials such as brass, iron, stainless steel, steel, plastics, or rubber in such forms as sheets, bars, tubing and piping, and cut them to company specifications. These materials were then machined, stamped, cut, or drilled before they were washed in a hot alkaline solution, rinsed and dried. From this step, the materials could be plated, painted, welded, deburred or a combination of these steps before being routed through different departments for assembly and shipment to customers (PAS-00102668). The plating area of the site consisted of seven metal finishing lines and a waste rinse water treatment system. The company plated with metals such as copper, nickel, gold, silver, zinc phosphate, and chrome. In this area, a hazardous wastewater sludge was generated from one press. The treatment system for rinse water used a cyanide destruction method and settling tank to remove solids before the water was discharged to the Passaic Valley Sewerage Commission (PVSC) system per W&T's permit. The plating baths were to be cleaned periodically when needed which also generated various other plating line hazardous wastes (PAP-00351128; PAS-00102669-70; PAS-00102717).

According to a 1980 *Selected Substance Report* (SSR), W&T used copper anodes (maximum inventory 850 pounds) in electroplating. Most of the copper was plated onto the product; however, there was a possibility of copper loss through dragout (PAP-00351777). The dragout tank had no outlet. The part being plated would then go to the rinse tank which was connected to the municipal sewer system. Periodically, the contents of the dragout tanks were transferred to 55-gallon drums and disposed of at an approved disposal facility. Concentrations of material in the discharge from the rinse tanks to the municipal sewer system had not been established, but the facility stated they estimated those concentrations to be minimal (PAP-00351778). Copper cyanide (maximum inventory 120 pounds) also was used to accelerate the electrolytic process. It remained in the tank but was gradually depleted and had to be replenished (PAP-00351779). Copper, other than in plating (maximum inventory 52,444 pounds), was also used in machining and fabrication operations at the site (PAP-00351825).

With respect to plating waste generation, a *TSD Facility Annual Report* from 1982 reported W&T had generated three drums of copper plating liquid and one drum of sludge from the plating sludge pit. That year, W&T shipped out five drums of copper plating solution and zero drums of sludge. In 1981, three drums of sludge and three drums of copper plating solution were on hand (PAP-00351759). A *Hazardous Waste Facility Annual Report* for 1984 notes that waste generated that year included 200 gallons of copper plating solution and 200 gallons of wastewater sludge from electroplating. Both were noted to be handled by handling method S01 (PAS-00102716-17). Note: According to a Hazardous Waste Permit Application for an unrelated facility code S01 corresponds to gallon or liter container storage (barrel, drum, etc.) (PAS-00044392).

In addition to plating wastes, the facility generated several other hazardous waste streams during operations. The main waste stream generated was waste cutting/cooling, and lube oil from the automatic screw department as well as the drill press, computer operated machining, assembly, and lathing/cutting departments. In addition, waste paint-related material was generated from the paint shop on site (PAS-00102669). According to a July 10, 1989, *Site Evaluation Submission (SES)*, spent solvents, waste oils and paint thinners were handled as hazardous wastes and were sent to an authorized off-site treatment/disposal facilities or to approved recovery/reclamation services (PAP-00351128-29).

The 1980 SSR reported lead (maximum inventory 170 pounds) was used in litharge powder and was mixed with glycerine to make a sealant which was used in a variety of products. Litharge powder was 99.5% lead monoxide (PAP-00351790). Lead naphthenate (maximum inventory 18 pounds) was used to lubricate gears in a number of assemblies (PAP-00351791). Lead (maximum inventory 13,456 pounds) was also used in the machining and fabrication of a variety of finished products. It was also found in paint and solder (PAP-00351827). Lead waste was generated from one of three Litharge stations in the assembly area (PAS-00102669).

The 1980 SSR also reported mercury (maximum inventory 875 pounds) were used in the production of pressure-measuring instruments such as primary standards and calibration equipment, testing of monometers and shipped to customers for use in mercurial monometers (PAP-00351792).

According to a 1987 *Worker and Community Right to Know Act Environmental Survey and Emergency Services Information Survey*, 10-100 pounds of mercury, 101-1,000 pounds of lead compounds, 10-100 gallons of lead compound soluble, 10-100 pounds of copper cyanide, less than 10 pounds of copper coil wire, less than 10 gallons of copper compounds, and 10-100 pounds of mercury were stored at the facility (PAP-00351551-58). According to a *Community Right to Know Survey* for 1988, W&T stored copper in Buildings 3, 6 and 32. Lead was stored in Buildings 3, 4 and 32, and mercury was stored in Building 3 (PAP-00351397-99, 418-23).

The North Yard portion of the site was used for receiving raw materials and for hazardous waste storage. Raw materials were received and stored on the concrete floor of Building 31, which was torn down in 1964. Waste metal shavings were also stored on this slab until they were shipped off-site for recycling. The hazardous waste storage area was located to the east, adjacent to this area, in a covered, open-sided shed located on an asphalt surface (PAP-00351255). Three storm drains received runoff from the North Yard area (PAP-00352594).

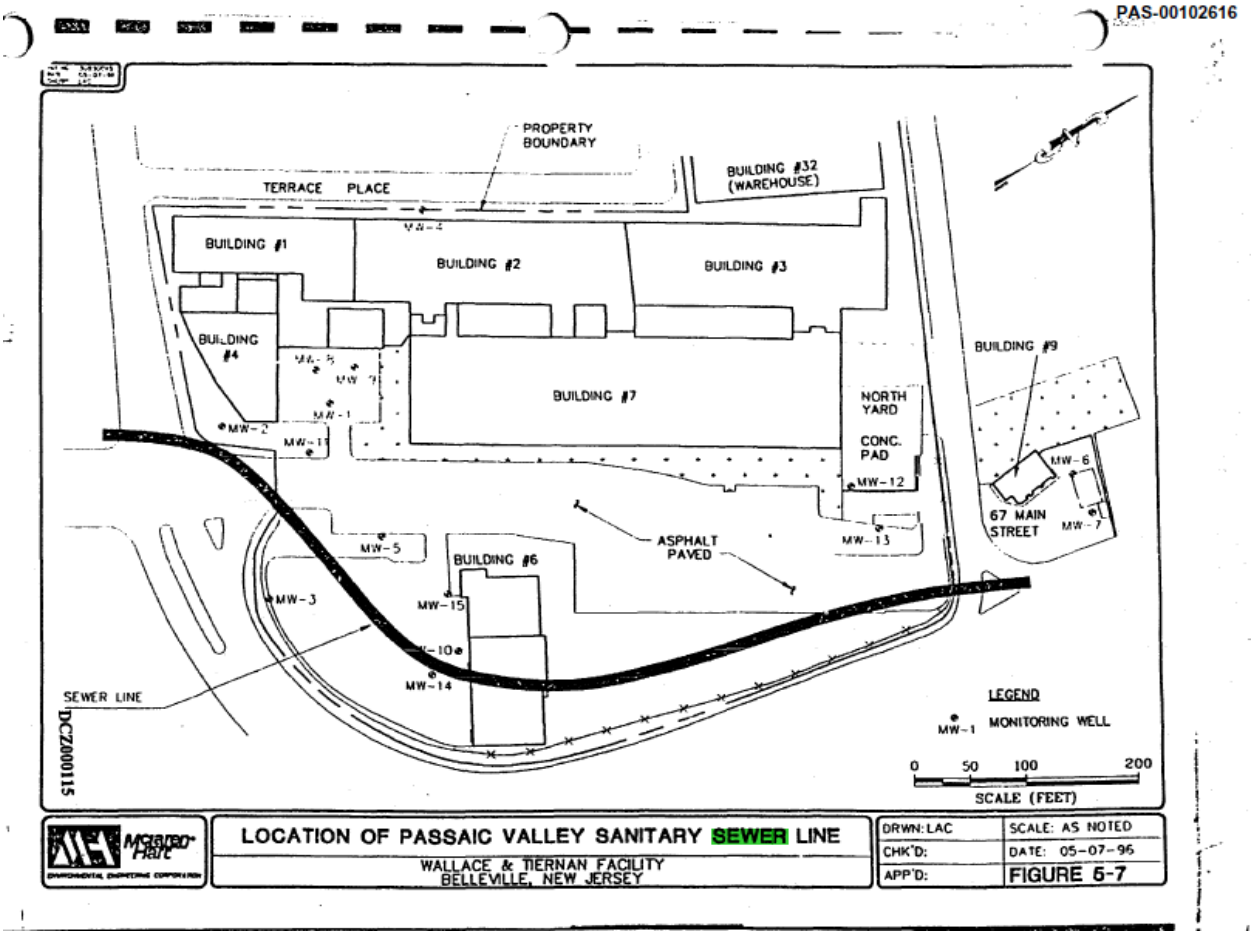
According to a 1987 *Worker and Community Right to Know Act Emergency Services Information Survey*, a total range of 10,001-50,000 gallons of fuel oil, 10-100 gallons of naptha solvent, 10-100 gallons of petroleum distillates, 101-1,000 gallons of petroleum oil and 101-1,000 gallons of petroleum spirits were stored at the 25 Main Street site (PAP-00351557-59). In addition, according to a *Community Right to Know Survey* for 1988, W&T stored fuel oil to the east of the boiler room under a concrete pad. Waste oil was stored in the North Yard. Paints were stored in Buildings 3, 4 and 32. Petroleum distillates and oil were stored in Buildings 2, 3, 4, 6 and 32 (PAP-00351407, 435-443, 458).

According to a July 17, 1987 Hazardous Waste Site Questionnaire, W&T disposed of 2,400 gallons of Bulk Liquid X-726 (Waste Oils), 1,517 gallons of Bulk Liquid X722 (Waste Oil N.O.S), and 1,500 pounds of F006 Solid-Drums Hazardous Waste Solid ORME (Wastewater treatment sludges from electroplating operations) in 1986 (PAP-00466426).[1]

The 1990 *ECRA Sampling Report and Phase II Sampling Plan* reported that the boiler for the W&T site was, at the time, oil-fired but was formerly coal-fired. Coal storage reportedly was in the vicinity of Building 7. The change in fuels occurred during the 1940s and Building 7 was subsequently constructed in 1968 (PAP-00352586).

The facility layout, building numbers, and location of the PVSC sewer line are depicted below (PAS-00102616):

[1] This Report was revised to include documents received on May 18, 2020. The additional documents did not change Arkema, Inc.'s previous certification.



67 Main Street

The property at 67 Main Street was purchased by W&T in 1964. No manufacturing operations were reportedly conducted at this property. The reported use of 67 Main Street was for maintenance and truck parking. Prior to W&T's purchase, the property was operated as a retail gasoline sales and service station, and earlier, as a restaurant (PAP-00351360).

McCarter Highway

According to a 1989 *Site Evaluation Submission (SES),* W&T has owned this property since 1950. No manufacturing operations were conducted on this site by W&T. A major portion of this property was paved and used for employees parking. Several buildings were located on the site which were used to store equipment, building materials (wood, metal), old office equipment and some machinery. For a brief period in the early 1980s certain drummed wastes from the manufacturing operations at 25 Main Street were temporarily stored on the property prior to off-site disposal (PAP-00352633). An inactive 2,000-gallon UST containing No. 2 fuel oil was located east of Building 6S and installed before the 1950s at this location (PAP-00352626).

According to the 1989 *Site Evaluation Submission (SES)*, no known spill incidents or discharges of hazardous substances or wastes have occurred at this site (PAP-00352627). When the W&T business was sold by Pennwalt (now Arkema) in 1989, DEP issued an ECRA Negative Declaration for this parcel (PAP-00352639).

4. Identified COCs

- PCBs (used, detected)
- PAHs (used, detected)
- Mercury (used, stored)
- Copper (used, stored, generated)
- Lead (used, stored, generated)

PCBs

According to the Monsanto Sale records, the following amount of Aroclor 1248 were purchased by the facility: 450 pounds in 1959, 300 pounds in 1962 and 165 pounds in 1963, 165 pounds in 1965, 330 pounds in 1966, and 330 pounds in 1967 (PAP-00304327-33, 368, 374, 422, 429).

A December 7, 1984, W&T letter regarding an EPA inspection states that the facility had seven liquid-cooled transformers, which were located in Building 2, one of which contained “marginal levels” of polychlorinated biphenyls (PCBs) (PAP-00351573).

A January 29, 1987, *Pennwalt Telephone Conversation Memo* discusses the potential disposal of two small electrical capacitors with PCBs to Banks Landfill in Pennsylvania (PAP-00351577).

A February 2, 1989, *Loss Prevention Report* discusses approximately 20 capacitors containing 1.9 gallons of PCB oil being disposed of in metal drums “per EPA guidelines” as the capacitors were no longer needed at the site (PAP-00351566).

According to the September 28, 1990, *ECRA Sampling Report and Phase II Sampling Plan,* PCBs were detected in a background soil boring (B-33 at 0 to 0.5 bgs), in a spill area at the warehouse loading bay (S-10 at 1.25 to 1.5 bgs), in a post-excavation soil sample near building 7 in the North Yard area, and in the plating room condensate drain. It was reported that the PCB concentrations in all of these areas did not exceed the “suggested ECRA [Environmental Cleanup Responsibility Act] action levels” for PCBs (PAP-00352603-04; PAP-00352609). Note: Table 1 and 6 with sampling results was not included in the report.

According to the *Evaluation of Site-Related COCs at the Former W&T Facility,* dated July 20, 2018, the following concentrations of PCBs were detected at the facility in on-site soil samples (PAP-00726494-550).

PCB Concentrations (mg/kg) In On-Site Soil Samples	
Area of Concern	**Concentration**
Background	0.59
North Yard Area	0.54
Plating Room Condensate Drain	2.5
Post-Excavation: Building 7	1.89 J
Warehouse Loading Bay	0.55

J: Estimated

PAHs

According to the *1990 ECRA Sampling Report and Phase II Sampling Plan,* the boiler room tank farm at 25 Main Street consisted of two 20,000-gallon capacity heating oil underground storage tanks (USTs) (Tanks 3 and 4); one 2,000-gallon capacity heating oil UST (Tank 6) and one UST (Tank 11) whose contents and capacity were unknown. Tank 6 was abandoned in place on May 1, 1990. Tanks 3 and 4 were connected and enclosed in a polyethylene liner and concrete slab. Tank 11 was discovered on June 15, 1990, and emptied on September 13, 1990 (PAP-00352592). During investigation, stained soil and petroleum odors were observed starting at depths of 8-10 feet and oil-saturated soils were observed at 8-14 feet below grade. Two soil samples contained base/neutrals and acids (BNAs) [which can include polynuclear aromatic hydrocarbons (PAHs)] at concentrations of 16.1 parts per million (ppm) and 10.86 ppm (PAP-00352605).

According to the 1989 *ECRA Sampling Plan*, one 1,000-gallon UST containing No. 2 fuel oil (Tank 7) was located south of Building 9 at 67 Main Street (PAP-00351256). Four samples were to be collected from 8-8.5 ft bgs and analyzed for PAHs (PAP-00351268).

On May 1, 1990, Tank 7 was emptied, removed according to NJDEP guidelines and backfilled with stockpiled excavated soil and certified clean fill (PAP-00352599). Note: Table 8 – Summary of Analytical Results – Tank 7 Post-excavation Samples was not included in the report (PAP-00352581).

According to the September 1990 *ECRA Sampling Report and Phase II Sampling Plan,* a 550-gallon UST (Tank 10) of unknown contents was found on May 23, 1990, at 67 Main Street, and appeared to have been improperly abandoned in place. Oily water was found inside the tank and analysis showed it was likely No. 2 fuel oil (PAP-00352599). On May 23, 1990, the tank was emptied and removed. Stained soil was observed during excavation and removed. Groundwater was encountered at the bottom of the excavation, at approximately six feet below grade (PAP-00352599-600). BNs were detected in soil at a maximum concentration of 113 mg/kg (PE-16 at 5.5 to 6 feet bgs) (PAP-00352611).

The 1990 *ECRA Sampling Report and Phase II Sampling Plan* states that at a spill area located in the warehouse loading bay, the" suggested ECRA action levels" were exceeded for BNA (88.26 mg/kg) which were predominantly composed of PAHs (PAS-00102649).

According to the *Evaluation of Site-Related COCs at the Former W&T Facility,* dated July 20, 2018, the following maximum concentrations of PAHs were detected at the facility in on-site soil samples (PAP-00726494-551).

Max PAH Concentrations (mg/kg) In On-Site Soil Samples						
PAH	**Boiler Room**	**Hydraulic Pit**	**North Yard**	**Plating Room**	**Warehouse Loading Bay**	**Perimeter Area**
Benzo(a)anthracene	35	270	9.8	20	31+	21
Benzo(a)pyrene	32	200	11	12J	29+	19
Benzo(b)fluoranthene	38	250	14	20	35+	25
Benzo(k)fluoranthene	17J	130	4	5.6	14+	10
Chrysene	32	250	12	27	31+	22
Dibenzo(a,h)anthracene	4.8J	38J	N/A	2.4J	3.1+	3
Indeno(1,2,3-cd)pyrene	16J	140	6.6	4.9J	15+	11

J: Estimated Value
+:Semivolatile analysis results showed low percent recovery and high relative percent difference for isolated compounds on one matrix spike sample and one matrix spike duplicate sample.

Metals – Copper, Lead, and Mercury

A March 31, 1975, *PVSC Waste Effluent Survey* reported maximum total daily discharges of copper 0.4 milligrams per liter (mg/L), lead (<0.2 mg/L) and mercury (<0.0005 mg/L) in facility wastewater (PAP-00351621).

A 1980 PVSC *Sewer Connection Application* reported concentrations of copper (1.45 mg/L), lead (0.25 mg/L) and mercury (0.0085 mg/L) in wastewater effluent (PAP-00351688, 90).

An April 15, 1982, *Baseline Report* reported maximum one-day concentrations of copper (5.05 mg/L) above the pretreatment standards for existing sources (PSES) of 4.5 mg/L per day. Copper concentrations were 2.7 mg/L for the four-day average and consistent with the 2.7 mg/L PSES limit. Lead effluent concentrations (0.2 mg/L maximum/day, <0.09 mg/L four-day average) were below the PSES limits of 0.6 mg/L maximum per day and the 0.4 mg/L four-day average (PAP-00351661).

A June 25, 1984, *Baseline Report* reported maximum one-day concentrations of copper (5.05 mg/L) above the PSES of 3.38 mg/L per day. Copper concentrations were 2.74 mg/L for the four-day average and above the 2.07 mg/L PSES monthly average limit. Lead effluent concentrations (0.2 mg/L maximum/day, 0.09 mg/L four-day average) were below the PSES limits of 0.69 mg/L maximum per day and 0.43 mg/L monthly average (PAP-00351636).

According to a 1985 PVSC Application, copper (0.656 mg/L), lead (<0.025 mg/L) and mercury (0.0015 mg/L) were reported in effluent from outlet 1 while outlet 2 only had detections of mercury (<0.0005 mg/L) (PAP-00352202-03). However, the *Pretreatment Discharge Monitoring Report* for outlet 2 reported copper (0.391 mg/L) and lead (<0.025 mg/L) concentrations for that same year (PAP-00352219, 2223).

According to a February 4, 1986 PVSC *Permit Renewal Application* (No. 01402162), samples of discharge at outlet 2 contained 0.346 mg/L copper, <0.025 mg/L lead and <0.0005 mg/L mercury (PAP-00351667-68, 73). Data for outlet 1 were not available.

An October 26, 1982, *Report of Analysis* from W&T's sludge waste reported a maximum concentration of 55.89 milligrams per kilogram (mg/kg) of copper (no maximum allowable level), 1.63 mg/kg of lead (maximum allowable level 5.0 mg/kg), and 0.0014 mg/kg mercury (maximum allowable level 0.2 mg/kg) (PAP-00351714-15).

According to a 1984 *Hazardous Waste Facility Annual Report*, the facility generated 200 gallons of copper plating solution that year (PAS-00102716-17).

According to a New Jersey Department of Environmental Protection (NJDEP) *Hazardous Waste Generator Waste Minimization Report* for 1986, W&T generated a total of 2,400 gallons of plating waste, 5,250 pounds of plating effluent waste, 200 gallons of paint waste, and 2,265 gallons of used lubricating oils from W&T's manufacturing facilities in 1985 (PAP-00351735-37).

As reported by an October 1988 *Waste Stream Characterization Record,* approximately 50 55-gallon drums of pre-effluent sludge containing copper from plating operations was produced annually (PAP-00351749-50).

A sample of accumulated solids (S-17A) was collected from the catch basin outside the loading bay at Building 4. Copper (1,230 mg/kg) and mercury (3.1 mg/kg) were detected. The sediments in the catch basin were removed for disposal during the sampling plan implementation in order to verify the catch basin's structural integrity (PAS-00102650).

The North Yard portion of the site was used for receiving raw materials and for hazardous waste storage. Raw materials were received and stored on the concrete floor of Building 31, which was torn down in 1964. Waste metal shavings were also stored on this slab until they were shipped off-site for recycling. The hazardous waste storage area was located to the east, adjacent to this area in a covered, open-sided shed located on an asphalt surface (PAP-00351255). Three storm drains received runoff from the North Yard area (PAP-00352594). A soil sample collected to the south of the North Yard (S-7 at 1.5 to 2 feet bgs) contained copper (302 mg/kg) and mercury (6.2 mg/kg) (PAP-00352607).

In addition, the 1990 *ECRA Sampling Report and Phase II Sampling Plan* notes that catch basin sampling conducted at the North Yard drum storage area identified elevated levels of metals, including copper and mercury. The copper concentrations ranged from 2,320 mg/kg to 4,220 mg/kg. The mercury concentrations ranged from 4.1 mg/kg to 8.1 mg/kg (PAS-00102647).

According to the *Evaluation of Site-Related COCs at the Former W&T Facility,* dated July 20, 2018, the following maximum concentrations of metals were detected in on-site soil samples at the facility (PAP- PAP-00726494-550).

Metal Concentrations (mg/kg) In On-Site Soil Samples							
Metal	**Boiler Room**	**Catch Basin**	**Former UST**	**North Yard**	**Plating Room**	**Unpaved Area**	**Warehouse Loading Bay**
Copper	337	1,230	N/A	4,220	1,660	13	90.4
Lead	208	345	196	704	2,740	11	640
Mercury	0.99	3.1	N/A	8.1	19.5	N/A	0.6

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[2]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[3] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[4] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[5]

The fill generally consisted of red-brown, fine to medium sand with trace silt and trace gravel. The thickness of the fill ranged from six to 12 feet (PAS-00102628).

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[2] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[3] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[4] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[5] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a September 2, 1987 Internal Memo, a paint thinner tank was to be removed at the beginning of next year. The two old gasoline tanks are scheduled for replacement by the end of 1987. New in-ground collection tanks for the plating waste liquids were to be installed by the end of 1987 and installed to meet appropriate regulations (PAP-00466428).[6]

According to the March 6, 2000 Supplemental Remedial Investigation Report / Revised Remedial Action Work Plan Addendum, Sanborn Map review depicts the Warehouse Building (Building No. 32) is not present on the site until 1950 and depict the additional building expansion on the main plant (PAP-00466467).[6]

The levels of PAHs, copper, lead and mercury detected at the site in sils are presented in the table below (PAP-00009098; PAS-00102647; PAP-00726494-550).

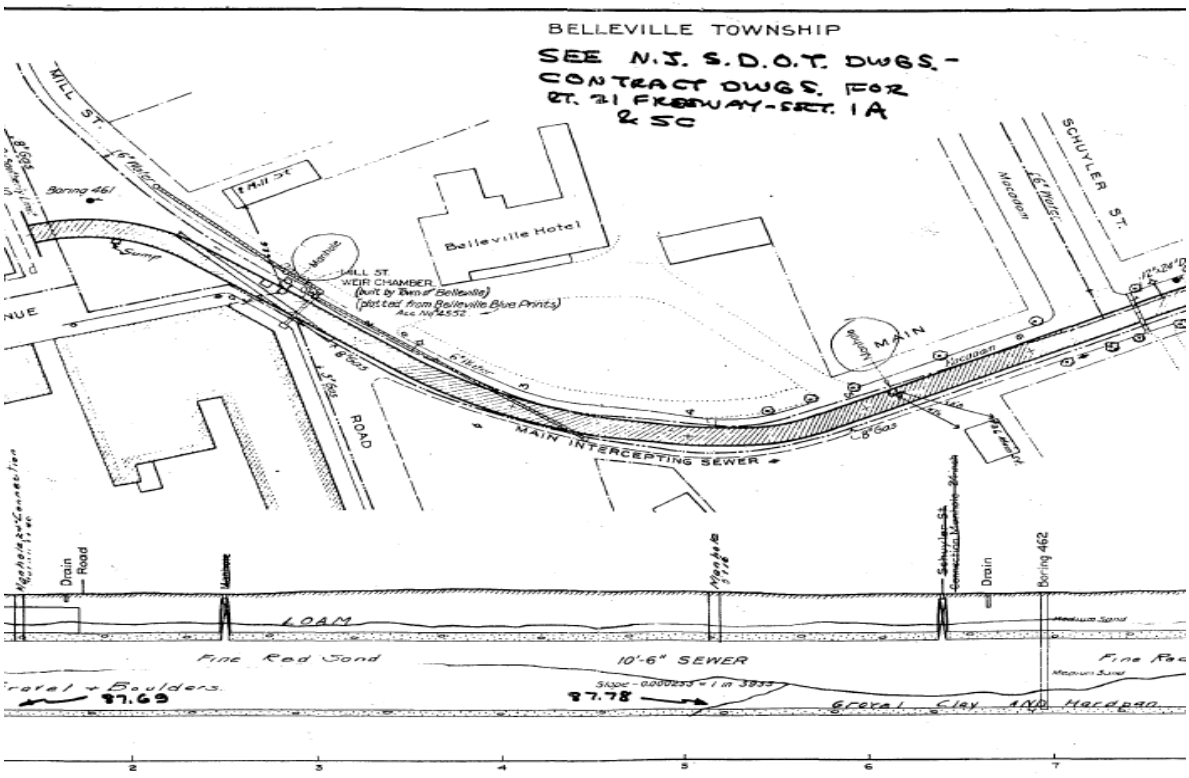
COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,740 mg/kg
Copper	4,220 mg/kg
Mercury	19.5 mg/kg
Benzo(a)anthracene	330 mg/kg
Benzo(a)pyrene	220 mg/kg
Benzo(b)fluoranthene	320 mg/kg
Benzo(k)fluoranthene	130 mg/kg
Dibenzo(a,h)anthracene	43 mg/kg
Indeno(1,2,3-cd)pyrene	140 mg/kg

[6] This Report was revised to include documents received on May 18, 2020. The additional documents did not change Arkema, Inc.'s previous certification.

5. COC Pathways

Sanitary Sewer

An October 1, 1912, map of the PVSC Main Intercepting Sewer below shows the PVSC Main Intercepting Sewer in place before the site was purchased in 1921 (PAP-00351640):



The site connects to the Township of Belleville sanitary sewers in Mill Street and in the former Main Street area which in turn connects to the Mill Street Meter Chamber. The site wastewater enters the PVSC Main Intercepting Sewer at the Mill Street Meter chamber. The 10.5-foot inner diameter Main Intercepting Sewer carries wastewater to the PVSC Sewer Treatment Plant in Newark. The Langan Report further notes that review of PVSC mapping shows that there are no downstream overflows / bypasses from the Main Intercepting Sewer to the Passaic River between the Mill Street Meter Chamber and the PVSC Sewage Treatment Plant (PAP-00095354-55; PAP-00095359; PAP-00097691-92; PAP-00097691; PAP-00142693; PAP-00142705; PAP-00142718; PAP-00111225-27). The nearest overflow/bypass for the Main Intercepting Sewer upstream of the Site is at the Yantacaw Bypass, which is approximately 3 miles upstream of the Site. There is an “Inlet Structure” identified on PVSC mapping along the Main Intercepting Sewer approximately 20 feet south of Mill Street that Langan understood was for inspection and maintenance activities only.

Diamond Alkali OU2 Allocation

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Facility Data Report

An August 10, 1977, *Industrial Sewer Connection Application* reports a total of 204,500 gallons / day of wastewater continuously discharging to the PVSC system and that two industrial processes accounted for most of W&T's industrial water discharge into the sanitary sewerage system. One process discharged into the line which connected to the municipal sewer on Main Street and handled W&T's plating rinse water overflow as well as most of their sanitary waste. The average daily discharge from this operation for 1976 was 83,000 gallons/day (PAP-00351695-700). The other process discharged into the line which connected to the municipal sewer on Mill Street and handled W&Ts water purification equipment test process water as well as some sanitary waste. The average daily discharge in 1976 was 30,000 gallons/day (PAP-00351699).

A July 17, 1980 PVSC *Sewer Connection Application*, reported industrial waste was discharged to the sanitary sewer continuously 5 days a week (PAP-00351685).

According to a 1985 PVSC Application, the daily average flow for outlet 1 was 98,509 gallons and 11,011 gallons for outlet 2 (PAP-00352200).

According to a February 4, 1986 PVSC *Permit Renewal Application* (No. 01402162), the daily average flow for outlet 1 was 98,509 gallons/day and for outlet 2- 11,011 gallons/day. (PAP-00351667-68).

W&T's Waste Effluent Surveys and PVSC applications document the following water data volumes of purchased water and sanitary sewer discharge (PAP-00351684-86; PAP-00351619; PAP-00352198).

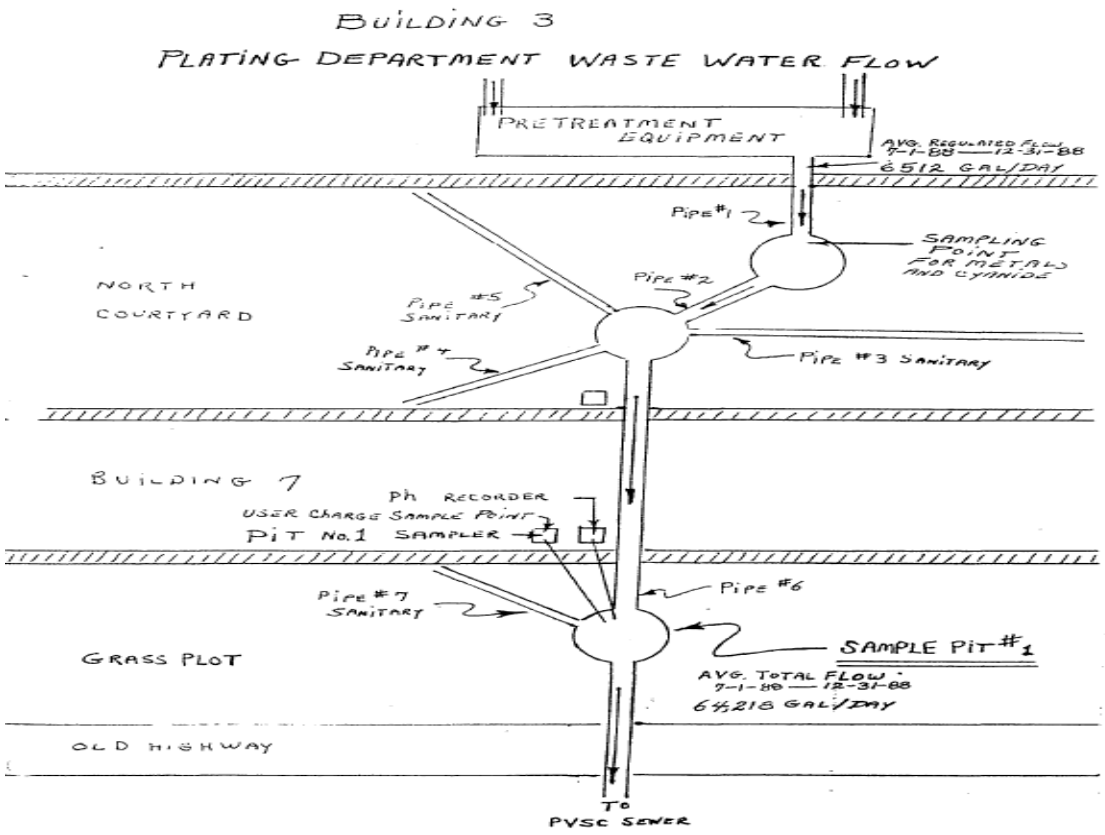
Arkema Discharge and Purchased Water Volumes (in gallons)			
Reporting Year	**Sanitary Water**	**Storm Sewer**	**Total Water Use**
1974	76,691,580	0	77,603,466
1978	64,285,108	0	65,358,638
1985	27,380,128	0	28,821,188

OUTLET * NUMBER	SEWER SIZE (INCHES)	AVERAGE DAILY FLOW (GALLONS)	CONTAINS INDUSTRIAL WASTE (YES OR NO)
1	8"	SANITARY 160,000	YES
2	8"	SANITARY 21,000	YES
3 *	15"	STORM SEWER ONLY	NO
4 *	10"	STORM SEWER ONLY	NO

W&T pre-treated the primary waste stream from plating operations prior to discharge to the PVSC system for pH, sludge, chrome and other metals (PAS-00102711-12; PAP-00351702). The liquid was drained out directly to the PVSC outlet and the sludge was pumped into a press and disposed of off-site (PAP-00351702).

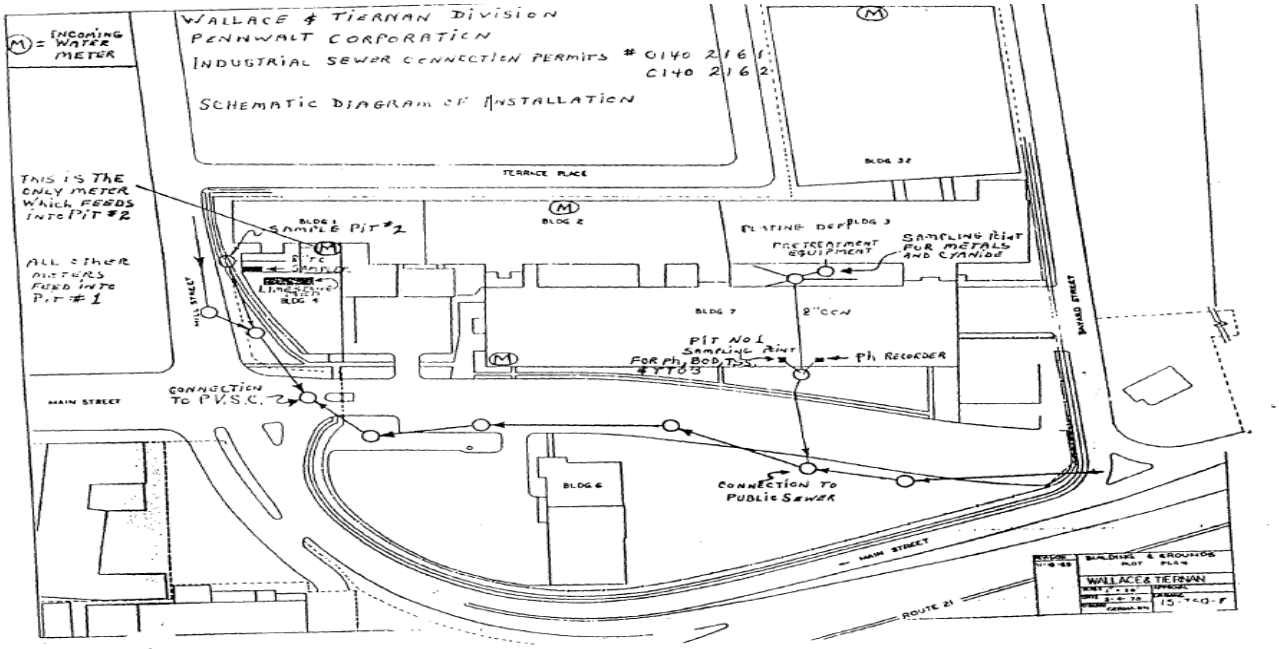
According to a September 29, 1987 Internal Memo, the Plating Department waste water treatment system was online and processing all of the rinse water flow in August (PAP-00466428). According to a September 22, 1988 Internal Memo, W&T achieved compliance with the PVSC requirements for the discharge of copper to their system (PAP-00466436).[7]

A *Pretreatment Monitoring Report* dated January 19, 1989 for the monitoring period 07/01/1988 – 12/31/1988, reported the regulated flow was 6,512 gallons/day with a maximum of 12,750 gallons/day and a total flow of 64,218 gallons/day, with average copper permit limits of 2.070 mg/L and maximum permit limits of 3.380 mg/L, the W&T copper average sample was 0.20 mg/L and the maximum sample was 0.26 mg/L. Lead average permit limits were 0.430 mg/L average and maximum permit limits were 0.690 mg/L, the W&T lead average sample was 0.20 mg/L and the maximum sample was 0.20 mg/L (PAP-00351703). A wastewater flow diagram is depicted below (PAP-00351580):

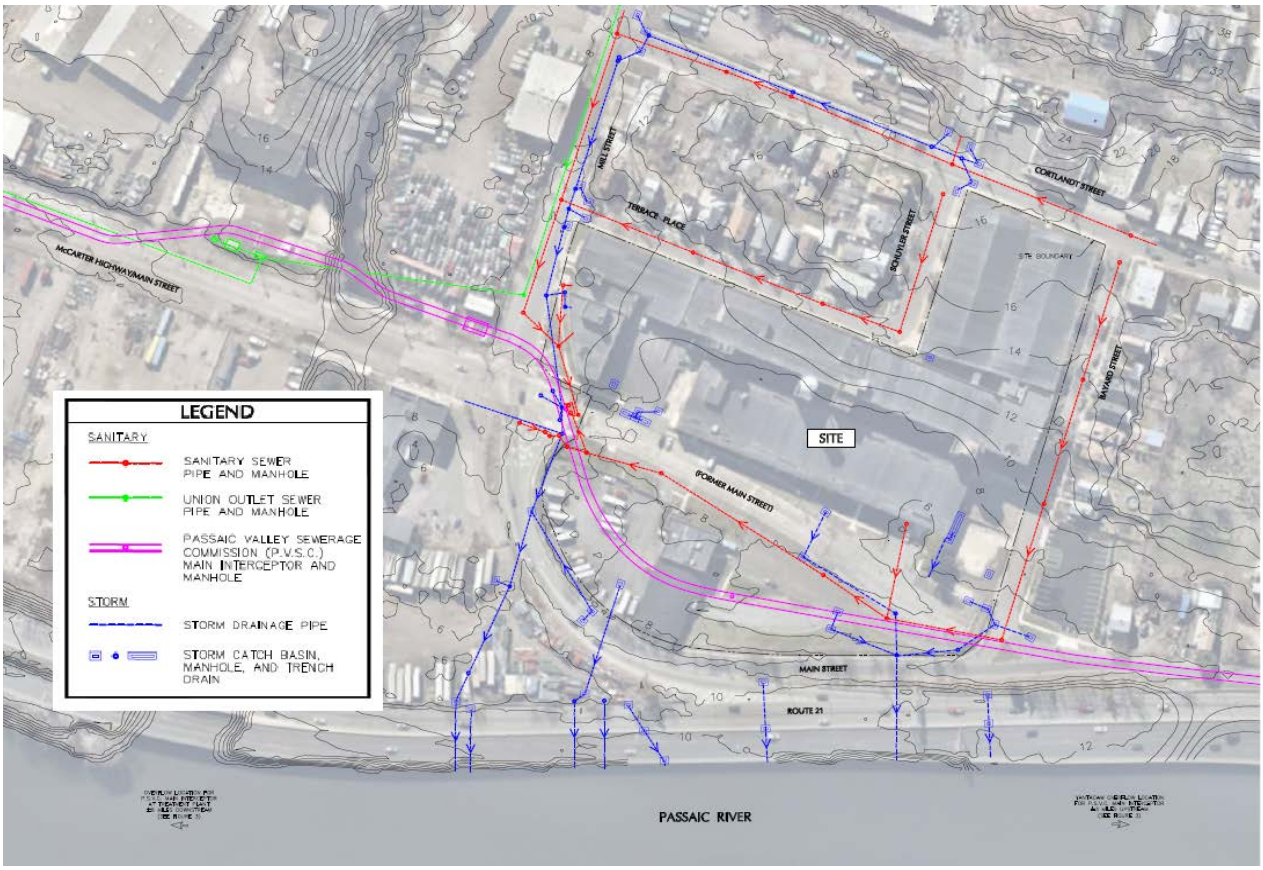


Sewer connections are depicted below.

[7] This Report was revised to include documents received on May 18, 2020. The additional documents did not change Arkema, Inc.'s previous certification.



(PAP-00351579)



(PAP-00726551)

Direct Release

According to a September 15, 1982 Internal Memo regarding the Belleville – Environmental Audit, certain undiked sections of the North Yard hazardous waste drum storage area are within close proximity to a stormwater drain which discharges to the Passaic River. EPA could consider this as a potential environmental hazard since spills or leaks could discharge to the drain (PAP-00466371). [8]

On June 19, 1984 and Internal Memo regarding an Environmental Audit by Doug Loutzenhiser of Pennwalt – King of Prussia, oil was getting into the River via storm drain near the North Yard it was recommended that empty drums stored along Bayard St fence be stored with the bungs at 9 and 3 o'clock positions and not 12 and 6 o'clock, oil has been leaking into storm drain (PAP-00466373). [8]

The April 18, 1986 Preliminary Environmental Audit noted evidence of oil having run to storm drain. Two drums E1606 in waste oil area were empty and no bungs in two drums (PAP-00466379). [8]

According to a June 5, 1987 Internal Memo regarding the Belleville Environmental Assessment Report, noted the measures taken several months ago to curtail waste oil from leaking into the ground has been effective (PAP-00466422).[8]

According to the 1990 *ECRA Sampling Report and Phase II Sampling Plan*, the site is relatively level, sloping very slightly toward the Passaic River. Surface water runoff was diverted via storm drains to the storm sewer system, which discharged to the Passaic River (PAS-00102627). The locations of stormwater outfalls to the Passaic River from the facility are shown in the above image. Stormwater runoff from the site is collected through a series of inlets and trench drains which connect to the municipal storm water sewer system in the streets surrounding the site. The municipal storm sewer system conveys flow from the site and surrounding streets to the Passaic River through a series of outfalls (PAP-00726551).

Spills

According to a May 7, 1986 Close-Out Discussion with Management prepared by M. Dixon, floor drains typically discharge to the storm sewer system and there are areas which appear to present a spill potential, specifically the degreaser area and associate drum storage were located in the vicinity of a storm drain. Cuttings saturated with oil in the North Yard are managed such that oil is allowed to drain to the asphalt. The concern was that rainwater washes the oils to the storm water system. The discussion also noted there is no secondary containment nor other spill control practices for two raw material drum storage areas (one near boilers and the other near the waste drum area in the North Yard with concerns of the close proximity to storm sewers and that there is no secondary containment or other spill control practices for the Unloading Areas (fuel

[8] This Report was revised to include documents received on May 18, 2020. The additional documents did not change Arkema, Inc.'s previous certification.

oil, gasoline, ammonia and paint thinner) to ensure that spillage does not enter the stormwater system (PAP-00466390-92; PAP-00466404-06).[9]

According to a July 21, 1986 Internal Memo regarding the Belleville Environmental Assessment Report, W&T reconditioned the north service yard where scrap metal and waste oil are collected. The western portions of this yard was repaved with new heavy duty concrete. The balance of the yard was reconstructed to accommodate the operation of collecting and disposing of these materials in such a way that waste oil will not enter the storm water system. At the time of this letter the project was in the planning stage and estimated 12 months to be the necessary time to carry out the procedures and actual construction (PAP-00466409).[9]

According to a September 29, 1986 Internal Memo, W&T established initial measures to eliminate entrained oil from washing out of the scrap metal drums and into the storm sewer system. The scrap metal is now be collected in drums that do not have holes in them and covers are placed on top and the spill containment plan for the Maintenance Stock area has been completed and under construction (PAP-00466415-16). According to an August 31, 1988 Environmental Assessment Follow-Up Plant actions to be taken included installing new handling system and repave the yard which was planned for July 1989 (PAP-00466432; PAP-00466446).[9]

An October 21, 1986 Internal Memo, reported all of the floor drains in the buildings were potential hazardous material spills could occur have been sealed off and that the spill containment curbing for the Maintenance Stock are has been completed (PAP-00466419).[9]

According to a July 10, 1989, *Site Evaluation Submission (SES)*, it was possible that minor releases of hydraulic oils and machine cutting oils may have occurred during routine manufacturing operations primarily in the north service yard (PAP-00351083).

According to the September 28, 1990, *ECRA Sampling Report and Phase II Sampling Plan, s*tained soil was identified beneath the condensate drains for the ventilator outside the plating room (PAP-00352595). Note: Table 6 – Summary of Analytical Results – Plating Room Compressor Area was not in the available report (PAP-00352581).. In addition, several areas of stained soil were observed outside Building 7. Oil from leaking machinery inside the building seeped through cracks in the wall and had stained the soil adjacent to the building outside the wall. W&T repaired the leaking machinery and the stained soil bordering Building 7 was removed and stockpiled for disposal on July 18, 1990 (PAP-00352596). BNs (32.97 mg/kg) were detected in soil samples (PAP-00352612). Further, oil had discharged from a hose connected to a vacuum pump onto the ground on the west side of Building 1. It was reported that all visibly stained soil was removed and no post-excavation sampling was conducted (PAP-00352596).

[9] This Report was revised to include documents received on May 18, 2020. The additional documents did not change Arkema, Inc.'s previous certification.

According to the September 28, 1990, *ECRA Sampling Report and Phase II Sampling Plan,* there was a former spill in the location of the warehouse loading bay, soil sample S-10 was analyzed for PCBs, metals and PAHs. It was reported that concentrations did not exceed "ECRA action levels" for PCBs: however ECRA action levels were exceeded for BNA (88.26 mg/kg) which were predominantly composed of PAHs (PAP-00352608). Note: Table 6 – Summary of Analytical Results – Warehouse Loading Bay Spill Area was not in the available report (PAP-00352581).

6. Regulatory History/Enforcement Actions

Inspections

A *Report of Inspection* dated December 12 and 20, 1989, based on an inspection that occurred several months after Pennwalt (now Arkema) sold the W&T facility in May 1989,noted deficiencies at the 67 Main Street location stating that the large floor drain or pit was observed to be full of sediment. A compressor on the inside of the building discharged blowdown to the outside. When the boiler for this building was in operation, it also appeared to have discharged blowdown to the exterior (PAS-00102606-07). According to the *ECRA Sampling Report and Phase II Sampling Plan*, the associated stained soil was later removed (PAS-00102639-40). The compressor blow-down pipe was rerouted by W&T, and as a result there was no longer an exterior discharge (PAS-00102642). The sediment in the garage pit was removed and drummed on May 2, 1990. The integrity of the pit was verified to be structurally sound (PAS-00102643). The area around the boiler pipe was also excavated on May 2, 1990 (PAS-00102642).

The December 1989 *Report of Inspection* notes that the exterior of 25 Main Street had staining on the east side of Building 7 in several areas. This staining was coming from oil associated with indoor machinery. In this area, oil was leaking from machine shop-type machinery and traveled along the floor to a seam in the wall where it leaked to the exterior. In the North Yard, there was a heavily stained drum storage area adjacent to the North Yard fence on Bayard Street. Exhaust ventilators for the plating room for Building 3 had condensate drains that were discharging to the soil below, which appeared to be stained (PAS-00102607).

All floor drains at 25 Main Street were reportedly sealed with rubber stoppers. At inspection, an open floor drain was observed inside the pump room of Building 7 (PAS-00102607). Additionally, several machines associated with the deburring process discharged to a floor trench that reportedly discharged to the sanitary sewer (PAS-00102608).

Deficiencies in the interior of Building 3 were noted to include two open pipes inside the plating room in a diked spill containment structure that appeared to lead to the sanitary sewer. The openings of these pipes were well below the rim of the dike. The report noted that if a spill was to occur the possibility existed for a discharge to occur (PAS-00102608).

Building 3 also had condensate blowdowns discharging under four of the five windows on the east side. Under the window in the northeast corner, a stain was accompanied by metal chips (PAS-00102608).

Deficiencies in the interior of Building 4 included a storm drain north of Building 4 that collected runoff from the paved area over tanks 3, 4 and 6 and between Buildings 4 and 7. There was a small drum storage area along the loading ramp and several spills from the loading bay area were observed on the pavement in this area. An oily sheen was observed on the water in this drain (PAS-00102608).

Violations

A September 25, 1986 Notice of Violation reported Pennwalt Corporation was in violation of N.J.A.C.7:26-9.4(g)18 – No Semi – annual drills constructed, N.J.A.C.7:26-9.6(f)1 – Failing to make arrangements to familiarize P.D, F.D and emergency report teams, N.J.A.C.7:26-9 (f)4 – Failing to make arrangements to familiarize local hospitals and N.J.A.C.7:26-9.7(e) and 9.7(i) – No description to coordinate emergency services (PAP-00466417). According to a October 10, 1986 Letter to NJDEP remedial action was taken to achieve compliance (PAP-00466420). [10]

An April 4, 1988 Violation Letter from PVSC reported W&T was in violation of 40 Code of Federal Regulations (CFR) 433 for lead. The results of wastewater discharge samples collected on 12/29/1987 and 12/30/1987 had lead concentrations of 0.74 mg/L and 1.41 mg/L, respectively, above the limit of 0.69 mg/L (PAP-00351641). On April 8, 1988, W&T's response letter reported lead was not used in their metal finishing operation (the plating operation) and their analysis of effluent had not shown any "excessive" lead (PAP-00351643). Weekly samples collected until compliance was achieved had maximum concentrations of lead at 0.101 mg/L in Pit 1 and 0.027 mg/L in eyewash in composite samples (PAP-00351645-51).

An August 15, 1988 Violation Letter from PVSC reported W&T was in violation 40 CFR 433 for copper (monthly average) under PVSC permit (No. 01402162). W&T was directed to collect weekly samples until three consecutive analyses were within permit limitations (PAP-00351653). On August 24, 1988, W&T reported compliance with concentrations of copper ranging from 0.168 mg/L to 0.271 mg/L (PAP-00351655).

Permits

In 1977, W&T submitted an Industrial Sewer Connection Application for wastewater discharges to the PVSC system (PAP-00351695).

In 1981, W&T held PVSC permit (No. 01402162) and was authorized to discharge from two outlets (PAP-00351582, 86-87).

[10] This Report was revised to include documents received on May 18, 2020. The additional documents did not change Arkema, Inc.'s previous certification.

W&T submitted a PVSC Application for renewal of a Sewer Connection Permit (No. 01402162) on February 4, 1986 (PAP-00351664-671).

7. Response Actions

According to an October 22, 2002 deed notice, in 1989, the sale of W&T triggered compliance with the NJDEP ECRA (PAP-00351360).

Characterization Activities

The following characterization activities have taken place at the facility:

- Final Remedial Investigation / Remedial Action Report, September 1995 (PAP-00008845).
- Supplemental Remedial Investigation Report / Remedial Action Work Plan Addendum, January 1999 (PAP-00009057).
- Supplemental Remedial Investigation Report / Revised Remedial Action Work Plan Addendum, March 2000 (PAP-00466449).[11]
- Remedial Action Report, March 2002 (PAP-00009178).

Phase I-IV 1990-1995: Phase I-IV of the investigation and remediation were performed between 1990 and 1995, and included soil and groundwater sampling and analysis, decommissioning of six USTs, excavation and disposal of contaminated soil, and recovery of free product from the groundwater (PAP-00351361). This included the collection and analysis of soil samples to determine the impact of a possible past spill. Analytical results for soil samples identified concentrations of lead and PAHs at the warehouse loading bay/perimeter area as well as in the hydraulic lift area (PAP-00009173-74). Sampling concentration data are provided below.

Supplemental Remedial Investigation 1999: The work completed addressed NJDEP requirements for the remaining soil areas of concern (AOCs). Compounds in soil at the boiler room area, North Yard area, hydraulic lift area and former gasoline piping area, warehouse loading bay and site perimeter were horizontally and vertically delineated. Sampling concentration data are provided below.

[11] This Report was revised to include documents received on May 18, 2020. The additional documents did not change Arkema, Inc.'s previous certification.

Arkema, Inc.

Diamond Alkali OU2 Allocation

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Facility Data Report

Soil

April 29, 1998

In accordance with the *Workplan Addendum* dated February 17, 1998, two soil samples and a field duplicate (WH-11, WH-12 and WH-12D) were collected in the warehouse loading bay area for PAHs. The data results are shown in the table below (PAP-00009097).

Sample Location:	NJDEP 1996 REVISED SOIL CLEANUP CRITERIA				WH-11	WH-12	WH-12D	WH-14	WH-18	WH-18D	WH-25R
Sample Depth (ft):					0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Langan Sample Number:					516	517	518	527	532	532	542
Laboratory Sample Number:	DIRECT CONTACT		IMPACT		57880	57881	57882	59539	67687	67688	70621
Sample Date:	RESIDENT.	NON-RESIDENT.	TO G.W.		4/29/98	4/29/98	4/29/98	5/7/98	6/22/98	6/22/98	7/9/98
Parameters				**Units**	**Q**	**Q**	**Q**	**Q**	**Q**	**Q**	**Q**
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)											
Naphthalene	230	4,200	100	ppm	1.7 J	12	18 J	11	7 J	14 J	17 J
Acenaphthylene	NS	NS	NS	ppm	1.1 J	1.2 J	1.4 J	0.74	0.830 J	1.1 J	0.66 J
Acenaphthene	3,400	10,000	100	ppm	1 J	18	36	16	12 J	20	23 J
Fluorene	2,300	10,000	100	ppm	1 J	17	33	14	10 J	20	22 J
Phenanthrene	NS	NS	NS	ppm	14	180	200	120	88	140	180
Anthracene	10,000	10,000	100	ppm	2.3	34	57	25	20	32	41
Fluoranthene	2,300	10,000	100	ppm	20	160	210	110	86	130	170
Pyrene	1,700	10,000	100	ppm	16	130	170	88	68	98	140
Benzo (a) anthracene	0.9	4	500	ppm	7.8	87	95	47	36	52	72
Chrysene	9	40	500	ppm	9.7	87	88	48	38	54	70
Benzo (b) fluoranthene	0.9	4	50	ppm	14	77	100	48	39	57	67
Benzo (k) fluoranthene	0.9	4	500	ppm	4.8	35	100	20	19	26	29
Benzo (a) pyrene (BaP)	0.66	0.66	100	ppm	8.4	54	82	37	30	44	53
Indeno (1,2,3-c,d) pyrene	0.9	4	500	ppm	2.7	14	38	19	17	25	31
Dibenzo (a,h) anthracene	0.66	0.66	100	ppm	0.25	1.5	11	1.6	4.7	6.4	8.1
Benzo (g,h,i) perylene	NS	NS	NS	ppm	2.4	11	35	18	16 J	24	26 J
TOTAL PAHs				ppm	102.35	897.5	1255	622.6	445.7	728.4	861.1

ND - Compound not detected.

190 - Indicates that concentration exceeds the NJDEP Residential Soil Cleanup Criteria.

June 22, 1998

Eight soil samples were collected in June 1998 from the warehouse loading bay area. The data results are shown in the table below (PAP-00009098).

Sample Location:	NJDEP 1996 REVISED SOIL CLEANUP CRITERIA				WH-12R	WH-15	WH-16	WH-17	WH-18	WH-19	WH-20	WH-21
Sample Depth (ft):					0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Langan Sample Number:					534	529	530	531	532	533	535	536
Laboratory Sample Number:	DIRECT CONTACT		IMPACT		JUN044.D	JUN039.D	JUN040.D	JUN041.D	JUN042.D	JUN043.D	JUN046.D	JUN047.D
Sample Date:	RESIDENT.	NON-RESIDENT.	TO G.W.		6/22/98	6/22/98	6/22/98	6/22/98	6/22/98	6/22/98	6/22/98	6/22/98
Parameters				**Units**	**Q**	**Q**	**Q**	**Q**	**Q**	**Q**	**Q**	**Q**
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)												
Naphthalene	230	4,200	100	ppm	8.1	2.8	4.7	3.1	190	0.68	18	ND
Acenaphthylene	NS	NS	NS	ppm	0.82	0.52	0.59	1.3	2.8	0.42	0.9 J	ND
Acenaphthene	3,400	10,000	100	ppm	15	7.7	11	6	160	2.8	25	1.6
Fluorene	2,300	10,000	100	ppm	13	6.5	9.5	5.2	180	2.3	18	1.1
Phenanthrene	NS	NS	NS	ppm	95	56	72	46	840	21	120	12
Anthracene	10,000	10,000	100	ppm	27	12	18	8.9	210	4.9	31	3
Fluoranthene	2,300	10,000	100	ppm	110	66	79	50	670	30	130	22
Pyrene	1,700	10,000	100	ppm	76	51	56	38	540	21	85	15
Benzo (a) anthracene	0.9	4	500	ppm	50	30	38	24	330	13	54	9.6
Chrysene	9	40	500	ppm	38	28	29	22	230	12	47	8.7
Benzo (b) fluoranthene	0.9	4	50	ppm	54	34	41	27	320	14	54	8.4
Benzo (k) fluoranthene	0.9	4	500	ppm	14	10	10	12	82	8.3	28	8.5
Benzo (a) pyrene (BaP)	0.66	0.66	100	ppm	38	25	30	21	220	12	44	8.8
Indeno (1,2,3-c,d) pyrene	0.9	4	500	ppm	14	12	14	8.9	92	4.6	15	3.5
Dibenzo (a,h) anthracene	0.66	0.66	100	ppm	6.6	5.5	6.5	3.9	43	0.5	6.8	1.5
Benzo (g,h,i) perylene	NS	NS	NS	ppm	11	11	12	7.8	77	4.2	12	3.1

ND - Compound not detected.

190 - Indicates that concentration exceeds the NJDEP Residential Soil Cleanup Criteria.

September 23, 1998
Additional soil samples were collected from the warehouse area: The results are shown in the table below (PAP-00009099).

Sample Location:					WH-28		WH-29		WH-31		WH-31D		WH-32		WH-33		WH-33 DUP		WH-34	
Sample Depth (ft):	NJDEP 1996 REVISED				0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
Langan Sample Number:	SOIL CLEANUP CRITERIA				544		545		547		548		549		550		551		552	
Laboratory Sample Number:	DIRECT CONTACT		IMPACT		85785		85786		85788		85789		85790		87769		87770		87771	
Sample Date:	RESIDENT.	NON-RESIDENT.	TO G.W.		9/23/98		9/23/98		9/23/98		9/23/98		9/23/98		10/2/98		10/2/98		10/2/98	
Parameters				**Units**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)																				
Naphthalene	230	4,200	100	ppm	1.5	J	1.6	J	0.072	J	0.14	J	1.9	J	0.079	J	0.12	J	0.16	J
Acenaphthylene	NS	NS	NS	ppm	0.27	J	0.13	J	0.13	J	0.21	J	0.95	J	0.28	J	0.34	J	0.28	J
Acenaphthene	3,400	10,000	100	ppm	2.4		2.2		0.23	J	0.47	J	5.4		0.23	J	0.24	J	0.34	J
Fluorene	2,300	10,000	100	ppm	2.4		2		0.18	J	0.46	J	5.4		0.24	J	0.27	J	0.35	J
Phenanthrene	NS	NS	NS	ppm	19		17		3.4		5.5		61		2.6		3.1		3.9	
Anthracene	10,000	10,000	100	ppm	4.8		4.2		0.53		1.2		11		0.69		0.82		0.84	
Fluoranthene	2,300	10,000	100	ppm	21		19		6.6		7.4		68		4.2		5.2		5.6	
Pyrene	1,700	10,000	100	ppm	17		15		3.7		6.5		66		3.9		4.8		5.8	
Benzo (a) anthracene	0.9	4	500	ppm	8		7.4		2		3.1		27		1.9		2.5		2.8	
Chrysene	9	40	500	ppm	8.3		8		2.4		3.8		31		2.6		2.8		3.3	
Benzo (b) fluoranthene	0.9	4	50	ppm	8.6		8		3.3		4.1		27		3.6		4.4		3.6	
Benzo (k) fluoranthene	0.9	4	500	ppm	3.7		3.8		1.2		1.9		12		1.4		2		1.7	
Benzo (a) pyrene (BaP)	0.66	0.66	100	ppm	6.7		6.4		2		3		22		2.1		2.7		2.7	
Indeno (1,2,3-c,d) pyrene	0.9	4	500	ppm	3.7		3.6		0.72		2		12		0.69		0.82		1.2	
Dibenzo (a,h) anthracene	0.66	0.66	100	ppm	0.85		0.9		0.2		0.44		2.9		0.18		0.2		0.31	
Benzo (g,h,i) perylene	NS	NS	NS	ppm	3.4		3.4		0.59		1.8		12		0.55		0.61		1.1	
TOTAL PAHs				ppm																

October 12, 1998
PAHs were detected in warehouse area soil samples collected from 0–0.5 ft bgs: WH-33 (25.24 ppm), WH-33 DUP (30.92 ppm), WH-34 (33.98 ppm), WH-35 (33.04 ppm), and WH-36 (9.154 ppm) (PAP-00009075; PAP00009099-100).

October 14, 1998
Additional soil samples were collected on October 14, 1998 (0–0.5 ft bgs) in the warehouse area: WH-38, WH-39, WH-40, and WH-41. Results are presented in the following table (PAP-00009076; PAP-00009100).

Sample Location:					WH-35		WH-36		WH-38		WH-39		WH-40		WH-41		WH-45		WH-45 DUP	
Sample Depth (ft):	NJDEP 1996 REVISED				0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
Langan Sample Number:	SOIL CLEANUP CRITERIA				553		554		556		557		558		559		580		581	
Laboratory Sample Number:	DIRECT CONTACT		IMPACT		87772		87773		89921		89922		89923		89924		101325		101326	
Sample Date:	RESIDENT.	NON-RESIDENT.	TO G.W.		10/2/98		10/2/98		10/14/98		10/14/98		10/14/98		10/14/98		12/8/98		12/8/98	
Parameters				**Units**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)																				
Naphthalene	230	4,200	100	ppm	0.13	J	0.096	J	0.25	J	0.034	J	0.067	J	1.4		0.024	J	0.04	J
Acenaphthylene	NS	NS	NS	ppm	0.12	J	0.063	J	0.16	J	0.14	J	0.16	J	0.11	J	0.14	J	0.15	J
Acenaphthene	3,400	10,000	100	ppm	0.43	J	0.14	J	0.54	J	0.1	J	0.12	J	2.3		0.08	J	0.084	J
Fluorene	2,300	10,000	100	ppm	0.36	J	0.17	J	0.41	J	0.077	J	0.15	J	2.1		0.08	J	0.094	J
Phenanthrene	NS	NS	NS	ppm	3.8		1.4		3.5		1.1		1.2		15.0		0.93		1	
Anthracene	10,000	10,000	100	ppm	0.98		0.34	J	0.81	J	0.29	J	0.3	J	4.1		0.22	J	0.25	J
Fluoranthene	2,300	10,000	100	ppm	6.0		1.8		4.9		2.2		1.8		16.0		1.6		1.6	
Pyrene	1,700	10,000	100	ppm	5.2		1.3		3.9		2.1		2.1		14.0		1.5		1.6	
Benzo (a) anthracene	0.9	4	500	ppm	2.8		0.66		2.2		1.1		1.0		7.7		0.77		0.77	
Chrysene	9	40	500	ppm	3.0		0.74		2.4		1.3		1.2		8.1		0.98		1	
Benzo (b) fluoranthene	0.9	4	50	ppm	3.4		0.77		2.8		1.8		1.5		7.9		1		1	
Benzo (k) fluoranthene	0.9	4	500	ppm	1.3		0.35		1.2		0.7		0.68		3.6		0.46		0.43	
Benzo (a) pyrene (BaP)	0.66	0.66	100	ppm	2.6		0.56		1.9		1.1		1.0		6.4		0.8		0.79	
Indeno (1,2,3-c,d) pyrene	0.9	4	500	ppm	1.3		0.35		1.3		0.5		0.42		3.4		0.49		0.39	
Dibenzo (a,h) anthracene	0.66	0.66	100	ppm	0.32		0.095		0.31		0.11		0.11		0.9		0.13		0.12	
Benzo (g,h,i) perylene	NS	NS	NS	ppm	1.3		0.32	J	1.0		0.41	J	0.34	J	3.2		0.45		0.38	
TOTAL PAHs				ppm																

October 29, 1998
Additional warehouse soil sample results are presented below (PAP-00009076; PAP-00009101).

Sample Location:					WH-28	WH-29	WH-29	WH-31	WH-31 DUP	WH-33
Sample Depth (ft):	NJDEP 1996 REVISED				0.5 - 1.0	0.5 - 1.0	1.0 - 1.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
Langan Sample Number:	SOIL CLEANUP CRITERIA				569	561	567	565	566	562
Laboratory Sample Number:	DIRECT CONTACT		IMPACT		95375	93182	95373	93186	93187	93183
Sample Date:	RESIDENT.	NON-RESIDENT.	TO G.W.		11/5/98	10/29/98	11/5/98	10/29/98	10/29/98	10/29/98
Parameters				**Units**		Q		Q	Q	Q
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)										
Naphthalene	230	4,200	100	ppm	ND	0.7 J	0.084 J	ND	ND	0.11 J
Acenaphthylene	NS	NS	NS	ppm	ND	0.023 J	0.017 J	ND	ND	0.21 J
Acenaphthene	3,400	10,000	100	ppm	0.014 J	0.92	0.12 J	ND	0.021 J	0.32 J
Fluorene	2,300	10,000	100	ppm	0.011 J	0.95	0.12 J	ND	0.017 J	0.34 J
Phenanthrene	NS	NS	NS	ppm	0.13 J	5.7	1.1	0.048 J	0.17 J	3.7
Anthracene	10,000	10,000	100	ppm	0.034 J	1.7	0.26 J	ND	0.042 J	0.98
Fluoranthene	2,300	10,000	100	ppm	0.17 J	5.2	1.3	0.082 J	0.27 J	5.0
Pyrene	1,700	10,000	100	ppm	0.13 J	4.2	1	0.084 J	0.22 J	4.4
Benzo (a) anthracene	0.9	4	500	ppm	0.081	2.4	0.58	0.045	0.12	2.6
Chrysene	9	40	500	ppm	0.075 J	2.4	0.53	0.051 J	0.12 J	2.9
Benzo (b) fluoranthene	0.9	4	50	ppm	0.079	2.4	0.65	0.049	0.14	3.2
Benzo (k) fluoranthene	0.9	4	500	ppm	0.035 J	1.0	0.27	0.023 J	0.053	1.3
Benzo (a) pyrene (BaP)	0.66	0.66	100	ppm	0.063	1.9	0.5	0.035 J	0.1	2.4
Indeno (1,2,3-c,d) pyrene	0.9	4	500	ppm	0.04	1.0	0.28	0.024 J	0.066	1.3
Dibenzo (a,h) anthracene	0.66	0.66	100	ppm	ND	0.29	0.083	0.0078 J	0.018 J	0.35
Benzo (g,h,i) perylene	NS	NS	NS	ppm	0.038 J	1.0	0.27 J	0.025 J	0.07 J	1.2

November 1999
According to a Memorandum from Christine Lacy, Technical Coordinator-NJDEP, dated June 2000, two soil samples (WH-46 and 47) were collected from the site perimeter area. The results reported the presence of carcinogenic PAHs at concentrations ranging from 0.7 to 1.4 ppm at both sample locations (PAS-00102612; PAP-00466460).

The same NJDEP Memorandum noted that PAHs continued to remain a concern at the facility. It was concluded that the PAHs were believed to be the result of historic urban and industrial fill materials. There was no knowledge of site activities being conducted in the areas where elevated PAHs were detected. Soil impacts remained beneath open, grassy areas and some sidewalks and driveways extending to depths ranging from six inches to 2.5 ft. below grade (PAS-00102612-13).

January 2000
According to the March 6, 2000 Supplemental Remedial Investigation Report / Revised Remedial Action Work Plan Addendum, additional soil samples were collected from the Site Perimeter Area at locations WH-46 and WH-47 in order to complete vertical delineation activities. Samples were collected at depth intervals of 1.0 – 1.5 below grade and 1.5 – 2.0 ft below grade from each location. No visible evidence of contamination was observed during collection of the samples and the proposed depth of excavation was modified to 2.5 ft bgs (PAP-00466460, 68). [12]

Results of the laboratory analysis detected the presence of PAHs in four samples, results are presented below (PAP-00466476-7).[12]

[12] This Report was revised to include documents received on May 18, 2020. The additional documents did not change Arkema, Inc.'s previous certification.

Arkema, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

SUMMARY OF SOIL SAMPLING ANALYTICAL RESULTS
January 2000

	UNIT	NJDEP Residential Direct Contact Soil Cleanup Criteria	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria	NJDEP Impact to Groundwater Soil Cleanup Criteria	Matrix:	SOIL				
					Date:	4-Jan-00	4-Jan-00	4-Jan-00	4-Jan-00	4-Jan-00
					Sample ID:	001	002	003	004	005
					Location:	WH-47	WH-47	WH-46	WH-46	WH-48
					Depth:	1-1.5'	1.5-2'	1-1.5'	1.5-2'	0-0.5'
					Lab ID:	177738	177739	177740	177741	177742
SEMIVOLATILE COMPOUNDS (GC/MS)										
Naphthalene	mg/kg	230	4,200	100		ND	ND	0.022J	0.02J	5.4
Acenaphthylene	mg/kg	NS	NS	NS		0.34J	0.25J	0.076J	0.12J	0.51J
Acenaphthene	mg/kg	3,400	10,000	100		0.14J	0.096J	0.12J	0.089J	8.2
Fluorene	mg/kg	2,300	10,000	100		0.17J	0.089J	0.11J	0.084J	5.2
Phenanthrene	mg/kg	NS	NS	NS		1.9J	1.1J	1.4	1.1	39.0
Anthracene	mg/kg	10,000	10,000	100		1.3J	0.64J	0.38	0.31J	10
Fluoranthene	mg/kg	2,300	10,000	100		28	11	2.2	2.4	41
Pyrene	mg/kg	1,700	10,000	100		29	12.0	1.8	2.1	35
Benzo(a)anthracene	mg/kg	0.9	4	500		**18**	**6.7**	**0.99**	**1.1**	**18**
Chrysene	mg/kg	9	40	500		**16**	6.6	1.0	1.1	**18**
Benzo(b)fluoranthene	mg/kg	0.9	4	50		**23**	**8.6**	**1.2**	**1.2**	**21**
Benzo(k)fluoranthene	mg/kg	0.9	4	500		**9.2**	**3.5**	0.5	0.54	**9.1**
Benzo(a)pyrene	mg/kg	0.66	0.66	100		**19**	**6.9**	**0.87**	**0.94**	**16**
Indeno(1,2,3-cd)pyrene	mg/kg	0.9	4	500		**11**	**3.8**	0.5	0.54	**8.3**
Dibenzo(a,h)anthracene	mg/kg	0.66	0.66	100		**3**	**1**	0.13	0.14	**2.2**
Benzo(g,h,i)perylene	mg/kg	NS	NS	NS		8.9	3.2	0.34J	0.46	7
Total Semi-Volatile Organic Compounds	mg/kg	NS	NS	NS		165.1	63.3	10.92	11.62	243.4

	UNIT	NJDEP Residential Direct Contact Soil Cleanup Criteria	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria	NJDEP Impact to Groundwater Soil Cleanup Criteria	Matrix:	SOIL				
					Date:	4-Jan-00	4-Jan-00	4-Jan-00	4-Jan-00	4-Jan-00
					Sample ID:	006	007	008	009	010
					Location:	WH-48	WH-49	WH-49	WH-52	WH-51
					Depth:	0.5-1'	0-0.5'	0.5-1'	1-1.5'	0.5-1'
					Lab ID:	177743	177744	177745	177746	177747
SEMIVOLATILE COMPOUNDS (GC/MS)										
Naphthalene	mg/kg	230	4,200	100		3.9	4	ND	0.092	1.5
Acenaphthylene	mg/kg	NS	NS	NS		0.63J	0.19J	ND	0.073	0.24
Acenaphthene	mg/kg	3,400	10,000	100		5.6	3.2	ND	0.36	3.8
Fluorene	mg/kg	2,300	10,000	100		4.9	3.4	ND	0.28	3.6
Phenanthrene	mg/kg	NS	NS	NS		46	28	0.0092J	2.8	32.0
Anthracene	mg/kg	10,000	10,000	100		11	5.4	ND	0.67	8.1
Fluoranthene	mg/kg	2,300	10,000	100		46	21	0.027J	3.9	35
Pyrene	mg/kg	1,700	10,000	100		39	17.0	0.025J	3.1	29
Benzo(a)anthracene	mg/kg	0.9	4	500		**21**	**7.4**	0.024J	**1.8**	**16**
Chrysene	mg/kg	9	40	500		**22**	8.3	0.018J	1.9	**16**
Benzo(b)fluoranthene	mg/kg	0.9	4	50		**25**	**9.4**	0.024J	**2.2**	**18**
Benzo(k)fluoranthene	mg/kg	0.9	4	500		**10**	**3.8**	ND	0.86	**8.1**
Benzo(a)pyrene	mg/kg	0.66	0.66	100		**18**	**5.9**	ND	**1.6**	**14**
Indeno(1,2,3-cd)pyrene	mg/kg	0.9	4	500		**7.7**	**3.3**	ND	**1.1**	**7.6**
Dibenzo(a,h)anthracene	mg/kg	0.66	0.66	100		**2.1**	**0.95**	ND	0.28	**2**
Benzo(g,h,i)perylene	mg/kg	NS	NS	NS		5.7	2.6	ND	0.92	6
Total Semi-Volatile Organic Compounds	mg/kg	NS	NS	NS		267.9	123.65	0	21.13	191.8

	UNIT	NJDEP Residential Direct Contact Soil Cleanup Criteria	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria	NJDEP Impact to Groundwater Soil Cleanup Criteria	Matrix:	SOIL				
					Date:	4-Jan-00	4-Jan-00	4-Jan-00	4-Jan-00	4-Jan-00
					Sample ID:	011	012	013	014	015
					Location:	WH-53	WH-54	WH-55	WH-55 dup	WH-57
					Depth:	0.5-1'	0-0.5'	0.5-1'	0.5-1'	0.5-1'
					Lab ID:	177748	177749	177750	177751	177752
SEMIVOLATILE COMPOUNDS (GC/MS)										
Naphthalene	mg/kg	230	4,200	100		ND	2.9J	0.41J	0.29J	ND
Acenaphthylene	mg/kg	NS	NS	NS		ND	0.2J	0.07J	0.067J	0.048J
Acenaphthene	mg/kg	3,400	10,000	100		ND	5.4	0.75J	0.6J	0.078J
Fluorene	mg/kg	2,300	10,000	100		ND	4.8	0.72J	0.58J	0.054J
Phenanthrene	mg/kg	NS	NS	NS		0.012J	36	6.4	5.6	0.7
Anthracene	mg/kg	10,000	10,000	100		ND	9.2	1.5	1.2	0.15J
Fluoranthene	mg/kg	2,300	10,000	100		0.025J	38	7.7	7	1.1
Pyrene	mg/kg	1,700	10,000	100		0.021J	32.0	5.7	5.5	0.96
Benzo(a)anthracene	mg/kg	0.9	4	500		0.02J	**16**	**3.5**	**3.2**	0.5
Chrysene	mg/kg	9	40	500		0.014J	**18**	3.5	3.4	0.6
Benzo(b)fluoranthene	mg/kg	0.9	4	50		0.02J	**20**	**4.1**	**3.8**	0.66
Benzo(k)fluoranthene	mg/kg	0.9	4	500		0.0089J	**8.2**	**1.7**	**1.5**	0.22
Benzo(a)pyrene	mg/kg	0.66	0.66	100		0.013J	**15**	**3**	**2.8**	0.47
Indeno(1,2,3-cd)pyrene	mg/kg	0.9	4	500		0.012J	**7.6**	**1.9**	**1.8**	0.3
Dibenzo(a,h)anthracene	mg/kg	0.66	0.66	100		ND	**2**	0.52	0.5	0.083
Benzo(g,h,i)perylene	mg/kg	NS	NS	NS		0.011J	6.2	1.5	1.5	0.3J
Total Semi-Volatile Organic Compounds	mg/kg	NS	NS	NS		0	218.4	41.02	37.8	5.633

	UNIT	NJDEP Residential Direct Contact Soil Cleanup Criteria	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria	NJDEP Impact to Groundwater Soil Cleanup Criteria	Matrix:	SOIL				
					Date:	4-Jan-00	4-Jan-00	4-Jan-00	4-Jan-00	4-Jan-00
					Sample ID:	016	017	018	019	020
					Location:	WH-56	WH-59	WH-58	WH-60	WH-50
					Depth:	0.5-1'	0.5-1'	0.5-1'	0.5-1'	1-1.5'
					Lab ID:	177753	177754	177755	177756	177757
SEMIVOLATILE COMPOUNDS (GC/MS)										
Naphthalene	mg/kg	230	4,200	100		0.27J	ND	0.15J	0.059J	ND
Acenaphthylene	mg/kg	NS	NS	NS		0.45J	0.019J	0.13J	0.64	ND
Acenaphthene	mg/kg	3,400	10,000	100		0.55J	0.016J	0.48	0.092J	ND
Fluorene	mg/kg	2,300	10,000	100		0.56J	0.012J	0.32J	0.13J	ND
Phenanthrene	mg/kg	NS	NS	NS		5.8	0.16J	3.0	1.2	ND
Anthracene	mg/kg	10,000	10,000	100		1.4	0.037J	0.76	0.55	ND
Fluoranthene	mg/kg	2,300	10,000	100		7.8	0.32J	4	3.1	ND
Pyrene	mg/kg	1,700	10,000	100		6.7	0.28J	3.3	3.2	ND
Benzo(a)anthracene	mg/kg	0.9	4	500		**3.5**	0.16	**1.8**	**1.9**	ND
Chrysene	mg/kg	9	40	500		4	0.17J	2.1	2.1	ND
Benzo(b)fluoranthene	mg/kg	0.9	4	50		**4.8**	0.21	**2.4**	**2.9**	ND
Benzo(k)fluoranthene	mg/kg	0.9	4	500		**1.9**	0.085	**1**	**1.3**	ND
Benzo(a)pyrene	mg/kg	0.66	0.66	100		**3.5**	0.2	**1.7**	**2.1**	ND
Indeno(1,2,3-cd)pyrene	mg/kg	0.9	4	500		**1.8**	0.11	**0.92**	0.9	ND
Dibenzo(a,h)anthracene	mg/kg	0.66	0.66	100		0.51	0.034J	0.25	0.27	ND
Benzo(g,h,i)perylene	mg/kg	NS	NS	NS		1.4	0.12J	0.74	0.68	ND
Total Semi-Volatile Organic Compounds	mg/kg	NS	NS	NS		43.11	0.725	22.45	20.84	0

Qualifiers:

39 Concentration exceeds the most stringent criteria

ND - Compound not detected, MDL below lowest SCC.
NS - No standard for this compound.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concetration given is an approximate value.

Response Actions

Impacted soil associated with the warehouse loading bay AOC was remediated. Additional delineation in this area identified that remaining PAHs did not originate from the warehouse loading bay and were not associated with any on-site source associated with site operations (PAS-00102558).

According the *Remedial Action Report* dated March 20, 2002, all soils impacted in the site perimeter area (plating room condensate drain, warehouse loading bay) were removed, and engineering and institutional controls at four remaining AOCs (boiler room area, North Yard area, hydraulic lift area, and former gasoline piping area) were to be implemented to prevent inadvertent contact with soils impacted by PAHs (PAP-00009178; PAP-00009196; PAP-00009330; PAS-00102613). A deed notice was filed on November 12, 2002 (PAP-00009346). The NJDEP issued a site-wide conditional No Further Action Letter (NFA) on December 18, 2002. The terms of the NFA included the filing of the deed notice for the four remaining AOCs with soils impacted by PAHs (boiler room area, North Yard area, hydraulic lift area, perimeter area and the former gasoline piping area (PAP-00009345).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation
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Facility Data Report

ASHLAND LLC

Facility Name, Address and Size: Ashland LLC/Ashland Chemical Company/Ashland Oil, Inc.; 221 Foundry Street, Newark, New Jersey; 11 acres; 18 employees (PAP-00089182).

1. **Business Type:** Industrial solvent and chemical repackaging and distribution (PAP-00089139).

2. **Time Period of Ownership/Operations**

   Operator: 1968 to 1992
   Owner: 1968 to 2003

   1968: Ashland Oil, Inc. acquired the property from Lasp Realty, Inc., in June 1968 (PAP-00089138; PAS-00050517).

   1991: Operations at the facility ceased in 1991 when the New Jersey Turnpike Authority notified Ashland Oil, Inc., of plans to widen the highway which would involve construction on Ashland Oil, Inc.'s property (PAP-00090522).

   1992: All facility buildings, process lines, and storage tanks, as well as on-site railroad sidings, were dismantled and removed from the site in 1992 (PAP-00090523).

   1995: Ashland Oil, Inc. changed its name to Ashland, Inc. in 1995 (PAS-00050518). Ashland Chemical Company is a division of Ashland, Inc. (PAS-00050518).

   2003: Foundry Street Development LLC acquired the property in 2003 (PAS-00000057).

3. **Operational History/COC Use and Presence at the Facility**

   According to a memorandum prepared by the New Jersey Department of Environmental Protection (NJDEP) dated April 3, 1991, the facility received bulk shipments of aliphatic and aromatic hydrocarbons, acids, alcohols, alkines, amines, esters, ethers, glycols, halogenated solvents, ketones, and nitro paraffins by rail car and tank truck. Upon receipt, the chemicals were transferred into a series of aboveground tank farms throughout the property. The chemicals were then repackaged into smaller bulk lots, such as bags, drums, and other containers for distribution to customers. No products were manufactured onsite using the received chemicals; however, a few special blends (solvent mixtures) were processed. Facility operations generated waste oils from the oil-water separator, spill cleanup material, and hose residue (PAP-00089139). According to a Storage Tanks and Product Inventory table in an *ECRA Sampling Plan*, dated July 6, 1988, at least 26 storage tanks containing petroleum distillate were listed as being present at the site ranging in capacity from 1,000 gallons to 30,000 gallons (PAP-00090204-06).

Ashland LLC

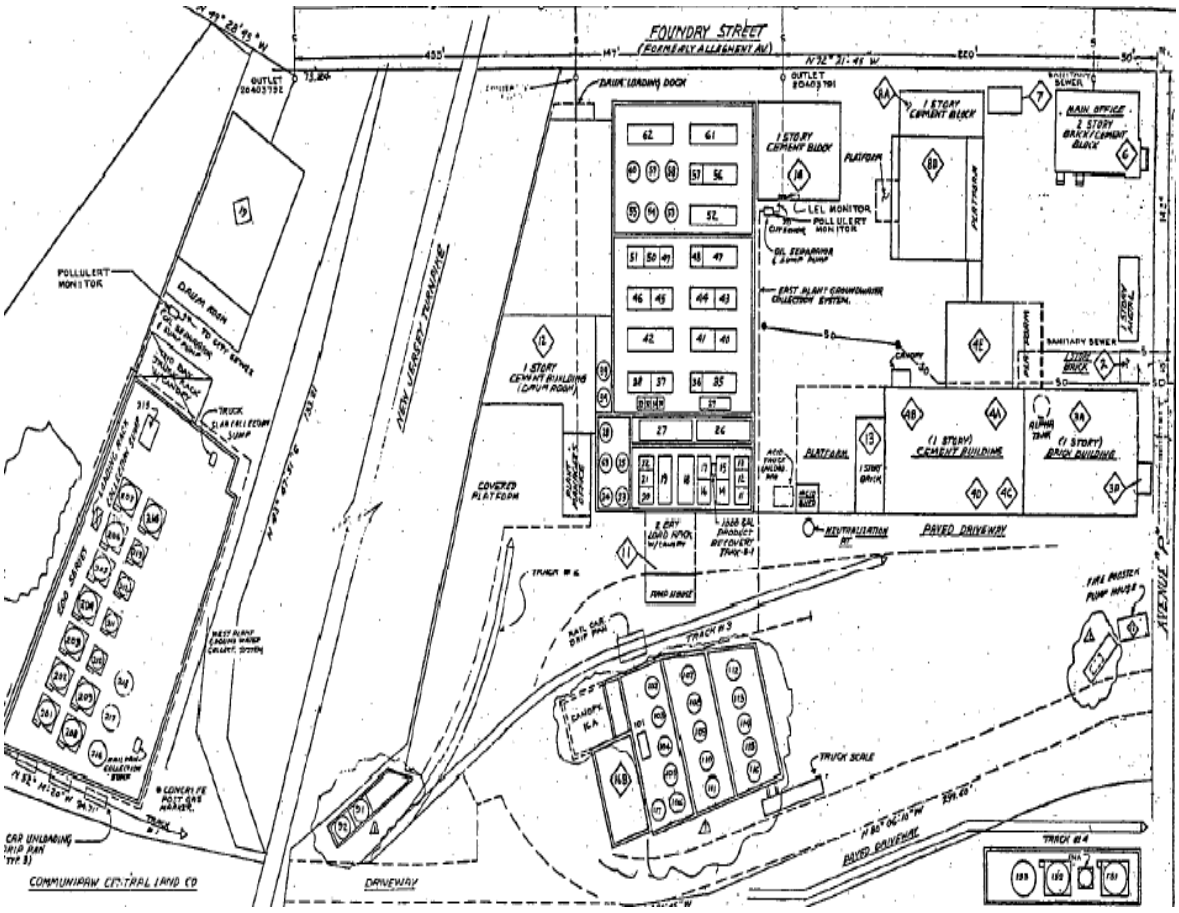
Diamond Alkali OU2 Allocation

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Facility Data Report

According to an undated *Documents Illustrating Nexus Between Ashland Chemical Company and Conditions in the Six Mile Study Area*, prepared by Maxus Energy Corporation on behalf of Occidental Chemical Corporation, OU2 contaminants of concern (COCs) stored and handled at the facility site included copper cyanide (PAP-00089119).

A facility layout is depicted below (PAP-00090201):



Monsanto sales records show the following sales of polychlorinated biphenyls (PCBs) to “Ashland Chemical Co Div.” in December 1968 (PAP-00207333; PAP-00207193):

- 3,000 pounds of Aroclor 1248
- 1,200 pounds of Aroclor 1242

However, the location of the facility receiving the PCB shipments is not identified in the Monsanto sales records nor by a review of available facility documents. Therefore, it is unclear if the shipment pertained to the Newark facility, and PCBs are not discussed further herein.

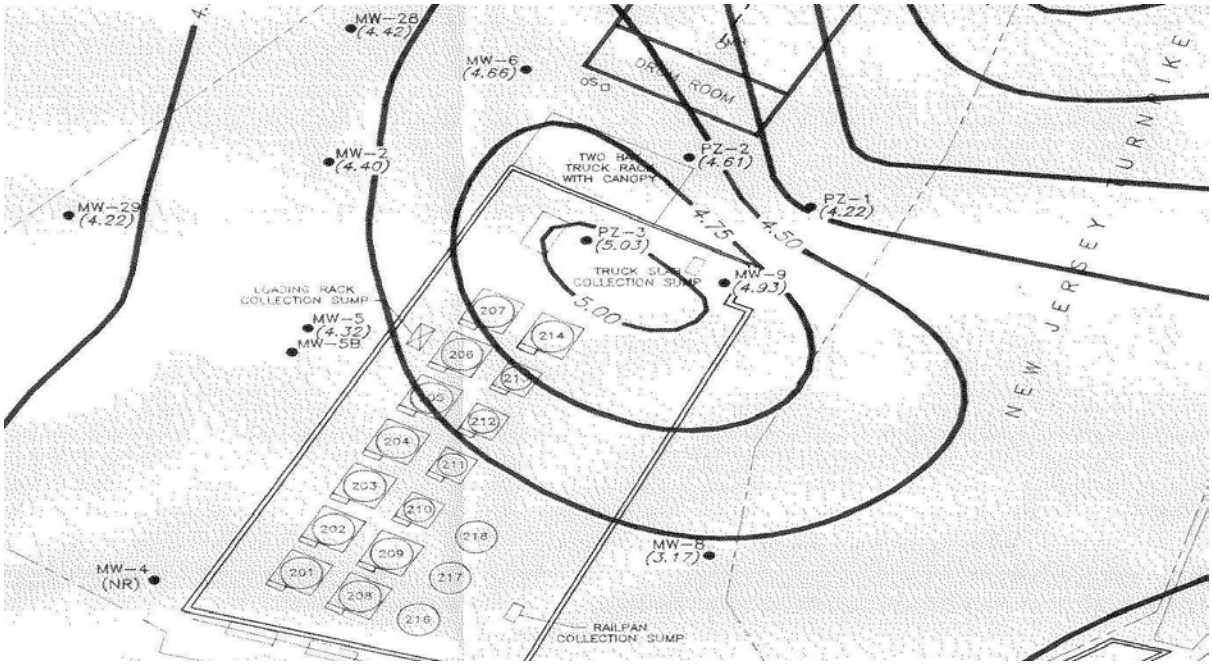
4. Identified COCs

- PAHs (stored, used, detected)
- Copper (stored, handled, detected)
- Mercury (detected)
- Lead (detected)

PAHs

According to a memorandum prepared by NJDEP dated April 3, 1991, the facility received bulk shipments of aliphatic and aromatic hydrocarbons. Upon receipt, the chemicals were transferred into a series of aboveground tank farms throughout the property. The chemicals were then repackaged into smaller bulk lots, such as bags, drums, and other containers for distribution to customers (PAP-0089139). A Storage Tanks and Product Inventory table included in an *ECRA Sampling Plan*, dated July 6, 1988, states that at least 26 storage tanks containing petroleum distillate were listed as being present at the site ranging in capacity from 1,000 gallons to 30,000 gallons (PAP-00090204-06). Petroleum distillate may contain PAHs.

According to a *Report of Findings, Soil and Groundwater Investigation*, dated December 15, 1992, in 1992, test pits were excavated around an area of "separate phase hydrocarbons" identified in two groundwater monitoring wells (MW-4 and MW-9). A black, viscous product resembling old asphalt was identified in five test pits, and a black, consolidated, hard, asphalt-like substance was identified in two test pits (PAP-00089971). A sample of the fill containing the black, asphalt-like material was collected (PAP-00089972). Low molecular weight PAHs were identified in the samples collected from two to 2.5 feet below ground surface (bgs) (PAP-00089995). The location of MW-4 and MW-9 (located at the west end of the facility, adjacent to a tank farm, west of the New Jersey Turnpike) is depicted below (PAP-00090008):



According to a *Report of Site Activities*, dated January 26, 2001, high and low molecular weight PAHs were identified in site soil in 21 of 37 areas of concern (AOCs) in 1999 (PAP-00089727-41). A figure depicting these AOCs is presented in Section 7 below.

Copper

As stated previously, according to an undated *Documents Illustrating Nexus Between Ashland Chemical Company and Conditions in the Six Mile Study Area*, prepared by Maxus Energy Corporation on behalf of Occidental Chemical Corporation, copper cyanide was stored and handled at the facility site (PAP-00089119).

According to a *Report of Findings, Soil and Groundwater Investigation*, dated December 15, 1992, in 1992, test pits were excavated around an area of "separate phase hydrocarbons" identified in two groundwater monitoring wells (MW-4 and MW-9). A black, viscous product resembling old asphalt was identified in five test pits, and a black, consolidated, hard, asphalt-like substance was identified in two test pits (PAP-00089971). A sample of the fill containing the black, asphalt-like material was collected (PAP-00089972). Copper was detected at a concentration of 19 ppm in one soil sample collected from a depth of two to 2.5 feet bgs (PAP-00089995). The report states that based on the physical characteristics and the analytical results from the sample, it appeared that the fill material in the area around the sample location contained a layer of degraded asphalt, and that this material was not believed to be related to site activities (distribution and re-packaging of solvents and chemicals) but rather to the fill material used to regrade this area of Newark. Therefore, no further action was proposed to address this material (PAP-00089980).

Lead

According to a *Report of Findings, Soil and Groundwater Investigation*, dated December 15, 1992, in 1992, test pits were excavated around an area of "separate phase hydrocarbons" identified in two groundwater monitoring wells (MW-4 and MW-9). A black, viscous product resembling old asphalt was identified in five test pits, and a black, consolidated, hard, asphalt-like substance was identified in two test pits (PAP-00089971). A sample of the fill containing the black, asphalt-like material was collected (PAP-00089972). Lead was detected at a concentration of 84 ppm in one soil sample collected from a depth of two to 2.5 feet bgs (PAP-00089995). The report states that based on the physical characteristics and the analytical results from the sample, it appeared that the fill material in the area around the sample location contained a layer of degraded asphalt, and that this material was not believed to be related to site activities (distribution and re-packaging of solvents and chemicals) but rather to the fill material used to regrade this area of Newark. Therefore, no further action was proposed to address this material (PAP-00089980).

Mercury

According to a *Report of Findings, Soil and Groundwater Investigation*, dated December 15, 1992, in 1992, test pits were excavated around an area of "separate phase hydrocarbons" identified in two groundwater monitoring wells (MW-4 and MW-9). A

black, viscous product resembling old asphalt was identified in five test pits, and a black, consolidated, hard, asphalt-like substance was identified in two test pits (PAP-00089971). A sample of the fill containing the black, asphalt-like material was collected (PAP-00089972). Mercury was detected at a concentration of 0.29 parts per million (ppm) in one soil sample collected from a depth of two to 2.5 feet bgs (PAP-00089995). The report states that based on the physical characteristics and the analytical results from the sample, it appeared that the fill material in the area around the sample location contained a layer of degraded asphalt, and that this material was not believed to be related to site activities (distribution and re-packaging of solvents and chemicals) but rather to the fill material used to regrade this area of Newark. Therefore, no further action was proposed to address this material (PAP-00089980).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

While the Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP, according to a *Report of Site Activities*, dated January 26, 2001, existing data show that the site is underlain by about five to eight feet of fill consisting of miscellaneous silt, sand and gravel with brick fragments, cinders and wood (PAP-00089700). The facility location was originally tidal marshland and was the location of extensive filling to allow development of the property. Initial filling began in the early 1900s (PAP-00089172).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00089727-41; PAP-00089980).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	84 mg/kg
Copper	19 mg/kg
Mercury	0.29 mg/kg
Benzo(a)anthracene	49 mg/kg
Benzo(a)pyrene	52 mg/kg
Benzo(b)fluoranthene	66 mg/kg
Benzo(k)fluoranthene	12 mg/kg
Dibenzo(a,h)anthracene	6.9 mg/kg
Indeno(1,2,3-cd)pyrene	30 mg/kg

5. COC Pathways

According to a *Spill Prevention Control and Countermeasure Plan*, dated October 24, 1983, the entire plant site is located in natural low area with almost no slope within the plant. On the south side of the property a 20-foot-high dirt embankment used as a railroad roadbed acts as a drainage barrier. The New Jersey turnpike runs roughly north/south through the center of the property and prevents any flow-through except at Foundry Street at the north end of the property and a railroad underpass at the south end of the property. In the event of a very large spill, some material might reach Foundry Street and flow to the corner of P Avenue where the lowest elevations near the plant occur. City storm sewers exist on the northwest side of the turnpike embankment and in P Avenue on the southeast side of the plant (PAS-00050565).

The Passaic River is located approximately 2,000 feet east of the site (PAP-00089321).

Sanitary and Storm Sewer

According to a memorandum prepared by NJDEP dated April 3, 1991, the site is part of the Foundry Street Complex. Approximately 30 buildings were situated throughout the complex, separated by narrow driveways which had strip-like drains in the middle of the lane. The drains were connected to an industrial sewer line on Roanoke Avenue and received surface water run-off and industrial discharge from companies in the complex. According to PVSC Annual Reports the Roanoke Avenue sewer connects to a sewer on Doremus Avenue, which flows to the PVSC treatment works. There is a combined sewer overflow (CSO) outfall to the Passaic River at the foot of Roanoke Avenue (approximately River Mile 1.1). In 1969, the City of Newark constructed a dam near this CSO to increase flow to the Doremus Avenue sewer, and ultimately, the PVSC treatment works (PAS-00044625-626). It is reported that the Roanoke Avenue combined sewer system and outfall to the Passaic River was documented by PVSC to have been inoperative from 1971 through late 1979, and that discharges of hazardous substances into the sewer system of the Foundry Street Complex would have ultimately discharged directly to the Passaic River via the Roanoke Avenue CSO during periods

when it was known to be in a chronic malfunctioning condition (PAS-00109572; PAS-00114295; PAS-00114311; PAS-00114320), (PAP-00089131).

According to a NJDEP Site Evaluation Submission, dated July 1, 1988, three wastewater streams were historically discharged to the Passaic Valley Sewerage Commission (PVSC) system:

- Sanitary sewage from 1940 to at least 1988 (based on the date of the referenced report, which identifies the end date as “present”);

- Groundwater (associated with a groundwater recovery system) collected in sumps and treated via oil/water separator prior to discharge from 1979 to at least 1988 (based on the date of the referenced report, which identifies the end date as “present”); and,

- Neutralized drum wash water from 1981 to 1987 (PAP-00088766; PAP-00089938). According to a letter prepared by Ashland, dated January 14, 1988, drum wash water resulted from washing of drums that previously contained acids and caustics (PAS-00050521).

According to a letter from Ashland to PVSC, dated October 2, 1986, discharge to the sewer system was approximately 2,300 gallons per day. The sanitary sewer outlets accounted for 2,000 gallons per day. The balance of the discharge was from the two groundwater monitoring wells and the neutralization pit (PAP-00089938). Permitted wastewater discharges were not required to be monitored for OU2 COCs (PAP-00089944-45).

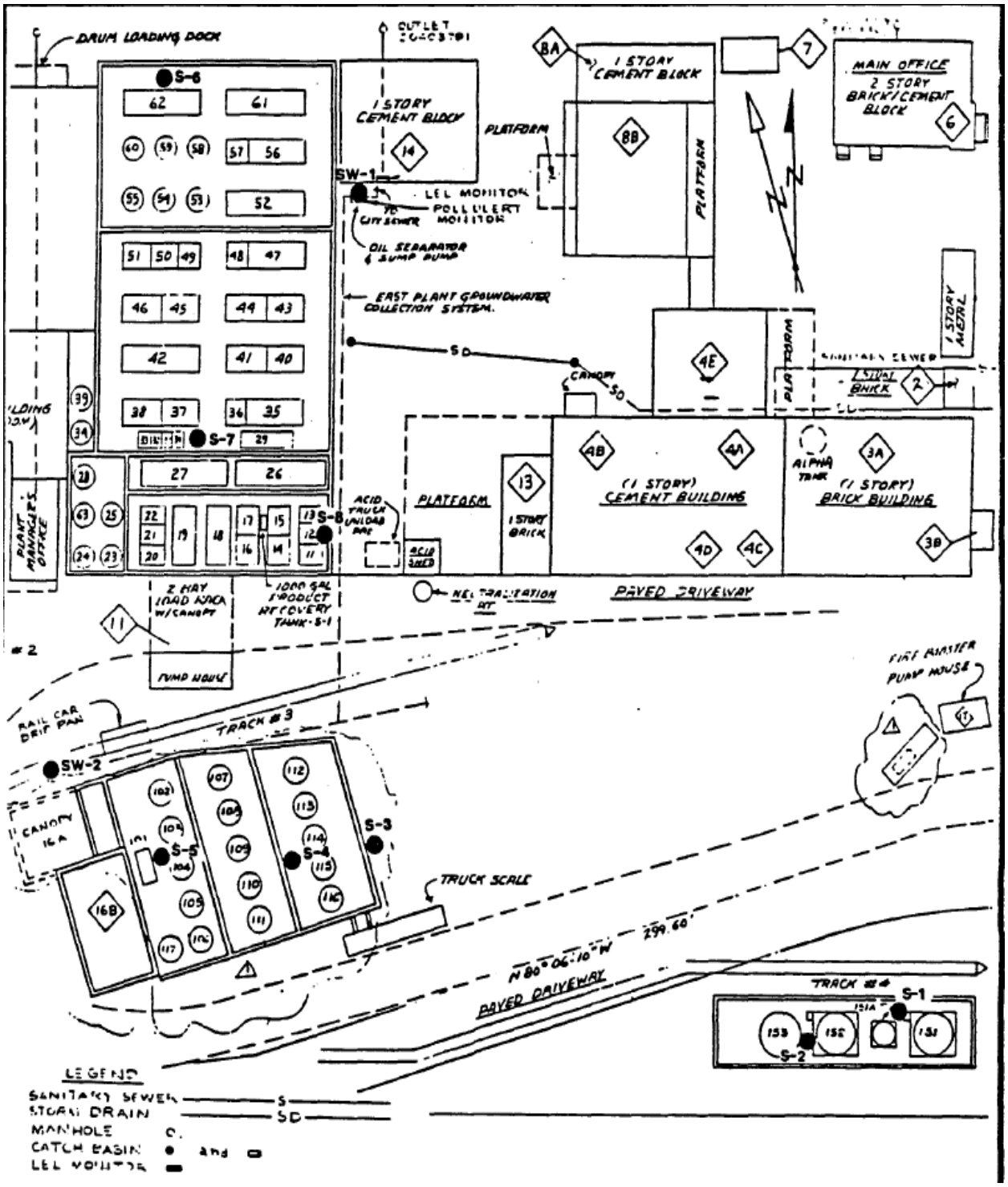
A figure that identifies the location of facility sanitary and storm drains is depicted below (PAP-00089285):

Ashland LLC

Diamond Alkali OU2 Allocation

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Note that the figure above appears to depict the eastern half of the site only; a figure depicting facility sanitary and storm drains on the western half of the site was not identified in the available file material.

Direct Release

According to a letter prepared by NJDEP, dated May 30, 1990, the facility had a New Jersey Pollutant Discharge Elimination System (NJPDES) permit (No. NJ0076651) for surface water discharge (PAS-00051046). However, no information regarding the nature or quantity of direct discharges to the Passaic River was available in the documents reviewed.

Spills

According to a memorandum prepared by NJDEP dated April 3, 1991, on March 7, 1979, a spill of No. 4 fuel oil occurred, but was contained within diking. Approximately 18,000 gallons of waste solvents and fuel oil were removed. Subsequently, a groundwater recovery system, consisting of three trenches was installed around the tank farm. Inspections conducted by NJDEP personnel on March 13 and 28, 1979, noted that the groundwater recovery system had been infiltrated with oil and solvents. In addition, spillage and/or leakage also was documented throughout Ashland's facility by representatives of the NJDEP. Areas noted included the following: all tank farms, loading/unloading manifolds, pipe connections, sumps, and the storm sewer system. According to NJDEP, corrective measures were discussed with Ashland's officials who stated that it would not be economically feasible for the company to implement all of the remedies required by NJDEP (PAP-00089139-40; PAP-00089932). Sampling data for OU2 COCs related to the referenced spills was not identified in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

According to a PVSC *Annual Report*, on May 17, 1971, Inspector J. McLaughlin sampled washings from Ashland, entering into the Roanoke Avenue Storm Sewer at Avenue P. Analysis of this sample stated it was "not only highly polluting," but contained flammable and explosive materials. The company was notified on May 26, 1971, to cease pollution at once, and warned against discharge to the sanitary sewer without proper pretreatment. Ashland replied on May 28, 1971, informing PVSC that plans to permanently correct this situation were in development and would be sent to the PVSC within two weeks. In the interim, Ashland would catch their liquid waste and have it disposed off-site (PAP-00089153). According to the *Annual Report, s*ubsequent samples were "bad." Ashland stated that the objectionable samples were due to truck washing activities. Ashland met with PSVC to submit plans to install an oil/water separator on site (PAP-00089154).

According to a June 15, 1976, letter prepared by PVSC, on May 6, 1976, a PVSC inspector found personnel pumping material out of a catch basin on Avenue P, which flowed into the Roanoke Avenue storm sewer, and then to the Passaic River. A sample collected by PVSC was determined to be highly flammable and potentially explosive. According to the letter, it appeared that the material came from the tank truck wash area

where tank trucks were brought for steam cleaning. Spills occurred when drivers disconnected hoses that had been connected from the steam cleaning equipment to the truck. This material then flowed into the catch basin and thereafter the Roanoke Avenue storm sewer (PAP-00089155). Sampling data for OU2 COCs related to the referenced spills was not identified in the available file material.

Violations / Enforcement Actions

The facility received a notice of violation from PVSC on August 10, 1990, for failure to maintain continuous monitoring of facility outfalls (PAS-00050635).

Permits

According to a letter prepared by NJDEP, dated May 30, 1990, the facility had a NJPDES permit (No. NJ0076651) for surface water discharge (PAS-00051046). According to a letter prepared by Ashland, dated February 20, 1995, Ashland did not know the years for which it held this permit (PAS-00050508). No information regarding the nature or quantity of discharges to the Passaic River is available from reviewed documents.

According to a letter prepared by Ashland, dated February 20, 1995, the facility discharged to the PVSC sewer system pursuant to a PVSC permit (No. 20402793). According to the letter, Ashland did not know the years for which it held this permit (PAS-00050508). It appears Ashland held the permit beginning prior to 1986, as the permit was renewed in October 1986 (PAP-00089938). Ashland was not required to monitor discharges for OU 2 COCs under this permit (PAP-00089944-45).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Report of Findings, Soil and Groundwater Investigation*, dated December 15, 1992 (PAP-00089956);
- *Progress Report*, dated May 11, 1995 (PAP-00089617);
- *Report of Progress and Remedial Action Proposal for Former Ashland Chemical Company IC&S Facility*, dated March 8, 1996 (PAP-00090506);
- *Report of Site Activities*, dated January 26, 2001 (PAP-00089694);
- *Remedial Investigation Report*, dated September 27, 2001 (PAP-00123558).

Sewer

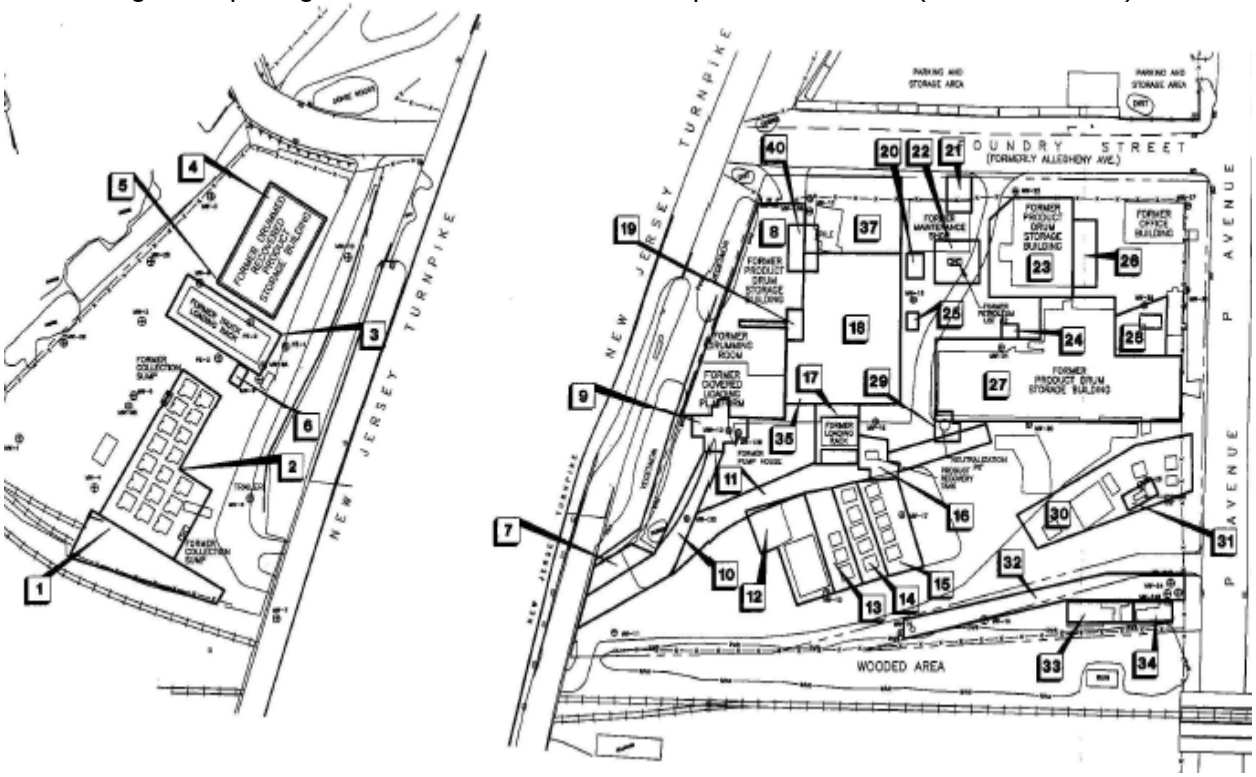
There is no information regarding sewer sampling in the available file material.

Soil

According to a *Report of Findings, Soil and Groundwater Investigation*, dated December 15, 1992, in 1992, test pits were excavated around an area of "separate phase hydrocarbons" identified in two groundwater monitoring wells (MW-4 and MW-9). A black, viscous product resembling old asphalt was identified in five test pits, and a black, consolidated, hard, asphalt-like substance was identified in two test pits (PAP-00089971). A sample of the fill containing the black, asphalt-like material was collected (PAP-00089972). Mercury, copper, and lead were detected at concentrations of 0.29 ppm, 19 ppm, and 84 ppm, respectively, in one soil sample collected from a depth of two to 2.5 feet bgs (PAP-00089995). The report states that based on the physical characteristics and the analytical results from the sample, it appeared that the fill material in the area around the sample location contained a layer of degraded asphalt, and that this material was not believed to be related to site activities (distribution and re-packaging of solvents and chemicals), but rather to the fill material used to regrade this area of Newark. Therefore, no further action was proposed to address this material (PAP-00089980).

According to a *Progress Report*, dated May 11, 1995, in 1994 a total of 250 soil borings were completed at the site. The soil borings were completed to characterize soil quality and delineate the distribution of "organics" in soils at 37 identified AOCs (PAP-00089629). Additional information as to the purpose of the investigation was not identified in the available file material.

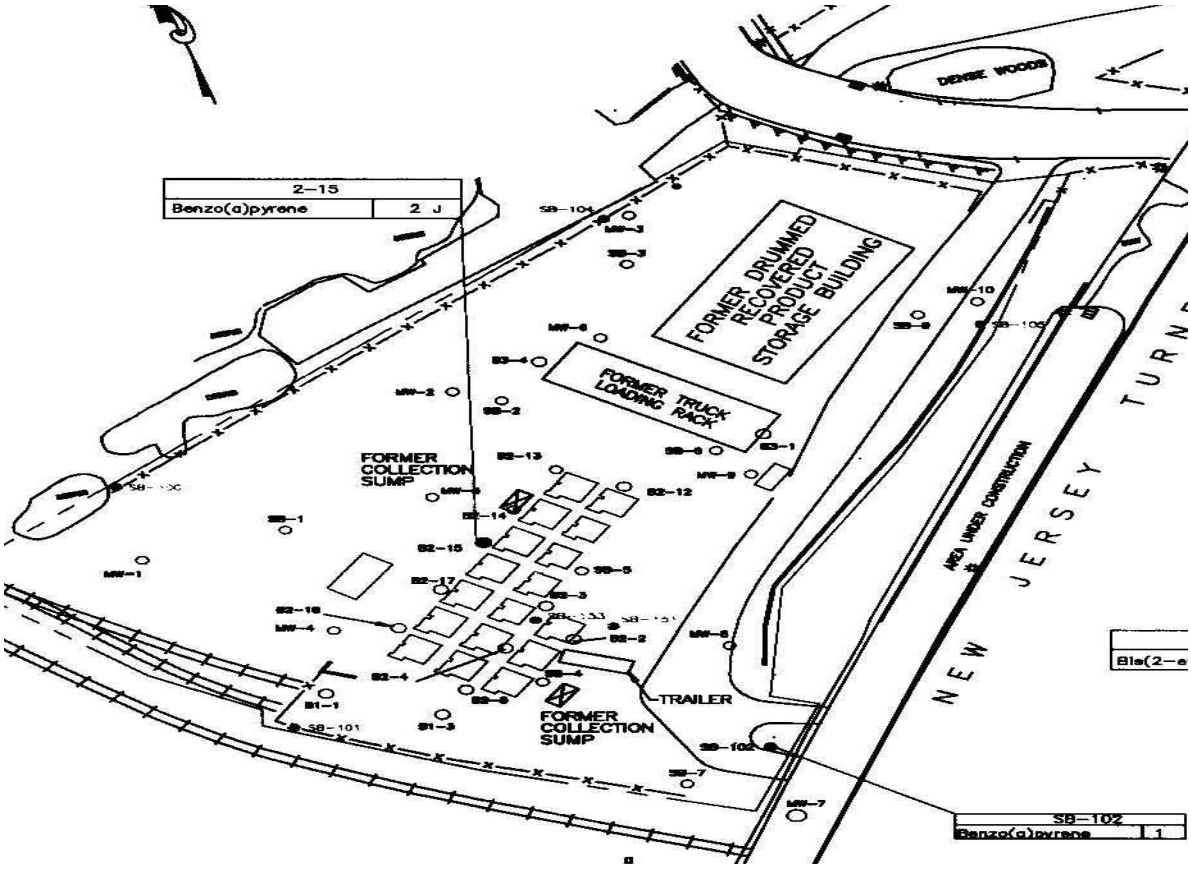
A figure depicting the locations of the AOCs is presented below (PAP-00089748):



Only total petroleum hydrocarbon data was reported in the *Progress Report*, dated May 11, 1995. No PAH data were identified in the referenced report (PAP-00089629, 32-81); however, further investigation was recommended at 22 AOCs due to the identification of total petroleum hydrocarbons in soil at concentrations greater than 10,000 mg/kg, as "required by the NJDEP" (PAP-00089630, 35, 39, 46, 50, 54, 59, 69, 73, 76). It is noted that no further action was proposed at the following AOCs related to site wastewater/stormwater discharges: West Oil/Water Separator, Central Sanitary Sewer Oil/Water Separator, Central Stormwater Catch Basin, and East Stormwater Catch Basin (PAP-00089638, 63, 64, 65). According to a *Report of Progress and Remedial Action Proposal for Former Ashland Chemical Company IC&S Facility*, dated March 8, 1996, a comprehensive evaluation of soil and groundwater quality data concluded that petroleum residues in soil are not a significant continuing source of groundwater contamination (PAP-00090508).

According to a *Report of Site Activities*, dated January 26, 2001, high and low molecular weight PAHs were identified in site soil in 21 of 37 AOCs in 1999. These are summarized in the figures below (PAP-00089727-41). It is noted that the two site stormwater catch basins were not sampled for PAHs (PAP-00089714).

The locations of PAH exceedances in surface soil (zero to two feet bgs) detected in the western third of the site are depicted below (PAP-00089755):



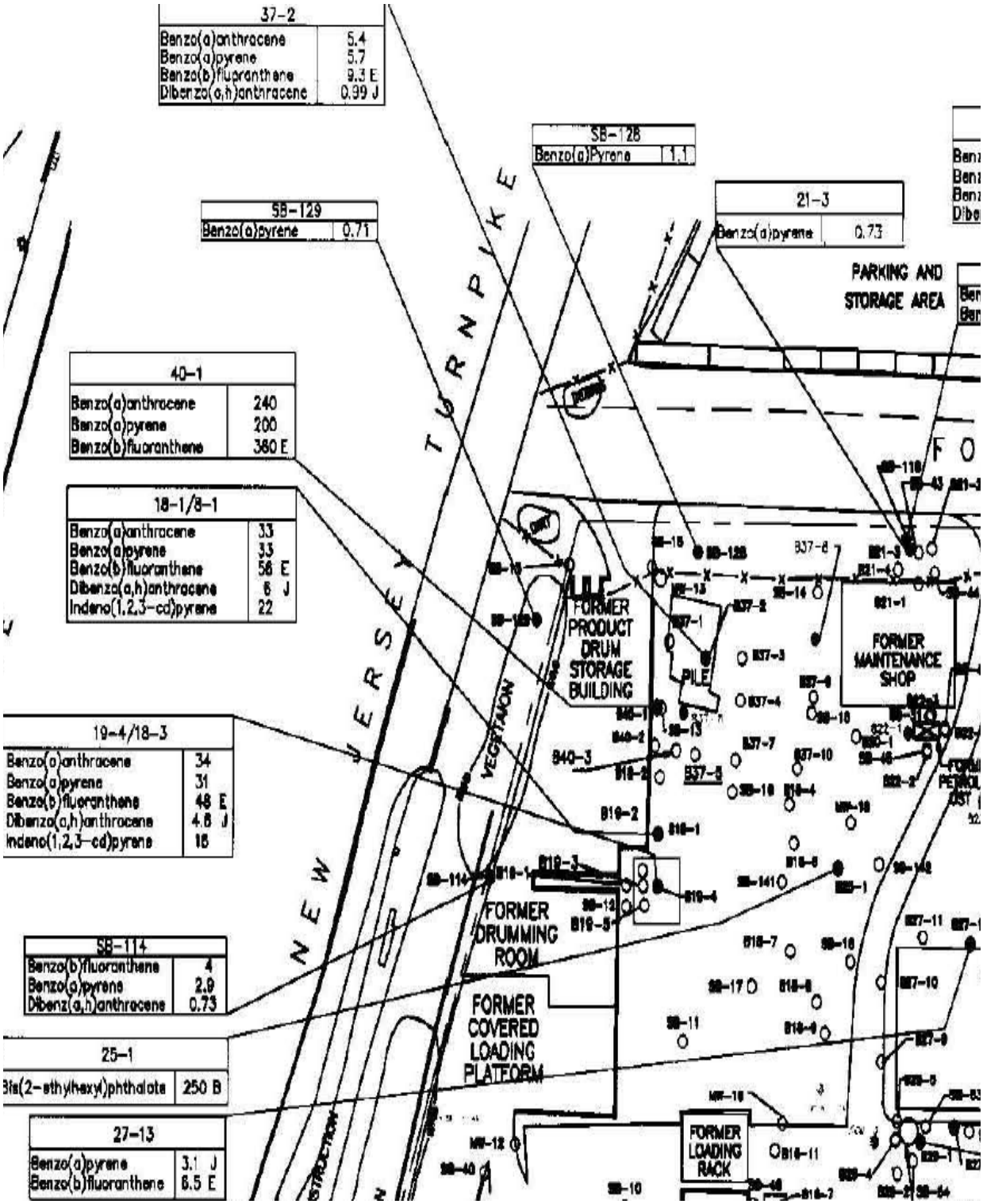
Ashland LLC

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The locations of PAH exceedances in surface soil (zero to two feet bgs) detected in the central third of the site are depicted below (PAP-00089755):



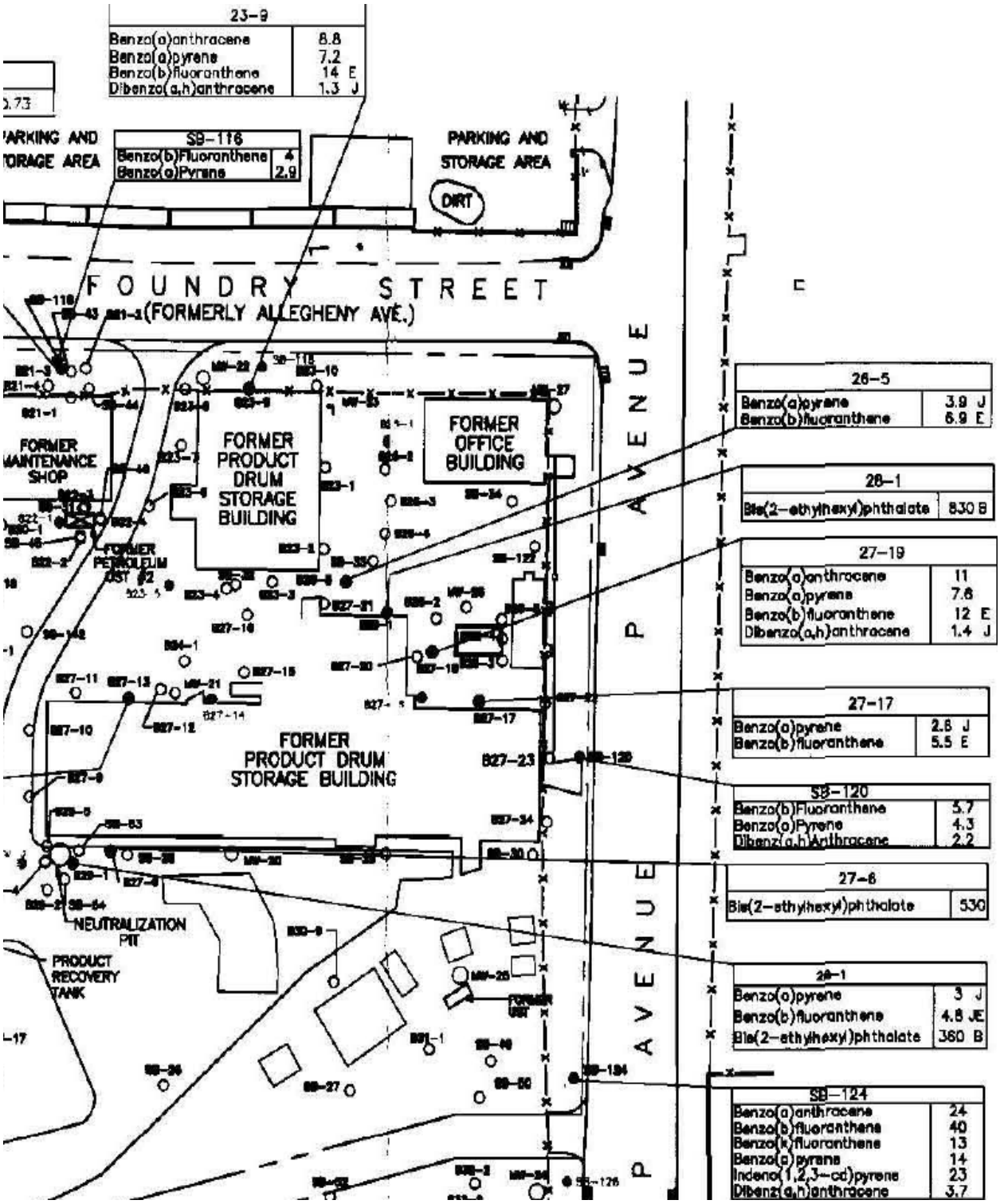
Ashland LLC

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The locations of PAH exceedances in surface soil (zero to two feet bgs) detected in the eastern third of the site are depicted below (PAP-00089755):



Remedial Activities

According to a *Report of Progress and Remedial Action Proposal for Former Ashland Chemical Company IC&S Facility*, dated March 8, 1996, Ashland filed under the NJDEP Environmental Cleanup Responsibility Act in 1988 when the New Jersey Turnpike Authority notified Ashland of plans to widen the highway which would involve construction on Ashland's property. Operations at the facility ceased in 1991, and corrective actions were commenced in 1992 (PAP-00090522). All facility buildings, process lines, and storage tanks, as well as on-site railroad sidings, were dismantled and removed from the site in 1992 (PAP-00090523).

A Cleanup Plan was prepared in 1993, and involved excavation of all soil that contained petroleum hydrocarbons at concentrations greater than 10,000 mg/kg (PAP-00090605). According to a *Report of Progress and Remedial Action Proposal for Former Ashland Chemical Company IC&S Facility*, dated March 8, 1996, quarterly progress reports were submitted to NJDEP for Industrial Site Recovery Act Case Number 88695, as part of the ongoing requirements of the 1993 Cleanup Plan (PAP-00090515).

According to a *Remedial Investigation Report*, dated September 27, 2001, in August 1999, approximately 750 tons of soil containing tar/asphalt were excavated from the Track No. 1 Rail Car Loading Area AOC (i.e., AOC 1, located in the western portion of the site) to a depth of four feet below ground surface (the depth to groundwater). When the western-most portion of the excavation area was excavated, viscous, tar-like material flowed into the excavation along the southern wall at a depth of approximately two to three feet below ground surface. Additional lateral excavation in this area was not possible due to the presence of both a fence and two rail road spurs. Absorbent booms were placed on top of the groundwater to restrict the tar-like material from floating to other portions of the excavation. Sinking materials were confined by the presence of subsurface remains of foundation walls. On October 18 and 19, 1999, the excavated soils were removed from the site for treatment off site. High molecular weight PAHs remained in surface soil (zero to two feet bgs) in this area at concentrations less than the NJDEP "Residential Direct Contact Soil Cleanup Criteria" of 660 micrograms per kilogram (µg/kg) for benzo(a)pyrene and 900 µg/kg for all other PAHs (PAP-00123568, 98). It is noted that the source of the tar-like material is not discussed in the *Remedial Investigation Report*, dated September 27, 2001. According to a 1979 *City of Newark, New Jersey Feasibility Study: Pollution Abatement Program* document, a black, tar-like sediment was found in the Roanoke Avenue sewer. The document states the "source is evidently" the Pitt Consol Chemical Company and that "spillage appears to have contaminated the groundwater." It is unclear if this is also the source of the tar-like material identified in groundwater at the Ashland site.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Atlantic Richfield Company

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ATLANTIC RICHFIELD COMPANY

Facility Name, Address and Size: Getty Newark Terminal; 86 Doremus Avenue, Newark, New Jersey; approximately 14.5 acres (PAS-00004907); the number of employees and shifts is unknown based on review of available file material.

1. **Business Type:** Storage and distribution of petroleum products

2. **Time Period of Ownership/Operations**

   Operator: 1930s to July 23, 1951
   Owner: 1930s to July 23, 1951

   1930s: Atlantic Refining Company owned and operated the facility from sometime in the 1930s until July 23, 1951 (PAP-00189227).

   1951: Atlantic Refining Company conveyed the site to Tide Water Associated Oil Company on July 23, 1951 (PAP-00189227).

3. **Operational History/COC Use and Presence at the Facility**

   A *Preliminary Assessment/Site Investigation Report, Former Getty Terminal 56230*, dated March 2014 (2014 PA/SI), states that historical aerial photographs identified 11 tanks at the site and two docks that appeared to be leading to the Passaic River in 1943 (PAP-00084083). An historical Sanborn Fire Insurance Map dated 1950 identified the following:

   - Seven storage tanks ranging from 220,000 to 845,000 gallons in size surrounded by concrete walls in the area to the east of Doremus Avenue (“East Yard”)
   - A garage and repair shop
   - A barrel storage area
   - An oil filling area with two oil tanks
   - A motor oil warehouse
   - A tank car filling area, among other buildings.

   The area to the west of Doremus Avenue (“West Yard”) included three additional large storage tanks surrounded by concrete walls, a gasoline pump storage building, and an unlabeled building. Railroad spur lines extend onto both the East Yard and West Yard (PAP-00084085, 166).

   At the time of Texaco’s operation of the facility, as documented in a *Cleanup Plan*, prepared for Texaco, dated October 1989, operations included the following:

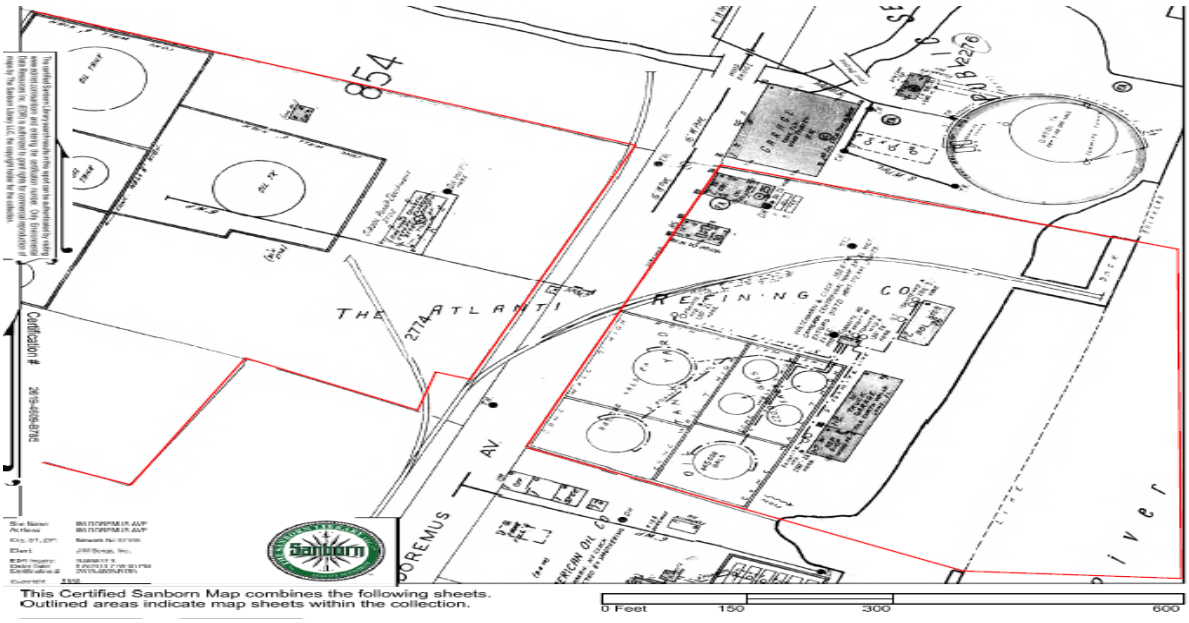
   - Petroleum products were received at the terminal primarily via a pipeline system. Occasionally, product was received from barges at a loading dock on the Passaic River and then piped into the proper storage tanks. The petroleum products were

stored in 11 aboveground tanks. Sediments that settled to the bottom of the tanks were removed, containerized and then transported for proper disposal. The petroleum products were dispensed into tank trucks at a loading rack for delivery offsite. This procedure was done via a truck loading rack with seven gasoline loading positions and two distillate loading positions (PAS-00004914).

An aerial photograph of the site in 1943 is depicted below (PAP-00084142):



An historical Sanborn Fire Insurance Map dated 1950 is depicted below (PAP-00084167):



4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Lead (detected)

No onsite sampling data were available from the time period during which Atlantic Refining Company owned/operated the Terminal. Data were collected from the terminal after Atlantic Refining Company's time, and identified the presence of COCs (lead, PAHs, PCBs) in one or more environmental medium. There are no statements in the available reference material suggesting that these detections are the result of Atlantic Refining Company's operations. These data are discussed further in Section 7 below.

PCBs

No onsite sampling data were available from the time period during which Atlantic Refining Company owned/operated the terminal.

According to a *Remedial Investigation Report*, dated July 2014, review of a 1947 aerial photograph did not identify any noticeable activity at Area A (PAP-00066683). Area A is located south of the West Yard (PAP-00189244). The *Cleanup Plan*, prepared for Texaco, dated October 1989*c*, also states Area A was never used for facility operations (PAS-00004919). It is noted that a letter prepared by the New Jersey Department of Environmental Protection (NJDEP) dated December 6, 1996, states that the "probable source" of PCB contamination in Area A is historic filling. The letter also states that while it is apparent based on historical aerial photographs that Area A was subject to filling, staging of materials at Area A was also observed (PAP-00189334).

PAHs

No onsite sampling data were available from the time period during which Atlantic Refining Company owned/operated the Terminal.

Lead

No onsite sampling data were available from the time period during which Atlantic Refining Company owned/operated the Terminal.

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and

[1]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to a *Cleanup Plan*, prepared for Texaco, dated October 1989, a portion of the site is underlain by fill, which contains a variety of material consisting of brick, and concrete fragments cinders, and sand and gravel in a silt and sand matrix (PAS-00004910-11). According to a *Remedial Action Work Plan Addendum, Getty Newark Terminal – Area A*, dated August 21, 2013, artificial fill comprises the upper two to 12 feet of the unconsolidated materials at Area A (PAP-00189228, 44).

The *Remedial Action Work Plan Addendum, Getty Newark Terminal – Area A*, dated August 21, 2013, states that the range of PAH, lead, and PCB concentrations detected at Area A are within the range of concentrations identified in historic fill and that the presence of PAH, lead, and PCB impacts at the site "are directly attributable to these historic fill materials" (PAP-00189233). The 2014 PA/SI states that an evaluation conducted in 2006 by Conestoga-Rovers and Associates concluded that fill is present throughout the full extent of the East and West Yards and that the presence of PAHs and lead are indicative of "historic fill" (PAP-00084092). An evaluation as part of the *Remedial Investigation Report*, prepared for Getty Properties Corp., dated April 2016 (2016 RI), also states that PAHs and lead in soil are due to fill (PAP-00086186). No onsite sampling data were available from the time period during which Atlantic Refining Company owned/operated the Terminal. The following data pertaining to fill were collected from Area A of the facility, as identified in the *Remedial Action Work Plan Addendum, Getty Newark Terminal – Area A*, dated August 21, 2013 (PAP-00189291) and the *Cleanup Plan*, prepared for Texaco, dated October 1989 (PAS-00005003). The *Cleanup Plan*, prepared for Texaco, dated October 1989, states Area A was never used for facility operations (PAS-00004919). It should be noted that these data may not be indicative of soil concentrations at the time of Atlantic Refining Company's ownership/operation of the facility.

The levels of PCBs, PAHs and lead detected at the site in soils are presented in the table below.

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[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found In Onsite Soils	
COC	**Maximum Detected Concentration**
Lead	8,200 mg/kg
Benzo(a)anthracene	12 mg/kg
Benzo(a)pyrene	19 mg/kg
Benzo(b)fluoranthene	23 mg/kg
Benzo(k)fluoranthene	26 mg/kg
Dibenzo(a,h)anthracene	2.8 mg/kg
Indeno(1,2,3-cd)pyrene	10 mg/kg
PCBs	40 mg/kg

*Note these data were collected after Atlantic Refining Company's ownership/operation of the site.

No information is available to determine if fill material was present at the terminal site during the period of Atlantic Refining Company's ownership or operation of the site. According to a description of historial aerial photographs presented in a 2014 *Remedial Investigation Report, Area A*, prepared by Leidos Engineering, Inc., filling activities may have taken place in Area A some time between 1947 and 1959, but not earlier (PAP-00066683). It is unknown if fill material (if any was present at the site prior to 1951) was disturbed during the period of Atlantic Refining Company's ownership/operation of the site.

5. COC Pathways

The site lies adjacent to the bank of the Passaic River (PAS-00004907).

No information on COC pathways during the time which Atlantic Refining Company owned/operated the facility is available; however, according to a *Cleanup Plan*, prepared for Texaco, dated October 1989, the average slope across the site is approximately 2-3 percent and is toward the east in the direction of the Passaic River. There are no streams, creeks or lakes located on the site (PAS-00004911-12). The 2014 PA/SI states that the Passaic River "frequently" floods the East Yard and parts of the West Yard during heavy storms and hurricanes (PAP-00084099); however, records of flooding during Atlantic Refining Company's ownership/operation of the site were not identified. The 2014 PA/SI states that a review of historical maps, aerial photographs and reports do not show any on-site wastewater treatment, septic system or discharge sources (PAP-00084090).

Storm Sewer

At the time of the 2014 PA/SI, no storm sewer drains were observed in the West Yard. Multiple storm and trench drains were observed in the East Yard (PAP-00084115); however, it is unknown from a review of available documents if these were present at the time of Atlantic Refining Company's ownership/operation of the site.

Direct Release

There is no information regarding direct release in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations/Enforcement Actions

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

There is no information regarding characterization activities in the available file material.

Sewer

There is no information regarding sewer sampling data in the available file material.

Soil

No onsite sampling data were available from the time period during which Atlantic Refining Company owned/operated the terminal. Data collected from the terminal after Atlantic Refining Company's time identified the presence of COCs in soil, groundwater, and surface water. It is unclear if these detections are the result of Atlantic Refining Company's operations or that of subsequent owners/operators. These data are discussed further below:

- As documented in the *Cleanup Plan*, prepared for Texaco, dated October 1989, lead was detected in the late 1980s in surface soil in a tank basin at a maximum concentration of 1,200 mg/kg, in a storm water discharge area at a maximum concentration of 2,700 mg/kg, and in Area A at 18 to 24 inches below ground surface at 8,200 mg/kg (PAS-00004921, 83, 87, 5003.

- In May 1990, a waste classification sample collected for disposal from Area A showed the presence of PCBs in the soil. Subsequently, NJDEP requested additional investigation to evaluate the potential presence of historic fill in Area A. Remedial activities conducted in 1990/1991 included the excavation and off-site disposal of approximately 4,000 tons of lead and PCB-impacted soil from Area A. The presence of PCBs extended to the property boundaries, and the concentrations of PCBs in soil samples showed decreasing concentrations with depth. In addition, PAHs were identified at various locations no greater than four feet deep in the fill material within Area A (PAP-00189231-32). "Hot spots" of PCB contamination were those with concentrations ranging from 20 mg/kg to 40 mg/kg (PAP-00189383), detected primarily in surface soil (PAP-00066766). Further removal of 229 tons of PCB-impacted soil was performed in 1996 (PAP-00189231-32). Upon completion of site investigation activities, an engineered cap was proposed for Area A (PAP-00189234). According to a *Remedial Action Work Plan Addendum*, dated April 21, 2013, the maximum PCB concentration at Area A remaining onsite was reported to be 1.52 mg/kg and the maximum concentration of lead was reported to be 996 mg/kg (PAP-00189268, 91). According to a *Remedial Investigation Report*, dated July 2014, PCB-impacted soils remain on-site at concentrations ranging from 0.064 mg/kg to 10.5 mg/kg (PAP-00066698).

Remedial Activities

There is no information regarding remedial activities in the available file material.

8. Summary of Asserted Legal Defenses

ARC asserts that petroleum, including crude oil or any fraction thereof, is not a CERCLA hazardous substance, such that a release of petroleum does not create CERCLA liability. 42 U.S.C § 9601(14).

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Facility Data Report

ATLAS REFINERY

Facility Address and Size: Atlas Refinery, 142 Lockwood Street: Facility includes 130-132 and 134-152 Lockwood Street and 121-143 Lister Ave., Newark, New Jersey (Block 2438, Lot 65, 66 and 68; Block 2412, Lots 7 and 82). 2.31 acres (PAP-00691256).

A May 15, 1972, PVSC Waste Effluent Survey states that Atlas had 36 employees with an average production of 12,000,000 lbs/yr of oil for the leather, textile and paper industry (PAS-00072990). An April 10, 1975, PVSC Waste Effluent Survey states that Atlas had 48 employees and an average production of the same type of materials of 14,000,000 lbs/yr. Operations were listed as refining of animal oils; sulfation and sulfonation of animal, vegetable and marine oils; and sulfation and sulfonation of straight chain hydrocarbons (PAS-00072980, PAS-00072990).

1. **Business Type:** Manufactures products used in the leather tanning industry. Operations include blending, aeration and various chemical reactions (PAP-00691080).[1]

2. **Time Period of Ownership/Operations**

   Operator: December 1897 to Present
   Owner: July 1918 to Present

   Atlas was incorporated on December 7, 1897 (PAS-00052059). According to an August 1, 1996, Response to Information Request, Atlas operated at the 142 Lockwood Street location since 1897, and has been the only company that has owned and operated the facility from 1940 to the present (PAS-00051977; PAS-00051980). However, a July 12, 1996, Response to Information Request states that Atlas operated at this location since 1887, and a historical brochure notes that the business origins stem from 1887 when Frederick Schroeder used a wood-fired kettle to render animal oils on the Schroeder family farm (PAS-00052101).

   According to the 1996 Response to Request for Information, the 142 Lockwood facility was expanded through the purchase of adjacent property. After occupying a portion of the facility as a tenant from 1897 to July 1, 1918, Atlas purchased this property from Frederic Schroeder and Emily Schroeder on July 1, 1918. Other portions of the facility were added through purchases from the following companies on the dates noted:

   - American Hair Felt Company; January 16, 1918
   - Continental Oil Company; August 30, 1943
   - The Central Railroad Company of New Jersey; June 30, 1969
   - Messinger Trucking; June 9, 1972 (PAS-00051980).

   No information was provided regarding the acreage of the property purchased from the above entities or the condition of the property at the time of purchase.

[1] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

3. Operational History/COC Use and Presence at the Facility

According to a February 2009 Phase I Environmental Site Assessment Report (SAR), Sanborn maps indicate that the earlier operations as Fred Schroeder – Grease and Tallow Refining in 1892. The operations were conducted in a single small building located in the northwest corner of what is currently Block 2412, Lot 7. Subsequent Sanborn maps from 1908 through 2003 depict Atlas as the sole operator at the Site and Schroeder family and / or Atlas have operated at the site since originally developed circa 1892 (PAP-00691258).[2]

According to a historical brochure, in 1887 Frederick Schroeder used a wood-fired kettle to render animal oils on the Schroeder family farm. He started a small business, collecting animal fat from Newark area farms and selling the by-products to local tanneries. This local trade was used as a springboard for developing and marketing new chemicals, then expanding the business to a nationwide level. The family farm was transformed into Atlas Refinery—at the same site of today's corporate operations and the business grew steadily during the early years. Atlas experimented with many different processes to improve leather-related products; at one time oils were bleached by sunlight in a "greenhouse" arrangement. The company also developed new paint oils and one of the first synthetic linseed oils. With the outbreak of World War I, Atlas supplied neatsfoot oil to the U.S. Cavalry for its saddlery (PAS-00103492).

During the 1920s, production increased at the facility. Demand grew for Atlas oil, a sulphated cod oil and the company established an in-house cooperage to meet the need for barrels. In the 1930's, “huge” storage tanks were erected on floating foundations, which rise and fall with the movement of the area's water table (PAS-00103493). During the 1950’s, the plant was renovated and a quality control system was developed to ensure the consistency of intermediates as well as finished products (PAS-00103495).

In the late 1980s, Atlas completed a 5,000 square foot research and development, quality control and tanning laboratory. In the pilot tanning area, significant results were made in experimental tanning, evaluation of new products and developmental work with “wet blue stock.” This included the installation of three stainless steel, fully automated Dose tanning drums; a dry mill; and an automatic temperature-controlled toggling and paste-drying unit (PAS-00103491).

According to a February 2009 SAR, the facility is comprised of three major manufacturing areas, chemical, textile, and sulfo. Additionally, there is a warehouse area, a wet chemistry laboratory, “blow shed” (where air is blown into natural oils), a courtyard for storage, a hot storage area, a tannery building, a loading / unloading area, a finished goods warehouse, and a large paved parking area. The chemical area is contained in a three-story brick building located behind the office building. The textile and sulfo areas are contained in two two-story buildings. Information obtained from the Sanborn Maps show these buildings were present on the Property in 1931 with small changes in later maps (PAP-00691257).

[2] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery’s previous certification.

In the paved courtyard between buildings, on the western side of the Property, two trailers and the courtyard are utilized as storage space for solid chemicals stored in 55-gallon drums as well as empty containers waiting to be filled (PAP-00691257). According to a Daily Inventory Plant Pumper Inspection Log Atlas storage the following materials (PAP-00691008).

MATERIAL	TANK NUMBER	TANK CAPACITY
Herring Oil	#1 Dough Boy	13,00dr / 305in
	#2 Dough Boy	840dr / 344in
Herring Oil	#3 Dough Boy	840dr / 344in
	Big Blue	1300dr / 360in
	#1 Ozite Tank	500 dr.
	#2 Ozite Tank	500 dr.
	B.R. Side Tank#1	60 dr.
	B.R. Side Tank#2	60 dr.
	B.R. Side Tank#3	60 dr.
# 6 Fuel Oil	Fuel Oil Tank	8100 dr.
	Blow Shed Tank	100 dr.
	Blow Shed Tank	100 dr.
	Blow Shed Tank	
	Hot Storage #1	160 dr
	Hot Storage #2	160 dr
	Hot Storage #3	160 dr
	Hot Storage #4	160 dr
	Hot Storage #5	160 dr
	Hot Storage #6	160 dr
Crude Recovery Oil	A-20 Tank	100 dr.
	640 Tank	170 dr.
25% Caustic	Large Tank	10,000 gal

Raw materials are delivered to the Property via bulk truck (tank wagons), rail, and drums. Bulk truck deliveries utilize the loading dock on Lockwood Street and the loading dock on the northern portion of the facility. Approximately, 80% of deliveries are bulk and pumped directly into the tanks. Bulk rail deliveries are for sporadic fish and lard oil deliveries only and each load is approximately 180,000 pounds of material. Drum deliveries utilize the loading dock on the northern portion of the facility and are brought directly into the manufacturing area (PAP-00691258).[3]

During processing, raw materials are pumped from tanks, through most 2-inch lines and some 3-inch lines, into reactor tanks. The platforms are utilized to add small amounts of raw materials as well as collect samples for testing in the quality control department. Most products turn into gel and/or solids at a certain temperature therefore tanks are both heated and/or agitated with air and the heat must be flow-able. Final products are pumped into or gravity-emptied into drums with some bulk filling into “tank wagons“. Some product is placed in smaller pails and used as samples (PAP-00691258).[3]

A July 1986 Application for a Sewer Connection Permit states that the principal products were water-soluble lubricants for the leather, textile and paper industries. The company processes included sulfate and sulphonate of natural and synthetic oils. The principal raw materials included fish oil, lard oil, petroleum oil and vegetable oils (PAS-00072965-67).

[3] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery’s previous certification.

According to a February 2009 SAR, all water from the facility is collected and processed through a central recovery system. The treatment includes a pH adjustment, oil and water separation through the use of a polymer and where the oil separates to the top of the water, a pH increase, and finally a separation where the water goes into a drain and oil in a holding tank where it can be held until sold as fuel (PAP-00691258).

The blow shed is utilized to create intermediates. The viscosity of a product is increased to thicker oil. Intermediate batches are pre-made and added to another batch (PAP-00691258). There are two boilers on the Property. The older boiler (approx. 1906) is fired using #6 fuel oil and the newer boiler is fired using gas. There is also #2 fuel oil on-site but is not currently being used and there were plans to remove the tank (PAP-00691258).

During the site reconnaissance it was reported that approximately 80% of deliveries to the Site are via bulk truck / tank wagons deliveries, which are pumped directly into tanks. Drum deliveries are received at the loading dock located on the north side of warehouse and reportedly these materials usually go directly to the manufacturing area where they are needed. Most final products were reportedly pumped into and shipped in drums, with some bulk filling into tank wagons. Drums with finished products are stored in the Finished Goods Warehouse, located in the northwestern portion of the facility, and are loaded onto trucks for delivery using the adjacent loading docks (PAP-00691274-75).

No evidence of underground storage tanks (USTs) was observed during the site reconnaissance conducted by ESA, and reportedly no USTs are known to have ever been present on the Site. Numerous aboveground storage tanks (ASTs) were observed throughout the Property, both within the facility interior and exterior. Based on visual observations, it appeared that the ASTs are in good condition (PAP-00691275).

The majority of the ASTs associated with the operations at the site are located within the facility interior. Exceptions to this include three fish oil ASTs located outside the Blow Shed at the northeastern portion of the facility, a salmon oil AST and caustic tank, both double lined vertical tanks, located outside near the drum storage area at the northwestern portion of the facility, and a former rail car that was used as a tank at one time, but was reportedly last used approximately 50 years ago. Additionally, two fuel oil ASTs are present. One AST is used to store #6 heating fuel oil that is used for heating purposes; this tank is reportedly approximately 100 years old. The second tank contains #2 heating fuel oil, which is reportedly not currently used any longer and therefore Atlas plans on removing this tank in the future (PAP-00691275).[4]

A Community Righty to Know Survey from 1993 states that Atlas Refinery was a manufacturer of specialty chemicals and fibre lubricants. A 1995 survey states that it was a manufacturer of fiber lubricants for the leather industry (PAS-00052030, PAS-00052041).

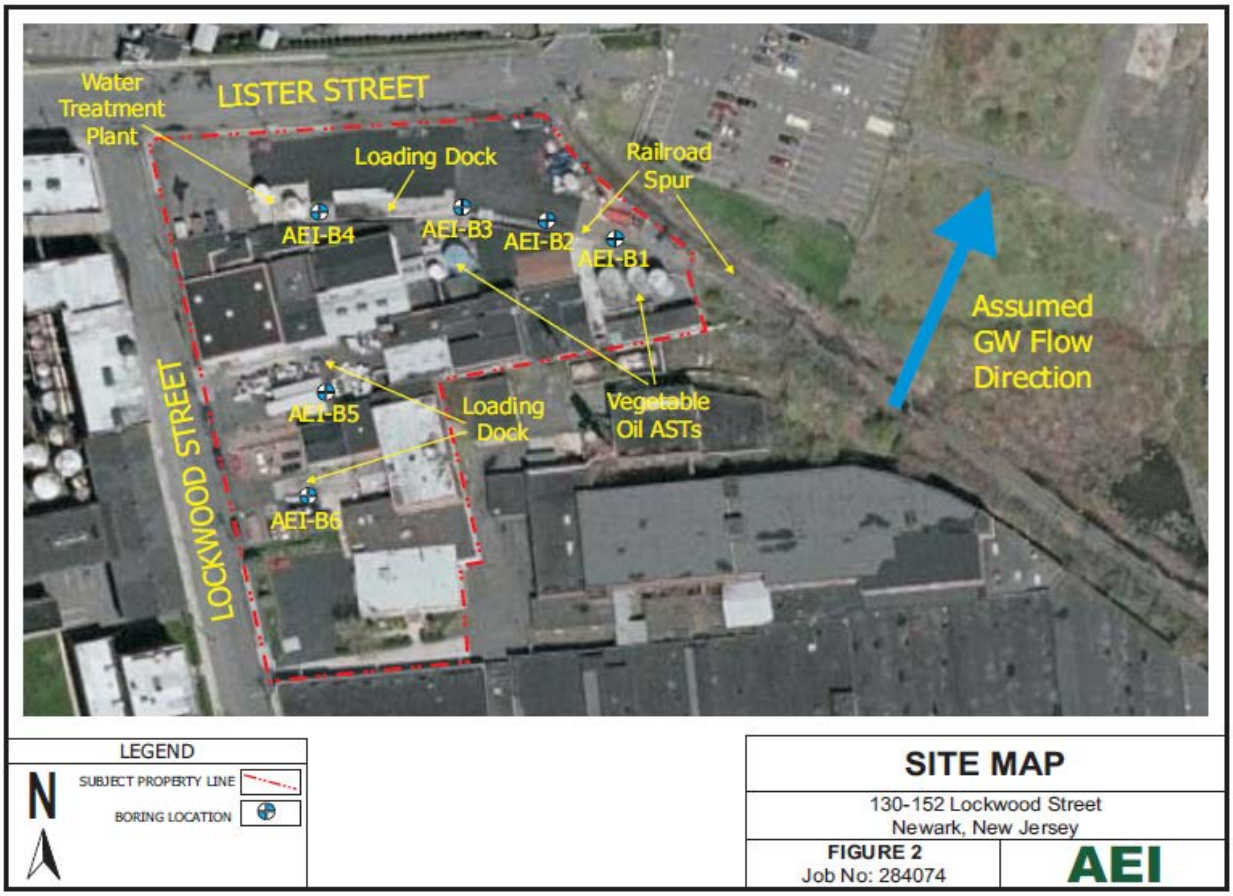
[4] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

A 1994 RCRA Inspection Report stated that Atlas was a manufacturer of a variety of water-soluble oils for the Leather Tanning industry. Atlas sold these oils directly to Leather Tanners around the world. They were specifically used to make leather feel softer and to increase resistance from discoloration to high temperatures and light. Atlas was using a variety of insoluble oils including: fish oil, castor oil, toluol fatty acid and other mineral oils that mixed with sulfuric acid to create a sulfonated oil. This reaction took place in one of several vertical tanks under atmospheric pressure. Water was added during the cooking process at 350 F. After the product had been cooked it was dropped to a vessel and cooled overnight (20 to 24 hours). Before packaging in 55-gallon drums, it was neutralized using a caustic solution (PAS-00103487-88).
Surveys from 1993 to 1995, show areas where chemicals were stored included a second and third floor chemical departments, an outside maintenance department, first floor engine room, outside of laboratory building, second floor textile department, a rear shipping dock and tannery. Chemicals listed included among others acetic acid, ammonium bicarbonate, ammonium persulfate, diethylene triamine, petroleum naphtha, and sodium hydroxide (PAS-00052030-44).



(PAP-00691309)[5]

[5] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

4. Identified COCs

- PAH (used and released)
- Copper (used)
- Mercury (used)
- Lead (used)

Copper, lead and mercury were detected in plant effluent. Petroleum hydrocarbons were also detected in plant effluent. Petroleum hydrocarbons can contain PAHs. Mercury wastes were generated on site in 1993.

PAHs

According to a PVSC User Charge Self-Monitoring Reports, Atlas Refinery's effluent included 8.4 mg/l of petroleum hydrocarbons in November 1994 and <1.0 mg/l of petroleum hydrocarbons in June of 1996 (PAS-00051978, PAS-00051984-85).

Sampling in June 1996 showed <1 mg/l of petroleum hydrocarbons and 32 mg/l of oil and grease (PAS-00051986-90).

According to a July 16, 2009 Phase II Subsurface Investigation prepared by AEI Consultants, the follow concentrations of PAHs were detected on site with sampling locations on the above site map (PAP-00691311).[6]

Sample ID:	AEI-B1	AEI-B2	AEI-B3	AEI-B4	AEI-B5	AEI-B6	NJDEP - Non Residential Direct Contact Soil Cleanup Criteria	NJDEP - Impact to GW Soil Cleanup Criteria
Sample Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample Depth:	4'	4'	4'	4'	4'	4'		
Sample Date:	6/29/2009	6/29/2009	6/29/2009	6/29/2009	6/29/2009	6/29/2009		
Volatile Organic Compounds (VOCs) via EPA Method 8260:								
Acetone	0.16700	0.51500	0.16100	0.03030	0.00492	0.01610	1000	100
Carbon Disulfide	0.00817	0.00976	ND	ND	ND	ND	NR	NR
2-Butanone	0.04270	0.10600	0.04210	ND	ND	ND	1000	50
Toluene	ND	0.00303	0.00442	0.00230	ND	0.00060	1000	500
Ethylbenzene	ND	ND	0.01200	ND	ND	ND	1000	100
M&P Xylenes	ND	ND	0.08360	ND	ND	ND	1000	10
O-Xylenes	ND	ND	0.01560	ND	ND	ND	1000	10
All other VOCs	ND	ND	ND	ND	ND	ND	N/A	N/A
Semi Volatile Organic Compounds (SVOCs) via EPA Method 8270:								
Naphthalene	ND	0.42700	ND	ND	ND	ND	4200	100
2-Methylnaphthalene	ND	0.22600	ND	ND	ND	ND	NR	NR
Dimethylphthalate	0.06330	ND	ND	ND	ND	ND	10000	50
Acenaphthene	ND	ND	0.90900	ND	ND	ND	10000	100
Dibenzofuran	ND	ND	0.37400	ND	ND	ND	NR	NR
Fluorene	ND	ND	0.55600	ND	ND	ND	10000	100
Phenanthrene	ND	0.50300	1.26000	ND	ND	ND	NR	NR
Anthracene	ND	ND	0.64400	ND	ND	ND	10000	100
Fluoranthene	ND	0.88200	2.93000	ND	ND	ND	10000	100
Pyrene	ND	0.79700	2.86000	ND	ND	ND	10000	100
Benzo(a)anthracene	ND	0.50900	0.85900	ND	ND	ND	4	500
Chrysene	ND	0.63600	1.23000	ND	ND	ND	40	500
Bis(2-Ethylhexyl)Phthalate	ND	ND	1.58000	ND	ND	ND	210	100
Benzo(b)fluoranthene	ND	0.62200	0.87000	ND	ND	ND	4	50
Benzo(k)fluoranthene	ND	0.48200	0.58900	ND	ND	ND	4	500
Benzo(a)pyrene	ND	ND	0.51800	ND	ND	ND	0.66	100
All other SVOCs	ND	ND	ND	ND	ND	ND	N/A	N/A

Notes:
ND = Non Detect
N/A = Not Applicable
NR = Not Regulated
Bold and highlighted values are in excess of the NJDEP Soil Cleanup Criteria

[6] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

Copper

PVSC Waste Effluent Surveys from 1972 and 1975, state that wastewater at the Atlas facility contained 4.438 mg/l of copper and <4.5 mg/l of copper in 1974 (PAS-00072991; PAS-00072981).

A July 1986 Application for a Sewer Connection Permit states that an analysis of industrial waste showed copper at 0.22 mg/l along with other metals (cadmium, chromium, cyanide, nickel, zinc) and phenol (PAS-00072970).

A 1991 Application for a Sewer Connection Permit states that an analysis of the industrial wastewater showed copper at 0.73 mg/l as well as other metals (chromium, nickel and iron) (PAS-00103451).

Reports of Analysis from Garden State Laboratories, Inc. showed results of samples taken from Building #5 wastewater for copper from October 19, 1994, to October 26, 1994, to have a max concentration of 0.21 mg/l (PAP-00051987-89).

A Phase II Heavy Metals Source Determination Study was conducted by Elson T. Killam Associates in April 1980 for PVSC (1980 Killiam Phase II Study) in compliance with an ocean dumping permit (PAS-00114124). Industrial sampling was undertaken for industries in the PVSC service area to identify the sources of heavy metals in the waste effluent and provide an initial basis for development of a pretreatment program. The study utilized a list of significant metals contributing industries in conjunction with an identification of the sub-areas with heavy contributions of industrial metals compiled during a Phase I study (PAS-00114142). A PVSC Heavy Metal Source Determination, Phase II Industrial Contribution, Sub-Area 0 table lists Atlas Refinery with 0.066 lbs/day of copper (0.358 mg/l) (PAS-00114149). A similar table showing “after pretreatment” amounts shows 0.066 lbs/day of copper at 0.358 mg/l) (PAS-00114153).

Lead

PVSC Waste Effluent Surveys from 1972 and 1975, state that wastewater at the Atlas facility contained 7.175 mg/l of lead in 1971, and 4.5 to 45.4 mg/l of lead in 1974 (PAS-00072991; PAS-00072981).

A January 6, 1977, correspondence requesting a response from PVSC to Atlas regarding the heavy metals noted in the Waste Effluent Surveys, states that the heavy metal (lead) in Atlas’s wastewater was coming from lead-lined neutralization tanks and that these tanks were being replaced with fiberglass (PAS-00072994). The correspondence does not refer to other metals.

A PVSC Heavy Metal Source Determination, Phase II Industrial Contribution, Sub-Area 0 table lists Atlas Refinery with 0.782 lbs/day of lead or 4.260 mg/l (PAS-00114149). A similar table showing “after pretreatment” amounts shows 0.55 lbs/day of lead at 0.300 mg/l (PAS-00114153).

A July 1986 Application for a Sewer Connection Permit states that an analysis of industrial waste showed 1.0 mg/l lead, along with other metals (cadmium, chromium, cyanide, nickel, zinc) and phenol (PAS-00072970).

A 1991 Application for a Sewer Connection Permit states that an analysis of the industrial wastewater showed lead at 0.17 mg/l as well as other metals (chromium, nickel and iron) (PAS-00103451).

Reports of Analysis from Garden State Laboratories, Inc. showed results of samples taken from Building #5 wastewater for lead as follows:

- October 19, 1994 - 0.216 mg/l
- October 21, 1994 - 0.046 mg/l
- October 26, 1994 - 0.033 mg/l (PAP- 00051987-89).

Mercury

A PVSC Heavy Metal Source Determination, Phase II Industrial Contribution, Sub-Area 0 table lists Atlas Refinery with mercury at 0.001 mg/l (PAS-00114149). A similar table showing "after pretreatment" amounts shows mercury at 0.001 mg/l (PAS-00114153).

A February 12, 1993, Maryland Department of Environment Hazardous Waste Manifest, notes that Atlas Refinery was the generator of chemicals including 20 pounds of metallic waste mercury and 20 pounds of waste mercurous nitrate. The wastes were shipped to Laidlaw Environmental Services in Laurel, Maryland (PAS-00052001).

Reports of Analysis from Garden State Laboratories, Inc. showed results of samples taken from Building #5 wastewater on October 19, 21, and 26, 1994, for mercury were <0.001 mg/L (non-detect) (PAP-00051987-89).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[7]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[8] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for

[7] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[8] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

metals, including lead, copper, mercury, and the OU2 PAH COCs.[9] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[10]

According to a February 2009 SAR, information contained in geotechnical soil boring logs from 1994 and 1995 indicated that fill material consisting of black to dark brown silty sand and gravel is present from 0-11 ft bgs, with gravel coarser with depth. A peat layer was identified at 11-11.5 ft, underlain by medium to coarse sand to approximately 24 feet, follow by find sand (PAP-00691268).[11]

According to a February 2009 SAR, Sanborn maps from 1892 show one building present and a loading dock on the property, in 1908 five buildings are present. The largest appears to be split into 10 different sections. In 1931 six buildings are present, the largest being split into 20 different sections, in 1950 the property have two additions, keg racks and four ASTs in the northeastern corner of the property. In 1973 the northern portion of the Property has been developed along the railroad spur and three one-story buildings appear in the northwestern portion (PAP-00691265).[11]

The levels of copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00072991; PAS-00072981; PAP-00691311).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	45.400 mg/kg
Copper	4.438 mg/kg
Mercury	0.001 mg/kg
Benzo(a)anthracene	0.859 mg/kg[11]
Benzo(a)pyrene	0.518 mg/kg[11]
Benzo(b)fluoranthene	0.859 mg/kg[11]
Benzo(k)fluoranthene	0.589 mg/kg[11]

[9] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[10] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

[11] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

5. COC Pathways

Sanitary and Storm Sewers

Atlas used both sanitary and storm sewers. Plant wastewater was released to the sanitary sewer since the creation of PVSC. No information was available regarding where the plant wastewater was released prior to the development of the sanitary sewer. In addition, in at least the early 1970s, oil was released as a result of Atlas activities in the railyard near the Central Railroad tracks, and during periods of rainfall this material drained towards Blanchard Street and entered the catch basin and thus the Passaic River. In 1977, dye that was introduced into one of the oil separators at the facility appeared in the Lockwood Street storm sewer. See also Section 8 Regulatory History below.

The company states that there has been no disposal or discharge of any hazardous material to the Passaic River from Atlas at any time. They also state that there has not been any incident resulting in a release or a discharge of any hazardous material on the property, into the wastewater or storm drainage system at the facility or to the Passaic River (PAS-00051979).

According to a February 2009 SAR, there exists in the facility a series a floor drains, trenches, and sumps that collect all waste water and directs the waste water to a waste water treatment system located alongside the Finished Good Warehouse building, at the northwestern portion of the facility (PAP-000691276). Additionally, the following was noted during the site reconnaissance (PAP-00691276-77):[12]

- Floor trench drains were observed in the Wet Chemistry Area. The drains feed into a sump, which receive and transport any water into the facility waste water treatment system.

- A collection pit was observed outside the Hot Box room. The Hot Box has a small boiler and is used to melt drummed materials, as the material in the drums are solid and must be heated to liquefy the material. Sometimes leaks reportedly occur when the drums are heated. This pit is reportedly kept clean because any material that accumulates in the pit will solidify as it cools and, once solidified, will clog and back up the drain.

- Drains were observed in the exterior Yard Storage Area, and are designed to collect any spills and runoff from this storage area. This drain system is connected to the facility waste water recovery system, with all water from this area passing through the treatment system and ultimately discharged to the sanitary sewer.

[12] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

- Floor drains were observed on the first floor of the "Tannery" Building, located adjacent to the Yard Storage Area. These drains reportedly tie into the facility waste water recovery system.

- Drums and small containers are filled on the first floor of the Sulfo building via gravity feed from overhead tanks and/or lines. The drums and containers are filled on scales, which have pits beneath them that collect any spillage. Anything collected in the pits is processed through the facility waste water recovery system. Similarly, floor drains and trenches observed in the fill areas are tied into the facility waste water recovery system.

- Two boilers are used for heating purposes; one high pressure steam boiler that is fired using gas, and one low pressure steam boiler that is fired using #6 fuel oil. The fuel oil fired boiler was installed circa 1906, while the gas fired boiler is newer. A tank is present in the boiler room for chemical adjustment of boiler water / steam condensate. A blow down pit is also present and is used to collect any blow down from the boilers, which in turn is tied into the facility waste water recovery system.

- Drainage ports observed in the Outside Drum Storage Area located in the northern portion of the facility reportedly also tie into the facility waste water recovery system.

All water from the facility is directed to a single pit located on the first floor of the building. This pit is constructed with a solid fiberglass tank set in concrete. The water collects in this pit, and is then pumped to three holding tanks located on the 2nd floor. The pit is reportedly pumped, cleaned and inspected on a regular basis as per MUA requirements (PAP-000691277).[13]

As indicated, upstairs are three tanks used to hold the waste water. The waste water then undergoes the following process: tanks are filled with water → pH is checked → polymer is added to adjust pH and is then agitated → then allowed to set while the oil and water separate, oil to the top and water to the bottom → oil is then pumped into another tank and any remaining water is "cooked off" (lost through evaporation) → the oil next goes to a cool off vat, after which the oil is sold (PAP-000691277).

After processing as described above, the water then passes through a final separator, prior to being discharged to the sanitary sewer. A collection pit is present next to the final separator in case of any problems, such as leaks, spills or overflows, which are collected in the pit and pumped directly back into the waste water recovery system (PAP-000691277-78).

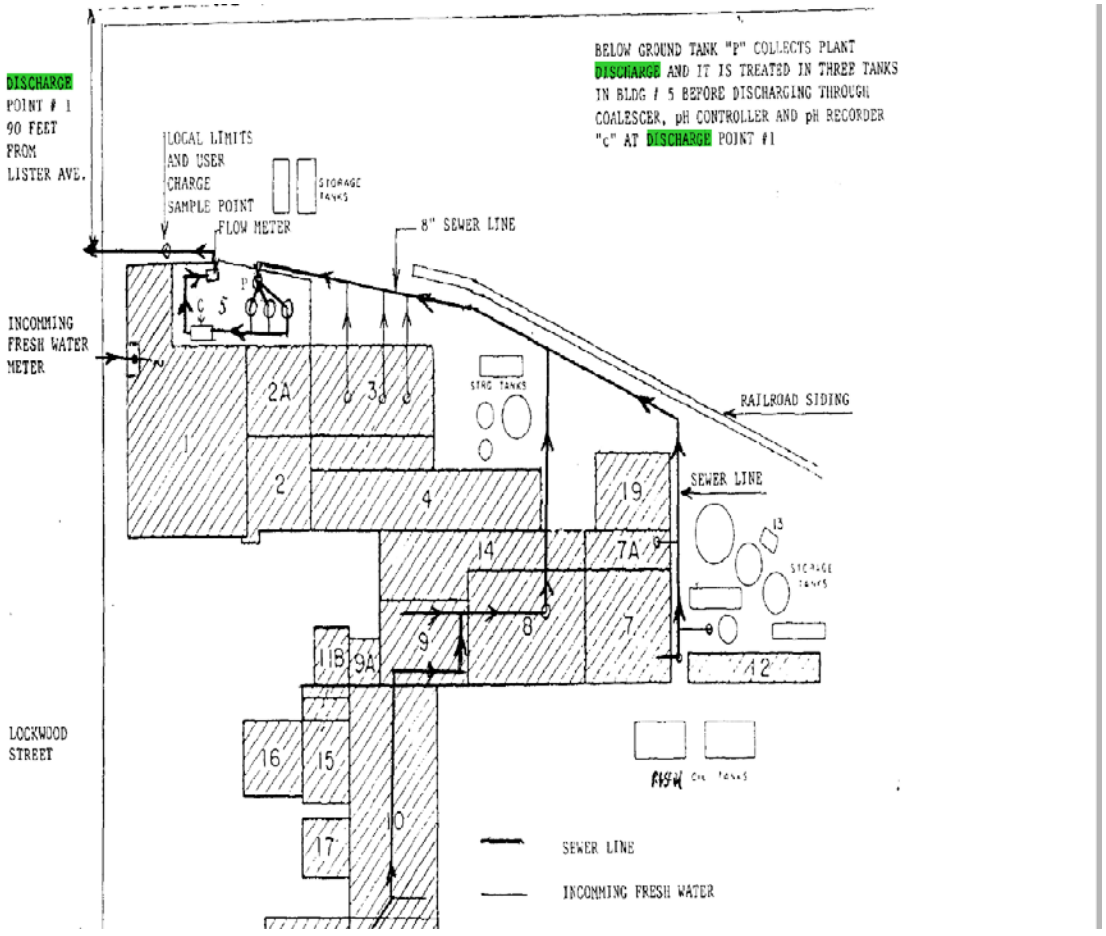
A sampling port is located after the final separator, and is where samples are collected by the MUA (Passaic Valley). Additionally, monitors are present to monitor the pH and flow rate of the waste water discharge to the sewer. The waste water effluent is

[13] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

reportedly checked monthly by the MUA, plus in-house testing is done by Atlas. A monthly effluent report is submitted the 20th of every month to the MUA. During the ESA site reconnaissance it was reported that there have been no problems associated with the waste water discharge, and that Atlas has received recognition from the MUA based on the test results (PAP-000691278).

Documentary evidence reviewed by ESA as part of this Phase I indicated that the Passaic Valley Sewerage Authority filed a Civil Action Complaint against Atlas for alleged violations as noted in violations issued to Atlas by Passaic Valley on or about April 28, 1986, October 20, 1986, February 24, 1988, April 8, 1988, May 24, 1988, June 28, 1988, August 3, 1988, September 22, 1988, November 22, 1988 and January 23, 1989. Atlas disputed the alleged violations and the suit was subsequently resolved with Atlas paying a $25,000 settlement to Passaic Valley and completing upgrades to the waste water recovery system (PAP-00691278).

A June 13, 1996, Plant Effluent Flow Diagram shows that a below ground tank collected plant discharge and was treated in three tanks in Building #5 before discharging through a coalesce, pH controller and pH recorder to the sanitary sewer at Discharge Point 1 as shown below which is noted to be on Lockwood Street, 90 feet from Lister Ave: (PAS-00051995).



Approximately 1,700,000 gallons of water were released to the sanitary sewer in 1971 and approximately 2,000,000 gallons of water was released to the sanitary sewer in 1974 (PAS-0007298, PAS-00072991). Wastewater was discharged to sanitary sewer intermittently for approximately 8 hours daily at a peak rate flow of 2,000 gallons/hour between.7:30 a.m. and 8:30 a.m. in 1971 and 2,000-2500 gallons/hour between 7:30 a.m. and 9:30 a.m. in 1974 (PAS-00072982; PAS-00072992).

According to a PVSC User Charge Self-Monitoring Reports, Atlas Refinery discharged the following volume of effluent to the sanitary sewer in the 1990s:

Atlas Sanitary Sewer Effluent (mg/L)		
Date	**Volume**	**Petroleum Hydrocarbons**
November 1994	100,500 mg/L	8.4
June 1996	137,400 mg/L	<1.0

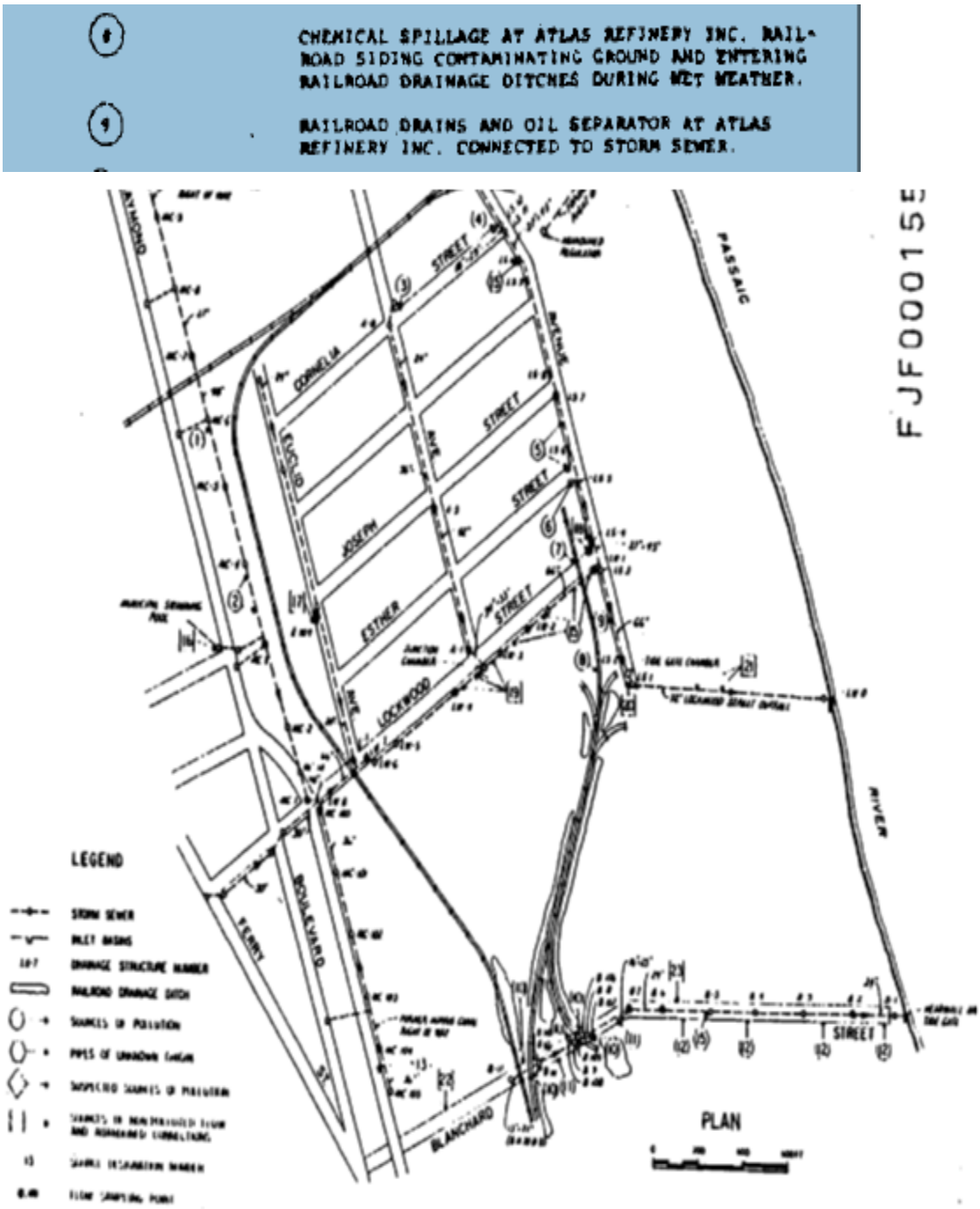
(PAS-00051978, PAS-00051984-85).

The August 1, 1996 Response to Request for Information states that there was no hazardous waste processing, treatment, storage or on-site disposal activity at the facility (PAS-00051977). No hazardous waste storage activity was conducted; however, some hazardous substances were used in the processes as raw materials. These chemicals were reacted with the raw materials and were chemically altered completely. They neither existed in the products nor accumulated as a waste. Hazardous material-containing drums of raw materials were stored inside the buildings. These drums were placed on concrete floors in self-contained skids for spill control purposes and only empty drums were kept outside of the buildings (PAS-00051978).

The 1996 Response to Request for Information also noted that the process wastewater generated at the facility did not contain any hazardous materials. It only required treatment for pH adjustment and oil recovery. Plant wastewater has been discharged to the PVSC sanitary sewer since the inception of the PVSC facility, the date of which was not specified. Plant wastewater has been and continues to be treated for pH adjustment and oil recovery prior to discharge, since it contains a variety of fish and lard oils. In addition, plant drains have been and continue to be connected to the sanitary sewer since the inception of the PVSC sanitary sewer. The company states that there are no records available prior to the creation of PVSC (PAS-00051978-79).

Storm sewers have also existed at the facility for many years, but the exact date that they were installed was noted to be unknown. At the time of the Response to Request for Information (1996), there was a small concrete catch basin at the north side of the facility to collect rainwater. This catch basin was built in 1972. The catch basin contained only rain water and there is no connection to the plant waste water line. According to Atlas, all storm water discharges have been released to the storm sewer. There has been no need to treat these discharges consisting solely of rainwater (PAS-00051978-79). There has been no connection to the storm basin on Blanchard Street. However, some oils were carried to the Blanchard Street storm basin over the railroad tracks by rainwater in June 1972 (see Section 7) (PAS-00051979).

A map from the 1978-1979 Feasibility Study shows the location of the Atlas facility in relation to the Lockwood and Blanchard Street Outfalls (PAS-00052138-2139). It notes two areas on the map related to the chemical spillage:



A July 1986 Application for a Sewer Connection Permit states that the following gallons of wastewater were released to the sanitary/combined sewer:

- Sanitary service only: 198,000
- Process Waste Water: 1,516,420
- Cooling Water: 23,030 (PAS-00072965-67).

An oil separator in building #5 received all plant industrial waste which was acidulated and heated to a boil to separate any residual oil from waste. Residual oil was recovered and separated with an automatic oil skimmer. Discharged water was neutralized to a pH of 6.8 to 7.0 and discharged in sewer outlet #1 (PAS-00072968).
A 1991 Application for a Sewer Connection Permit states that the following gallons of water were released to the sanitary/combined sewer:

- Sanitary service only: 173,000 (estimated)
- Process Waste Water: 2,541,000
- Cooling Water: 768,000 (estimated) (PAS-00103446-47).

Treatment was described as: All process water is collected and treated with polymers and pH is adjusted for complete oil and water separation. .The oil is recovered, and the water is metered through an emulsion breaking/separator system for additional pH adjustment and oil recovery (PAS-00103449).

According to the 1994 RCRA Inspection Report, any wastewater generated during both the manufacturing process and the cleaning out of lines and tanks after a batch was made, was discharged to floor drains connected to a primary Waste Water Treatment System (WWTS). Atlas' primary WWTS consisted of a coalescing separator that separated oil from the water. The recovered oil was used again in the manufacturing process. The treated effluent was discharged to a sanitary sewer leading to the PVSC under permit #20402420 (PAS-00103487-88).

Direct Release

According to a February 2009 SAR, no surface water was observed on or immediately adjacent to the Site during the ESA site reconnaissance. The nearest surface water body is the Passaic River, located to the north of the Site. Review of historical documents indicates that surface water may have been historically located on or immediately adjacent to the Site. The 1892 Sanborn map identified adjoining property to the north as marsh meadows, while the 1908 map identifies a stream on the portion of the Site that is currently identified as Block 2438, Lot 65, 66 and 68 (PAP-00691270).

Information obtained from the NJDEP Geographic Information System (i-MapNJ) indicated the site had very high, low and negligible runoff potential, it is well drained and somewhat excessively drained and has a slope percent of 0-8 (PAP-00691268).[14]

[14] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

Floods

According to the 1996 Response to Information Request, in December 1992 there was flood overflow from the Passaic River to the site for less than one day (PAS-00052104-2105).

Spills

A Special Report dated March 20, 1981, notes that there was a spill within the plant while loading an 8,000 gallon tank of Olefant Oil (overfill of approximately 500 gallons) which was washed from the second floor. After most of it was recovered, some did reach the yard drain which goes to an oil separator then into the sanitary sewer (PAS-00103407).

According to a January 09, 2009 EDR Radius Map Report, a spill of an unknown hazardous substance occurred on July 12, 1989 at the Atlas facility the release was continuous (PAP-00691422).[15]

6. Regulatory History/Enforcement Actions

Inspections

A 1972 inspection by PVSC traced an oily liquid to Atlas Refinery's yard. A June 16, 1972 letter to the company from PVSC states that a considerable amount of oil and material lies in this yard near the Central Railroad tracks, and during periods of rainfall this polluting material drains towards Blanchard Street and enters the catch basin and thus the Passaic River (PAS-00051991). A violation summary in a PVSC Annual Report regarding Atlas Refinery dated June 6-August 4, 1972, states that oil and other industrial material going into the storm catch basin on Blanchard Street, thence to the Passaic River, was noticed by Inspector J. McLaughlin. Mr. McLaughlin reported that this is a case of poor housekeeping, where spillage from this company flows onto the Central Railroad tracks east of Blanchard Street, where it usually stays until a rain causes it to flow to Blanchard Street. Both Inspector McLaughlin and Supervisor Cuccinello notified representatives of the company concerning this matter. On June 16, Mr. Lubetkin wrote to the company, directing them to clean the area to halt the pollution. On June 27, Mr. A. Schroeder, Jr. replied, stating that the material on the tracks was caused by a broken pipe. He stated that when the broken pipe was discovered, it was immediately disconnected to halt further flow, but he did not specify the date the pipe broke or was discovered. Mr. Schroeder also stated that they had contracted to install a sanitary catch basin in the area to intercept any polluting flow and bring the material back to their plant. At the plant they were to separate and remove the oils and grease, with the remainder going to the sanitary sewer. On July 25, 1972, Mr. Schroeder wrote, informing PVSC that their contractor, John Marzano and Sons has received word from Central Railroad that they will raise the tracks while Atlas cleans the area and install permanent drainage of the surface water to the storm sewer. At the same time they

[15] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

were to install a fibre glass receiving tank and sump pump to bring the plant sanitary line back into the plant where oil and grease is to be separated before discharges to sanitary sewer. Inspector McLaughlin reported that the violation was eliminated as of August 4, 1972 (PAS-00051992-93; PAS-00052130-31).

A Stream Contamination Report dated February 29, 1977, states that there was no flow entering the Lockwood Street storm sewer from the Atlas Refinery (PAS-00103320).

On August 5, 1977, PVSC received a call from the City of Newark that they had uncovered a possible source of pollution of the Lockwood Street storm sewer. Dye-testing of the sanitary lines was conducted to determine if illegal connections existed (PAS-00103341). An August 8, 1977 Stream Contamination report says that dye testing was completed and the lines in the plant were found to be hooked directly to the sanitary sewer (PAS-00103327-28). Another PVSC Report states that on August 8, dye that was introduced into one of the oil separators appeared in the Lockwood Street storm sewer. Although the company plugged up the illegal connection, the yard area flooded when it rained, indicating additional connections, and the line was then reopened (PAS-00103341).

An August 25, 1977, letter from the Newark Department of Engineering to Atlas states the following:

- A drain of approximately four inches in diameter leading from your firm's property on Lockwood Street has been noted to be discharging objectionable material to a separate storm sewer in violation of municipal ordinances;

- Numerous spills of oily material have been noted on your firm's property and on adjacent railroad tracks, posing a hazard to the health and safety of your employees and the general public.

The company was asked to permanently seal the connection to the storm sewer and improve housekeeping (PAS-00103333). Another PVSC report notes that by September 2 the connection had been temporarily resealed eliminating the violation. Atlas planned to install an oil separator in the small yard area where the oil drums were stored and connect the overflow to the sanitary sewer. The final plans were approved by the Newark Plumbing Department on October 28 and construction was expected to be completed in November. At that time the connection to the storm sewer would be physically disconnected and abandoned (PAS-00103345).

According to a City of Newark, New Jersey, Feasibility Study Pollution Abatement Program document, September 1978, revised January 1979, inlets were receiving flow from the railroad spurs and sidings. The location of the inlets was not specified. The ditches along the tracks drained wet lands that were observed to contribute continuous flow for up to two weeks during wet periods. Chemical spillage was observed on the tracks and in the adjacent ditches. The Source of the chemicals was noted to be leakage from railroad tank cars, but no leaking cars were observed. Major spills were noted from the Atlas railroad siding. Rain was washing some of this spillage through the drainage ditches and railroad ballast into the Blanchard Street storm inlets. The report

notes that valves may not always be closed when the cars are unloaded and chemicals may drip out while the cars are standing on the spurs in a totally random pattern. Atlas, as well as The Fairmount Chemical Company, the Benjamin Moore Company, and the Fiske Brothers Refining Company, were receiving tank cars through this railroad spur at that time (PAS-00004237, PAS-00004241; PAS-00052137). The report further noted that the eastern portion of the Atlas siding was draining into railroad drainage ditches that were connected to the Blanchard Street storm sewer system (PAS-00004250).

The report states that pertaining to the Lockwood Street Outfall an abandoned railroad drain was found connected to manhole LS-1. The last 25 feet of the 72-inch outfall was exposed and showed evidence of chemical attack. A portion of the crown had completely deteriorated (PAS-00004251).

The storm and sanitary sewers on Lockwood Street, Lister Avenue, Albert Avenue, and the easterly portion of the Harris Canal right-of-way were smoke tested as part of the 1978-1979 Feasibility Study and three inflow sources were detected. All observed roof and area drains at Atlas were connected to the sanitary sewer. These drains were a major source of inflow and the report stated that they should be reconnected to the storm sewer (PAS-00004254).

The 1978-1979 Feasibility Study included a television inspection. The inspection of the Lister Avenue line revealed an oil separator at Atlas connected to the 66-inch storm sewer approximately 120 feet upstream of manhole LS-2. This connection was believed to be a major source of pollutants. There was a railroad siding drainage system connected to this oil separator. Tank cars containing chemicals were unloaded at the siding daily and spills were frequent. Much of the spillage was believed to pass through the separator and enter the Lister Avenue storm sewer. No other sources of flow were found during the television inspection of Lister Avenue. The report concludes that the flow from the Atlas oil separator, immediately downstream could cause high pollutant concentrations in the Lister Avenue storm sewer (PAS-00004255). As noted above, the Lister Avenue storm sewer discharges to the Lockwood Avenue outfall.

The television inspection also revealed a connection of unknown origin in the Lockwood Avenue storm sewer 53 feet downstream of manhole LW-3. Inlet connections were also observed 170 feet and 183 feet downstream of LW-3. The pipe at 53 feet connected on the east side and was noted to have possibly been from Atlas. A pipe crossing broken into the crown of the 66-inch line and running perpendicular to it was noted at 201 feet. These pipes were not flowing when televised. A 2-inch connection located approximately 10 feet upstream of manhole LW-2 was observed by City personnel. This connection came from the east side of the street and was discharging flow when observed. This connection appeared to originate at Atlas. Three connections were noted between manholes LW-2 and LW-l in the Lockwood street storm sewer. Pipes were observed 149 feet, 159 feet and 215 feet downstream of manhole LW-2. The connection at 159 feet is believed to be from an inlet that was removed during construction of a new building at Atlas (PAS-00004256-57).

The report concluded that several improvements were required at Atlas including:

- The oil separator should be connected to the sanitary sewer rather than to the storm sewer
- The spillage at the railroad siding should be cleaned up and procedures developed to prevent future spills
- Roof and area drains should be connected to the storm sewer rather than to the sanitary sewer as at present (PAS-00004258).

The plant was noted to have been expanded several times over the years and complete plans of the piping systems were not available. The Lockwood Street storm sewer was located under the sidewalk in front of the Atlas plant. The report notes that connections could have been made without excavation in the street. According to the inspection report, connections of unknown origin between manholes LW-3 and LW-l appear to lead to drains in the Atlas plant complex. The report noted that Atlas should be required to evaluate its piping and identify connections to the storm sewer. Any sanitary facilities, chemical processes or drains that accept polluted flow should be reconnected to the sanitary sewer. Authorized discharges to the storm sewer should be made through a manhole or chamber to allow monitoring by the City (PAS-00004258).

According to a January 8, 2009 Inspection Summary Report for Atlas, during a February 21, 2007, site inspection visit it was observed that the basement floor of the Textile Building (identified as Building 14) required repairs to maintain the impermeability of the concrete. The facility was informed of this in a letter dated March 9, 2007. Atlas Refinery later indicated that the repairs have been completed by removing the existing concrete and pouring a new floor. The site visit conducted on October 2, 2007, found that the new floor was in a different building identified as the Sulpho Department (Building 3). The concrete in the basement of the textile building was found to be in the same condition observed in February. The facility agreed to complete repairs on the concrete floor of the Textile Building basement (PAP-00691082).[16]

Violations

A Stream Pollution Report for the week of July 30 - August 3, 1979, states that Atlas Refinery had an inoperative oil separator that discharged polluting wastewater to “the Lockwood Street storm sewer and the Passaic River.” Although this was reported as far back as May 24, 1979, the company had reportedly not taken any action towards replacing or repairing the oil separator. They were directed to re-connect the discharge to the sanitary sewer, but not until the oil separator was in good working condition. The report notes that PVSC will have to take action against this company, beginning with a strong letter from the Chief Engineer informing them of strict penalties for this continued violation (PAS-00008132).

[16] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery’s previous certification.

An April 1, 1981, letter from the Newark Department of Engineering to PVSC states that the Atlas facility on Lockwood Street was a known source of pollutants entering the Lockwood Street storm sewer. A history of poor housekeeping had left the railroad siding and other land adjacent to the Atlas plant contaminated with oil and other pollutants. A perforated pipe drained the siding area to an oil/water separator. The water fraction was discharged from the separator to the Lockwood Street storm sewer. Despite some improvements in site management over the past few months the quality of the effluent entering the storm sewer had not noticeably improved. The pH was consistently higher than 10 and the effluent was very turbid. The Engineering department felt that the effluent from, the oil/water separator should be directed to the sanitary sewer line and the connection to the storm sewer permanently closed (PAS-00072987).

The Response to Information Request states that Atlas Refinery was cited by the PVSC in March 1989. The reason for this citation was the excess Total Petroleum Hydrocarbon (TPH) presence in the discharged plant effluent (PAS-00051980).

According to a March 8, 1989, Civil Action Complaint filed in the Superior Court of New Jersey, PVSC issued a sewer connection permit to Atlas on December 16, 1986 (PAS-00052009-10). By the complaint, PVSC was requesting that the permit be revoked stating that the petroleum hydrocarbon content control system and other pretreatment systems were functioning improperly. The complaint notes that violations were issued to Atlas on April 28, 1986, October 20, 1986, February 24, 1988, April 8, 1988, May 24, 1988, June 28, 1988, August 3, 1988, September 22, 1988, November 22, 1988, and January 23, 1989 (PAS-00052011-12).

A Civil Action Answer to the above noted Civil Action Complaint states that Atlas did provide continuing analysis of wastewater parameters, that commencing in 1986 after the effective date of 40 CFR 403.12, Atlas installed a Pretreatment System and that Atlas submitted monthly compliance monitoring reports pursuant to PVSC regulations. Atlas alleged that when the oil skimming system it had installed proved unsatisfactory it installed a new State of the Art Pretreatment System that became operations on April 18, 1989 (PAS-00052015-17). The complaint was later dismissed (PAS-00052028).

According to an October 29, 1990 Administrative Order and Notice of Civil Administrative Penalty Assessment, as the result of an investigation conducted on June 13, 1990, NJDEP determined that Atlas constructed, installed, or altered and operated a 3,000 gallon acrylic acid storage tank without obtaining the required permits (PAP-00691073).

According to a January 8, 2009 Inspection Summary Report for Atlas, during a February 21, 2007 site visit, it was found that internal visual inspections of several tanks having capacities greater than 2,000 gallons including a No. 6 fuel oil Tank 4A and a Mineral Oil Tank 68 had not been completed within the past five years. As a result, a Notice of Violation was issued (PAP-00691080).[17]

[17] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

Permits

A July 1986 Application for a Sewer Connection Permit states that the following gallons of wastewater were released to the sanitary/combined sewer:

- Sanitary service only: 198,000
- Process Waste Water: 1,516,420
- Cooling Water: 23,030 (PAS-00072965-67).

A 1991 Application for a Sewer Connection Permit states that the following gallons of water were released to the sanitary/combined sewer:

- Sanitary service only: 173,000 (estimated)
- Process Waste Water: 2,541,000
- Cooling Water: 768,000 (estimated) (PAS-00103446-47).

Atlas received PVSC Sewer Connection Permit No. 20402420 on December 16, 1991 with the expiration date of December 16, 1996(PAS-00103464).

The 1994 RCRA inspection noted above, included all manufacturing areas mentioned above including the QA/QC Laboratory where Atlas generated/accumulated one waste stream: Waste ignitable liquid (DOO1) from laboratory extractions using alcohol. This D001 waste was satellite accumulated in a 5-gallon container and when filled was sent to Safety-Kleen in Newark, NJ. Since the DOO1 waste was generated in 5-gallon intervals, Atlas was considered a small quantity generator under N.J.A.C. 7:26-8.3. The D002 waste generated from a one-time operation of cleaning the inside walls of their Sulfuric acid above-ground tank was sent to Northeast Environmental Services in Wampsville, NY (1/13/94). The shipments made on February 1993 were all lab packs from cleaning an old laboratory. Finally, the X900 shipments on 7/1/93 to S&W Waste in Kearny, NJ contained waste castor and other mineral oils from a one-time above-ground storage tank clean-out operation. The tank was removed later and disposed as scrap metal. No violations were found during the inspection (PAS-00103488).

According to a November 26, 1996 inspection, Atlas was operating at that time under NJPDES Permit No. NJ0116904 (PAS-00103500). A May 5, 1997, Renewal states that the original authorization date was September 21, 1993. This renewal was valid until 2002 (PAS-00103519). Annual re-certifications for this permit were filed from 2002 to 2005 (PAS-00103508-15). According to a January 09, 2009 EDR Radius Map Report, NJPDES permit NJG0116904 was active until May 31, 2012 (PAP-00691438).[18]

[18] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Evaluation of the 80 Lister Avenue 2, 3, 7, 8-Tetrachlorodibenzo-P-Dioxin (TCDD) Data in Conjunction with Available CDC Guidance Documents dated April 10, 1984 (PAS-00125402).
- Phase I Environmental Site Assessment Report dated February 2009 (PAP-00691248).
- Phase II Subsurface Investigation dated July 16, 2009 (PAP-00691299).

An April 10, 1984*, Evaluation of the 80 Lister Avenue 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD) Data in Conjunction with Available CDC Guidance Documents* prepared for EPA, evaluated analytical data from samples taken in the vicinity of 80 Lister Avenue in conjunction with the CDC document entitled, "Health Implications of 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) Contamination of Residential Soil" and previous documents relating to soil contamination at various sites in Missouri. The CDC document states that "residential soil levels greater than 1 ppb TCDD pose a level of concern." It also states that in commercial zones, a "level of concern may not be reached until levels several fold or more above 1 ppb are reached." The term "several fold or more" was interpreted to mean at least 5 to 7 ppb. Atlas Refinery was located in Commercial Zone 4 for this study. Commercial Zone 4 did not have any samples with TCDD concentrations above 5 ppb. No further sampling or remediation was required for the zone. Five of nine soil samples at Atlas Refinery East, End of Lister Avenue showed 0.29, 0.07 (c), 0.2 (c), 0.55 (c), and 0.57 (c) ppb of TCDD. (c) means that the results were corrected for lab bias. The remaining four samples were ND (PAS-00125401, 406, 408, 422, 445, 487-88).

According to a September 1993 Potentially Responsible Parties Summary (author unknown) for Atlas Refinery, sediments in Sample 93, collected at the Lockwood Street storm sewer outfall to the Passaic River, contained significant concentrations of total extractable petroleum hydrocarbons, as well as total PAHs in exceedance of NOAA criteria (PAS-00052129). The summary does not specify by whom and when the sample was collected.

According to a July 16, 2009, Phase II Subsurface Investigation prepared by AEI Consultants, AEI drilled and logged six exterior borings at the property on June 29, 2009 (PAP-00691302). Soil samples were collected and analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (PAP-006391301).

Concentrations in soil sample AEI-B2-4’ were naphthalene (0.427 ppm), 2-methylnaphthalene (0.226 ppm), phenanthrene (0.503 ppm), fluoranthene (0.882 ppm), pyrene (0.797 ppm), benzo(a)anthracene (0.509 ppm), chrysene (0.636 ppm), benzo(b)fluoranthene (0.622 ppm) and benzo(k)fluoranthene (0.482 ppm) (PAP-00691304).

Concentrations in soil sample AEI-B3-4' were acenaphthene (0.909 ppm), dibenzofuran (0.374 ppm), fluorine (0.556 ppm),phenanthrene (1.26 ppm), anthracene (0.644 ppm), fluoranthene (2.93 ppm), pyrene (2.86 ppm), benzo(a)anthracene (0.859 ppm), chrysene (1.23 ppm), benzo(b)fluoranthene (0.87 ppm), benzo(k)fluoranthene (0.589 ppm) and benzo(a)pyrene (0.518 ppm). The concentrations of SVOCs in soil were all below their corresponding Non-Residential Direct Contact Soil Cleanup Criteria and the Impact to Groundwater Soil Cleanup Criteria per the NJDEP's Cleanup Standards for Contaminated Sites (N.J.A.C. 7:26D) (PAP-00691034).[19]

Remedial Activities

There is no information regarding remedial activities in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

[19] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Atlas Refinery's previous certification.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

AUTOMATIC ELECTRO-PLATING CORPORATION

Facility Name, Address and Size: Automatic Electro-Plating Corporation (AEP); 185 Foundry Street, Newark, New Jersey; site acreage not available (PAS-000109628). According to a 1996 New Jersey Manufacturing Directory, AEP had 12 employees and was established in 1960. Sales that year were $500-999K (PAP-00318786-87). In the 2004 Directory, the company had 14 employees and sales of $1.5 – 2M (PAP-00318791).

1. **Business Type:** Electroplating of steel components (PAS-00014386).

2. **Time Period of Ownership/Operations**

   Operator: AEP – 1970-At least 2005 (PAS-00109629; PAP-00318793)
   Owner: Foundry Street Corporation – 1970-Unknown (PAS-00109629; PAS-00114494)

   AEP is a privately held company that has been under the control of the Borriello family since its inception in 1960 (PAS-00109629; PAS-00114482; PAS-00114469). The Foundry Street Corporation serves as the landlord and real estate management company for the facility's real property (PAS-00109566). Foundry Street Corporation was started in 1970 and incorporated in the State of New Jersey as of April 14, 1971 (PAS-00114494; PAS-00109628).

   AEP began operations in Buildings 19, 21 (approx. 17,000 square feet), and 22 of the Foundry Street Complex, a multi-tenant industrial complex, in 1970 (PAS-00109567; PAP-00031785).

3. **Operational History/COC Use and Presence at the Facility**

   According to a 1991 New Jersey Department of Environmental Protection (NJDEP) Memorandum regarding a Responsible Party Investigation, AEP conducted an electroplating operation in Buildings 19, 21 and 22 since April 1971. The company performed nickel and zinc plating which incorporated two automated methods: RACK (metal parts suspended from racks) in Building 21 and BARREL (metal parts placed in a polypropylene barrel) in Building 22. Both procedures involved dipping steel components in the various plating solutions and rinses (PAP-00374593). According to the 1991 “Responsible Party Investigation” report prepared by NJDEP, AEP used materials containing chromium, copper, nickel, silver, zinc and cyanide (PAS-00000228).

   AEP operations consisted of electroplating of steel components with nickel or zinc finishes. Facility processes included electroplating, plating, polishing, anodizing and coloring (PAS-00109568; PAP-00125761). According to the NJDEP 1991 “Responsible Party Investigation” report, metal parts were submerged in either zinc or nickel solutions. The zinc solution consisted of zinc chloride, potassium chloride, and boric acid, while the nickel solution consisted of nickel sulfate, nickel chloride, and boric acid. These operations took place in Buildings 21 and 22 of the Foundry Street Complex. Building 19 is reported to have been used to store dry chemicals. A yard south of Building 19 was used to store acid carboys (PAS-00000192-93).

A 1981 AEP letter states that the average production rate of metal finishing in Building 21 at that time was approximately 25,000 lbs per day with an effluent flow rate of 30,000 gallons per day average. Pollutants listed did not include any COCs (PAS-00073021).

4. Identified COCs

- PCBs (detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

PCBs

According to the 1991 "Responsible Party Investigation" report, "Elevated levels of VOCs, B/Ns [base/neutrals], PCBs, organic acids, unknown semi volatile compounds and priority pollutant metals (i.e., cadmium, chromium, copper, lead, nickel, zinc)" were detected in a sediment sample collected from the catch basin in July 1990 (PAS-00000227). No information was available regarding the use of PCBs by AEP.

Metals – Copper, Lead and Mercury

According to a 1991 "Responsible Party Investigation" report prepared by NJDEP, an effluent sample collected on December 12, 1979, during "usual electro-plating" operations contained arsenic, cadmium, chromium, copper, lead, nickel, and zinc. (PAS-00000228). There is no information in the available documents regarding the use of lead by AEP.

According to a PVSC *Heavy Metal Source Determination Study*, dated April 1980, documented discharges in the influent to the PVSC system from the AEP facility included copper, lead, and mercury, among other metals (PAS-00114149). There is no information in the available documents regarding the use of mercury by AEP.

According to the 1991 "Responsible Party Investigation" report, a flow diagram submitted by AEP to the PVSC in January 1989 depicts process lines from Buildings 21 and 22 discharging into the drain on the north side of the facility. It is reported that "high concentrations" of arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc were detected in a surface water sample collected from this drain on October 14, 1988. In addition, this drain and the noted sewer line are reported to connect to one another at a catch basin situated near the corner of Building 21. "Elevated levels of VOCs, B/Ns [base/neutrals], PCBs, organic acids, unknown semi volatile compounds and priority pollutant metals (i.e., cadmium, chromium, copper, lead, nickel, zinc)" were detected in a sediment sample collected from the catch basin in July 1990 (PAS-00000227).

According to a memorandum prepared by William F. Cifelli (Mr. Cifelli's affiliation is unclear based on the available file material), dated August 17, 1994, lead detections associated with AEP were over the "limit" of 0.6 on four occasions in July 1994. Concentrations ranged from 0.84 to 2.24. The concentration units, sample types and locations are not described in the memorandum (PAS-00073023).

It is also noted that according to a "Foundry Street Complex Site Inspection" report prepared by NJDEP, dated November 15, 1990, a material storage area located on the south side of Building 19 appeared to be stained and that "a small area, approximately 2' x 2', appeared to be saturated with oil" near the northwest corner of Building 19 (PAS-00105569). Oil can contain PAHs; however, no sampling information was available.

According to a PVSC 2003-2004 Annual Report, AEP had an average daily flow of 0.005 MGD to the POTW (PAP-00381267).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

However, an inspection report for the Foundry Street complex states that Mr. Borriello indicated soil borings made by Sun Chemical indicated the plant was built on fill material consisting of zinc slag. Mr. Borriello stated that zinc mining was once big in New Jersey and attributed zinc and lead contamination on site to the fill material (PAP-00031578). No soil sampling data was available regarding the AEP facility.

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Combined Storm and Sanitary Sewer

According to a memorandum prepared by NJDEP dated April 3, 1991, the AEP facility is part of the Foundry Street Complex. Approximately 30 buildings were situated throughout the complex, separated by narrow driveways which had strip-like drains in the middle of the lane. The drains were connected to an industrial sewer line on Roanoke Avenue and received surface water run-off and industrial discharge from companies in the complex (PAP-00125228).

According to PVSC Annual Reports the Roanoke Avenue sewer connects to a sewer on Doremus Avenue, which flows to the PVSC treatment works. There is a combined sewer overflow (CSO) outfall to the Passaic River at the foot of Roanoke Avenue (approximately River Mile 1.1). In 1969, the City of Newark constructed a dam near this CSO to increase flow to the Doremus Avenue sewer, and ultimately, the PVSC treatment works (PAS-00044625-626). It is reported that the Roanoke Avenue combined sewer system and outfall to the Passaic River was documented by PVSC to have been inoperative from 1971 through late 1979, and that discharges of hazardous substances into the sewer system of the Foundry Street Complex would have ultimately discharged directly to the Passaic River via the Roanoke Avenue CSO during periods when it was known to be in a chronic malfunctioning condition (PAS-00109572; PAS-00114295; PAS-00114311; PAS-00114320).

According to the 1991 “Responsible Party Investigation” report, the drainage system at the Foundry Street complex bordered the AEP facility on it north, west and south side and received point source discharge and surface water run-off from AEP. A sewer line on the east side of the Foundry Street Complex was connected to a sanitary source at the AEP facility (PAS-00000227).

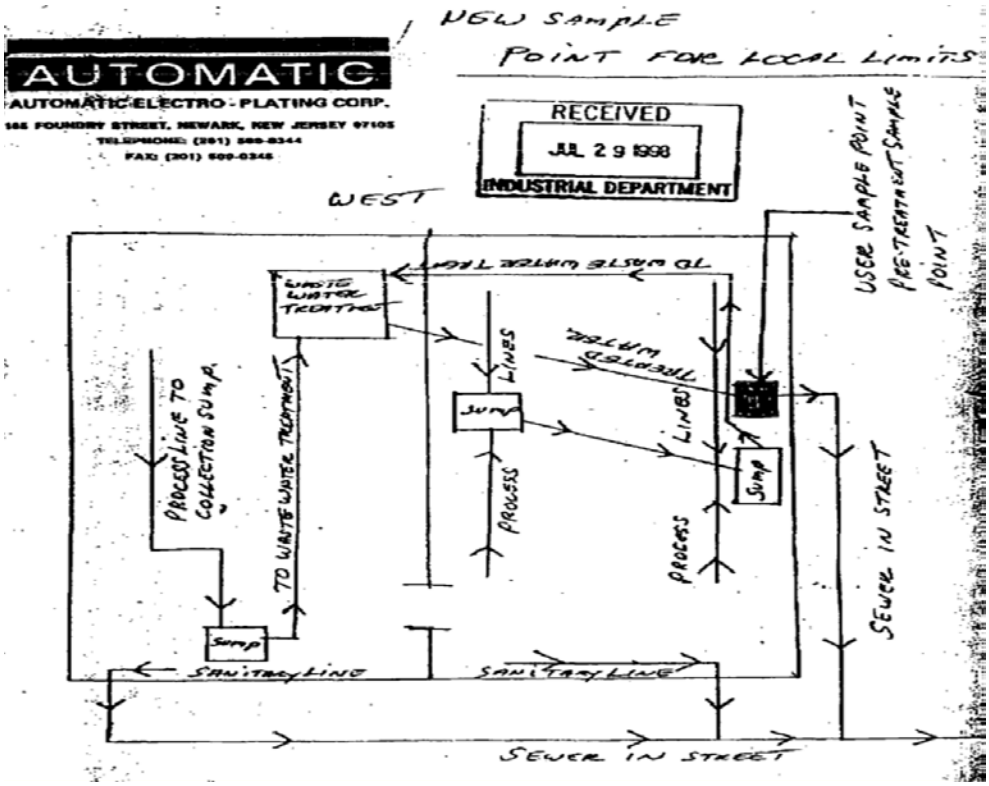
Figures depicting discharge lines at AEP (PAS-00014389) and the surrounding Foundry Street Complex (PAS-00114186) are presented below.

Automatic Electro-Plating Corp.

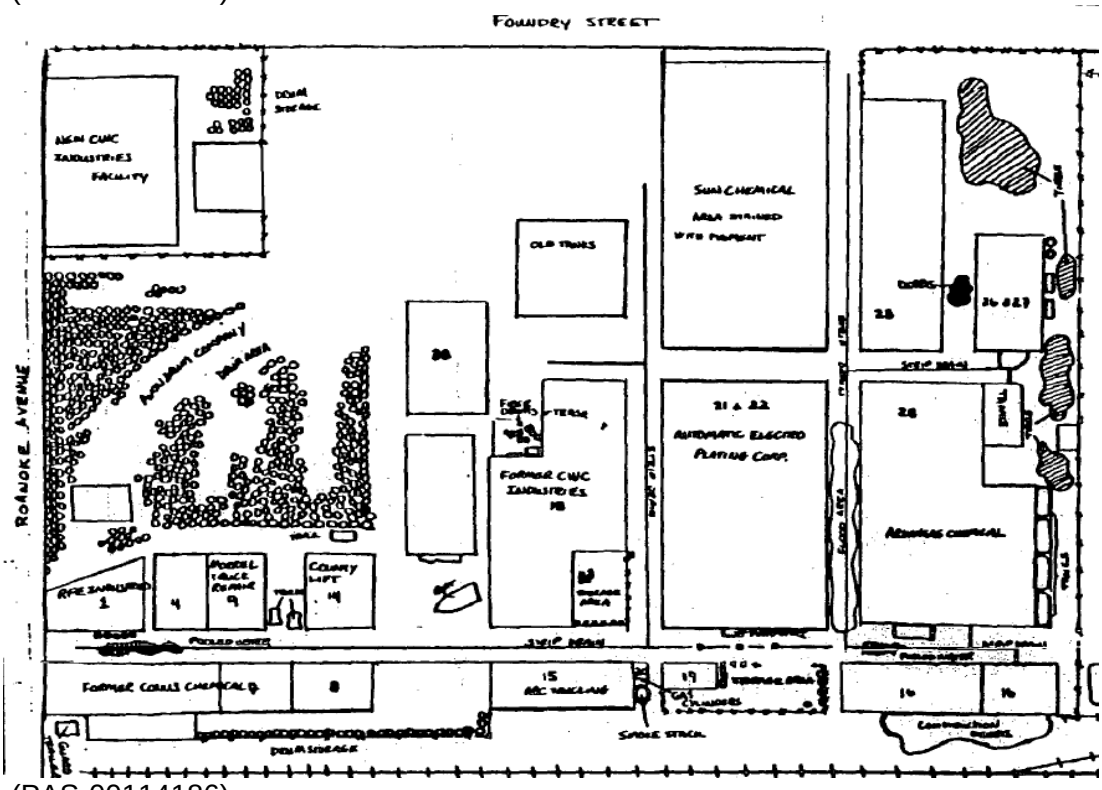
Diamond Alkali OU2 Allocation

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Facility Data Report



(PAS-00014389)



(PAS-00114186)

During a November 1990 site inspection at the Foundry Street Complex conducted by NJDEP, NJDEP observed a series of strip drains outside on both the northern and southern sides of the AEP operation in Buildings 21 and 22. It is reported that the two strip drains appeared to connect to another strip drain located along the western side of AEP's facility. This strip drain, in turn, appeared to be routed through the Foundry Street Complex and towards Roanoke Avenue located to the north of the site (PAS-00109573; PAS-00105573; PAS-00105583; PAS-00114186). Spent plating solution was discharged via two outlets into the outside drains (PAS-00000193).

According to a 1996 AEP Response to Request for Information, substances found in the plating solution(s) were “dragged into the rinse water.” (PAP-00031785). The rinse waters from the plating processes were piped to an on-site collection/sampling pit where the pH was reportedly adjusted, and the treated wastewater was then discharged to the sanitary sewer (PAS-00109570; PAS-00114513; PAP-00125762). In 1979, AEP reported that all wastewater was discharged to the sanitary sewer, and no water was discharged to the “storm sewer, river, or ditch” (PAS-00114408).

In 1978, an investigation by the PVSC determined that the regulator that controlled the diversion of material in the Roanoke Avenue combined sewer overflow (CSO) collection system was broken in the open position. As a result, all material collected in this area, including the effluent discharged by AEP, was bypassed directly to the Passaic River (PAS-00053953).

6. Regulatory History/Enforcement Actions

Inspections/Violations

In a 1980 follow-up investigation by PVSC to assess the extent of heavy metals discharges into the PVSC collection system, AEP was identified as having the following levels of metal contaminants in its effluent to PVSC, described as being its "industrial contribution:

- Copper (0.184 lbs/day - 0.525 mg/kg)
- Lead (0.033 lbs/day - 0.095 mg/kg)
- Mercury (0.0009 lbs/day - 0.002 mg/kg)

(PAS-00109576; PAS-00114149). As noted above, no use of lead or mercury was found in the available records.

An inspection of the Foundry Street complex by the NJDEP in November 1990 revealed that many sections of the drains on the property had collapsed or were broken. These drains reportedly frequently flooded during rainstorms, and their contents would be carried to the Passaic River when the flood waters receded (PAS-00053954).

According to the 1991 "Responsible Party Investigation" report, in January 1986, AEP was found to be "in violation of Sections 307 and 308 of the Clean Water Act, 33 U.S.C. Subsection 1317, and Subsection 1318" (PAS-00000193)[5]. The report also states, "AEP consistently failed to meet electro-plating discharge standards which initiated enforcement actions by the USEPA in 1986" (PAS-00000228). A Civil-Action Suit (86-0920) was filed by USEPA, Region 2, and AEP signed a Consent Decree on April 15, 1987 for settlement of the pending actions (PAS-00000193; PAS-00014392).

A 1995 Response to Request for Information from PVSC to EPA, lists AEP as one of the companies that PVSC had information on "releases, disposal or discharges of hazardous substances into the Passaic River, either directly or indirectly (through, for instance, possible combined sewer overflows)" (PAP-00304314; 18). No additional information was provided.

Permits

AEP held a PVSC Sewer Connection Permit from July 1981 to July 1986 (PAS-00114429). According to a 1991 "Responsible Party Investigation" report prepared by NJDEP, AEP also held a PVSC permit that was effective until July 14, 1991 (PAS-00000193). A permit application shows that AEP applied for a permit in 2001 (PAS-00114450). The application shows sampling in AEP industrial waste as follow: copper (0.02 mg/l), lead (<0.1 mg/l), mercury (0.0004 mg/l) and other metals (PAS-00114456).

According to a PVSC brochure, AEP received a PVSC Permit Compliance Award for 10 years from January 1, 1996 to December 31, 2005, without an effluent evaluation (PAP-00318793).

7. Response Actions

A composite soil sample was obtained from beneath a floor drain in the "process building" located near the area where a sludge material was discovered outside. The sample contained VOCs, B/Ns, and metals below ECRA action levels. The floor drains were determined not to be a source of the sludge through the concentrations detected in the soil sample (PAP-00374594). It is unclear whether "process building" refers to Building 21 or Building 22 and specific concentration were not noted.

In October, 1988, Dames & Moore collected a sediment sample and water sample from the drainage basin situated on the north side of the process building. The sediment sample contained copper at 1,096 mg/kg and lead at 1,044 mg/kg. The water sample contained low levels of lead. The concentration of lead in the water was not noted (PAP-00374594).

[5] Subsection 1317 pertains to toxic and pre-treatment effluent standards and Subsection 1318 pertains to access to records.

Metals samples were taken in December 1992 and June 1993 from locations in the lower Passaic River adjacent to the “AEP discharge point.” Results included the following: (PAS-00053955)

COC	1992		1993	
	Depth	mg/kg	Depth	mg/kg
Lead	Surface	239	Surface	238
	1.83 ft	657	5.33 ft	575
	3.83 ft	385	9.00 ft	669
			12.67 ft	59
Copper	Surface	225	Surface	237
	1.83 ft	460	5.33 ft	683
	3.83 ft	290	9.00 ft	247
			12.67 ft	43

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

BASF CATALYSTS, LLC

Facility Name, Address and Size: BASF Catalysts, LLC ("BASF Catalysts"), 1 West Central Avenue, East Newark, New Jersey, 2.2 acres (PAP-00050552), Block 17, Lot 2 (PAP-00050569). In 2000, the facility (under the name of Engelhard Corporation) employed 70 full-time employees that worked one shift for 286 days per year (PAP-00050569).

In 1990, Engelhard Corporation employed 140 full-time employees that worked one shift for 286 days per year (PAP-00054033), and in 1980, Engelhard Industries Division of Engelhard Minerals & Chemicals Corporation employed 124 full-time employees five days per week (PAP-00054020). In 1975, Hanovia Liquid Gold, Department of Engelhard Industries Division employed 86 people for five days per week for one shift per day (PAP-00054004) and in 1972, Hanovia Liquid Gold, Department of Engelhard Industries Division employed 75 people five days per week for one shift per day (PAP-00050552). Of note, in 1979 the property was located on Block 1571, Lots 2 and 3 (PAP-00054020).

1. **Business Type:** Manufacturer of precious metal coating product-ink, powder, and solution (PAP-00050571).

2. **Time Period of Ownership/Operations**

Operator: BASF Catalysts, LLC including related entities: since between 1957 and 1960 – May 2009 (PAP-00050629; PAP-00050655)
Owner: BASF Catalysts-related entities (including Engelhard): May 1957 – May 2009 (PAP-00050655)

1875: The site was developed as part of a mill complex (PAP-00050655).

1899: The oldest portions of the building were originally constructed in 1899 and used as a part of a textile thread mill operated by Clark Thread Company (PAP-00050629; PAP-00050655). Records state it was owned by The Clark Thread Company from 1899 or earlier to 1935 (PAP-00050655; PAP-00050706). The Clark Thread Company is not a predecessor or affiliate of BASF Catalysts (PAP-00050701).

1935: The East Newark Realty Corporation purchased the site in September 1935 (PAP-00050655).

1957: The East Newark Realty Corporation changed its name to East Newark Industrial Center, Incorporated on May 24, 1957 and merged into Baker & Company Incorporated on December 20, 1957 (PAP-00050655).

1960: The aforementioned merged entity was renamed Engelhard Industries, Incorporated (Engelhard Industries, Inc.) on March 31, 1960 (PAP-00050655).

The facility processed precious and non-precious metals producing metal-organic pastes, powders, and solutions that were used in the electronics, electroplating, and glass/china decorating industries (PAP-00050629).

1966: Engelhard Industries, Incorporated changed its name to Engelhard Hanovia, Incorporated on December 31, 1966 (PAP-00050655).

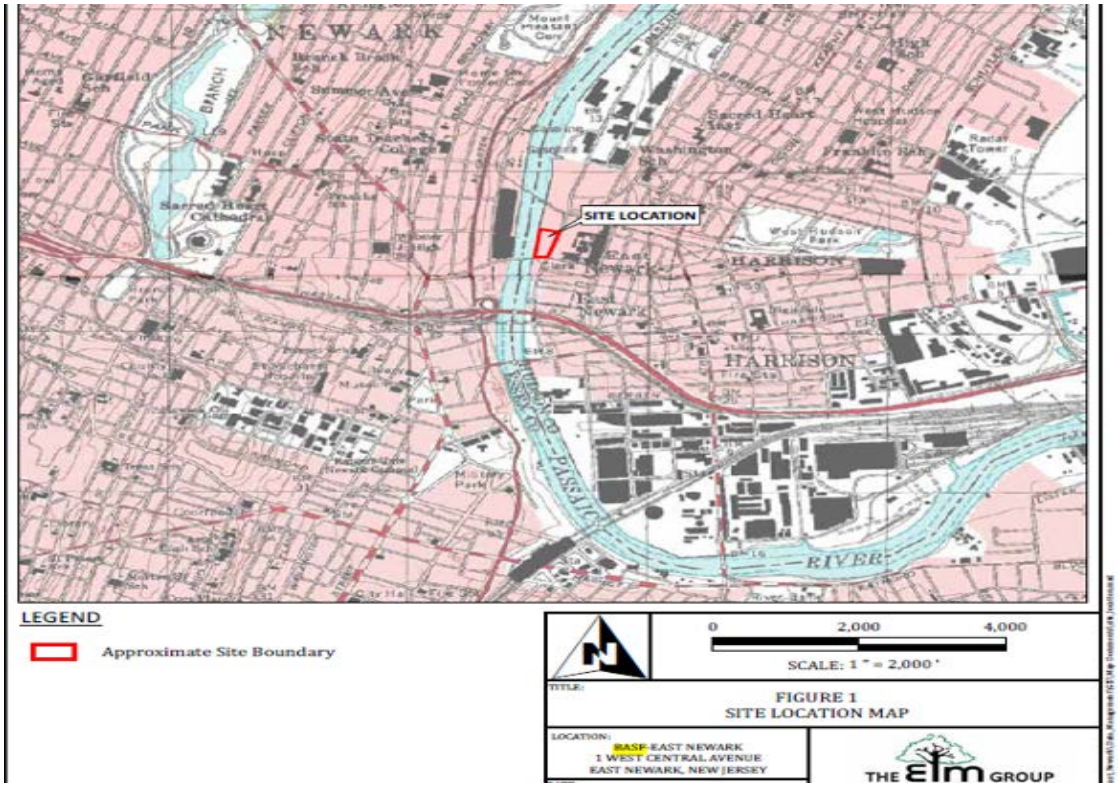
1970: HD Properties, Incorporated acquired the property from Engelhard Hanovia, Incorporated on December 31, 1970 (PAP-00050655).

1971: Engelhard Minerals & Chemicals Corporation acquired the property from HD Properties, Incorporated on April 20, 1971 (PAP-00050655; PAP-00050766).1981: According to a 1990 Site Evaluation Submission, as of 1981 the facility was owned by Engelhard Corporation (PAP-00335905-6).

2006: Through a merger transaction effective June 9, 2006, Engelhard Corporation became a member of the BASF Group. Through several intermediate holding companies, Engelhard Corporation became a wholly owned subsidiary of BASF Corporation (PAS-00050655). On June 9, 2006, BASF Catalysts, LLC acquired the property from Engelhard Minerals & Chemicals Corporation (PAP-00050655). As of August 1, 2006, Engelhard Corporation converted under Delaware law to a limited liability company under the name of BASF Catalysts, LLC (PAS-00129877).

2009: Manufacturing operations ceased in May 2009 (PAP-00050655).

2010: The BASF Catalysts facility was demolished in 2010/2011 (PAP-00050655).

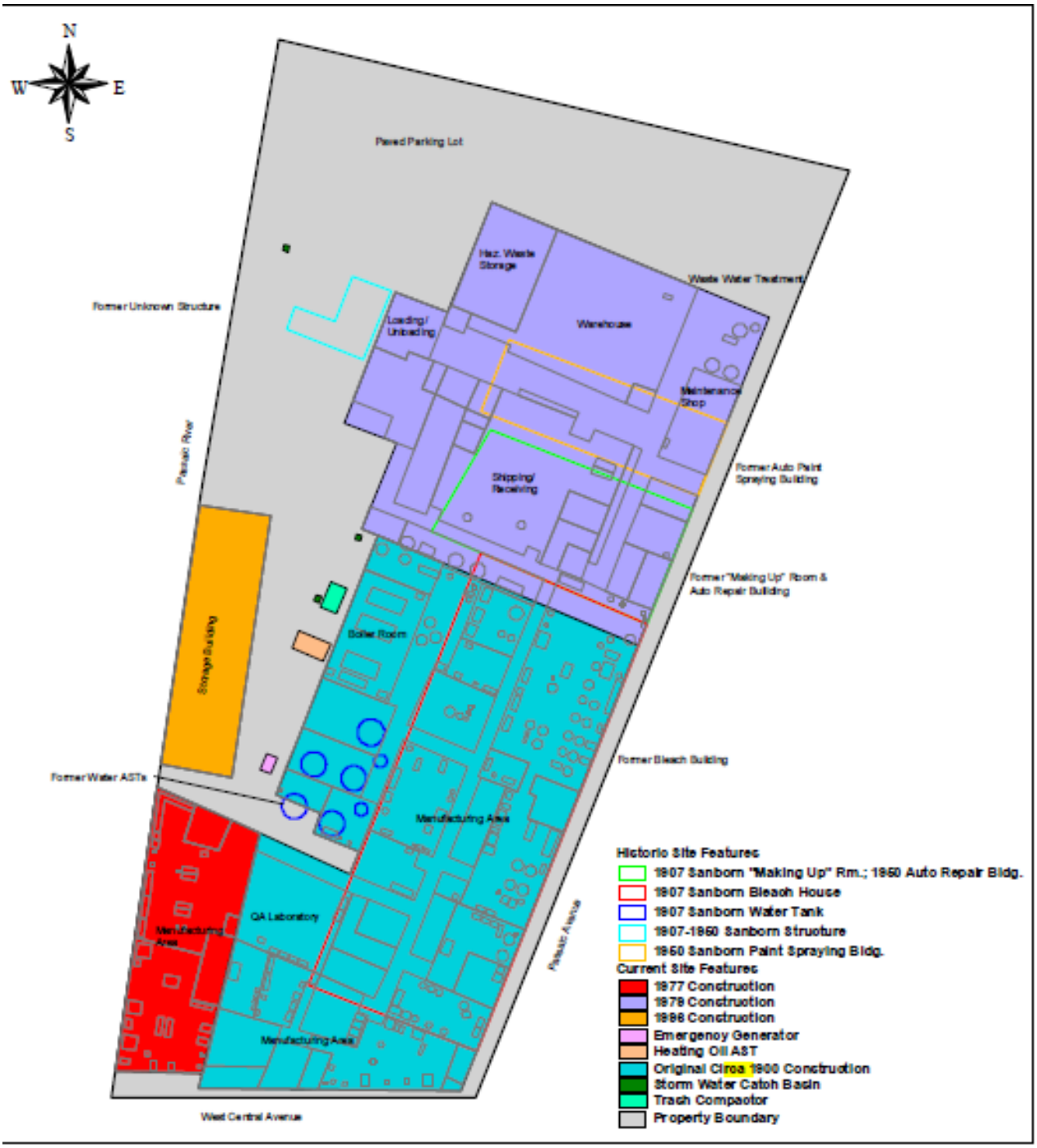


(PAP-00050637)

3. Operational History/COC Use and Presence at the Facility

According to a February 2012 *Industrial Spill Recovery Act (ISRA) Preliminary Assessment/Site Investigation (PA/SI) Report* prepared by Advanced GeoServices Corporation (Advanced GeoServices) for BASF Catalysts, the Clark Thread Company was one of the largest thread mill complexes in the United States. The Clark Thread Company operated at the BASF Catalyst Site from 1899 to 1935 prior to the Engelhard operational period beginning in 1957 (PAP-00050655). The 1907 and 1950 Sanborn Fire Insurance Maps identified structures at the facility that included a bleach house, aboveground water storage tanks and a "make up" building. An auto repair and paint spraying building were also present prior to Engelhard's expansion of the site (PAP-00050656). According to Sanborn Maps consulted for the 2012 Preliminary Assessment, the bleach house was located on the eastern portion of the property. The "make up" or making up room was to the north of the bleach house and attached to the bleach house. On the 1950 Sanborn Map the making up room was identified as an auto repair building (PAP-00050724). The 1985 Sanborn Map identifies the bleach house as the chemical works building (PAP-00050725).

According to the February 2012 PA/SI, BASF Catalysts, used the same manufacturing processes, chemicals, and raw materials as the Engelhard Industries entities (Engelhard Corporation, Engelhard Minerals & Chemicals Corporation, and Engelhard Industries, Inc.) that operated at the Site before it (PAP-00050658). Beginning between 1957 and 1960, the facility engaged in chemical processing of precious and non-precious metals producing metal-organic pastes, powders, and solutions incorporated into electronics, electroplating, and glass/china decorating industries (PAP-00050701). Products included silver, palladium, gold powder, palladium-silver powder, palladium liquor, palladium yellow salt solution, and palladium powder (PAP-00050701). The majority of the incoming precious metals were typically in elemental form, and chemicals involved in the process were in liquid form. Chemical processing involved dissolving precious metals in inorganic acid solutions or a mixture of several organic compounds. A precipitation of desired components formed, and solutions were filtered, centrifuged, or dried for product recovery. Chemical reactions occurred in kettles and reaction vessels that underwent heating electrically or with steam. Factory operations primarily took place in the central portion of the building including the main reaction operations areas (factory, factory annex, dissolving room). The laboratory was located on the second floor in the central and southern portion of the building (PAP-00050720).



(PAP-00051503)

According to the February 2012 PA/SI Report, Engelhard manufactured all its products in batches typically ranging in volume between one and 200 gallons. Production time for each batch ranged from one hour to three days (PAP-00050720). A Waste Effluent Survey prepared by Paul N. Cheremisinoff, Environmental Control Engineer, dated April 25, 1972, stated Hanovia Liquid Gold, Department of Engelhard Industries Division used

raw materials that included precious metals, organic solvents, essential oils, balsams, resins, sundry chemicals, and acids in manufacturing metallo-organic precious metal coatings at an average of 290 pounds per day. Products from reactors were either filtered, centrifuged, dried, or transported directly to storage for subsequent blending and sale. Small amounts (a few pounds) of miscellaneous products were prepared in small containers, heated, or blended at room temperature. Wastes from the process reactors went to recovery tanks (PAP-00050552). According to the same Waste Effluent Survey, in 1971 the facility purchased a total of 3,528,430 gallons of water of which 3,465,100 gal went to the sanitary sewer. The remaining 63,330 gallons of water were used in product formation, evaporation or were lost (PAP-00050553). A Waste Effluent Survey dated April 24, 1975 for Hanovia Liquid Gold, Department of Engelhard Industries Division prepared by Dr. Walter Drobot, Senior Environmental Engineer, documented an average production of 300 pounds per day of waste effluent; however, the value varied due to the diversified product lines and economic "slow-down" (PAP-00054004).

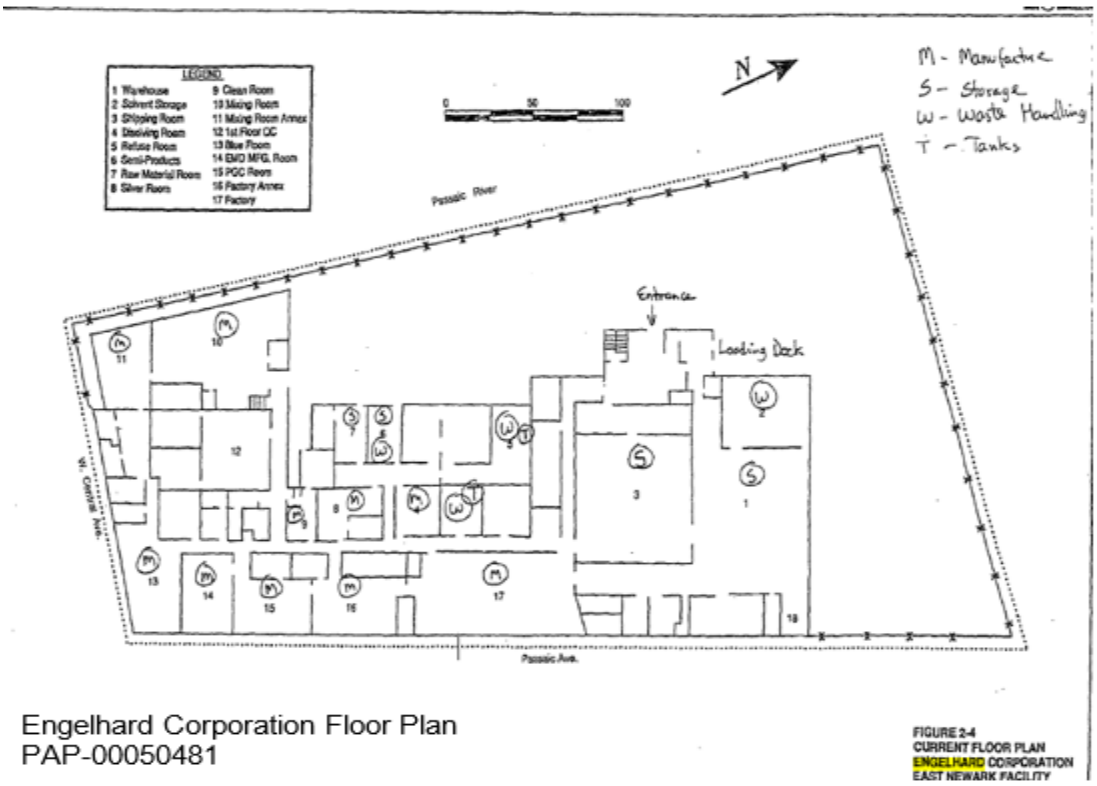
According to the February 2012 PA/SI Report the facility began operating an incineration system in 1983. The permitted incineration system controlled the volume of precious metal refuse, metal losses, and reduced solid waste disposal to off-site landfills (PAP-00050720).

A 1990 *Passaic Valley Sewerage Commissioners Sewer Connection Application for Engelhard Corporation* stated that naphthalene, dieldrin, Dichlorodiphenyltrichloroethane (DDT), Dichlorodiphenyldichloroethylene (DDE), polychlorinated biphenyls (PCBs), and 2,3,7,8-tetrachlordibenzo-p-dioxin (TCDD) were known to be absent from effluent. Metals such as copper, lead, and mercury were suspected to be present (PAP-00054043-44).

Based on a 1991 Community Right to Know Survey, chemicals of concern (COCs) stored on-site 365 days a year included:

- Between 1,001 and 10,000 lbs of inorganic lead compounds in all locations (PAP-00050557; PAP-00050336)
- Between 101 and 1,000 lbs of copper cyanide in locations 1, 14, and 23 (PAP-00050349)
- Between 1,001 and 10,000 lbs of lead chromate in locations 1 and 3 (PAP-00050352)
- Between 11 and 100 lbs of copper in locations 1, 17, and 21 (PAP-00050384)
- Between 11 and 100 lbs of mercury in locations 7, 16, and 17 (PAP-00050407)
- Between 101 and 1,000 lbs of mercuric oxide in locations 1 and 17 (PAP-00050429)
- Between 1 and 100 lbs of lead in location 12 (PAP-00050439)
- Between 11 and 100 lbs of mercuric chloride in all locations (PAP-00050448)
- Between 11 and 100 lbs of cupric nitrate in location 23 (PAP-00050473).

Please see below for locations.



Engelhard Corporation Floor Plan
PAP-00050481

A 1994 *Slug Loadings Control Questionnaire* prepared by Engelhard Corporation described a 40,000 to 50,000 gal/day average daily wastewater discharge flow from the facility between 7AM to 5PM five days per week. There were up to 200 drums of flammable liquids stored in rooms with no drains. The facility had no floor drains, due to the manufacture of precious metal coating products. The form noted that there was minimal to no possibility of releases of copper, lead, or mercury to the sewer from the storage rooms due to no floor drains being in the storage area and an employee training program for emergency response in spill handling and containment (PAP-00050479-80).

A 1997 Community Right to Know Survey covering January 1 through December 31, 1997 states that Engelhard Corporation stored between 1,001 to 10,000 pounds of lead compound mixtures in plastic bottles or jugs 365 days per (PAP-00050557) and between 1,001 and 10,000 pounds of lead/cadmium compound mixtures in plastic bottles or jugs 365 days per year in a warehouse (PAP-00050558).

A more recent description of floor drains at the facility is found in the July 2009 *ISRA Preliminary Assessment* prepared by AMO Environmental Decisions for the New Jersey Department of Environmental Protection (NJDEP) and BASF Corporation. Floor drains and a sump network/drainage system discharged to the Passaic Valley Sewerage Commission (PVSC) publicly owned treatment works (POTW). According to this report, floor drain construction was a seamless trench/drain system built into the concrete floor in the manufacturing area. The manufacturing area had several sumps for collection of process liquid, should spills occur. Process sumps were double-lined within concrete vaults. There were no indications of failed integrity of any drainage systems. The floor

drains connected to sub-floor piping and led to the wastewater treatment area. Sanitary waste water was connected to the waste water treatment area in the northeast corner of the building. It was reported by site personnel that the former waste water discharge lines were replaced by the current system, and were constructed of clay (PAP-00050741).

The July 2009 ISRA Preliminary Assessment noted that hazardous materials were stored on concrete floors in the warehouse area in bins or 55-gallon drums. Drip pans were located by the drum storage racks (PAP-00050743). According to the February 2012 PA/SI, the warehouse, contained numerous floor drains which discharged to the sanitary sewer system. Hazardous wastes were shipped off-site for proper disposal (PAP-00050657).

Hazardous wastes were also stored in 55-gallon containers in an explosion-proof room that had secondary containment and a floor drain. The floor drain discharged to a 275-gallon waste solvent tank (overflow underground storage tank) (PAP-00050657). According to the February 2012 PA/SI, Engelhard Corporation used several techniques to recover precious metals from waste streams, such as containment sumps below the kettles, vessels, and the incineration of still bottoms (PAP-00050658, PAP-00050736). Incinerated solids were sent to BASF's Seneca, SC facility for reclamation of precious metal for reuse at the East Newark facility. (PAP-00050736). Solid wastes not containing precious metal residue were staged in 55-gallon drums in the hazardous waste storage room and sent off-site and disposed of as either hazardous or non-hazardous material. (PAP-00050736).

As for liquid process waste streams, precious metal-containing liquid waste was distilled and chemicals/solvents were separated out (PAP-00050736). The resulting precious metal-bearing sludge was incinerated and sent to BASF's Seneca, SC facility for reclamation of precious metal for reuse at the East Newark facility. The solvent/ chemical liquid that was separated out was stored in 55-gallon drums and staged in the hazardous materials storage room and then sent off-site for proper disposal. (PAP-00050736; PAP-00050721).

Non-contact cooling water and boiler blow down were sent to the on-site wastewater treatment system and then sent to the PVSC POTW under Permit No. 04402500 (PAP-0050736).

When BASF acquired the property from Engelhard Corporation in June 2006, they utilized the same manufacturing processes, chemicals, and raw materials as Engelhard Corporation. Prior to BASF's acquisition of Engelhard Corporation, glass/china decorating processes were discontinued, and BASF reduced operations between them as it transferred processes to other sites in North America (PAP-00050658).

According to the July 2009 ISRA PA, there was one electrical distribution station and four pad-mounted transformers. Three transformers were located in the transformer room along the eastern edge of the building. The fourth transformer was located northeast of the building. All four transformers were owned by PSE&G and reportedly contained no PCBs (PAP-00053852, PAP-00053881). However the 1990 Site Evaluation Submission includes a letter from PSE&G reporting that 2 transformers are PCB-

containing (PAP-00053852, PAP-00053881, PAP-0033574). Three former transformers that were known to exist before the 1979 building expansion and their locations were along the northern portion of the property (PAP-00050743).

The February 2012 PA/SI noted that manufacturing operations ceased in May 2009, and the facility was demolished between 2010 and 2011 (PAP-00050658).

4. Identified COCs

- PCBs (used, detected)
- Dioxins and Furans (precursor detected)
- PAHs (used and detected)
- Copper (stored, used, detected)
- Lead (stored, used, generated)
- Mercury (stored, used, generated)

PCBs

In a letter dated September 24, 2010, the United States Environmental Protection Agency (EPA) was notified that BASF was planning to demolish buildings at the facility down to the existing concrete slabs. During pre-demolition sampling, conducted on June 29 and 30, 2010 with supplemental sampling conducted on August 2, and 13, 2010, PCBs were found at concentrations greater than 50 milligrams per kilogram (mg/kg) in 10 samples from wall materials and I door sample in the original central portion of the building (PAP-00050628, PAP-00050631; PAP-00050637). Samples were collected using a hammer drill and core bits with continuous samples collected to a depth of approximately one inch in accordance with NJDEP guidance. The highest concentrations of PCBs (i.e., greater than 50 milligrams per kilogram (mg/kg)), were found in four rooms in the central portion of the building (i.e., factory, factory annex, silver room and dissolving room) (PAP-00050630; PAP-00050641, 44). The central portion was the oldest part of the facility that housed the most manufacturing. PCBs were detected in other locations, but at concentrations less than 50 mg/kg (PAP-00050631).

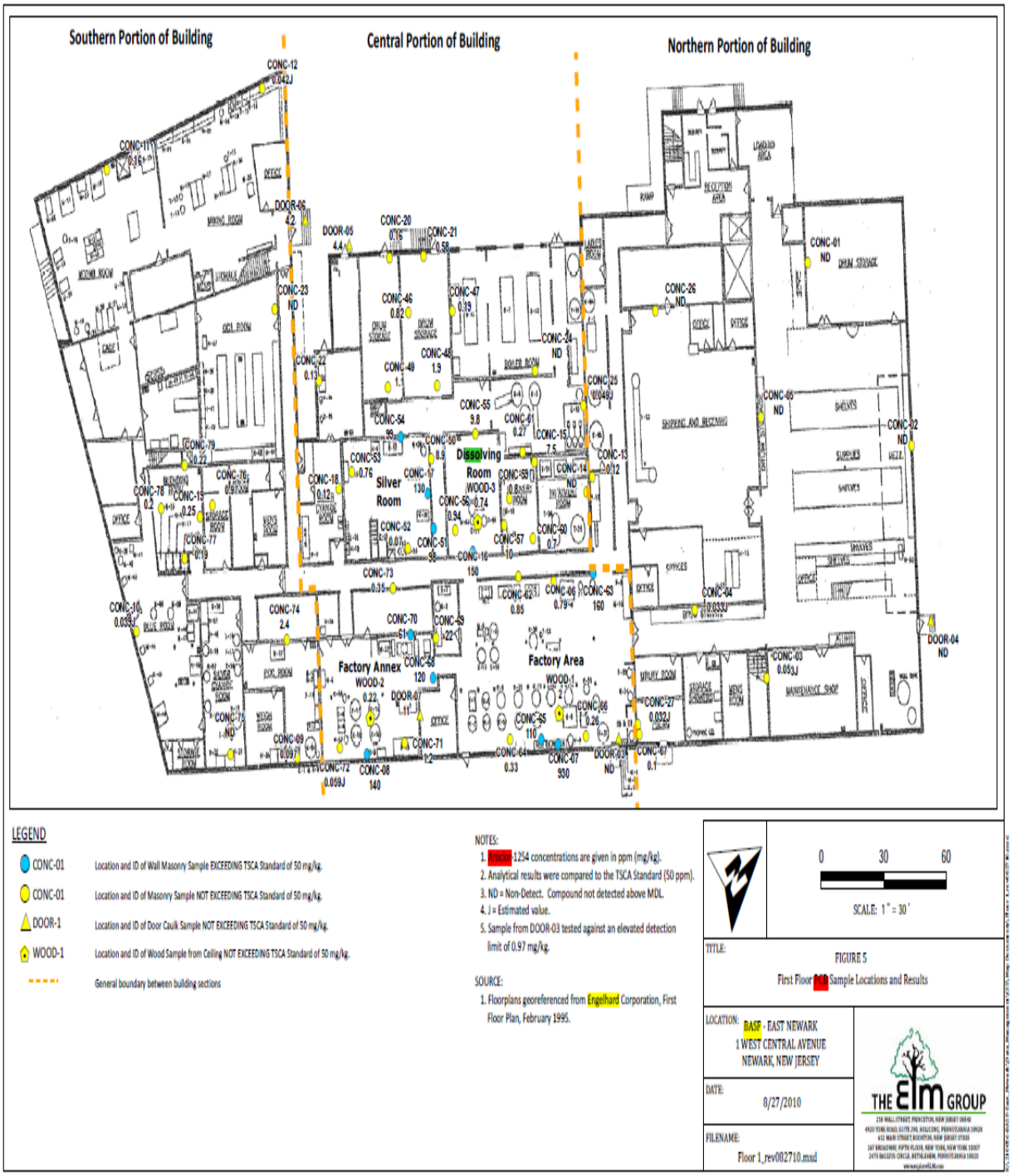
According to the 2010 letter, Aroclor-1254 was detected in samples CONC-07, CONC-08, CONC-16, CONC-17, CONC-51, CONC-54, CONC-63, CONC-65, CONC-68, CONC-70, and DOOR-1 at a minimum concentration of 61 mg/kg from sample CONC-70 to a maximum concentration of 930 mg/kg from sample CONC-07(PAP-00050635-636). The map below shows these samples were collected along the east central boundary of the building.

During the February 2012 PA/SI, Advanced GeoServices stated PCB-1254 was detected at 0.83 mg/kg in soil sample B-30 at 1.5 feet below ground surface (bgs) and 0.94 mg/kg in soil sample B-30 at 4.5 feet bgs. Samples were collected on February 10, 2012 (PAP-00050686). The PCB concentrations were detected along the central portion of the building by the eastern boundary (PAP-00050696).

The February 2017 Remedial Investigation Report (RIR) prepared by Advanced GeoServices for BASF recorded 0.61 mg/kg Aroclor-1254 in soil boring B-112 at 1.5 feet

bgs, sampled on June 6, 2013 (PAP-00053921) and 0.78 mg/kg Aroclor-1254 in soil sample B-148 collected at 6 feet bgs sampled on June 14, 2013 (PAP-00053932).

PAP-00050641



(PAP-00050641)

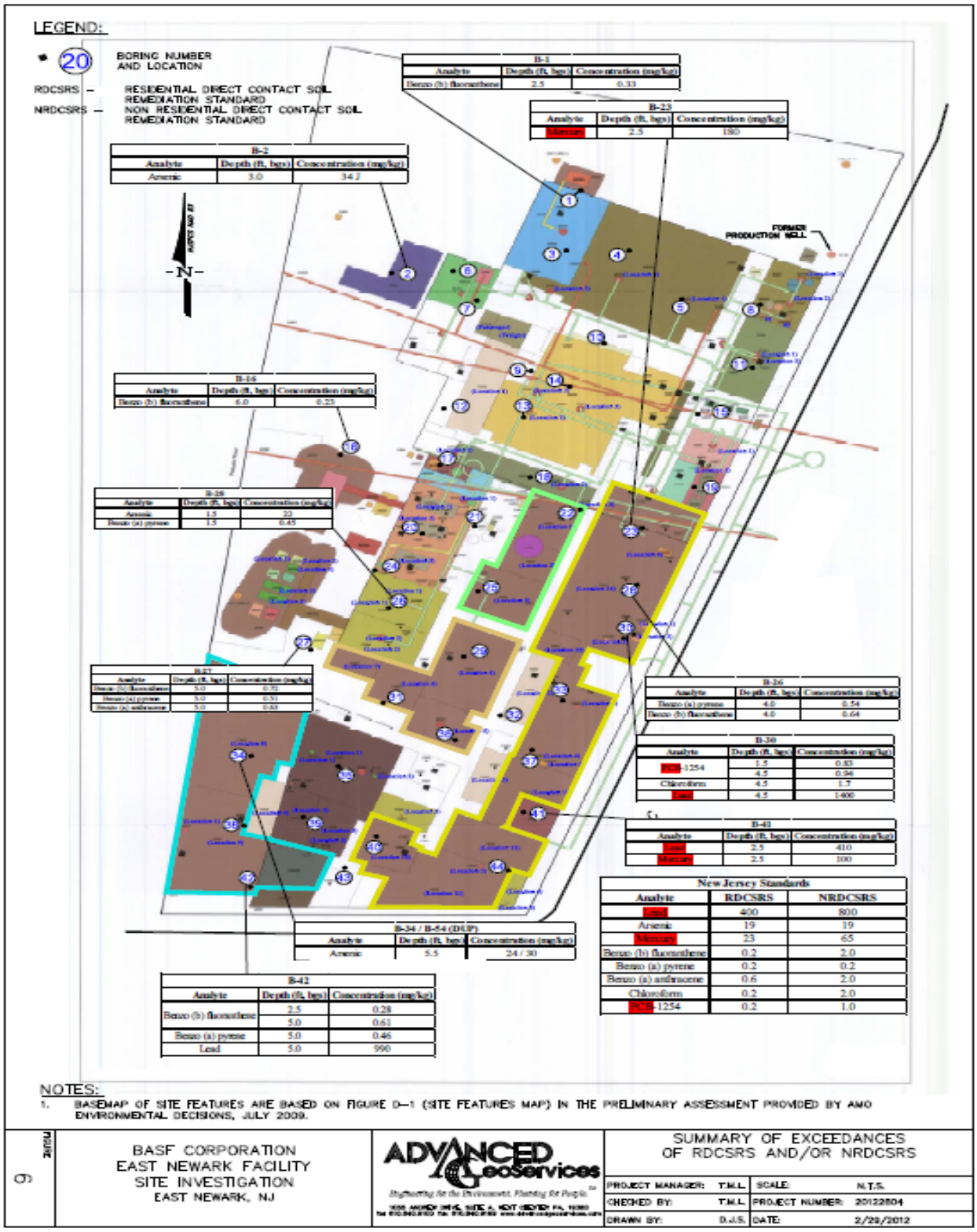
BASF Catalysts, LLC

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

PAP-00050696



Dioxins and Furans

Sampling for the February 2012 PA/SI identified 0.078 mg/kg dibenzofuran in soil boring B-42 collected at 5 feet bgs on February 9, 2012 in the southwestern portion of the facility (PAP-00050688). Sampling results from 2013 contained in the 2017 RIR showed 0.250 mg/kg dibenzofuran in sample B126 at 4 feet bgs (PAP-00053924); 0.4370 mg/kg in soil sample B-131 at 1.5 feet bgs (PAP-00053926); and 2.410 mg/kg dibenzofuran in soil sample B-143 collected at 6 feet bgs (PAP-00053930). Concentrations of dibenzofuran were detected as low as 0.025 mg/kg as shown in sample B-142 at 6 feet bgs and as high as 2.41 mg/kg in sample B-143 at 6 feet bgs (PAP-00053930).

PAHs

According to the 2012 PA/SI, thread making (pre-BASF Catalysts/Englehard) operations often used aniline dyes that were coal-tar based (PAP-00050663). The 2012 PA/SI found 0.46 mg/kg benzo(a)pyrene in sample B-42 at 5 feet bgs in the southwestern portion of the facility on February 9, 2012 (PAP-00050688).

The February 2012 sampling results found in the February 2017 RIR showed 0.54 mg/g benzo(a)pyrene in soil boring B-26 at 4 feet bgs; and benzo(b)fluoranthene in soil boring B-27 at 0.72 mg/kg collected at 5 feet bgs (PAP-00053909).

The 2013 sampling results found benzo(a)anthracene in soil boring B-106-2 at 4.16 mg/kg; benzo(a)pyrene at 4.09 mg/kg and benzo(b)fluoranthene at 5.76 mg/kg (PAP-00053915). Soil sample B-132 collected at 3 feet bgs contained benzo(a) anthracene at 6.57 mg/kg, benzo(a)pyrene at 6.33 mg/kg and benzo(b)fluoranthene at 9.11 mg/kg (PAP-00053926). Soil sample B-142 collected at 6 feet bgs detected benzo(a)anthracene at 0.6880 mg/kg, benzo(a)pyrene at 0.690 mg/kg and benzo(b)fluoranthene at 0.978 mg/kg (PAP-00053929). Indeno(1,2,3-c,d)pyrene was found at 4.44 mg/kg in soil sample B-143 collected at 6 feet bgs (PAP-00053930).

According to the February 2017 RIR, some of the PAH compounds found in soils could have been generated from on-site incineration; however, there did not appear to have been widespread usage of PAHs. Benzo(a)pyrene was found in the incinerator area in soil sample B-107 at a concentration of 0.34 mg/kg, which is below accepted Historic Fill concentrations (PAP-00053835). According to the RIR, the absence of non-Historic Fill PAHs supports the conclusion that PAHs were Historic Fill related (PAP-00053836).

Copper

Copper was used in the production of precious and non-precious metal coatings and metal salts at the facility (PAP-00050733-34). During the February 2012 PA/SI, copper was detected in site soils at a minimum concentration of 6.2 mg/kg in a soil sample collected from boring B-14 at a depth of 1.5-2 feet bgs to a maximum concentration of 270 mg/kg in soil sample collected from boring B-10 at a depth of 6.5-7.0 feet bgs on February 11, 2012 (PAP-0050682-688).

Please refer to the previous maps for boring locations that show:

- Boring B-10 was located in the north central vicinity
- Boring B-14 was located in central portion of the facility

The February 2017 RIR contained 2012 and 2013 sampling results that showed total copper concentrations as high as 588 mg/kg in soil sample B-124 at 2 feet bgs collected on June 6, 2013 (PAP-00053922) and as low as 7.6 mg/kg in soil sample B-4 collected between 5.5 and 6 feet bgs on February 11, 2012 (PAP-00053905). Figures that showed sampling locations were not included.

Lead

Lead was used as an intermediate in the production of precious and non-precious metal coatings and metal salts at the facility (PAP-00050733-34). Site operators listed the following lead containing raw materials in the facility raw material inventory. (PAP-00051483-96).

- 2004 Lead Compounds – 10,001 – 50,000 lbs
- 2005 Lead Compounds – 1,000 – 9,999 lbs
- 2006 Lead Compounds – 1,000 – 9,999 lbs
- 2007 Lead Compounds – 1,000 – 9,999 lbs
- 2008 Lead Compounds – 1,000 – 9,999 lbs
- 2008 Lead Borosilicate <55 Gal Drum
- 2008 Lead NAP-All <55 Gal Drum
- 2008 Lead Nitrate Crystals <55 Gal Drum
- 2008 Lead Fluoride – <55 Gal Drum
- 2008 Lead Monosilicate – <55 Gal Drum
- 2008 Lead Borate – <55 Gal Drum

The February 2012 PA/SI detected lead at 1,400 mg/kg in soil boring B-30 at 4 to 4.5 feet bgs sampled on February 10, 2012 (PAP-00050686) and 410 mg/kg in soil boring B-41 collected between 2 and 2.5 feet bgs sampled on February 9, 2012 (PAP-00050688). Lead was found as low as 7.4 mg/kg in soil sample B-3 collected between 3 and 3.5 feet bgs sampled on February 8, 2012 (PAP-00050682).

Refer to the previous maps for boring locations that show:

- Boring B-3 was located in the north central portion of the facility
- Boring B-30 was located in the east central portion of the facility

The February 2017 RIR contained 2012 and 2013 sampling results that showed a maximum lead concentration of 530 mg/kg in soil boring B-106 at 6.5 feet bgs collected on May 30, 2013 (PAP-00053916). Figures that showed sampling locations were not included.

Mercury

Mercury was used in small quantities in site operations as a catalyst and as a laboratory reagent in the quality assurance laboratory (PAP-00050733-34, PAP-00051483-96). The facility also reported the use of fluorescent and ultraviolet light bulbs which can contain small amounts of mercury. Waste streams containing mercury were manifested as hazardous waste and disposed at facilities permitted to handle waste streams containing mercury (PAP-00050733-34, PAP-00051483).

Site operators reported in 2008 that there was a less than 55 gallon capacity drum of mercury listed in the Facility raw material inventory (PAP-00051493-96). The following mercury containing waste streams were manifested and disposed of off-site:

- 2004 Spent UV Medium – 90 gal
- 2004 Spent UV Medium – 55 gal
- 2004 Fluorescent Bulbs – 50 lbs
- 2004 Spent UV Medium – 110 gal
- 2005 Waste Mercury – 12 lbs
- 2006 Fluorescent Lamps – 100 lbs
- 2008 Fluorescent Lamps – 55 lbs

The February 2012 PA/SI detected mercury at 100 mg/kg at soil boring B-41 between 2 and 2.5 feet bgs sampled on February 9, 2012 and at 180 mg/kg in soil boring B-23 between 2 and 2.5 feet bgs sampled on February 11, 2012 (PAP-00050685; PAP-00050688). Mercury concentrations were found as low as 0.096 mg/kg in soil sample B-2 collected between 2.5 and 3 feet bgs sampled on February 10, 2012 (PAP-00050682). Refer to the previous maps for boring locations that show:

- Boring B-2 was located in the northeast corner of the facility
- Boring B-23 was located in the east central portion of the facility and
- Boring B-41 was located in the southeast corner of the facility

The February 2017 RIR contained 2013 sampling results that showed mercury at 383 mg/kg in soil boring B-122 at 1.5 feet bgs on June 6, 2013 (PAP-00053921) and 509 mg/kg in soil sample B-148-6D at 6 feet bgs on June 14, 2013 (PAP-00053932). Mercury concentrations were as low as 2.1 mg/kg found in soil sample B-119-6 at 6 feet bgs (PAP-00053921) on May 30, 2013. Figures that showed sampling locations were not included.

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,400 mg/kg
Copper	588 mg/kg
Mercury	509 mg/kg
Benzo(a)anthracene	6.57 mg/kg
Benzo(a)pyrene	6.33 mg/kg
Benzo(b)fluoranthene	9.11 mg/kg
Benzo(k)fluoranthene	1.9 mg/kg
Indeno(1,2,3-cd)pyrene	4.4 mg/kg

Subsequent to a 2012 PA/SI, 36 soil borings generally advanced to a level of eight feet revealed 11 samples in exceedance of Residential Direct Contact Soil Remediation Standards (RDCSRS) or Non-Residential Direct Contact Soil Remediation Standards (NDCSRS) (PAP-00050648).

The PA/SI concluded that the site is underlain by variable Historic Fill with minor exceedances in limited locations (PAP-00050649).

Three of the 36 soil borings showed analytes not consistent with Historic Fill, but it was likely that many of the areas of concern (AOCs) would be designated as Historic Fill Areas, except the three soil borings discussed above (PAP-00050649). One exceedance of benzo(b)fluoranthene in soil sample B-16 at the 6–foot depth was attributed to late-1800's flooding event (PAP-00050673).

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[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

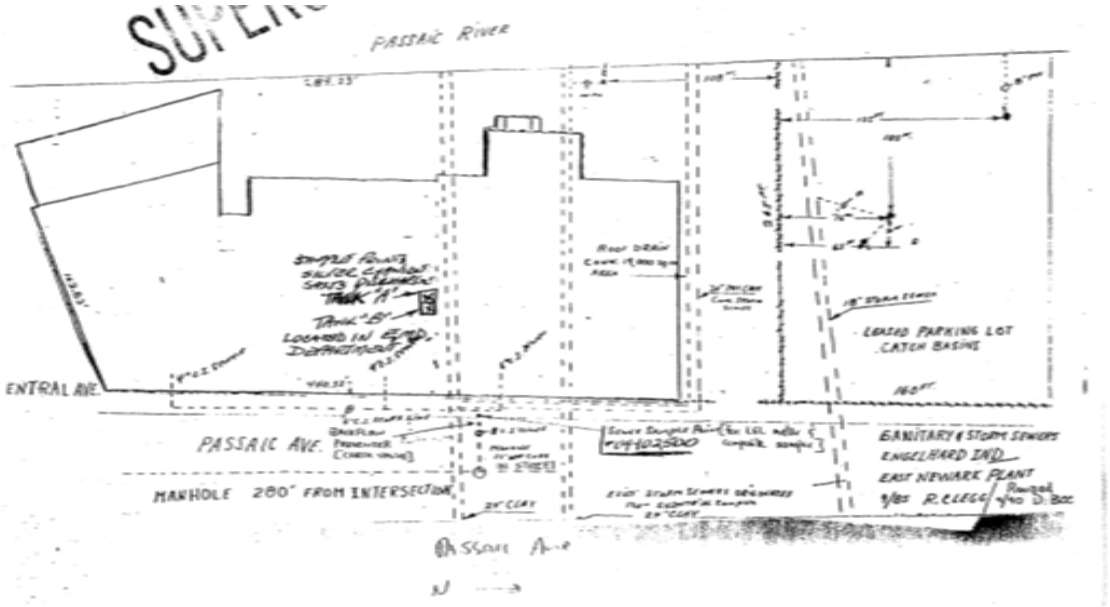
Direct Release

A 1993 NJDEP Communications Center Notification Report documented a spill of metal solvents and metal shavings from a vat, due to sloppy housekeeping at the Engelhard Industries facility. The solvent waste did not enter the water. The spill was reported by Officer Megill of the New Jersey State Police Marine Services Bureau (PAP-00050478). The Passaic River is directly adjacent to the western border of the site, and the site grades from east to west (PAP-00050652). There was nothing recorded about cleanup of the metal solvents.

Sanitary Sewer

A 1972 Waste Survey completed by Paul Cheremisinoff, Environmental Control Engineer showed the facility discharged 182 ug/L a day of copper, less than 10 ug/L per day of lead and 4 ug/L per day of mercury for eight hours a day, five days a week. The facility discharged 14,560 gal per day to the sanitary sewer. The samples were collected from April 5, 1972 to April 13, 1972 (PAP-00054002). A Waste Effluent Survey dated April 24, 1975, stated discharge volume was 27,100 gal per day, eight hours a day for five days a week. Discharged waste to the sanitary sewer was stated as 27,100 gallons of industrial waste per day. Results were based on two 24-hour samples collected on March 18, 1975 and March 20, 1975. The Survey was completed by Dr. Walter Drobot, Senior Environmental Engineer (PAP-00054006).

A 1993 NJDEP Office of Pollution Prevention and Right to Know Release and Pollution Prevention Report states that BASF Catalysts, LLC's average wastewater discharge to PVSC was estimated at 50,000 gal/day – none of which entered a receiving stream or discharged to groundwater (PAP-00050482).



(PAP-00050287)

According to the February 2012 PA/SI, the warehouse area contained numerous floor drains that discharged to the sanitary sewer system (PAP-00050657). Sanitary waste was pH adjusted at the wastewater treatment plant prior to discharge to the PVSC (PAP-00050736). All treated wastewater and sanitary sewage was discharged to the sanitary sewer with eventual discharge to the PVSC for treatment (PAP-00050657). The storm sewer collection system was also connected to the PVSC POTW (PAP-00050741).

Flooding

The site is within a 100-year flood zone. The Passaic River is directly adjacent to the western border of the site and flows to the south. The site grades from east to west (PAP-00050652). There, however, is no documentation on effects of storm surges or excessive precipitation.

6. Regulatory History/Enforcement Actions

Permits

According to the February 2012 PI/SI Report, the facility began an incineration system that produced process steam permitted by NJDEP Bureau of New Source Review, Permit 260002 (PAP-00050657). It is unclear what this permit was issued for, based on review of available files.

PVSC Sewer Connection Permit 04402500 for Engelhard Corporation for discharges at 1 West Central Avenue, East Newark. The permit was effective March 17, 1991 to March 17, 1996 (PAP-00050274; PAP-00054048). According to the permit, the sample point was on the east side of the building discharging to Passaic Avenue, and Engelhard Corporation had a set reporting schedule (PAP-00050278). During the permitting period the effluent was tested and monitored monthly for biological oxygen demand (BOD), total suspended solids (TSS), silver (1 mg/L), and CN- (5 mg/L) and continuously monitored for lower explosive level (LEL) of explosive sewer gas, pH (permit range 5 to 10.5) and for the daily effluent volume discharged (PAP-00050515 ; PAP-00050505-06).

Air Pollution Control Permit to Construct, Install or Alter Control Apparatus or Equipment and Certificate to Operate Control Apparatus or Equipment for Engelhard Corporation issued by NJDEP for the Batch Production Plant (APC Plant 10419) (PAP-00054008). The permit included monitoring, recordkeeping, testing, reporting, and inspection requirements (PAP-00054012-14). No information on the expiration of Permit 10419 was available in the referenced documents.

PVSC Sewer Connection Permit 04402500 for Engelhard Corporation at 1 West Central Avenue. The Permit was effective March 17, 1996 to March 17, 2001 (PAP-00050504). Threshold values were set for 0.001 mg/L mercury, 0.092 mg/L copper, and 0.029 mg/L lead. Monthly average discharge limitations were 3.02 mg/L copper, 0.54 mg/L lead, and 0.08 mg/L mercury (PAP-00050507).

Diamond Alkali OU2 Allocation
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Engelhard Corporation applied for a PVSC Sewer Use Permit (Permit 04402500) in September 2000 that documented principal raw materials at the time were gold, silver, platinum, acids, bases, organic solvents, and resins (PAP-00050571). Their industrial waste stream for copper, lead, and mercury were below permit parameters (PAP-00050573). 4,4-DDT, 4,4-DDE and 4,4-DDD were known to be absent from their waste stream, as well as PCBs, dioxins, and furans (PAP-00050579; PAP-00050581).

According to the February 2012 PA/SI, BASF Catalysts, LLC operated under PVSC Wastewater Discharge Permit 04402500. The waste water was pH adjusted prior to being discharged to the PVSC POTW (PAP-00050736). The date of the permit was undocumented.

The following permits pertained to BASF Catalysts, LLC operation between 2006 and 2009 (PAP-00050753):

Permits				
Description	**Permit Number**	**Original Permit Date**	**Expiration Date**	**Issuing Authority**
Sewer Connection Permit	04220003	Unknown*	2/28/06	PVSC
Hazardous Waste (RCRA/EPA)	NJD002141489	Unknown*	NA	USEPA
Physical Connection Permit (well)	0631	3/31/03	NA	NJDEP
General Industrial Permit	NJ0088315	Unknown*	5/31/12	NJDEP
Radiation (QA/QC Equipment)	110690	Unknown*	Annual Renewal	NJDEP
Well Permit	26-5159	1/31/03	NA	NJDEP
Tidelands License	93-0156-T	Unknown*	3/2/09	NJDEP
Hudson Regional Health Commission (air)	0200001	Unknown*	3/30/10	Hudson Regional Health Commission
North American Boiler 150 HI (air)	PCP960001	Unknown*	11/13/09	NJDEP
North American Boiler 200 HP (air)	PCP960003	Unknown*	7/27/09	NJDEP
Batch Permit (air)	PCP96005	Unknown*	6/26/07	NJDEP
Incinerator & York Shipley Waste Heat Boiler HP (air)	PCP960002	Unknown*	5/4/08	NJDEP
Waste Water Vent HP (air)	125374	Unknown*	Unknown	NJDEP

Unable to locate the original permitting date(s).
NA – Not applicable

Inspections and Violations

The 2012 PA/SI documented the following enforcement violations:

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on August 20, 1984 for failure to use process equipment described in the facility air permit. The facility corrected the deficiency and paid an unknown assessment penalty. No further action was needed from NJDEP (PAP-00050754).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on February 27, 1985 for improper use of PCB material. A $6,750 fine was paid and the deficiency corrected. No further action was needed from NJDEP (PAP-00050754).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on December 12, 1986 for an incorrect waste ID; insufficient waste analysis plan; incomplete inspection records; no semi-annual fire drills; and the facility contingency plan was outdated. A $2,900 fine was paid and deficiencies corrected. No further action was needed from NJDEP (PAP-00050754).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on March 24, 1988 for a permit violation because the facility installed and operated 11 pieces of equipment not listed on the permit. A $400 fine was paid and the deficiency was corrected. No further action was needed from NJDEP (PAP-00050754).

The facility received two Administrative Consent Orders – Civil Penalty from NJDEP. The first, on August 1, 1988 because the quantity of hazardous waste was not documented on the manifest. The manifest was corrected and a $300 fine was paid. On November 15, 1988 the facility was found to have an incomplete hazardous waste manifest because the quantity of hazardous waste was omitted. The facility corrected the manifest and paid a $1,125 fine. In both instances, no further action was required by NJDEP (PAP-00050755).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on April 25, 1989 for a permit violation, the facility was found to be using sodium nitrite which was not listed on permit to operate apparatus. Facility stated a typographic error in permit and that sodium nitrite should be on it. Facility paid a $640 fine and no further action was required by NJDEP (PAP-00050755).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on September 12, 1989 for a permit violation for allegedly failing to submit stack testing results by deadline; however, the facility requested a hearing for a stay on the Administrative Order (PAP-00050755).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on September 12, 1989 for a permit violation. Facility allegedly operated process equipment without the use of a scrubber, which was damaged in a fire. Facility requested a hearing for a stay of the administrative Order. Results of hearing concurred that the facility operated appropriately under the given (fire) conditions. No further action was required by NJDEP (PAP-00050755).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on October 3, 1989 for a permit violation. Facility was cited for an emissions failure to the atmosphere. Facility retested emissions and found to be in compliance. Facility paid $5,000 fine. No further action was required by NJDEP (PAP-00050756).

The facility received a warning letter from EPA on November 21, 1989 for improper waste manifest preparation. The facility improperly filled out a hazardous waste manifest sent to the disposal facility. The facility corrected the deficiency. No further action was required by EPA. (PAP-00050756).

The facility received another Administrative Consent Order - Civil Penalty from NJDEP on December 14, 1992 for a permit violation due to an exceedance of carbon monoxide permit limits. The facility ensured the existing policy and procedures associated with emissions would be followed and facility paid a $1,400 fine. No further action was required by NJDEP (PAP-00050756).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on October 13, 1993 for a permit violation, due to a failure to maintain owner's manual near ionizing radiation producing machine and failure to maintain records for testing all safety devices. The facility was fined $2,500, and owner's manual and testing procedures were modified to meet requirements. No further action was required by NJDEP (PAP-00050756).

The facility received a Notice of Prosecution from NJDEP on October 13, 1993 due to a failure to register radiation equipment. Equipment was registered and facility paid a $300 fine. No further action was required by NJDEP (PAP-00050756).

The facility received five Notice of Violations for 1) On October 13, 1993, PVSC found that facility's LEL meter was out of compliance, 2) On October 21, 1993, NJDEP stated a failure to register on-site radiation equipment, 3) On June 13, 1994, NJDEP stated that primary and secondary balsam scrubber were turned off due to leaks in the scrubber and 4) On August 11, 1994, PVSC found that facility's pH control system detected pH levels below 5.0. No further actions was required on any of them (PAP-00050757).

The facility received an Administrative Consent Order – Civil Penalty from NJDEP on August 31, 1994 for a permit violation. The balsam scrubber was turned off during plant operations. A fine was paid and the scrubber was turned on during all operations. No further action was required by NJDEP (PAP-00050757).

The facility received nine Notices of Violation from PVSC and NJDEP (on October 12, 1994, February 22, 1995, July 3, 1995, October 16, 1995, December 8, 1995, April 18, 1996, February 19, 1997, April 25, 1997, June 12, 1997) for pH levels below 5.0 and one Administrative Consent Order – Civil Penalty from NJDEP for the same violation on April 9, 1995. The Administrative Consent Order facilitated the construction of the waste water treatment system. Following correction, no further action was required on any of them (PAP-00050757-59).

In a letter dated August 21, 1996 PVSC advised Engelhard Corporation that a sample of wastewater discharge contained lead 0.56 mg/L, an amount that exceeded local limits. PVSC requested a plan and a timetable to achieve compliance with lead limits within ten days (PAP-00050541-42).

The facility received a Notice of Violation from NJDEP on November 7, 1997 and an Administrative Consent Order - Civil Penalty on December 19, 1997 for exceeding carbon monoxide emission levels from the incinerator. Facility paid a $1,000 fine and corrected the deficiency. No further action was required by NJDEP (PAP-00050759).

The facility received an Administrative Consent Order - Civil Penalty from NJDEP on November 24, 1998 for poor record keeping; radiation monitoring deficiencies; and lack of labeling equipment. A $2,500 fine was paid and requirements met. No further action was required by NJDEP (PAP-00050759).

An Administrative Consent Order – Civil Penalty was issued by NJDEP on September 18, 2002 for failure to conduct a fourth quarter cylinder gas audit. All subsequent audits were performed at appropriate times, no further action was required by NJDEP (PAP-00050760).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Wastewater Sampling Study (PAP-00050546).
- Notification of Self Implementing PCB Cleanup (PAP-00050628).
- Site Evaluation Submission (October 1990) (PAP-00335904)
- Preliminary Assessment/Site Investigation Report (February 29, 2012) (PAP-00050645).
- Remedial Investigation Report, (February 24, 2017) (PAP-00053810).

Sewer

In response to a 1996 PVSC request for a determination of compliance, Engelhard Corporation conducted a five month sampling program to determine whether they could meet copper, lead, mercury, molybdenum, nickel, and zinc permit parameters effective July 1, 1997. Samples of well, wastewater and city water were collected three times a week on average by Engelhard Corporation. Samples were sent to the Engelhard Carteret Laboratory. Samples of the well and city water served as background to assess contamination from other sources. The Engelhard Carteret Laboratory identified no exceedances of the new permit limits. Therefore, continued sample analysis was sent to an outside-certified laboratory, Townley Laboratories (PAP-00050547). Well water did not show any permit exceedances for the OU2 COCs. PVSC collected samples that were analyzed by three laboratories for metals and gold. Split samples were sent to Townley Laboratories. The results stated that Engelhard could meet new permit limits, and that additional pretreatment of wastewater was unnecessary (PAP-00050548-49).

Remedial Activities

The Remedial Investigation Report dated February 24, 2017, stated that at the majority of the areas of concern (AOCs), constituents detected were related to site wide Historic Fill present to a nominal depth of 7.5 feet and deeper in some areas (PAP-00053811). In some cases, low levels of contaminants that were observed within a specific AOC did not appear to be related to releases associated with the AOC in which they were found, rather, attributed to site-wide conditions or conditions that resulted in contamination across several AOCs. In general, few AOCs were identified to have impacts related to specific past operations within the AOC (PAP-00053861). Much of the operating history, the facility recovered and processed precious metals. Extreme care was taken to avoid any discharges of waste containing these metals (PAP-00053861). With the buildings removed in 2010/2011, security fencing surround the site that is generally covered with seeded clean fill and topsoil. The floors and foundations were removed in 2013 (PAP-00053812). Eight soil borings served to characterize the nature and extent of Historic Fill that resulted in concluding that PCBs were not part of the imported fill (PAP-00053831). 137 soil borings were completed between May 2013 and November 2015 for the RIR (PAP-00053826). The deepest exceedances of PCBs at 10 feet bgs would be addressed with a deed restriction that designated the restricted area on-site to a depth of 10 feet (PAP-00053852).

Approximately 650 tons of certified clean fill was used to backfill underground storage tank excavations. A Classified Exception Area was proposed to address arsenic exceedance (PAP-00053894). Maps of soil boring locations were not included in this report.

At the time of the February 29, 2012 report, the buildings were demolished and building slabs and subsurface piping networks remained beneath the slabs (PAP-00050652). The only significant previous remediation reported was related to underground storage tank (USTs) removals conducted in the 1990's. The effort received no further action status from NJDEP (PAP-00050659). Sampling involved 36 soil borings (PAP-00050648), 11 of which contained exceedances of RDCSRS or NRDCSRS. Most of the exceedances were semi volatile organic compounds, lead, or arsenic that were within the range (and typically lower than the average) of the Historic Fill Database values (PAP-00050648). Three soil borings contained PCB-1254 or mercury above RDCSRS and NRDCSRS, and these areas were to be more fully delineated during the remedial investigation (PAP-00050648-76).

In a letter dated September 24, 2010, BASF Corporation through the ELM Group notified the EPA that it was planning to demolish their facility. During pre-demolition sampling, PCBs were found at concentrations greater than 50 mg/kg in core samples from wall materials in the original central portion of the building (PAP-00050628). In the letter, ELM explained its Self-Implementing PCB Cleanup and proposed disposing of walls containing greater than 50 mg/kg PCBs at a landfill permitted to accept materials with greater than 50 mg/kg PCBs. The remainder of the material would be disposed of at a municipal solid waste facility (PAP-00050632).

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

BASF Corporation

Facility Name, Address and Size: BASF Corporation (BASF); 50 Central Avenue, Kearny, New Jersey; 27 acres (PAP-00057982); located on Tax Block 288, Lots 1, 2, and 3 (PAP-00058123); 190 employees, seven days a week for three shifts a day in 1972 (PAP-00058129); 189 employees in 1981 and 154 employees in 1982 (PAP-00058577); approximately 140 employees in 1990 at the time of the site's closure (PAP-00057886); BASF acquired the company that previously owned/operated the site, United Cork Companies, in 1964 (PAP-00062138).

1. **Business Type:** BASF Manufactured phthalic anhydride (PA), organic dyestuffs, polymerized acrylic dispersions and a range of plasticizers (PAP-00057886; PAP-00058129).

2. **Time Period of Ownership/Operations**

Operator: 1936-1990
Owner: 1936-2008

1920s: Property has a history of industrial use dating back to the early 1870s (PAP-00057781). The site was a sawmill operation in 1882 (PAP-00057933). Lumbering operations ceased in the early 1900s. Following cessation of the lumbering operations, the site was purchased and operated by Boston Excelsior in the early 1900s and later by the American Splint Companies, until the 1920s (PAP-00057781).

The property was seized by the Town of Kearny and used for county storage. While serving as a storage facility, most of the American Splint Company structures on the western end burned down. During the late 19th and early 20th century, the eastern portion of the southern tip was a landfill with the intention to raise the level of the property to the same level as the western portion (PAP-00057782).

1936: The United Cork Companies purchased Lot 3 of Block 288 (parcel 3) on June 8, 1936 from Boston Excelsior (PAP-00062133).

1947: On May 29, 1947, United Cork Companies purchased Lot 2 of Block 288 (parcel 2) (PAP-00062133).

1957: On June 12, 1957, BASF Aktiengesellschaft (BASF AG), a German corporation, acquired all outstanding shares of capital stock of Putnam Chemicals Corporation and changed the name of the company to BASF Colors and Chemicals, Inc. (PAP-00062138).

1964: BASF Colors and Chemicals, Inc. purchased the eastern portion of the site from United Cork Companies and the western half of the site by 1964, and a third portion (the lower southwestern portion) in 1968 (PAP-00057782; PAP-

00062127). On January 4, 1964, BASF AG acquired all outstanding shares of capital stock of United Cork Companies (PAP-00062138).

1966: On June 8, 1966, United Cork Companies changed their name to Badische Products Corporation (PAS-00054024-25). Badische Products Corporation began production of dyestuffs, such as Basacryl dyes in powder form at the property in 1966 (PAP-00057933). During 1966, a Dispersion Plant became operational (PAP-00057933).

1968: Effective January 1, 1968, BASF Colors and Chemicals, Inc. and Badische Products Corporation merged, and the surviving entity was renamed BASF Corporation (a New York corporation) (PAP-00062138). BASF Corporation was a wholly owned subsidiary of BASF AG (PAS-00054406). On December 19, 1968, BASF purchased Lot 1 of Block 288 (parcel 1) (PAP-00062127).

1969: In 1969, BASF AG acquired controlling interest in the outstanding shares of capital stock of Wyandotte Chemicals Corporation (PAP-00062138).

1970 In December 1970, BASF merged into Wyandotte Chemicals Corporation. The name of the surviving corporation was changed to BASF Wyandotte Corporation (PAP-00062138).

1971: In late 1971, a Phthalic Anhydride (PA) Plant and Dioctylphthalate Plant each became operational at the site (PAP-00057933). The facility manufactured an annual average of 130 million pounds per year of PA, organic dyestuffs, plasticizers, and polymerized acrylic dispersions (PAP-00058129).

1973: Production of Palanil dyes began in 1973 (PAP-00057933). At this time, the primary wastewater pretreatment (WPT) facility was built to handle process wastewater from the Palanil process (i.e., pH, solids, and color) (PAS-00054144).

1976: In February 1976, dispersions operations ceased (PAP-00057933).

1978: The Basacryl dye plant was shut down in March 1978 (PAP-00057933).

1980: Abandoned operation buildings used for the dispersions operations and the Basacryl dye operations were demolished by February 1980. Construction of a Batch Plasticizer Plant began in February 1980, with start-up in October 1981. Palanil dye operations were suspended in May 1981 (PAP-00057933).

1981: On December 30, 1981, BASF Wyandotte Corporation conveyed the Kearny site, i.e. parcels 1, 2, and 3 to Badische Corporation , also a subsidiary of BASF AG (PAP-00062127-28; PAS-00054039). According to a Town of Kearny deed search, between 1982 and 1987, the facility was simultaneously referred to as the Badische Corporation (Dow Chemical), and in 1985 the site was referred to as the BASF Corporation (PAP-00057783).

1985: A *Dun & Bradstreet (D&B) Report*, dated January 26, 1996 (D& B Report) on BASF Corporation stated that in December 1985 several subsidiaries of BASF AG, including Badische Corporation, BASF Systems Corporation, BASF Wyandotte Corporation, and Inmont Corporation merged, with the surviving entity being named BASF Corporation. At the same time, the company received, through a direct transfer ownership from the parent, BASF Structural Materials, Inc. (PAS-00054039). The D&B Report stated that the BASF Corporation is a BASFIN Corporation subsidiary who is a wholly owned subsidiary of BASF AG (the BASF Group) that started in Ludwigshafen, Germany in 1865 (PAS-00054042).

1986: In mid-1986, a facility to flake molten PA was brought online (PAP-00057933).

1988: In 1988, the site had three manufacturing plants and a facility to flake molten PA (PAP-00057934). *A Supplemental Information Report for 1989*, dated September 19, 1990 documented that in 1989 BASF produced 2,792,000 pounds of bis(2-ethylhexyl)adipate (PAP-00061014); 89,877,000 pounds of di(2-ethylhexyl)phthalate (PAP-00061020); 5,996,000 pounds of di-n-butyl phthalate (PAP-00061024); and, 99,000,000 pounds of PA (PAP-00061031).

1990: According to a *General Information Submission*, dated June 11, 1990, BASF notified New Jersey Department of Environmental Protection (NJDEP) they planned to cease production by the end of that year. No sale was planned (PAP-00057882-4). All production activities were discontinued by the end of September 1990 (PAP-00060089).

1991: In December 1991, NJDEP informed BASF that they have concluded that BASF had appropriately closed all hazardous waste units and that BASF was delisted to generator status only (PAP-00060278).

1992: In December 1992, decommissioning of the facility was completed (PAS-00054149).

1995: The facility was completely dismantled by October 1995, and the site existed as a secure, 27-acre parcel with no buildings, except for the front guard house (PAS-00054149).

2008: Ownership of the property was transferred to HP Real Estate, LLC, a redevelopment company. HP Real Estate, LLC received approval to develop the property into a warehousing and distribution center from Kearny Point, LLC, the entity that has municipal and state approvals (PAP-00061591).

3. Operational History/COC Use and Presence at the Facility

Between 1936 and 1964 United Cork Companies operated the facility (PAP-00182826). During operations by United Cork Companies, “cork waste” from production of stoppers, bungs, gaskets, bottle cap discs, and similar material was used to form cork blocks and sheets for use as flooring, insulators against heat, and for absorbing vibrations in

machinery (PAP-00058672). According to patent #2,041,377, dated December 5, 1935, this process superheated the cork particles with steam to use the natural resins in the cork to bind the particles together (PAP-00058672-74).

An article in *The New York Times,* dated April 12, 1956, announced United Cork Companies had obtained a license to use the BASF AG. process for making polystyrene plastic foam and molding the material into finished products. The foam was molded under heat from polystyrene "beads" resembling coarse grains of sugar (PAP-00065199). The facility was used to produce expanded polystyrene insulation in 1965 and 1966 by United Cork Companies (PAS-00053995-96; PAS-00053997-99) and in 1967 and 1968 by Badische Products Corporation (PAS-00054000-03). In 1964, BASF AG acquired the physical assets of the United Cork Companies and in 1966 Badische Products Corporation began production of Basacryl dyestuffs, and later added dyes, plasticizers, and PA (PAP-00057933).

PA and benzaldehyde were process chemicals handled by BASF at the facility that were classified as Class III organic compounds (PAP-00182826; PAS-00054145, 52, 92). The United States Environmental Protection Agency (EPA) publication *Dioxins: Volume III, Assessment of Dioxin-Forming Chemical Processes*, dated June 1980, identifies Class III organic compounds as those with the possibility, but less likely, of dioxin formation (PAP-00169111).

According to documents contained in BASF's *ECRA Site Evaluation Submission SES*, dated August 3, 1990, between approximately 1966 and 1977, the Basacryl plant manufactured water based or solvent based cationic acrylic dyes, and water based dispersions for methacrylate and acrylate chlorides (PAP-00057783). A list of raw materials and products is presented below (PAS-00054152-53):

BASF CORPORATION
Kearny, New Jersey

BASACRYL PLANT

Raw Materials and Products

A AMINO ACETANILIDE
ACETIC ACID GLACIAL
ACETOXY ETHYL ETHYL ANILINE
ACETOXYLINE
ACRIDYLIC ACID
ALBIGEN A
ALLYLNITRILINE
ALPHA AMINO ANTHRAQUINONE
ALUMINUM PDR ST 30
AMINO-PHE-HYD-ANTHRAQUINONE
ANTHRANILIC ACID DRY
AQUA AMMONIA
ASTRA N FUCHSIN CONC.
BASOLON B PDR.
BASOPHEN RBD = TENSACTOL A
BASOPHOR FJ
BASOPHOR OU
BASOTOL
BASOWET BX DRY
BENZALDEHYDE
BENZIMID
BETA NAPHTOL
BOHRMITTEL HOECHST
BORIC 100%
BROMINE
BUTYL-CYANOETHYL-ANILINE
CHLORANIL
CHLORINE
CHLOROSULFONIC ACID
CHROMOXIDE EX WET
CYANO ETH OXETH ANIL BENZOATE
CYANO ETHYL ETHYL ANILINE
CYANO ETHYL ETHYL M TOLUIDINE
CYETH ETHCARB OXETH ANILINE R
DEKOL N
DI PROPYLENE GLYCOL
DIBENZANTHRONE DRY
DICHINYL C
M-NITROANILINE
N N ACETOXY ETHYL AMINO A A
NEKAL 73 U
NITRA ACID AMIDE
NITRO DIAZOXYL ACID
NITROFORMALID PDR. @ 100%
NITROSYL SULFURIC ACID 40%
N-DIMETHYL ANILINE
N-DI-ETHYL ANILINE

N-ETHYL-O-TOLUIDINE
N-MONO METHYL ANILINE
OXTYL AMID MOIST @ 100%
OCTYLAMID PST
OLEUM 24%
OXETHYLNITRILINE @ 100%
OXETHYLNITRILINE
OXY ETHYL ETHYL ANILINE
OXYANTHRAQUINONE MIX
OXYQUINALDINE CARBOXYLIC ACID
PARA CHLORO META CRESOL
PARA CRESOL
PARA FORMALDEHYDE
PARA NITRO ANILINE
PARA NITROANILINE O METHYL SULFONE
PYRIDINE
PHENOL CRYST 100%
PHOSPHORIC ACID 83-85
PHTHALIC ACID ANHY FLAKE
PHTHALIC ACID ANHYDRIDE = PAA
PLURACOL E-400
PLURACOL E-600
POTASSIUM CARBONATE
POTASSIUM HYDROXIDE
PROPIONIC ACID
PROPYLENE GLYCOL
2 AMINO 6 NITRO BENZO THIAZOLE
2 ANISID W METHAN AC PST (R)
2-AMINOBENZONITRIL
2-AMINO-5-NITROBENZONITRIL
2-CHLORO-4-NITROANILINE
2-CHLORO-4-NITRO-6-BROMO ANILINE
2.4 DINITRO 6 BROMO ANILINE
2.5 DICHLOROSULFANILIC ACID

DIHYDROBIBENZOTETR IRON COMPLEX
DIOXETHYL-META-CHLORO-ANILINE
DISINFECTION SOLUTION 73 U
DISPERSING AGENT SS EXTRA PDR.
DISPERSING AGENT SSP PDR.
DRY ICE
EKTASOLVE DB
EMULPHOR ON 870
ETHYL ANILINE ESTER @ 100%
ETHYL ANILINE ESTER
ETHYL NITRILINE
ETHYLENE GLYCOL
ETINGAL A
FOAMMASTER V
FORMIC ACID
GELB PYRIDONE @ 100%
GELB PYRIDONE
GLYCERINE
HEXANDIOL-1.6
HYDRAZON
HYDROCHLORIC ACID 31%
HYDROGEN PEROXIDE 35%
IGEPON T-77
INDANTHRENE BLUE RS
INDANTHRENE BLUE RS GROUND
INDIGO PU POWDER KN (DRUMS)
INDIGO 75 POWDER @ 100% (BINS)
ISOBUTANOL
LIGNOSOL FTA
LIPAMIN OK
LOMAR PW
MANGANESE DIOXIDE
METHANOL
METHYL CARBITOL
METHYL PYROLIDONE SOLN.
METHYL QUINOLONE
MONO ETHYLENE GLYCOLDIACETATE
M-CRESOL
RABTEX OIL
REAX 85 A
SELLOGEN H.R.
SODIUM ACETATE
SODIUM BICARBONATE
SODIUM BISULFITE
SODIUM BROMIDE
SODIUM CARBONATE
SODIUM CHLORIDE

SODIUM CYANIDE
SODIUM FORMATE
SODIUM HYDROSULFITE
SODIUM HYDROXID 50% SOLN. 100%
SODIUM HYPOCHLORITE
SODIUM NITRITE CRYST.
SODIUM NITRITE SOLN @ 100%
SODIUM SULFATE
SODIUM SULFITE ANHYDROUS
SORBITOL LIQUID
SOYA LECITHIN CONC. W
SULFAMIC ACID
SULFUR MILLED
SULFURIC ACID 93-98%
SULFURIC ACID 98%
SURFYNOL 104H
TAMOL NNOK
TAMOL NNOK SA
TAMOL SN
TETRONIC 1504
TETRONIC 904
TRIBUTYL PHOSPHATE
UREA
ZEWA POWDER MGF
2 AMINO 5 NITRO BENZONITRILE
2 AMINO 5.6 DICHLORO BENZOTHIAZOLE
2.6 DICHLORO 4 NITROANILINE
2.6-DIBROMO-P-NITROANILINE
3 ETHOXY PROPYLAMINE
3-ETHYL AMINO P CRESOL
3-METHOXY PROPYLAMINE
3-(BIS ACETOXETHYL) AMINO 4 MAA
5 NITRO ANTHRANILIC A THIOAMID

Batch plasticizer production began in 1981 (PAP-00057933). PA, a core constituent of both ester production processes, required a continuous process as follows according to the *ECRA Site Evaluation Submission SES*, dated August 3, 1990 (PAP-00057899):

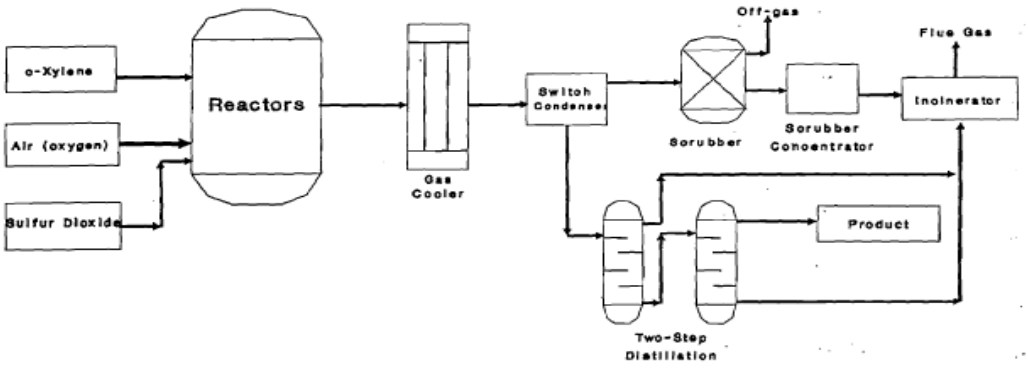
- Partial oxidation of orthoxylene took place over a fixed catalyst bed of vanadium pentoxide. The addition of sulfur dioxide produced an exotherm removed using a eutectic solution that was temperature controlled by high pressure steam.
- The PA reaction gas was further cooled, sublimed and then melted into crude PA. The crude PA was refined through a two-step distillation process, and byproducts were burnt in an on-site incinerator.
- Three blowdown streams generated during the process included the gas cooler, oil cooler, and cooling tower. The gas and oil cooler blowdown were directed to the Basacryl sump pit, and the cooling tower blowdown was released to the sump via the sewer system.
- All effluents were treated at the on-site WPT facility (PAP-00057899-903).

A flow diagram of the PA manufacturing process is presented below (PAP-00057904):

BASF CORPORATION
KEARNY, NEW JERSEY

Figure 5-1

PHTHALIC ANHYDRIDE
PROCESS FLOW DIAGRAM

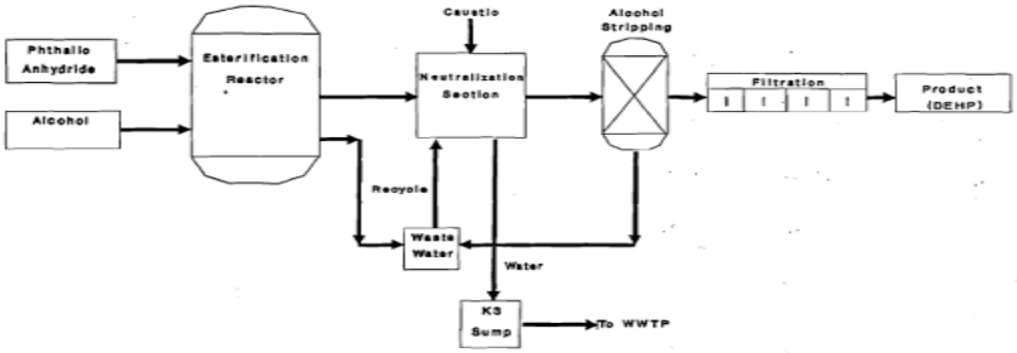


Continuous esters (i.e., di(2- ethylhexyl) phthalate [DEHP], diisononyl phthalate [DINP]) were produced as follows:

- At the Continuous Ester Plant, two phthalate esters were produced via esterification of PA with an alcohol. Bis(2-ethylhexyl) phthalate required 2-EHOL and Palatinol-N required n-nonanol. The process consisted of five steps: 1) esterification; 2) alcohol removal; 3) neutralization and washing; 4) steam stripping and drying; and, 5) filtration.
- Esterification took place in a four-reactor continuous cascade system.

- Byproducts were either removed and sold as co-products, or treated at the WPT facility.
- The process resulted in a washed diester that was stripped of any remaining alcohol. The dry diester, essentially free from alcohol, was filtered using high powered carbon and a filter aid (PAP-00057901-02).

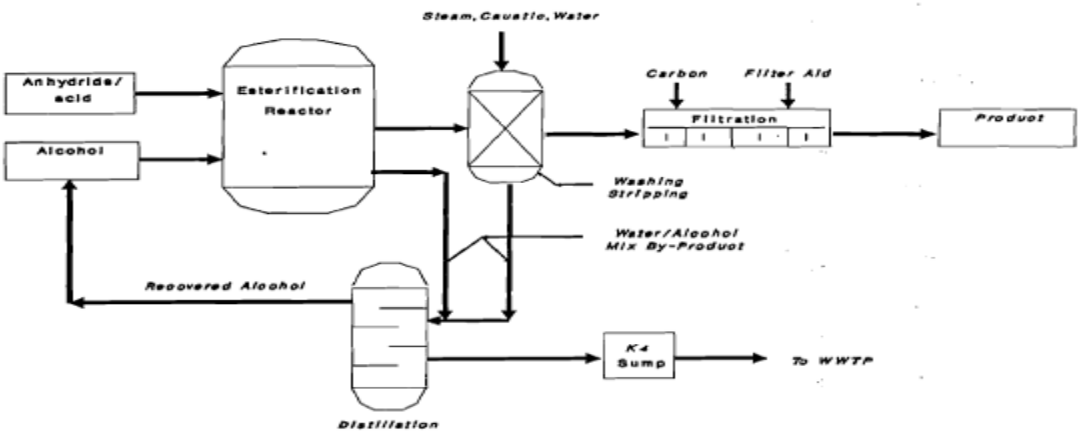
A flow diagram of Continuous Ester Plant process is presented below (PAP-00057905):



Batch Ester Processes took place in the Specialty Esters Plant. The discontinuous (batch) operation produced six esters as follows:

- Alcohols used varied from C_4 to $C_{9\text{-}11}$. The acid or anhydride used were PA, trimellitic anhydride or adipic acid.
- A typical reaction involved n-butanol esterification of PA to form di-(n-butyl) phthalate. The process involved: 1) esterification; 2) alcohol stripping; 3) neutralization and washing; 4) steam stripping and drying; and, 5) filtration (PAP-00057902).
- Light fractions of alcohol were sold as co-product EP275.
- Neutralization and washwater were treated in the on-site WPT facility. The washed diester was steam stripped of alcohol, dried, and filtered.
- Excess water was either recycled or used for neutralization (PAP-00057902-3).

A flow diagram of Batch Ester process is presented below (PAP-00057906):



BASF constructed the Kearny incinerator in 1971 to treat off-gas scrubber water during PA production. According to a BASF response to an EPA Request for Information, dated November 30, 1995, off-gas scrubber water sent to the Kearny incinerator can be characterized as an organic acid/water solution. Additional waste streams (K093 and K094) from PA distillates were also incinerated (PAS-00054146). The incinerator ceased operations upon plant closure in 1990 (PAS-00054286).

A table of the chemical makeup and properties of the incinerator feed-streams is presented below (PAS-00054154):

CHEMICAL MAKEUP AND PROPERTIES OF BASF INCINERATOR FEEDSTREAMS

Feedstream Name	Nominal Feed Rate	Chemical Composition	Other Physical Properties
Scrubber Water	4000 lbs/hr Continuous	Phthalic Acid 5-8% Misc. Organic acids 25-40%, principally maleic acid Chlorine <0.1% Sulfur <0.01% Ash 0.03% Water & NH_3 50-70%	Aqueous Stream (Non-Hazardous) Temp. 40-45°C (liq) Sp. Gr. 1.10-1.15 pH 3-5 Viscosity 1.0 cp @ 50°C
PAA Distillates	400 lbs/hr Intermittent	Phthalic Anhydride 60% Maleic Anhydride 5-10% Misc. Organic Acids and Anhydrides 16-26% Chlorine <0.1% Sulfur 0.1% Ash <0.35%	Organic Waste Stream Temp. 135°C (liq) Sp. Gr. 1.1-1.2 Flash Point -- 180°F Heating Value 9-10 KBTU/lb
DOP Lights	220 lbs/hr Intermittent	2-Ethyl Hexenes 75-80% 2-Ethyl Hexanol 5-15% 2-Ethyl Hexanal 1-2% n-Butanol 2% Chlorine <0.1% Sulfur <0.1% Ash <0.1%	Organic Waste Stream Temp. 20-40°C (liq) Sp. Gr. 0.73-0.76 Viscosity 32 SUS @ 100°F Flash Point 135°F Heating Value 11-18 KBTU/lb
MX Organics	220 lbs/hr Intermittent	2-Ethyl Hexanol 20-30% n-Butanol 0-10% Isodecanol 10-20% Bis (2-Ethylhexyl) Phthalate 3.0% Di-n-butyl Phthalate 1.2% Phthalic acid esters, n.o.s 35-45% Chlorine <0.1% Sulfur <0.1% Ash <0.1%	Organic Waste Stream Temp. 20-40°C (liq) Viscosity 43 SUS @ 100°F Flash Point 131°F Heating Value 14-17 KBTU/lb

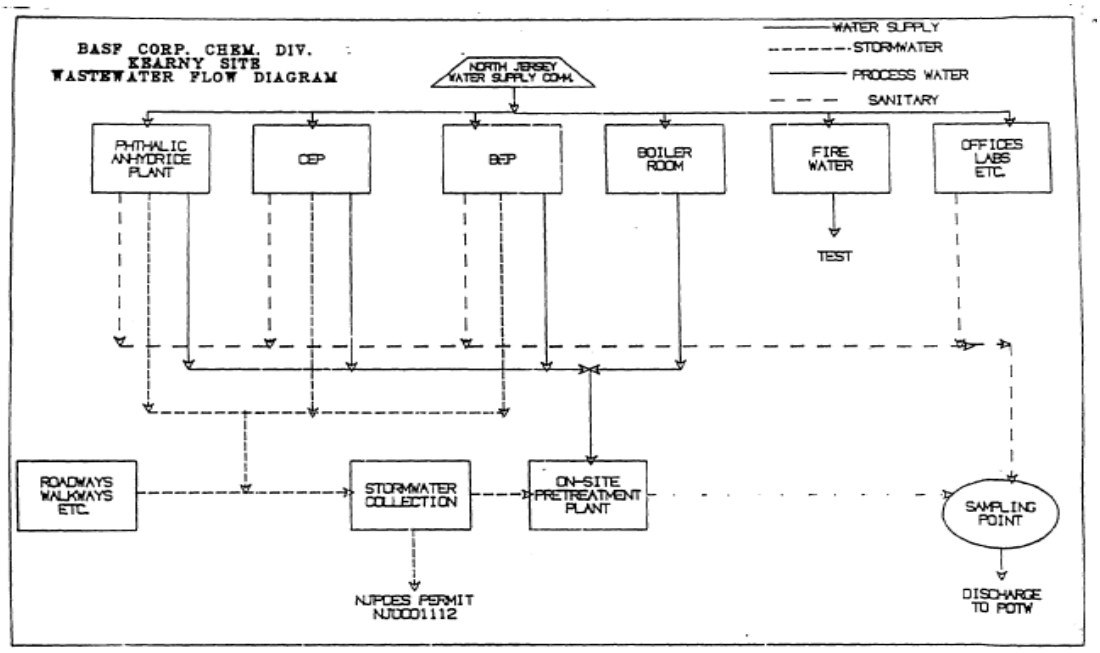
Between 1966 and 1973 process wastewater from the Basacryl Plant was first placed in a pit and air sparged and then neutralized before discharging to the Kearny Publicly Owned Treatment Works (POTW) (PAS-00054144). In 1973, BASF completed a WPT facility. Wastewater lagoons (lined earthen impoundments), located south of the wastewater treatment plant and boarding the Passaic River, were used to process wastewater prior to treatment (PAP-00058722). In addition, according to *Potential PCB Sources to PRSA (Volume 1 of 4)*, dated December 18, 2001, between 1971 and 1976, the facility used concrete-lined evaporation ponds located at the southern end of the facility to reduce the volume of incinerated materials (PAS-00124538). There are no citations or available underlying documents to support these statements.

According to the amended *Baseline Monitoring Report*, dated November 30, 1988, process wastewater and contaminated stormwater was routed through the WPT facility prior to being discharged to the Kearny POTW (PAP-00060950). Process wastewater from the production of plasticizers was sent to a skimmer pit in order to remove organics before discharge to the Kearny POTW. Prior to December 2, 1988, stormwater was first sent to an underflow/overflow outfall pit to remove organics before being discharged to Newark Bay (PAS-00054144).

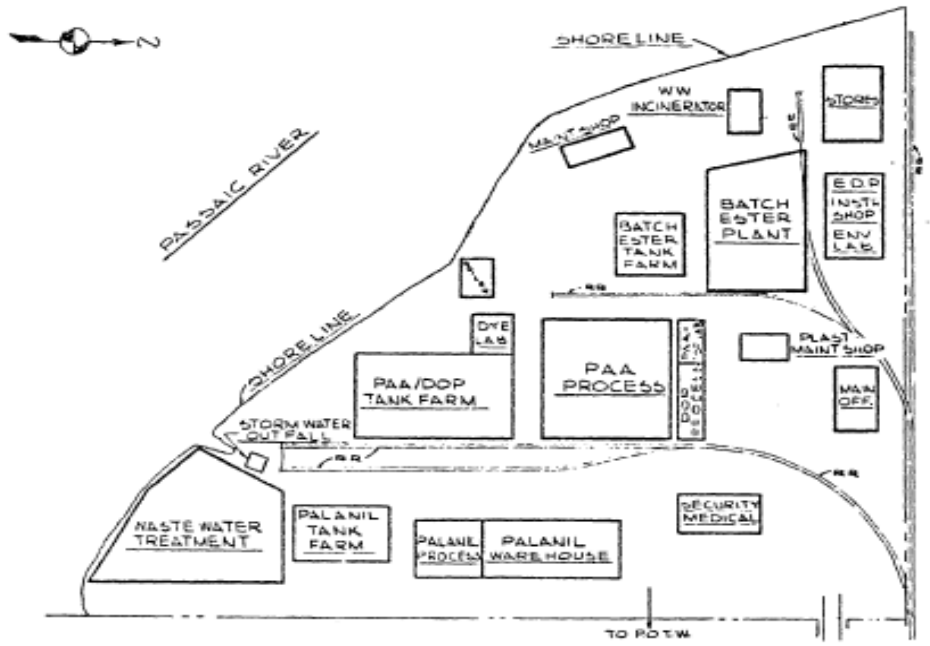
As reported by the September 4, 2002 *Sources of Dioxin in the PRRI Area*, by Tierra Solutions, non-contact water generated from the site's boiler room and PA Plant discharged directly to the Passaic River via a New Jersey Pollution Discharge Elimination System (NJPDES) permit to Discharge to Surface Water (PAP-00182860). However, this is not consistent with the Manufacturing Operation Description, which states that wastewater from the PA Plant was directed to the Basacryl sump pit and treated through the site waste treatment plant (PAP-00057900), or with the Description of Operations, which states that non-contact cooling water and boiler regeneration were combined with contaminated process and stormwater (PAP-00060950). Effluent from the treatment plant was combined with sanitary sewer effluent prior to discharge to the Kearny POTW (PAP-00060950).

According to a Resource Conservation and Recovery Act (RCRA) Part B Permit Application revised in October 1985 and completed by Badische Corporation in 1985, the facility generated the following amount of hazardous waste: 1.5 tons/year of phthalate ester spill residue; 180 tons/year of PA distillation residue; 180 tons/year of PA distillation lights; 100 tons/year PA spill residue; 800 tons/year of MX Organics; 40 tons/year of spent catalyst; and, 800 tons/year of DOP lights (PAP-00061959). Sampling results for DOP Lights were less than the detection limits (less than 4 parts per million [ppm] lead and less than 0.2 ppm mercury) (PAP-00061970). Sampling results for MX Organics were also less than the detection limits (less than 4 ppm lead and less than 0.2 ppm mercury) (PAP-00061972). According to a NJDEP *Hazardous Waste Generator Annual Report 1989 Waste Summary Form* completed by BASF in 1990, BASF stated they generated greater than 100 tons of hazardous waste during the 1989 calendar year, specifying 400 gallons of liquids and 2,804,112 pounds (PAS-00054062-63).

A diagram of the site wastewater flow is presented below (PAP-00060958):



A drawing of the BASF site layout is presented below (PAS-00054201):



OVER VIEW
KEARNY WORKS

4. Identified COCs

- PCBs (detected)
- Dioxins/Furans
- PAHs (detected)
- DDx (detected)
- Copper (detected)
- Mercury (detected)
- Lead (detected)

PCBs

A Hazardous Substances and Waste Inventory identified a use code of 11 for polychlorinated biphenyls (PCBs), which corresponds to a typical use range of 11 to 110 pounds. The PCBs were stored in drums at the PA/Continuous Ester Plant (CEP) (PAP-00057918, 20). The year of the inventory was not specified, but it was submitted as part of the *ECRA General Information Submission Form*, dated June 11, 1990 (PAP-00057882).

A 1987 NJDEP *Uniform Hazardous Waste Manifest* completed by BASF documents that PCBs were shipped offsite to a waste facility (PAP-00061051).

The BASF *PCB Pre-Inspection Report*, dated July 11, 1988 stated that there were 29 pieces of oil filled electrical equipment at the site, and 20 of these were tested for PCBs in February 1984. There were 17 oil containing transformers onsite:

- four were known to have contained less than 50 ppm PCBs (two were silicone fluid transformers);
- eight contained between 50-500 ppm PCBs;
- one transformer contained over 500 ppm PCBs;
- one transformer was out of service and awaiting removal; and,
- three were askarel transformers (PAP-00061060).

There were additionally three oil-containing heat transfer systems, one of which was tested for PCBs and contained less than 50 ppm PCBs. The other two were not tested because they were sealed type; information was requested from the manufacturer. There were also six oil-containing circuit breakers onsite. Two were tested for PCBs, one of which contained less than 50 ppm PCBs and the other contained greater than 50 ppm PCBs. The four other circuit breakers were not tested because they were in the old substation and were old equipment of the sealed type. One was noted as appearing to be oozing from the side, which the maintenance operator felt was from insulation (PAP-00061060). The *PCB Pre-Inspection Report*, dated July 11, 1988, also noted that the foundations on which four transformers sat in the old substation showed clear evidence of oil spillage, though none appeared to be leaking at the time of the inspection (PAP-00061060). PCB concentrations of the transformers in the substation ranged between 80 and 85 ppm. PCB concentrations of the three transformers in the boiler house ranged between 75 ppm and 3640 ppm (PAP-00061094-96). The *PCB Pre-Inspection Report*, dated July 11, 1988 does show that before November 1987, 1,825 gallons of new oil had been replaced in electrical equipment to reduce its PCB content (PAP-00061088). A BASF *PCB Audit Report*, dated February 27, 1989, noted that the oil

used in 261 pieces of equipment did not contain PCBs, according to the oil manufacturer (PAP-00061122).

Dioxins and Furans

According to a January 28, 1994 response to EPA Request for Information, BASF states it did not, to the best of its knowledge, receive, utilize, manufacture, discharge, release, or dispose of any pesticides, materials containing 2,3,7,8-tetrachlorodibenzo-p-dioxin, or any other dioxin compounds (PAS-00054400).

In a March 12, 1996 letter to EPA, BASF stated dioxin precursors used in facility operations included chloranil, PA, maleic acid, and 2,6-dibromo-p-nitroaniline (PAS-00053985). Benzaldehyde was also handled at the facility (PAS-00054152).
No information regarding the detection or remediation of chlorinated dioxins or furans was identified in the available site files.

PAHs

Polynuclear aromatic hydrocarbon (PAH) containing materials such as No. 2 fuel oil, No. 6 fuel oil, and gasoline were handled at the site as a part of plant operations (e.g., heating), but it is unclear whether other materials at the site described in general terms, such as waste oil, cold oil, or oil, refer to PAH-containing materials. A 34,000 gallon No. 6 fuel oil tank was installed in 1969 and was still present in 1990 (PAP-00057914).

Fuel oil was unloaded into an aboveground storage tank (AST) diked holding tank, located at the north end of the site. From the holding AST, fuel was dispersed to a boiler house. The boiler house was present in 1990 and had operated since 1971. Prior to 1971, a boiler house located at the north end of the site, adjacent to the holding AST, was used. This boiler house was demolished in February 1980 (PAP-00057907-08).

Other fuel and oil tanks and storage at the site include:

- Two No. 6 fuel oil ASTs, with capacities of 30,000 gallons and 60,000 gallons, respectively (both ASTs were diked);
- Two gasoline underground storage tanks (USTs), with capacities of 500 gallons and 1,000 gallons, respectively (the USTs were decommissioned in 1990);
- A No. 6 fuel oil PA/Maintenance tank;
- 1,900 gallons of oil stored in drums;
- An 8,000 gallon waste oil tank, installed in 1975;
- A 500 gallon waste oil tank, installed in 1975;
- An 8,000 gallon cold oil tank, installed in 1970;
- A 5,000 gallon hot oil tank, installed in 1970; and,
- Waste oil stored in drums at the truck shop (PAP-00057912-20).

Equipment that operated at the site and had potential to emit PAHs include:

- Dowtherm boiler – used to heat reactors in the BEP Plant, exact period of use unknown, but United Cork Companies manufactured cork products with heat between 1936 and 1966, potential for PAHs in air emissions and ash (PAP-00057996);

- Organic waste incinerator – operated at the site to incinerate organic wastes from the ester process, operated from 1971 to 1979, potential for PAHs in air emissions and ash (PAP-00057995); and,

- RCRA incinerator and scrubber – used to burn distillation residues from the PA process until the plant was decommissioned in 1990, potential for PAHs in air emissions and ash (PAP-00057982).

DDx

Sampling results contained within the *Remedial Investigation Work Plan, BASF Corporation*, dated January 1995 identified 50.8 micrograms per kilogram (µg/kg) 4,4'-DDT in sample #AEC17-ADD1 collected from between 0.5 and 1 feet below ground surface (bgs). The sample was collected on March 12, 1991 (PAP-00058888).

Mercury

An undated Hazardous Substances and Waste Inventory identified a use code of 10 for mercury, which corresponds to a typical use range of 1 to 10 pounds. The mercury was stored in bottles at the Electric Shop/Lab (PAP-00057917, 20; PAP-0061244). The year of the inventory was not specified, but it was submitted as part of the *ECRA General Information Submission Form*, dated June 11, 1990 (PAP-00057882).

An October 1985 RCRA Part B Permit Application completed by Badische Corporation contained analytical information about incinerator waste: mercury was less than the detection limit of 0.01 ppm from solid-phase PA distillation and less than the detection limit of 0.2 ppm from MX Organics (PAP-00061971-72). MX Organics was characterized as a hazardous waste due to ignitability (PAP-00061962).

Lead

An October 1985 RCRA Part B Permit Application completed by Badische Corporation contained analytical information about incinerator waste: lead was less than the detection limit of 0.2 ppm from solid-phase PA distillation and less than the detection limit of 4 ppm from MX Organics (PAP-00061971-72). MX Organics was characterized as a hazardous waste due to ignitability (PAP-00061962).

Historic Fill

The Allocation Team has determined that the property is located on regional Historic Fill as designated by the NJDEP.[1]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 contaminants of concern (COCs): PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to the *Baseline Ecological Evaluation*, dated September 2008, the site was filled in the late 1880s/early 1900s, and soil characterization demonstrated the presence of PAHs and various metals in the historically placed fill. The *Baseline Ecological Evaluation*, dated September 2008, did not include PAHs and metals in its investigation, but did include PCBs (PAP-00062468).

The *Addendum A Remedial Action Work Plan for BASF Corporation's Kearny Facility*, dated November 15, 2000 noted that analytical results showed that PAHs and metals were "ubiquitous throughout the site" and were unrelated to former BASF operations. It was determined that PAHs and metals were likely components of Historic Fill, as opposed to PCBs that were attributed to facility operations (PAS-00107464).

The *Addendum A Remedial Action Work Plan for BASF Corporation's Kearny Facility*, dated November 15, 2000 claims BASF has adequately demonstrated Historic Fill conditions, consistent with New Jersey Administrative Code (NJAC) 7:26E-4.6(b) for the remedial investigation of landfills. The *Addendum A Remedial Action Work Plan for BASF Corporation's Kearny Facility*, dated November 15, 2000 also states that the investigations adequately located and characterized fill while segregating hot spot areas not related to the Historic Fill, and 192 test pits installed over the 27-acre site provided

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS & lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

more than the required number of test pits. Moreover, the site demonstrated ubiquity and consistent correlation with acceptable Historic Fill concentrations. PAHs and metals were addressed with engineering and institutional controls (PAS-00107471-72).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	6,100 mg/kg
Copper	37,000 mg/kg
Mercury	2.2 mg/kg
Benzo(a)anthracene	51 mg/kg
Benzo(a)pyrene	47 mg/kg
Benzo(b)fluoranthene	82 mg/kg
Benzo(k)fluoranthene	4.62 mg/kg
Dibenzo(a,h)anthracene	4.44 mg/kg
Indeno(1,2,3-cd)pyrene	2.96 mg/kg
Total PCBs	254 mg/kg

5. COC Pathways

The site is located at the southern end of Kearny Point and is boarded on the west and the south by the Passaic River (PAP-00061594).

Sanitary and Storm Sewer

Pre-treated effluent from the WPT facility was then directed to the Kearny POTW (PAP-00057909-10; PAP-00061593; PAS-00054144).

The sewer system at the facility was comprised of three components: 1) stormwater, 2) process flows, and 3) sanitary flows. The process and stormwater flows were combined as a single sewer system, while the sanitary sewer system was separated and discharged directly to the trunk sewer line to the Kearny POTW. Process and stormwater flows were directed to sewer and sump systems for pretreatment at the WPT facility at the far southern portion of the property (PAS-00054404-05).

The sanitary sewer system discharged to a K1-sump which ran into to the Kearny POTW. The sump was the sole location where all three sewer systems (sanitary, treated process, and treated storm) were mixed at the facility. Prior to this sump, the systems were separate and distinct (PAS-00054405; PAP-00057910). Process flows from the Continuous Ester Plant, the Batch Ester Plant, and all floor drains were directed to sumps. Process wastewater then flowed to two treatment tanks, the clarifier and post-neutralizer, and two sumps before discharging to the Kearny POTW. Non-contact cooling water blowdown was directed to the Basacryl pit. Water from the oil and gas coolers and non-contact boiler house water were also directed to the Basacryl pit sump (PAS-00054404).

BASF Corporation

Diamond Alkali OU2 Allocation

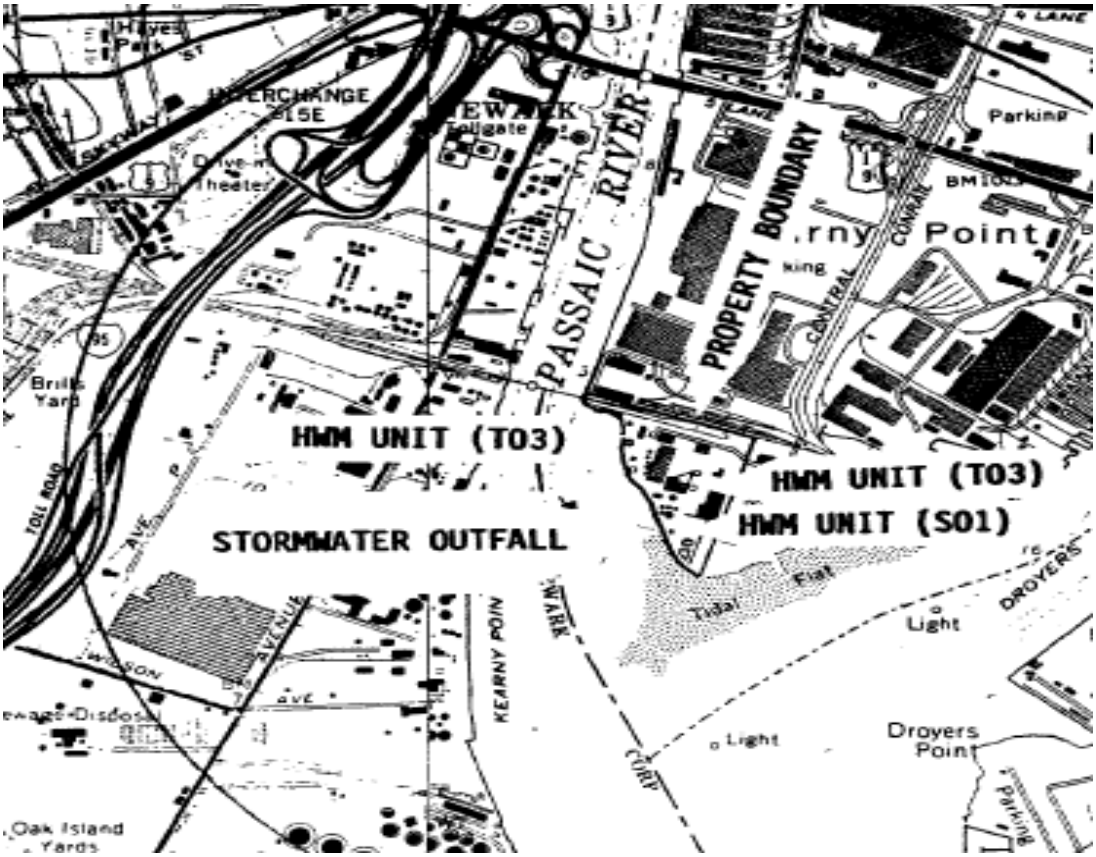
ADR Confidential

Facility Data Report

Based on a November 30, 1995 response to an EPA Request for Information, prior to December 2, 1988, BASF sent stormwater runoff to an underflow/overflow outfall pit (sump) to remove organics before discharging to Newark Bay (PAS-00054144). The sump contained two baffles; an underflow baffle retained any floating oils; and, an overflow baffle retained heavier suspended solids. A floating rope skimmer removed residual oils and conveyed them to a bulk storage tank. Debris and sediment in the storm sewers were retained in the second baffle and removed manually. Under normal conditions, surface water was discharged to the site WPT facility prior to discharge to the Kearney POTW. Only during intensely heavy rainfall did surface water overflow the diversion capacity and discharge into receiving waters (PAP-00058223).

According to the January 28, 1994 response to EPA Request for Information, storm flows originally discharged to the Passaic River through two concrete pipes located near the fire water tank on the southern tip of the property (PAS-00054405). According to a *Stormwater Pollution Prevention Plan*, dated July 1995, BASF's NJPDES Permit expired on July 17, 1989. Concurrently on that date, BASF began discharge of facility stormwater to the PVSC system (PAP-00061482). BASF ceased operations in 1990, and facility decommissioning took place between 1991 and 1992 (PAP-00061482).

A figure depicting the location of the stormwater outfall and the hazardous waste management units is presented on the below (PAP-00062194):



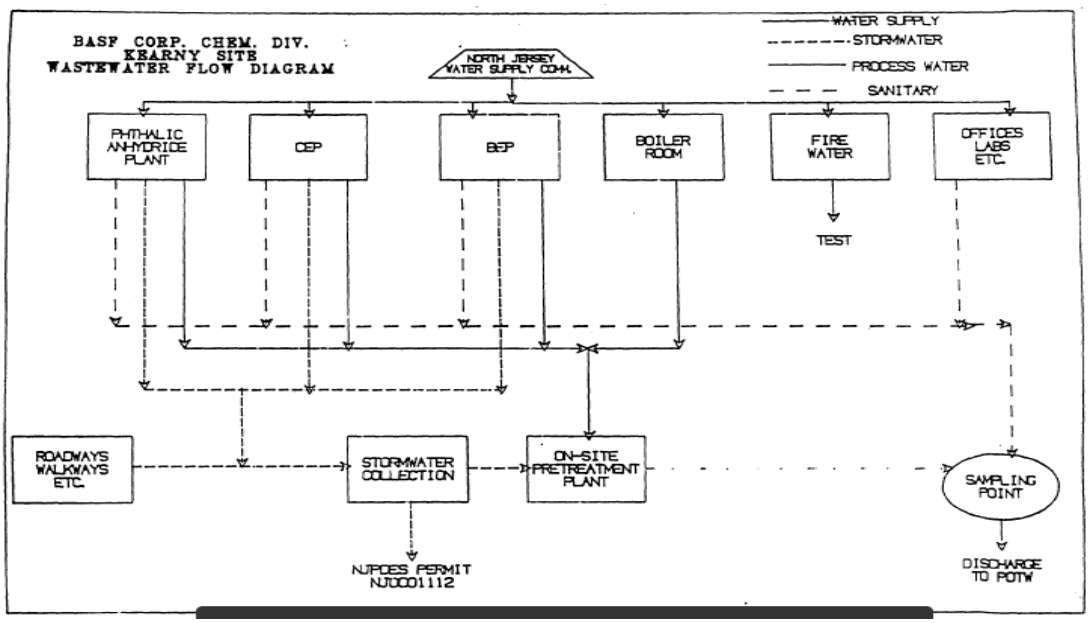
Documented wastewater discharge volumes are as follows:

- According to a *PVSC Waste Effluent Survey*, dated August 3, 1972, BASF Wyandotte Corporation used 30.9 million gallons for water for product and discharged 111.8 million gallons to the sanitary sewer in 1971. Rainfall of approximately 45 inches per year was noted to discharge to the storm sewer (PAP-00058130). The discharge to the sanitary sewer was continuous and constant over a 24 hour period with an approximate 5 percent reduction in volume on the weekends (PAP-00058131). Water quality results were not specified for OU2 COCs, so it is unclear whether testing of copper, lead, or mercury occurred.

- According to an undated EPA Standard Form A-Municipal, Section IV, Industrial Waste Contribution to Municipal System, the volume of water discharged to the Kearny POTW during 1973 was 823,000 gallons per day (PAP-00060973). On November 26, 1973, wastewater concentrations of lead were 0.0 and wastewater concentrations of mercury were 0.0003, however units were not specified (PAP-00060974).

- The effluent from the WPT facility and an existing dye plant resulted in 350,000 gallons per day, which was treated prior to discharge to the Kearny POTW (PAS-00054118). The time period for this information was not specified, but the WPT facility was constructed in 1973, so it must be post-1973.

- According to the amended *Baseline Monitoring Report*, dated November 30, 1988, the site average and maximum daily flows to the Kearny POTW were 248,000 gallons per day and 530,000 gallons per day, respectively, based on measured flows from October 1987 to November 1988. Non-contaminated wastewater (cooling tower blowdown - 7 percent, wet surface cooler - 8.5 percent, boiler regeneration - 7.7 percent, and demineralizer – 6.6 percent) constituted approximately 29.8% of the total flow (PAP-00060951). Six 24-hour composite samples of the site effluent were collected over a two-week period during February 1988; lead was detected at a maximum concentration of 0.100 ppm and an average concentration of 0.100 ppm (PAP-00060951, 57). The diagram below depicts the sampling location and the various water sources (PAP-00060958).



- According to a letter from BASF to NJDEP, dated June 17, 1994, since July 17, 1989, BASF discharged approximately 20,000 gallons per day of stormwater and sanitary waste to PVSC. BASF was instructed by PVSC to obtain a discharge permit for site stormwater (PAP-00061506).

Direct Release

According to the *PVSC Annual Report for 1971*, dated January 18, 1972, on July 13, 1971 PVSC received a call from Mr. T. Harding of the State Department of Environmental Protection about BASF discharging into the Passaic River. Upon inspection by PVSC, industrial waste was seen coming out of the ground and flowing into the Passaic River. BASF immediately ordered excavation of the area and found a break in a 3-inch pipe which was a temporary sanitary line for a construction trailer. The sewage from the main line was backing up and flowing out through the break. The break was repaired the same day and the line was later removed (PAS-00034592).

The PVSC *Annual Report for 1973*, dated February 28, 1974, stated BASF ordered five truckloads of 2-ethyl-hexanol from Eldorado Terminal Corp. for delivery on Saturday, February 10, 1973. During delivery, a welded seam ruptured on the storage tank and 2,500 barrels of alcohol drained into the Passaic River. The loss was not detected by BASF until Sunday, February 11, 1973. No detrimental effects were discovered upon inspection by BASF personnel (PAS-00034721).

Spills

According to a RCRA Part B Permit application revised in October 1985 and completed by Badische Corporation, barriers for drainage or flood control, and runoff control systems did not exist at the site (PAP-00062140).

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

According to information contained in BASF's January 28, 1994 response to an EPA Request for Information, in 1985 the sump drain overflowed twice due to rain. The first time was on August 30, 1985 when 34,000 gallons of wastewater spilled, and the second time was on October 23, 1985 when 20-25 gallons of "91P" spilled (PAS-00054427).

Spill reports state that two releases of No. 6 fuel oil occurred at the site: a spill of an unknown quantity of fuel oil occurred in 1965 (PAP-00057923), and a second spill of 10-15 gallons of No. 6 fuel oil occurred in 1984 (PAP-00057924).

Evidence of oil spillage near transformers located in the old substation (transformers with serial Nos. 68946, 528028, 528029, and 1316793) occurred near the northern property boundary (PAP-00061060). One transformer (serial No. 19415), which was located in the main substation near the maintenance building, had a possible weld leak that existed since February 1987 (PAP-00061135). An audit conducted in 1988 identified cracks in the concrete under certain transformers (PAP-00061133).

A table of spills and discharges that occurred at the site is presented below (PAP-00057923-25):

BASF CORPORATION
Kearny, New Jersey

ECRA PROGRAM

Former Spills or Discharges

Reference Number	Date	Chemical Released	Amount	Reported To	Action Taken
S-1	1973	2-ethylhexanol	150,000 gal	BASF	unknown
S-2	1965	#6 Fuel oil	unknown	unreported	none; oil from boiler was permitted to leak into soil by previous owner
S-3	1976	Molten Phthalic anhydride (old dye lab)	unknown	BASF	permitted to harden, chipped away
S-4	1/2/90	EP275 (mixed pthalate esters)	unknown	BASF	excavation of contaminated soil and debris
S-5	4/11/90	bis(2-ethylhexyl)phthalate(DEHP)	35 gal	BASF	outside contractor cleanup (Cambridge)
S-6	1977	indigo spill Palanil Plant	1,500	BASF	to sewer to WWTP
S-7	5/19/90	Phthalic Anhydride (PA)	50-70 gal	BASF	cleaned up
S-8	4/11/90	DEHP	35 gal	BASF	outside contractor cleanup (Cambridge)
S-9	2/22/90	Water/alcohol mix	10 gal	BASF	none seepage occurred
S-10	2/13/90	DEHP	20 gal	BASF	directed to sewer to WWTP
S-11	12/19/89	TOTN-E	25-35 gal	BASF	cleanup effected by BASF
S-12	1/6/90	Palanil N	10-20 gal	BASF	contained in dike
S-13	12/19/89	PA	15-20 gal	BASF	unknown
S-14	11/28/89	DEHP	4,000 gal	BASF	contained in dike/DEHP reworked
S-15	11/21/89	DEHP	15 gal	BASF	contained in drain
S-16	11/8/89	PA	85-90 gal	BASF	outside contractor cleanup (Cambridge)
S-17	9/5/89	DEHP	100 gal	BASF	outside contractor cleanup (Cambridge)
S-18	8/10/89	DEHP	200 gal	BASF	outside contractor cleanup (Cambridge)
S-19	5/3/89	PA	30-35 gal	BASF	spill dispersed with water
S-20	1/15/88	PA	45-50 gal	BASF	unknown

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

S-21	8/31/87	DEHP	30-40 gal	BASF	BASF cleaned up spill
S-22	9/8/87	PA	10 gal	BASF	contained in dike
S-23	4/30/87	2-ethylhexanol (EH)	100 gal	BASF	contained in dike
S-24	4/26/87	2EH	500 gal	BASF	contained in dike
S-25	4/15/87	DEHP	100 gal	BASF	BASF cleaned up spill
S-26	4/22/86	TOTM-E	20 gal	BASF	pads applied to spill
S-27	4/3/86	mixed organics	5-30 gal	BASF	unknown
S-28	4/2/86	DEHP	20 gal	BASF	contained in dike
S-29	3/10/86	DEHP	30-40 gal	BASF	unknown
S-30	3/3/86	PAL-N	5-10 gal	BASF	soda ash applied; spill cleaned up
S-31	2/6/86	PA	200 gal	BASF	unknown
S-32	12/19/85	Waste organics	unknown	BASF	unknown
S-33	12/2/85	Wastewater	unknown	BASF	unknown
S-34	10/23/85	91P	20-25 gal	BASF	overflow of sump due to rain
S-35	8/30/85	Wastewater	34,000 gal	BASF	overflow of sump due to rain
S-36	6/24/85	Wastewater	unknown	BASF	unknown
S-37	6/13/85	DEHP	400-500 gal	BASF	spill on concrete
S-38	1/3/85	PA	20 gal	BASF	unknown
S-39	1/26/85	Wastewater	7,000 gal unknown	BASF	soda ash and water applied to spill directed to sewer
S-40	11/4/84	DIDP-E	50 gal	BASF	directed to sewer
S-41	9/11/84	Isopropyl alcohol	100 gal	BASF	contained in diked area
S-42	8/2/84	PA	500 gal	BASF	unknown
S-43	7/18/84	DEHP	20 gal	BASF	unknown
S-44	7/9/84	91P	30 gal	BASF	unknown
S-45	6/19/84	DEHP	5-10 gal	BASF	absorbent applied and cleaned up
S-46	1/4/84	#6 fuel oil	10-15 gal	BASF	unknown
S-47	12/30/83	2EH	25 gal	BASF	cleaned up
S-48	12/19/83	Heat transfer salt	50 gal	BASF	unknown
S-49	12/13/83	Wastewater	unknown	BASF	directed to sewer
S-50	11/4/83	TOTM	15 gal	BASF	unknown
S-51	8/11/83	2EH	100 gal	BASF	unknown
S-52	5/13/83	2EH	30-35 gal	BASF	unknown
S-53	5/9/83	PA	30 gal	BASF	unknown
S-54	12/7/82	2EH	60 gal	BASF	unknown
S-55	6/15/82	2EH	60-70 gal	BASF	unknown
S-56	6/2/82	PA	70 gal	BASF	unknown
S-57	4/12/82	PA	15-20 gal	BASF	unknown
S-20A	6/8/88	DEHP	32,000 lbs.	NJDEP/BASF	All free liquid collected approximately 20 cy of soil and debris removed and shipped to Alabama.

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

6. Regulatory History/Enforcement Actions

Inspections

On March 7, 1990, BASF responded to a Compliance Evaluation Inspection/Corrective Action Report pertaining to exceedances of a permitted lead threshold of 0.05 ppm in upgradient Well 2 which in the second quarter of 1989 had 0.64 ppm lead, and three downgradient wells (4, 7, and 11) exceeded discharge limits at 0.076, 0.099, and 0.056 ppm, respectively. Base neutral extractables also exceeded discharge limits (PAP-00061049).

On October 4, 1994, BASF received a letter from NJDEP indicating that a September 13, 1994 inspection found a soil pile next to the Passaic River that was on a plastic liner. The booms were deteriorating and the pile was uncovered. The NJDEP Bureau of Environmental Evaluation and Cleanup Responsibility Assessment Supervisor required more information about the source of the pile that needed to be covered and properly boomed. BASF was to contact them with a proposed timeframe for submitting remedial investigation and remedial action work plans (PAP-00058586).

Violations

On January 20, 1981, BASF Wyandotte Corporation was found by NJDEP to have exceeded total organic carbon (TOCs) conditions of National Pollutant Discharge Elimination System (NPDES) Permit No. NJ0001112. The finding was based on an inspection sample taken on October 28, 1980 by NJDEP (PAP-00057808; PAP-00057822).

According to documents submitted with the *ECRA Site Evaluation Submission SES*, dated August 3, 1990, on April 14, 1988, BASF received a notice from NJDEP regarding significant violations of the NJPDES Permit No. NJ0001112. BASF had received an "unacceptable" rating from NJDEP following a Compliance Evaluation Inspection conducted on February 9, 1988. The Discharge Monitoring Reports (DMRs) for the period June 1, 1987 and August 31, 1987 revealed that all the permitted parameters (total organic carbon, petroleum hydrocarbons, temperature, and pH) exceeded established limitations. The DMRs for September 1, 1987 and November 30, 1987 revealed all parameters (with the exception of petroleum hydrocarbons) exceeded permit limitations (PAP-00057827-28).

On July 19, 1988 BASF received a Notification of Noncompliance with Sludge Quality Assurance Regulations from NJDEP which stated that they had no records of the facilities reporting, and was required to report in compliance within 60 days (PAP-00057832).

In August 1988, BASF was given a Notification of Reportable Events #22-27 for violating PCB regulations. The July 1987 Annual Report noted PCB contaminated transformer YAR 49871 had been stored for disposal on site for more than one year and the area the unit was stored in did not comply with regulations (PAP-00061053-58).

The site also had several violations related to the air permits, incinerator air emissions, and waste handling and/or documentation:

- The NJDEP issued a draft Notice of Final Denial of a Hazardous Waste Incinerator Permit Application for the PA incinerator (PAS-00054128). It is unknown when this notice was issued to BASF.

- On July 18 1988, BASF received an Administrative Order of Revocation and Notice of Civil Administrative Penalty Assessment for exceeding permit conditions for the incinerator (PAP-00057875).

- On October 11, 1988, BASF received an Administrative Order and Notice of Civil Administrative Penalty Assessment from NJDEP for operating an air pollution control apparatus with expired certificates (PAP-00057854).

- On November 1, 1988, NJDEP issued an Administrative Consent Order to BASF, and following a trial burn of the incinerator, a review of emission rates resulted in denial of the PA incinerator permit (PAS-00054133-35).

- On September 22, 1989, NJDEP issued an Administrative Order of Revocation and Notice of Civil Administrative Penalty Assessment to BASF for exceeding stack emissions from the incinerator (PAP-00057846).

- On November 19, 1989, NJDEP filed an Administrative Order and Notice of Civil administrative Penalty Assessment against BASF for failure to submit ten quarterly reports for the calendar periods April 1, 1987 to July 1, 1989 (PAP-00057843).

- In February 1990, BASF received a Notice of Civil Administrative Penalty Assessment from NJDEP for failure to submit a Risk Management Program Statement by June 30, 1989 (PAP-00057865).

- On June 21, 1990, Badische Corporation received a Notice of Civil Administrative Penalty Assessment from NJDEP for failure to submit a 1988 Generator Annual Report (PAP-00057857).

- On June 21, 1990, Badische Corporation received a Notice of Civil Administrative Penalty Assessment from NJDEP for failure to submit a hazardous waste generator annual report for 1989 (PAP-00057861).

On August 2, 1995, PVSC responded to a Request for Information and marked “yes” for BASF Wyandotte, indicating that they had information pertaining to the direct or indirect release, disposal, or discharges of hazardous substances into the Passaic River (PAP-00185357).

Permits

According to the September 4, 2002 *Sources of Dioxin in the PRRI Area*, by Tierra Solutions, non-contact water generated from the site's boiler room and PA Plant discharged directly to the Passaic River via a NJPDES permit to Discharge to Surface Water (PAP-00182860). However, no supporting documentation was provided with this document and this information was not corroborated with any other documentation. In a November 30, 1995 response to an EPA Request for Information, BASF states NJDEP issued a NJPDES stormwater discharge permit on November 30, 1979, Permit No. NJ0001112 (PAS-00054145). The NJPDES stormwater Permit No. NJ0001112 authorized BASF Wyandotte Corporation to discharge stormwater to Newark Bay/Passaic River beginning November 30, 1979 until December 2, 1988 (PAS-00054145).

According to a *Stormwater Pollution Prevention Plan*, dated July 1995, BASF's NJPDES Permit expired on July 17, 1989 (PAP-00061482); however, according to the *ECRA Site Evaluation Submission SES*, dated August 3, 1990, the permit expired on March 14, 1989 (PAP-00057792).

In 1995, BASF applied for and was issued another NJPDES stormwater discharge permit to Newark Bay (PAS-00054145).

On May 11, 1984, BASF was issued NJPDES Permit No. NJ0001112 that expired on March 14, 1989. The permit was effective on June 15, 1984. The permit covered discharges to groundwater from eight containment areas which functioned as surface impoundments and for the control of spills from storage tanks (PAP-00058643-45).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Phase I Sampling Plan Report/Phase II Sampling Plan, (*November 1991) (PAP-00059313)
- *ECRA Decommissioning Report,* August 1993 (PAP-00060085)
- *Remedial Investigation Work Plan,* January 1995 (PAP-00058675)
- *Stormwater Pollution Prevention Plan (SPPP),* July 1995 (PAP-00061474)
- *Remedial Action Work Plan,* October 1998 (PAS-00107417)
- *Addendum A Remedial Action Work, Plan* November 15, 2000 (PAP-00107459)
- *Remedial Investigation Report/Remedial Investigation Workplan,* October 2007 (PAP-00062216)
- *Remedial Action Report/Remedial Action Workplan*, November 2008 (PAP-00061578)
- *Baseline Ecological Evaluation (BEE)*, September 2008 (PAP-00062459)
- *Addendum 2 to the BEE,* May 2010 (PAP-00061437)
- *Soil Remediation Action Report*, 2011 (PAP-00062530)

Characterization Activities

Sewer

According to the updated *Baseline Monitoring Report*, dated November 30, 1988, six twenty-four hour composite samples of the site effluent were taken over a two week period during February 1988, and are stated to be representative of the expected pollutant discharge to Kearny POTW (PAP-00060951). Fluoranthene was detected at a maximum of 75 µg/L and an average of 24.3 µg/L; anthracene was detected at a maximum of 600 µg/L and an average of 213.3 µg/L; pyrene was detected at a maximum of 100 µg/L and an average of 27.5 µg/L; lead was detected at a maximum of 0.100 ppm and an average of 0.100 ppm (PAP-00060955-57).

Soil

Soil sampling results obtained from a *Remedial Investigation Work Plan, BASF Corporation*, dated January 1995 identified the following constituent concentrations:

Test Pit #19 – 26,000 µg/kg lead, 7,200 µg/kg copper, and 87 µg/kg mercury in test pit sample #S TP#19 (PAP-00058873).

AEC #1, Buildings 19, 28, and 28A – Soil sample #S SB1AEC1 collected between 0 and 0.5 feet bgs contained a laboratory estimated concentration of 7,200 µg/kg benzo(a)anthracene and was sampled on January 14, 1991 (PAP-00058783).

AEC #2, Tank Farm Area – Soil sample #S SB1AEC2 collected between 0 and 0.5 feet bgs contained 1,680 µg/kg benzo(b)fluoranthene. Sample was collected January 14, 1991 (PAP-00058799). Soil sample #AEC2-2B collected between 3.5 and 4 feet bgs contained 1,030 µg/kg benzo(a)anthracene. The sample was collected June 29, 1993 (PAP-00058803). Soil sample #AEC2-8A collected between 0 and 0.5 feet contained a laboratory estimated value of 4,400 µg/kg benzo(a)anthracene and 3,650 µg/kg benzo(b)fluoranthene. Sample was collected on June 29, 1993 (PAP-00058811). Soil sample #AEC2-9A collected between 0 and 0.5 feet bgs contained laboratory estimated concentration of 2,100 µg/kg benzo(a)anthracene. The sample was collected on June 30, 1993 (PAP-00058815).

AEC #3, Former Organic Waste Incinerator and Dowtherm Boiler Area – Soil sample #S AEC3-ADD2 collected between 0 and 0.5 feet bgs contained 3,280 µg/kg benzo(a)anthracene; 3,330 µg/kg benzo(a)pyrene and 5,040 µg/kg benzo(b)fluoranthene. The sample was collected on March 12, 1991 (PAP-00058819).

AEC #5, Compactor Area 40 Yard Compactor Roll-Off Box – Sample #S AEC5-ADD1 collected between 0 and 0.5 feet bgs contained 1,380 µg/kg benzo(b)fluoranthene. The sample was collected March 12, 1991 (PAP-00058827). Sample #AEC5-3 collected between 0 and 0.5 feet bgs contained 1,390 µg/kg benzo(b)fluoranthene. The sample was collected June 30, 1993 (PAP-00058831).

AEC #6, Buildings 23 and 23A, Boiler House Area and Basacryl Sump Pit – Sample #AEC6-1 collected between 3.5 and 4 feet bgs contained a laboratory estimated concentration of 1,500 µg/kg benzo(b)fluoranthene. The sample was collected June 28, 1993 (PAP-00058835).

AEC #7, Electrical Substation Area – Sample #S AEC7-ADD1 collected from the top six inches of soil contained 37,700 µg/kg Aroclor-1254 and 254,000 µg/kg Aroclor-1248. Sample was collected on March 11, 1991 (PAP-00058841). Sample #AEC7-1 collected from the top six inches of soil contained 23,200 µg/kg Aroclor-1232 and 2,220 µg/kg Aroclor-1260. The sample was collected on June 28, 1993 (PAP-00058845).

AEC #10, Electrical Substation Area – 758 µg/kg Aroclor-1260 was found in chip sample #X AEC10CH3 collected on January 22, 1991 (PAP-00058857). According to information contained in response to an EPA Request for Information, dated March 2, 1995, it states that PCBs in chip samples from the concrete pad ranged between 0.12 and 0.76 ppm in Area of Concern (AOC) 10 – Electrical Substation Area (Transformers 1, 2, 3, and 4) (PAS-00054098).

AEC #12, Continuous Ester Plant Area – Laboratory estimated value of 1,200 µg/kg benzo(b)fluoranthene in soil sample #AEC12-ADD1 collected from the top six inches of soil. The sample was collected on March 13, 1991 (PAP-00058863).

AEC #15, PA/CEP Tank Farm Area – 2,960 µg/kg indeno(1,2,3-c,d)pyrene and 2,810 µg/kg fluoranthene in soil sample #S AEC15-1 collected from the top six inches of soil. Sample was collected on January 18, 1991 (PAP-00058868).

AEC #16, Former Wastewater Lagoon Area – Soil sample #S B4AAEC16 collected from the top 6 inches of soil contained 1,940 µg/kg Aroclor 1254 collected on January 15, 1991 (PAP-00058881). Soil sample #S B1BAEC16 collected from the top six inches of soil contained 4,810 µg/kg benzo(a)anthracene, 5,560 µg/kg benzo(a)pyrene, 5,350 µg/kg benzo(b)fluoranthene, and 2,850 µg/kg benzo(k)fluoranthene. Sample was collected on January 15, 1991 (PAP-00058875). Soil sample #S B3BAEC16 collected from the top six inches of soil contained 5,060 µg/kg benzo(a)anthracene, 5,200 µg/kg benzo(a)pyrene, 5,380 µg/kg benzo(b)fluoranthene, and 4,620µ/kg benzo(k)fluoranthene. The sample was collected on January 15, 1991 (PAP-0058875). Soil sample #S SB5BAEC16 collected from the top six inches of soil contained 3,990 µg/kg benzo(a)anthracene, 5,970 µg/kg benzo(a)pyrene, 4,230 µg/kg benzo(b)fluoranthene, and 4,440 µg/kg dibenzo(k)fluoranthene. The sample was collected January 16, 1991 (PAP-00058879).

AEC #17, Wastewater Treatment Area [WPT Facility] – Soil sample #AEC17-ADD1 collected between 0.5 and 1 foot bgs contained 87,000 µg/kg copper, 64,000 µg/kg lead, and 280 µg/kg mercury. The sample was collected March 12, 1991 (PAP-00058889). Soil sample #AEC17-ADD1 collected within the top foot of soil contained 137 µg/kg Aroclor-1260 collected on March 12, 1991 (PAP-00058889). Soil sample #AEC17-ADD2 collected from between 0.5 and 1 feet bgs contained 1,280 µg/kg benzo(b)fluoranthene. The sample was collected on March 12, 1991 (PAP-00058887).

Soil sample #AEC17-ADD2 collected between 0.5 and 1 foot bgs contained 1,030 µg/kg indeno(1,2,3-c,d)pyrene (PAP-00058888).

AEC #18, Former Pilot Plant and Old Tank Farm – Soil sample #AEC18-ADD1 collected between 0 and 0.5 foot bgs contained 16,000 µg/kg copper, 34,000 µg/kg lead, and a laboratory estimated concentration of 42 µg/kg mercury. The sample was collected March 11, 1991 (PAP-00058897).

AEC #19, Former Dyestuff Plant and PA Flaker – Chip sample #X AEC19CH1 contained 425 µg/kg Aroclor 1260 and was collected on January 22, 1991 (PAP-00058901).

AEC #21, Railroad Spurs – Soil sample #AEC21-1A collected from 0 and 0.5 foot bgs contained 6,100,000 µg/kg copper, 37,000,000 µg/kg lead, and 2,200 µg/kg mercury. Sample was collected June 30, 1993 (PAP-00058917). Soil sample #S AEC21RR2B collected in the first six inches of soil contained 3,170 µg/kg benzo(a)anthracene, 714 µg/kg benzo(a)pyrene, and 2,040 µg/kg benzo(b)fluoranthene. The sample was collected March 11, 1991 (PAP-00058907). Soil sample #S AEC21RR4C collected from within the top 6 inches of soil contained 2,520 µg/kg benzo(a)anthracene, 2,990 µg/kg benzo(a)pyrene, and 3,490 µg/kg benzo(b)fluoranthene. The sample was collected March 12, 1991 (PAP-00058911). Soil sample #AEC21-1A collected from the top 6 inches of soil contained 3,560 µg/kg benzo(a)anthracene, 3,480 µg/kg benzo(a)pyrene, and 5,660 µg/kg benzo(b)fluoranthene. The sample was collected June 30, 1993 (PAP-00058915).

AEC #23, Former Stormwater Outfall – Soil sample #AEC23-ADD1 collected from 0 and 0.5 foot bgs contained 39,000 µg/kg copper, 27,000 µg/kg lead and 220 µg/kg mercury. The sample was collected March 12, 1991 (PAP-00058925).

According to the *Remedial Action Work Plan for BASF Corporation's Kearny Facility*, dated October 1998, Aroclor 1248 was detected at concentrations ranging between 0.640 and 254.0 milligrams per kilogram (mg/kg) at the site (PAS-00107438).

Remedial Activities

According to the *ECRA Decommissioning Report, BASF Corporation,* dated August 1993, activities included in decommissioning were asbestos removal, building and equipment decontamination, and sewer cleaning (PAP-00060089). BASF conducted a controlled plant closure by emptying tanks and piping, flushing them with detergents and/or caustics. Washwaters from the Palanil Area entered building drains that discharged to the sewer system to the on-site WPT facility. Decommissioning of the WPT facility involved passing washwater through a carbon and sand filtration system before entering the WPT facility. Sludge from the equalization tank, clarifier, and lime tank product was removed for off-site disposal (PAP-00060100-01). In the Batch Ester Area, where plant sewer systems were not available, wash water was collected or allowed to drain when available. Fuel tanks were emptied of content that was solidified and loaded for off-site disposal; staining and residual material was removed for off-site disposal (PAP-00060102). Hardened product in condensers were removed and drummed for off-site disposal. Sewers were cleaned with a high pressure jet hose

inserted into an upstream manhole or catch basin, and liquids and solids were removed via vacuum (PAP-00060104-05). Aboveground pipes were cleaned in a similar fashion. Solids were transported to an on-site pool, and liquids were decanted back into the sewer (PAP-00060105).

The *Remedial Action Work Plan for BASF Corporation's Kearny Facility*, dated October 1998, called for in situ remediation and a sediment washing pilot test for treatment of dredged sediments from the New York/New Jersey Harbor. The sediment washing project was conducted in conjunction with EPA, NJDEP and the Army Corps of Engineers. BASF ultimately planned to address the entire site with a full scale sediment treatment operation (PAS-00107420).

According to *Addendum A Remedial Action Work Plan for BASF Corporation's Kearny Facility*, dated November 15, 2000, due to the ubiquitous nature of metals and PAHs, the work plan singled out PCB remediation with soil/sediment washing. Metals and PAH concentrations and locations were believed to be the result of Historic Fill (PAS-00107471, 74). Soil washing extended to the water table with related soil suitable for non-residential usage relative to PCBs. Treated soil was to be deposited in a one foot layer over 12 acres of the untreated site (PAS-00107481). The *Remedial Action Report/Remedial Action Workplan*, dated November 14, 2008, states that between 2001 and 2005, BASF treated approximately 44,476 cubic yards by soil washing that included soil containing less than 50 mg/kg PCBs between August 2001 and June 2005. Treatment reduced PCB concentrations to within acceptable NRDCSCC. Soil exceeding that threshold was shipped offsite (PAP-00061602).

In a letter dated October 4, 2005, ELM, on behalf of BASF notified EPA that they were going to undertake a Self-Implementing PCB Cleanup (PAP-00061286). The *Remedial Action Report/Remedial Action Workplan*, dated November 14, 2008, states that BASF excavated 300 cubic yards of PCB contaminated soil with concentrations that exceeded Toxic Substances Control Act regulatory levels in 2005 (PAP-00061603). The *Remedial Action Report/Remedial Action Workplan*, dated November 14, 2008 also states that in response to the Notice of Self-Implementing PCB Remediation Notice, 438 tons of soil containing PCBs greater than 50 mg/kg above the water table were excavated and disposed of offsite. Any PCB concentrations remaining in the soil less than 100 mg/kg would be capped and incorporated into the site wide Deed Notice (PAP-00061603-04).

According to the *Baseline Ecological Evaluation*, dated September 2008, soil in two areas of the property contained PCBs at levels above 50 mg/kg. The contaminated soil from these two areas totaled approximately 400 cubic yards and were excavated under a self-implementing remedial action (PAP-0062469).

The *Remedial Investigation Report/Remedial Investigation Workplan*, dated October, 2, 2007 states that remedial actions to date included off-site delineation of PCBs along the southeastern property line to New Jersey Residential Direct Contact Soil Cleanup Criteria (RDCSCC) and removal of soil to address residual petroleum constituents (PAP-00062226). It was estimated there were approximately 5,000-6,000 cubic yards of contaminated soil with PCBs above the RDCSCC of 0.49 mg/kg beyond the southeastern property line (PAP-00062233). The document proposed excavation of soil

containing PCBs at concentrations greater than the RDCSCC and New Jersey Nonresidential Direct Contact Soil Cleanup Criteria (NRDCSCC) and establishing a Deed Notice (PAP-00062237).

According to the *Remedial Action Report/Remedial Action Workplan*, dated November 14, 2008, between September and October 2008, approximately 6,200 cubic yards of soil containing PCB concentrations greater than RDCSCC were removed from the Central Avenue Right of Way. Following sampling, it was determined approximately 5,200 cubic yards would be reused onsite and 1,000 yards would be appropriately disposed offsite (PAP-00061630). A site wide vegetative cap was proposed for the site (PAP-00061635). A site wide Deed Notice was filed with the Town of Kearny to designate the land use was for nonresidential purposes (PAP-00061635).

According to the *Baseline Ecological Evaluation*, dated September 2008, approximately 35,000 square feet of off-site PCB contaminated soil was removed in August 2008 (PAP-00062470).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

BENJAMIN MOORE & CO

Facility Name, Address and Size: Benjamin Moore & Co (Benjamin Moore), 134 Lister Avenue, Newark, New Jersey, 07105 (the BMC Plant); approximately 15.6 to 17 acres (PAP-00238238; PAP-00725042). The BMC Plant is bordered by the Passaic River on its north side and Lister Avenue on its south side (PAS-00014454). According to a *Generator Inspection Report*, prepared by the New Jersey Department of Environmental Protection (NJDEP) Solid and Hazardous Waste Enforcement Bureau (the *Generator Inspection Report*), dated December 10, 1996, the BMC Plant had 190 employees and operated 15 shifts a week (PAP-00238238).

1. **Business Type:** Benjamin Moore is a paint manufacturing company (PAP-00238576; PAP-00725044).

2. **Time Period of Ownership/Operations**

   Operator: 1925 to Present (Block 2438, Lots 40 and 62)
   1958 to Present (Block 2438, Lot 34)

   Owner: 1925 to Present (Block 2438, Lots 40 and 62)
   1958 to Present (Block 2438, Lot 34)
   (PAP-00238574-75)

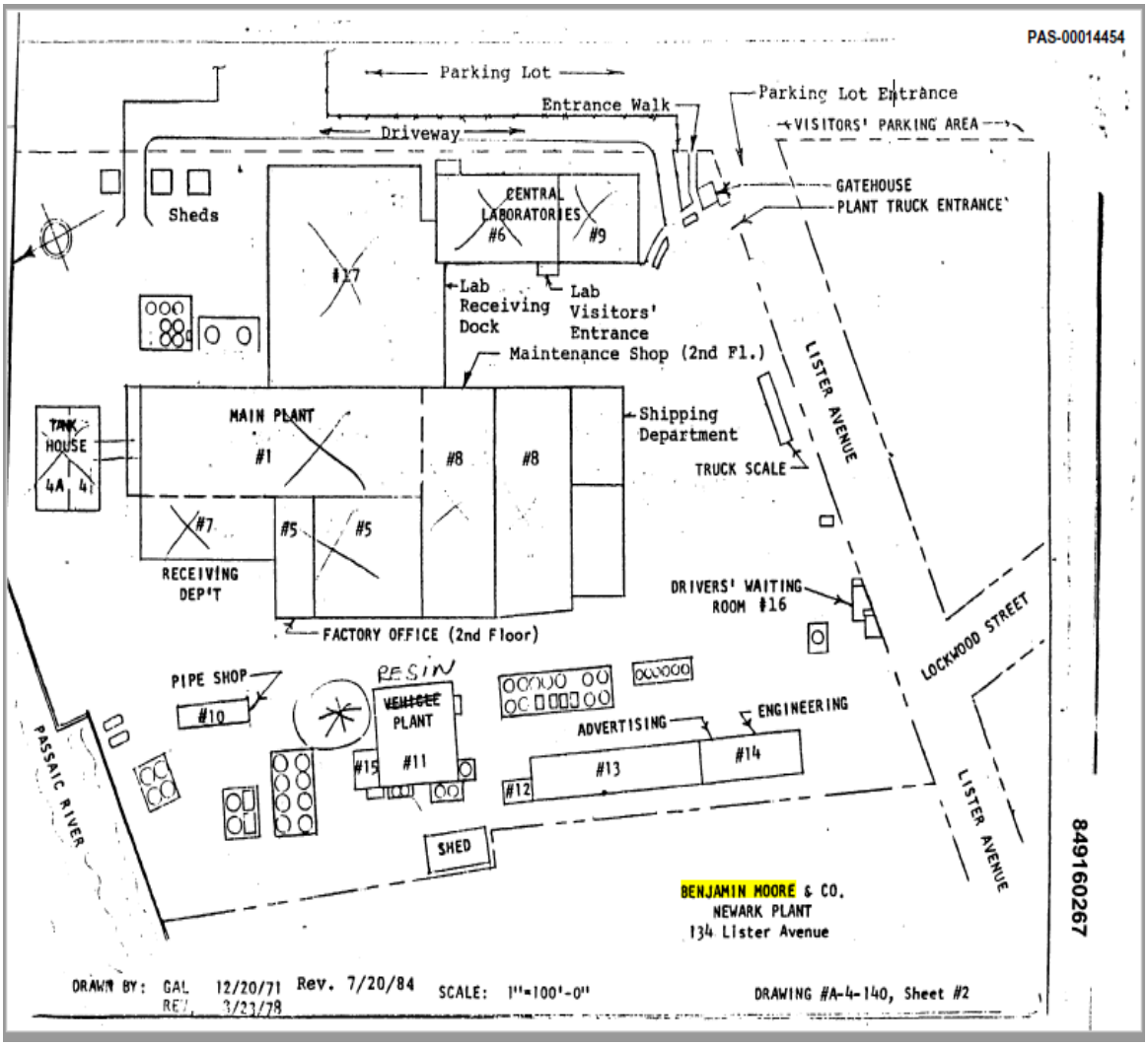
3. **Operational History/COC Use and Presence at the Facility**

   Over time, Benjamin Moore's manufacturing operations have consisted of: (a) manufacture of latex and alkyd resins (known as "vehicles"); (b) manufacture of latex and alkyd (oil-based, or solvent-based) paints, colorants, and technical coatings; and (c) packaging and distribution of finished products (PAP-00725044; PAS-00055155). The solvents used in alkyd paints contain mostly mineral spirits (PAP-00725044). Benjamin Moore has manufactured and packaged alkyd paint at the BMC Plant for distribution since 1925 (PAP-00725044; PAS-00055155). Benjamin Moore added the manufacture of latex paints in 1955, alkyd resin in 1959, latex resin in 1963, and colorants in 1965 (PAS-00055155-57). Benjamin Moore also manufactured aerosol paint sprays from 1966 to 1980 (PAS-00055155). Alkyd paints were phased out from production at the BMC Plant by 2012. As of 1993, "the facility produc[ed] 8 million gallons of paint per year which consist[ed] of 80 percent water-based [(i.e. latex)] paints and 20 percent solvent-based [(i.e. alkyd)] paints" (PAP-00238576). According to the *Terraphase Site Assessment Report,* dated April 16, 2019 and prepared for Benjamin Moore (the Site Assessment), the BMC Plant currently only manufactures latex vehicle, latex paints, and colorants (PAP-00725044).

   According to the Site Assessment, mercury compounds were used by Benjamin Moore in the manufacture of paints from approximately 1953 until as late as 1971 (PAP-00725047). Lead compounds were used from approximately 1951 until at least 1971. After 1971, lead chromate was added to paints; however, these specialty paints only comprised 0.4 percent of Benjamin Moore's total paint production (PAP-00238576; PAP-00725047-48).

According to the 1993 *Preliminary Assessment*, prepared by the NJDEP (the Preliminary Assessment), the spent solvents from these specialty paints were kept separate from other waste solvents (stored in 55-gal drums) and recycled in subsequent batches (PAP-00238576). Benjamin Moore used raw material containing trace amounts of copper compounds in pigments used in the manufacture of paint. Because no specific information regarding the timing and use of copper at the BMC Plant is included in the available file materials, the Site Assessment assumed copper may have been used during the entire manufacturing history (PAP-00725048). The facility stopped using mercury in paint in 1971 (PAP-00238576).

In 1984, the facility layout was as shown below.



(PAS-00014454)[1]

[1] Except for the yellow highlighting, PAS-00014454 has not been altered by AlterEcho to include the handwritten notes, which are original to the document as produced in this Allocation.

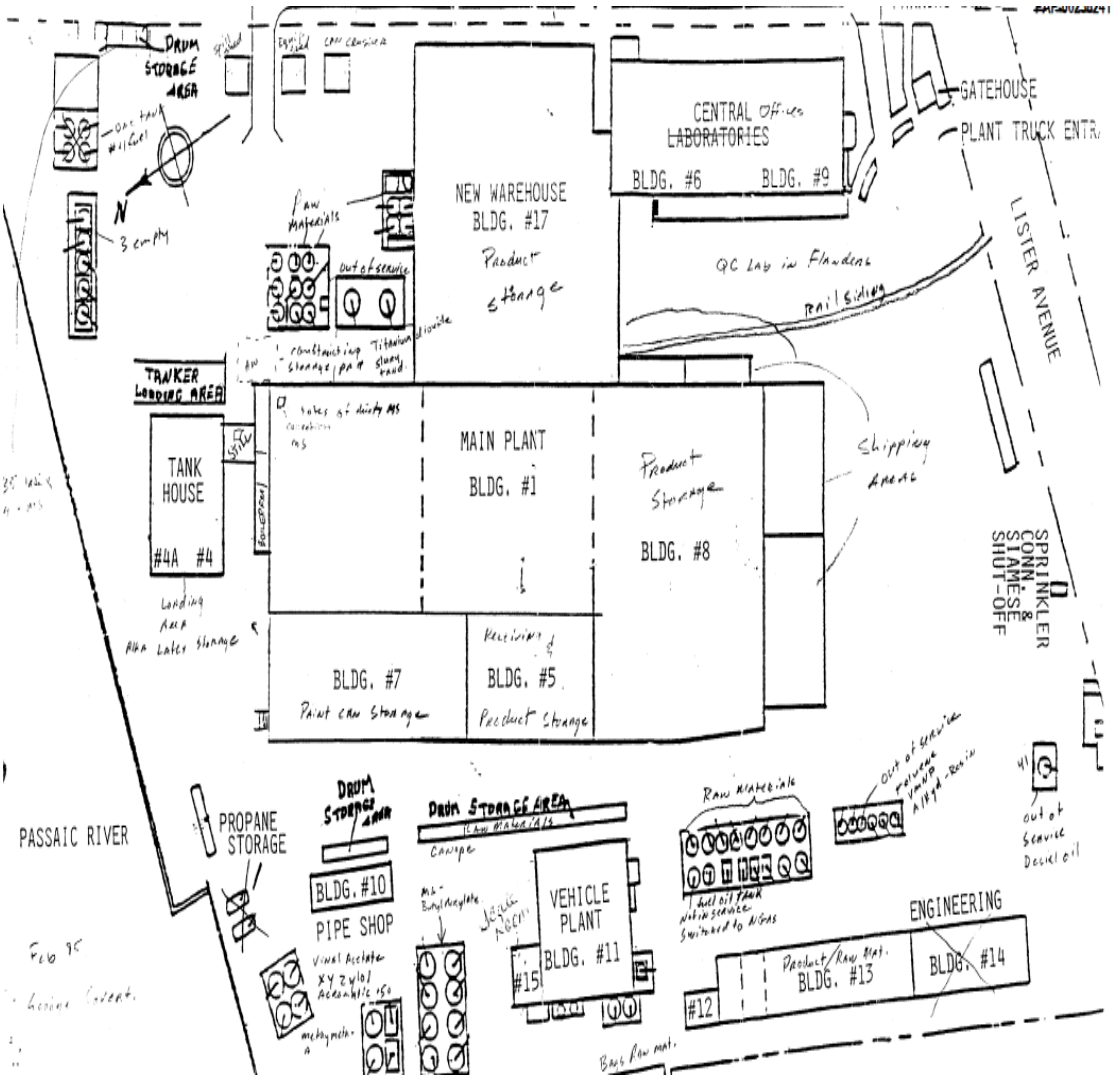
Benjamin Moore & Co

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

As described in the *Generator Inspection Report*, Benjamin Moore has several aboveground storage tanks (ASTs) for raw materials (resins and oils) and paint additives located at the BMC Plant (PAP-00238237-39). The ASTs are located in Buildings 4 and 4a and outdoors in diked areas located directly northeast of the central building complex (PAP-00725048). The ASTs do not store hazardous waste, and there are no other hazardous waste storage tanks or underground storage tanks (USTs) onsite (PAP-00238239; PAP-00725048). There are several additional storage areas, including areas for raw materials (Building 4 and 4a and Building 7) and for finished product (Building 5) (PAP-00725043). Product loading areas included Building 8 and Building 4, and the tank trailer loading area (PAP-00238239). Distribution areas are designated as Building 8 and Building 17 (PAP-00725043).



(PAP-00238241[2])

[2] PAP-00238241 has not been altered by AlterEcho to include the handwritten notes, which are original to the document as produced in this Allocation.

According to the Site Assessment, various processes result in the generation of waste from the BMC Plant, specifically the manufacture of alkyd paint, tank and equipment cleaning, washing of equipment with solvents, and washing of equipment with caustic solution. There are four waste streams generated through these processes: D001 (ignitable mineral spirit waste and paint sludge), D002 (sodium hydroxide or caustic soda), and F003 and F005 (spent non-halogenated solvents) (PAP-00725053). According to the *Generator Inspection Report*, in 1996 the facility generated the following hazardous waste streams: waste oil/mineral spirit based paints, classified as D001 (ignitable) waste; caustic solution (sodium hydroxide), used for process tank cleaning and classified as D002 (corrosive) waste; and waste latex paint related materials, classified as X900 waste (a NJDEP-specific non-hazardous process waste code) (PAP-00238239). According to the Site Assessment, based on the historic use of certain OU2 COCs in products, it is possible that trace amounts of OU2 COCs (lead, mercury, copper, and naphthalene) may have been present in wastes generated at the BMC Plant and discharged to the Passaic Valley Sewerage Commission (PVSC) system. However, as stated, any waste would have been pre-treated prior to discharge and there is no data to suggest more than *di minimis* quantities of OU2 COCs reached the Passaic River from Benjamin Moore (PAP-00725053). "The overwhelming evidence points to the fact that Benjamin Moore's waste was predominantly non-hazardous waste" (PAP-00725063).

Benjamin Moore recycled waste streams back into product or reused waste material as a cleaning solution as much as possible. According to the Site Assessment, "to the extent waste may have contained trace elements of certain [OU2] COCs, the waste was primarily recycled and reused in the next batch of product or disposed off-site." Historically, waste taken off-site may have contained trace amounts of [OU2] COCs, including copper, lead, or mercury present in wash water or solvent wash (PAP-00725063). None contained either PCBs or dioxin-related materials (PAP-00725064).

At the time of the *Generator Inspection Report*, 35-55 gallon drums of latex paint waste (X900) and four 55 gallon drums of oil/mineral spirit based paint waste (D001) were found in the waste storage area (PAP-00238239). All hazardous waste drums were labeled and displayed accumulation start dates. All hazardous wastes were shipped to North East Chemical Corp. in Cleveland, Ohio. Non-hazardous latex waste were shipped to the East Liverpool landfill in Warren, Ohio (PAP-00238239).

4. Identified COCs

- PCBs (used, detected)
- PAHs (used, detected)
- Copper (used)
- Lead (used, detected)
- Mercury (used)

PCBs

According to the Lehnert Affidavit, one part of the manufacturing process utilized a heat exchange system that required the use of substance known as Therminol, which contained PCBs (PAP-00238467-68).

According to the Terraphase Site Assessment, Benjamin Moore utilized a closed-loop heat transfer system in the alkyd manufacturing operation located in the former Building 11. The heat transfer fluid "was circulated in heat transfer 'jackets' external to the pressurized high temperature alkyd reaction vessels called kettles and was used to provide indirect/non-contact precision heating" up to 650 degrees Fahrenheit (PAP-00725050). According to the Site Assessment, this process was in operation using Therminol FR (a PCB-containing oil) from approximately 1969 to1972, and later Therminol 66 (a non-PCB-containing oil) from approximately 1972 to 1977. Therminol FR was never combined with, nor came in contact with, Benjamin Moore's product (PAP-00725050). Benjamin Moore sent spent Therminol FR to Monsanto to be disposed of by incineration (PAP-00238150). According to the February 1990 letter, Monsanto received 32 drums of heat transfer fluid from the Benjamin Moore facility in Newark, NJ (PAP-00238150). In 1982, Benjamin Moore confirmed through sampling that a sample of Therminol 66 submitted by Benjamin Moore did not contain PCBs above 1ppm (PAP-00238362).

A 1973 Benjamin Moore memorandum states that "Therminol leaks must be attended to promptly and a program should be instituted at once to replace faulty old type valves with new leak-proof ball valves" (PAP-00725212). According to the Site Assessment, because of the prior use of Therminol FR in Building 11, samples of concrete were collected for laboratory analysis. As a result of this sampling, concrete was identified with PCBs, with the highest concentrations of PCBs found in the area where the Therminol heater was located. Despite the known minor leaks associated with the Therminol heater, "[t]here was no evidence that minor leaks that may have occurred from the Therminol heater could have escaped the building and concrete slabs and no direct pathway from this portion of the building (e.g., floor drains, etc.)" (PAP-00725051).

According to the Site Assessment, "Benjamin Moore had transformers located outdoors at the BMC Plant that likely contained PCB-oils until the early- to mid-1980s. PCBs were also likely present in fluorescent light ballasts at the BMC Plant" (PAP-00725049). The record reflects there were no leaks from transformers or ballasts.

According to the 2018 RAR, during June and July 2001, Benjamin Moore installed a new water line for the fire sprinkler system at the facility. The line was installed in a trench dug on the western portion of the site. During the excavation of the trench, it appeared that soils in Area of Concern (AOC) 1, may have contained PCBs (PAP-00724499).

In June and July 2001, Ramboll collected four soil samples (TR1A, TR1B, TR2A, and TR2B) from each end of the sprinkler line trench. These samples were analyzed for PCBs. PCBs were not detected in samples TR1A, TR1B, or TR2B. Soil sample TR2A contained Aroclor-1242 at a concentration of 4.7 milligrams per kilogram (mg/kg). A limited volume of soil was later removed from boring TR2A and disposed off-site at CWM Chemical waste Services, LLC landfill in Model City, NY (PAP-00724499).

The 2018 RAR also notes that Benjamin Moore received correspondence from the NJDEP, dated November 1, 2004 and June 19, 2007 requiring delineation of the PCB impacts identified in the vicinity of TR2A. Soil samples were collected in August 2006, with supplemental sampling in December 2006, July 2007, and August 2007. The

delineation study concluded that the extent of PCB contamination extended to a maximum depth of approximately 10 feet below ground surface (ft bgs) over a 510 square foot area. The results of this delineation study suggested that given historic fill conditions in the region, coupled with only the sporadic occurrence of PCBs at low concentrations, the identified PCBs were attributed to historic fill (PAP-00724500). Benjamin Moore received approval for the Remedial Investigation Report/Remedial Action Work Plan and Remedial Action Work Plan Addendum in a February 14, 2012 correspondence from the NJDEP (PAP-00724500). According to the report, the majority of the site is covered with asphalt pavement or concrete and is surrounded by a 100-year flood wall, preventing stormwater from reaching the Passaic River (PAP-00724499-50).

Benjamin Moore also had hazardous waste manifests that stated that Benjamin Moore disposed two drums of PCBs in liquid form in 1985, which was around the time that Benjamin Moore was changing out oils in transformers that may have been PCB-containing. Additionally, Benjamin Moore disposed fluorescent light ballasts containing small capacitors noted as PCB waste in 1994 and 2009, and a transformer in 1999 (PAP-00238423-426; PAP-00725055).

Dioxins

As stated above, according to the 2018 RAR, during June and July 2001, Benjamin Moore installed a new water line for the fire sprinkler system at the facility. The line was installed in a trench dug on the western portion of the site (PAP-00724499).
In June and July 2001, Ramboll US Corporation collected four soil samples (TR1A, TR1B, TR2A, and TR2B) from each end of the sprinkler line trench. These samples were analyzed for dioxins. Dioxin levels were converted to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) Toxic Equivalents (TEQs), and all four results (0.001 microgram per kilogram [µg/kg], 0.0033 µg/kg, 0.0038 µg/kg, and 0.0093 µg/kg) were at least an order of magnitude below both Residential (0.051 µg/kg) and Industrial (0.72 µg/kg) EPA Regional Screening Levels. During the excavation of the trench, it appeared that soils in AOC 1 may have contained dioxins; however, based on available references Benjamin Moore did not use or store dioxin containing materials at the site; therefore, the source of onsite dioxin detections is unknown (PAP-00724499).

According to the Site Assessment, dioxin identified on site is “the result of deposition on the Benjamin Moore property, either by wind or flood, from the nearby Diamond Alkali property and [is] not the result of discharges at the BMC Plant from Benjamin Moore” (PAP-00725061).

According to the 2018 RAR, “[t]he majority of the site is covered with asphalt pavement or concrete and is surrounded by a 100-year flood wall, preventing storm water from reaching the underlying contaminated soil or the Passaic River” (PAP-00724499-50).

PAHs

Benjamin Moore used and stored certain PAHs, which were additives in certain products. According to the Site Assessment, Benjamin Moore used naphthalene as additives to paint products (PAP-00725065).

A fire-water sprinkler failure at the BMC Plant occurred in December 2007 south of Building 11, initiating an investigation that was consolidated with ENVIRON's then-ongoing investigation at the BMC Plant. Soil samples were collected and analyzed for Priority Pollutant volatile organic compounds (VOCs) with a 10- compound library search (VOC+10), Priority Pollutant Base Neutral SVOCs with a 15-compound library search (BN+15), Priority Pollutant metals (PP metals), Priority Pollutant pesticides (PP pest), Total Petroleum Hydrocarbons (TPHCs), and PCBs (PAP-00724500). Benzo(a)anthracene (0.93 mg/kg, MW02; 4.5-5 ft bgs) and benzo(b)fluoranthene (1.1 mg/kg, MW02, 4.5-5 ft bgs) concentrations exceeded the Residential Direct Contact (RDC) Soil Cleanup Criteria (SCC) and RDC Soil Remediation Standards (SRS) (PAP-00724814).

According to the 2018 RAR, "[t]he majority of the site is covered with asphalt pavement or concrete and is surrounded by a 100-year flood wall, preventing storm water from reaching the underlying contaminated soil or the Passaic River" (PAP-00724499-50).

Copper

According to Benjamin Moore's Supplemental Response, Benjamin Moore used raw material containing "trace amounts" of copper compounds in pigments in the manufacture of paint (PAS-00055010).

The Selected Substance Report, lists copper as a substance that was manufactured, processed, formed, repackaged, released, used, disposed of or stored at the BMC Plant (PAP-00238087-88). Copper phthalocyanine complexes were used as pigments in paint. The total copper substance released to the PVSC sanitary sewer was estimated to be 5 pounds per year, which was calculated to include any quantity of copper that may have been in the water supply from the City of Newark; the sewerage analysis was 0.144 ppm (PAP-00238095, 99). Sanitary wastes from the BMC Plant went directly to the PVSC system, where the waste was treated by the PVSC and then discharged to the New York Bay (PAP-00238579). Available file materials did not provide a specific timeframe over which these discharges occurred.

Lead

Benjamin Moore used lead compounds in the manufacture of paint from approximately 1951 until at least 1971 (PAP-00725047; PAP-00238576). According to Benjamin Moore's *Supplemental Response to EPA's First and Second Request for Information under CERCLA § 104(e)*, dated November 22, 1996 (Benjamin Moore's Supplemental Response), "At about the same time it eliminated mercury compounds in its latex paints [in 1968], Benjamin Moore also began eliminating the use of lead compounds" (PAS-00055009). According to an affidavit of employee Garry Lehnert (the Lehnert Affidavit),

yellow chromate, also known as lead chromate, was added to paints at the BMC Plant after 1971 (PAP-00238468); however, lead-containing specialty paints only comprised 0.4 percent of Benjamin Moore's total paint production (PAP-00238576).

The 1980 *Selected Substance Report*, prepared by Lawrence N. Berg for Benjamin Moore (the Selected Substance Report), lists lead as a substance that was manufactured, processed, formed, repackaged, released, used, disposed of or stored at the BMC Plant (PAP-00238087-88). Lead compounds were used as pigments and rust preventive agents in industrial maintenance coatings (PAP-00238096).

According to the *Preliminary Assessment*, "The spent solvents from . . . [lead-containing] paints were kept separate from other waste solvents (stored in 55-gal drums) and recycled in subsequent batches" (PAP-00238576). Lead-containing paint sludge was also stored separately and disposed off-site (PAP-00725048). As reported in the Selected Substance Report, the total amount of lead released to the PVSC sanitary sewer was estimated to be 36 pounds per year, which would include any quantity of lead that may have been in the water supply itself. The actual sewerage analysis was 0.31 parts per million (ppm) (PAP-00238096, 99). Sanitary wastes from the BMC Plant went directly to the PVSC system, where the waste was treated by the PVSC and then discharged to the New York Bay (PAP-00238579).

According to the 2018 Remedial Action Report, conducted by Ramboll US Corporation (the 2018 RAR), lead was identified in Historic Fill at the site and was within the range of Target Contaminant Concentrations of Historic Fill Material (PAP-00724501). Lead concentrations were addressed with the historic fill by an engineering control (i.e. cap) and a deed notice at the BMC Plant (PAP-00724504).

Waste disposal manifests from 1980 to 1994 stated that lead and lead-containing compounds were disposed to permitted disposal facilities (PAP-00238369-426).

Mercury

Benjamin Moore used mercury compounds in the manufacture of certain red paints and a biocide in latex paints from approximately 1953 until approximately 1968/1971 (PAS-00055009; PAP-00238468). According to Benjamin Moore's Supplemental Response, "In 1968, Benjamin Moore stopped using raw materials that contained mercury compounds in the manufacture of paint; mercury compounds were a common component of biocides - used to prevent mildew in water (latex) based paints. Benjamin Moore's elimination of mercury from its paint is verified by a June 1972 Consumer Reports article that tested exterior latex paints and commended Benjamin Moore for eliminating mercury from its paints although mercury was used by other paint manufacturers at the time of the article" (PAS-00055009; 59).

According to Benjamin Moore's Supplemental Response, "The only 'waste water' produced in its paint manufacturing process that BMC is aware of . . . was 'wash water'" (PAS-00055012). Wash water is an industry-specific term for waste water that results from rinsing equipment used in latex paint manufacture (PAS-00055012). According to the Site Assessment, the United States Environmental Protection Agency

(EPA) has not listed wash water as a hazardous waste (PAP-00725053). Benjamin Moore began recycling wash water "in 1955 when the plant began producing latex paint. . . . When the wash water could not be recycled because of its color, it was placed in a [lagoon], the water allowed to percolate or evaporate and the dried latex collected and disposed of as solid waste. NJDEP analysis of aerial photos of the plant concluded that a definite [lagoon] first appeared in 1971. However, one employee remembers that there was a [lagoon] settling system in use in 1966. This [lagoon] basin/system eventually became part of the stormwater retention system" (PAS-00055012).

The Selected Substance Report states that a lagoon was used onsite from 1954 to 1970 for the disposal of latex emulsion paint containing mercury. The amount disposed was noted to be unknown (PAP-00238088). The cover letter to the Selected Substance Report notes that the lagoon system was used to dispose of the wash water used for cleaning latex paint production machinery. Therefore, the wash water contained very diluted latex paint. The system consisted of two lagoons, one of which would be used until it filled up at which time they switched to the second one while the first lagoon dried out as a result of natural evaporation. The solid material was then dug out with a backhoe and hauled away by truck. Based on a typical paint recipe, the selected substance content of the solid material in the lagoons was in the neighborhood of 0.17% mercury. Phenol mercuric acetate was used as a mildewcide and bactericide during the 1950's and 1960's. Use of the lagoons was terminated in 1970 by order of top management. The letter states that no records were kept of the amount of the material pumped into the lagoon or the amount carted away (PAP-00238098-99). No information regarding sampling or remediation in the lagoon area was located.

According to a Benjamin Moore letter dated July 31, 1980, "Use of the lagoons was terminated in 1970 by order of [its] top management." No records were kept of the amount of the material pumped into the lagoons or the amount carted away (PAP-00238098-99). According to the Site Assessment, it is unlikely that contaminants in wash water, if any, would have adversely affected the Passaic River sediment through stormwater runoff. This is because the solids in wash water naturally settled to the bottom of the lagoon and were not likely dissolved in surface water. Solids accumulated in the lagoons were periodically removed and transported off-site for disposal and would not be expected to impact the stormwater and/or the river (PAP-00725064). No information regarding sampling or remediation in the lagoon area was located in the available file materials. The *Report on Flood Control for Manufacturing Plant of Benjamin Moore & Company* (the Flood Control Report), dated June 28, 1961, notes that on three occasions since the Main Plant Building was constructed in 1925, floodwater had risen above the first floor level (PAP-00238186).

Waste disposal manifests from 1980 to 1994 stated that mercury were disposed to permitted disposal facilities (PAP-00238369-426).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[3]

According to the 2018 RAR, Historic Fill was identified during Ramboll investigations conducted at the BMC Plant. The 2018 RAR notes that "[H]istoric fill contamination is ubiquitous in this area . . . . The NJDEP approved [an] action to address historic fill contamination present on-site in its correspondence dated February 14, 2012" (PAP-00724498-501, 507).

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[4] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[5] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[6]

Ramboll identified metals, PAHs, and PCBs within Historic Fill found on-site. Except for naphthalene, identified metals and PAHs were within the range of target contaminant concentrations in typical Historic Fill material. Ramboll attributed the naphthalene detection to Historic Fill; however, based on the semi-volatile organic compounds (SVOC) contaminant mix in the fill material (PAP-00724507).

Additionally, "[g]iven historic fill conditions in the region, coupled with only the sporadic occurrence of PCBs at low concentrations, Ramboll determined that the PCBs are the result of the historic placement of fill." Ramboll's attribution of PCBs to Historic Fill was approved by Benjamin Moore's Licensed Site Remediation Professional (LSRP) and accepted by the NJDEP (PAP-00725050).

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[3] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized Historic Fill).

[4] *Characterization of Ambient Levels of Selected Metals and PAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[5] New Jersey Department of Environmental Protection (NJDEP), N.J.A.C. 7:26E Technical Requirements for Site Remediation, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated Historic Fill Technical Guidance (April 2013) as NJDEP believed that the tables list of Historic Fill constituents was too restrictive].

[6] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

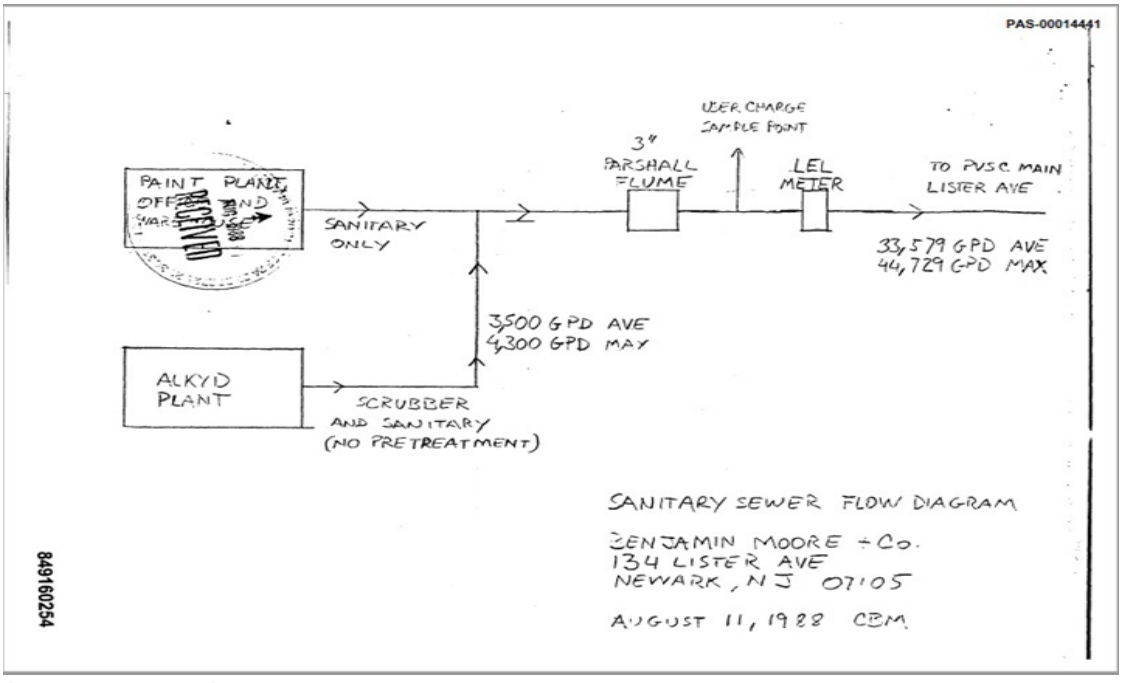
The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00725057).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,200 mg/kg
Benzo(a)anthracene	42 mg/kg
Benzo(a)pyrene	31.6 mg/kg
Benzo(b)fluoranthene	39.1 mg/kg
Benzo(k)fluoranthene	32.9 mg/kg
Dibenzo(a,h)anthracene	7.61 mg/kg
Indeno(1,2,3-cd)pyrene	17.7 mg/kg

5. COC Pathways

Sanitary Waste and Stormwater

According to a Benjamin Moore's Response to the Environmental Protection Agency's Request for Information under CERCLA 104(e), dated February 21, 1995, the BMC plant has always had a segregated plant stormwater system because of its location adjacent to the Passaic River (PAS-00055368; PAS-00055192, 96). A depiction of the location of the storm sewer and outfall, and a separate on-site stormwater outfall at the BMC Plant can be found on a Passaic River Study Area map (PAS-00055368). The sanitary waste system is depicted and further described below.



(PAS-00014441)

Sanitary Sewer

According to the Site Assessment, "Sanitary waste has been discharged directly to the PVSC sewer system since operations began at the BMC Plant in 1925 (PAP-00725051). Benjamin Moore first discharged sanitary waste under permit No. 20403112 and later under permit No. 20250002. According to Benjamin Moore's Passaic Valley Sewerage Commission Application for a Sewer Permit, approximately 8,183,261 gallons of sanitary waste was discharged to the PVSC under permit No. 20403112 from October 1994 until October 1995 (PAS-00055119). According to the Site Assessment, Benjamin Moore's "[p]ermit conditions require continuous monitoring of the effluent's lower explosive limit (LEL), as well as collection of a 24-hour composite sample for biological oxygen demand (BOD), total suspended solids (TSS), arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, and zinc to be reported to the PVSC on a monthly basis" (PAP-00725051).

PVSC permit 20250002 identified two outlets (one industrial, one sanitary) with approximately 0.019 million gallons per day (MGD) of industrial wastewater discharged in 2006 (PAP-00478668) and approximately 0.009 MGD in 2016 (PAP-00478689). PVSC permits 20403112 and 20250002 required monthly measurements for volume from both outlets, but volume limits were not specified.[7]

According to *Benjamin Moore's Supplemental Response*, "For a short period, 1967-1968, excess wash water was diluted with water to lower the solids content and then permissibly disposed in the sanitary sewer. The wash water was subsequently collected and sent to Earthline, a waste treatment facility next door to BMC, which then became SCA and finally Chemical Waste Management (CMW). There are no known records of these waste water shipments although a BMC employee who used to work for the SCA/CWM remembers treating BMC's wash water (flocculation of solids). In 1980, better use of recycling techniques led to the complete recycling of all wash water. There was no 'wash water' produced prior to 1955, when the plant began producing latex paint. Consequently, there are no diagrams of waste water collection or disposal systems" (PAS-00055012). According to the Site Assessment, Benjamin Moore never discharged solvent wash, which is hazardous due to its ignitability, to the PVSC sanitary sewer (PAP-00725054).

Data associated with Benjamin Moore's discharge to the PVSC showed low levels of copper (0.449 milligrams per liter [mg/l]), lead (<0.010 mg/l), and mercury (<0.0004 mg/l) in the discharge from November 1995 (PAS-00055118-122). According to the Site Assessment, these concentrations were below discharge thresholds (PAP-00725051). According to the Site Assessment,, "[w]aste manifests and notes from [Resource Conservation and Recovery Act] RCRA and NJDEP inspections conducted from 1978 until 1994 demonstrate Benjamin Moore was disposing waste containing lead and mercury offsite, confirming Benjamin Moore was not disposing these [lead and mercury] wastes to the PVSC" (PAP-00725055).

[7] This Report was revised to include documents received on May 26, 2020. The additional documents did not change Benjamin Moore's previous certification.

According to the Site Assessment, the PVSC has owned and operated a stormwater and sewage (industrial and sanitary wastes) collection system since 1924. The collection system carries stormwater and sewage to the PVSC treatment plant, which was installed in 1937. Once stormwater and sewage arrives at the treatment plant, they are treated to reduce solids and contaminants and then discharged primarily to the PVSC's primary outfall in the New York Bay. PVSC has a second outfall where waste is discharged at the mouth of the Newark Bay, but the outfall is used as a backup and like the primary outfall, all waste sent to this outfall is treated. Unlike other facilities which connect to PVSC sewer lines that are controlled with bypasses or have automatic discharges from combined sewer overflow, Benjamin Moore's stormwater was not connected to the PVSC system and the site's sanitary lines are "directly connected to the PVSC treatment plant and there has never been any bypass or CSO [combined sewer outfall] outfall between the BMC Plant and the PVSC treatment plant. . . . PVSC treated all waste sent to the [PVSC's] treatment plant before discharging to the New York Bay or backup outfall, and therefore Benjamin Moore's sanitary waste was treated before any discharge. No untreated waste from the BMC plant would have been discharged by PVSC to the River" (PAP-00725052). While it is possible that OU2 COCs from Benjamin Moore's operation (lead, mercury, copper, or naphthalene) were present in Benjamin Moore's sanitary wastes, it was a rare occasion that PVSC disposed of waste to its second outfall – any discharges from this outfall would be pretreated to stay within PVSC's discharge permit limitations (PAP-00725053).

Stormwater

According to the Site Assessment, Benjamin Moore currently collects stormwater at the BMC Plant using an underground stormwater system that discharges to a pump house on the northern end of the site, as recommended by a the Flood Control Report (PAP-00725052; PAP-00238199-201; PAS-00055012-13). Benjamin Moore implemented on-site secondary containment measures for tanks and chemical handling areas to protect the storm sewer from contamination via these areas (PAP-00725049). Water from the pump house is discharged to the Passaic River via connection to the City of Newark 72-inch storm water outfall, east of the pump house, which is situated on the Benjamin Moore property. On an occasion of heavy flooding, a manual pump in the pump house is evacuated when water rises to a predetermined level, and a wet well is used to pump the water either directly to the river via Benjamin Moore's 14-inch discharge pipe or to the City of Newark storm sewer. Benjamin Moore's stormwater discharge is permitted under NJPDES General Permit No. NJ0088315 (PAP-00725052). "Neither the direct (to the River) / emergency discharge system nor the normal storm water discharge system is connected to any process on the property. The sole function of both systems is to discharge storm water and any water that might collect within the property through rain, infiltration, or flood" (PAS-00055013).

According to the Site Assessment, Benjamin Moore directly discharged stormwater to the Passaic River via a 10-inch outfall that was sealed sometime after 1961 (PAP-00725052). For some time after the pump house was in use, Benjamin Moore also utilized a stormwater retention basin located on Lot 62, which was situated at the former lagoon location (PAP-00725052). The stormwater retention retained stormwater on site

rather than allowing it to enter the stormwater collection system and flow to the Passaic River (PAP-00725051).

The Flood Control Report recommended that the entire BMC Plant be surrounded by a 100-year flood wall (PAP-00238185-206). The wall was installed and is currently in place (PAS- 00055196; PAP-00725049). While the exact date of the installation was unknown, the wall was likely installed in response to the recommendations in the Flood Control Report (PAS-00238471; PAS-00238476). One record states the wall was in place by at latest 1986 (PAP-00238765). As previously discussed, the *Flood Control Report* notes that on three occasions since the Main Plant Building was constructed in 1925, floodwater had risen above the first floor level. These floods reportedly damaged manufactured products stored in the building, and raw materials in cars on Railroad Siding No. 1 (PAP-00238186). The Flood Control Report provides no information about the type of raw material damaged, but according to the Site Assessment, only the two latter flood events could have possibly come in contact with OU2 COCs, namely copper, lead, or mercury, if any such material was outside of designated storage containers. Benjamin Moore was not using Therminol FR during this time period (PAP-00725047-48, 50).

The City of Newark has an easement for the City of Newark storm sewer and outfall located on Benjamin Moore's property and is responsible for maintaining the storm sewer. Other industrial properties in the vicinity of Benjamin Moore discharge stormwater to the City of Newark stormwater system, which discharges in the outfall located on the BMC Plant (PAP-00725052). These facilities include the facilities connected to allocation parties 21st Century, Newark Group, Inc., STWB, and Atlas Refinery.

The *Flood Control* Report also stated that rain water runoff was to be directed through storm drains towards a pump station located alongside the River. This water was then to be placed in a cement holding sump. There were to be two pumps in the station. A manual pump was to direct the stormwater to the Newark storm system, where it would be treated by the PVSC (PAP-00238579-80). The *Preliminary Assessment* confirms that this approach was put into place. It also notes that on an occasion of heavy flooding, the manual pump was evacuated when the water rose to a predetermined level and a wet well was used to pump the water either directly to the river or discharge it to a storm sewer (PAP-00238579-80).

On August 15, 1969, Benjamin Moore received an Administrative Order from the New Jersey Department of Health (NJDOH), Water Pollution Control Program (WPCP), citing Benjamin Moore for the discharge of industrial waste and other polluting matter into the Passaic River (PAS-00055021). Benjamin Moore responded in an October 20, 1969 letter, which clarified that investigations at the BMC Plant revealed some incidents of latex wash liquid being discharged into the flood control system via a practice of rinsing strainers and thereby eventually into the Passaic River (PAS-00055008, 29). The letter stated that operators had subsequently been instructed not to do so (PAS-00055029; PAP-00725052). Benjamin Moore's solution to this problem was to collect and pump this rinse water "into the same storage area where all of the present latex wash from the paint plant [was] collected" (PAS-00055008, 29). According to Benjamin Moore's

Supplemental Response, “[i]n February 1973, after Benjamin Moore sought to clarify the status of the 1969 order, the State again tested some effluent discharged from Benjamin Moore’s storm water system. This test resulted in similar problems with color, turbidity, etc.” (PAS-00055008). According to a March 26, 1973 letter from Benjamin Moore to NJDEP, “[t]he effluent that [was] tested came from the discharge pipe of [the] underground storm water drainage system. The feeds to that system were catch basins in [the] yards and roof drains” (PAP-00055044). At that time, Benjamin Moore initially thought that the problem was caused by infiltration of river water into the sump, but Benjamin Moore decided to check the "entire underground drainage system, which feeds the drainage sump" (PAS-00055044). Further investigation as to the source of the exceedances revealed that the practice of rinsing strainers was not the result of a discharge; rather three drains in Building 11 were discharging to the storm sewer system from a portable kettle cooling operation, a reactor cooling system, and a sink in the laboratory” (PAP-00725052; PAP-00238493; PAS-00055009; PAS-00055196). Further “These drains were subsequently connected to the PVSC on or before May 1973 (PAP-00725052; PAS-00055049; PAS-00055196; PAP-00238493).

According to the Site Assessment, there is no indication that these drains allowed process waste or OU2 COCs to enter the storm sewer system by this inadvertent connection and “no COCs were associated with these water sources (PAP-00725052). All other drains at the BMC Plant were connected to the sanitary sewer, and “[t]he main paint plant and the vehicles manufacturing department never had floor drains” (PAS-00055196).). It should be noted that from approximately 1968 until the spring of 1972, Benjamin Moore used Therminol FR, a fire-resistant PCB-containing heat transfer fluid, in a closed loop heater system associated with the manufacture of alkyd resins in Building 11 at the Benjamin Moore facility. According to *Benjamin Moore’s Supplemental Response*, “Although there was a ‘release’ of water that allegedly caused problems with turbidity, etc., there is no evidence that this release contained hazardous materials. Neither turbidity nor color is related to the presence or discharge of hazardous materials. The water discharged from cooling the portable kettles would not have come in contact with any product material, so it could not pick up any hazardous materials if any were present. The scrubber used in the reactor system operated only when the manhole in the reactor was opened to add certain solid ingredients and would have picked up airborne particles released only during the addition of these ingredients into the reactor when the reactor manhole was open. . . . [t]he ingredients added to the reactor and the particles captured by this system do not contain chemicals similar to the list in 104 (e) question No. 3 as can be seen in examining the air permit for the scrubber . . . . The sink was used to wash hands” (PAS-00055009). According to the Site Assessment, the water discharged from the cooling and portable kettles would not have encountered any product material or PCB-containing Therminol. The only water discharged from the reactor would have been condensate water; all other material was recycled back into the reactor. The sink drain would have carried handwashing or possibly the washing of paintbrushes, but any discharge of [OU2] COCs would have been inconsequential. In addition, COCs that may have been present in certain pigments, additives, etc. (copper, lead, mercury) were not handled in Building 11. These COCs, when present, were managed and added to paints on the second floor of Building 1 (PAP-00725052-53).

According to the *Newark Testing Laboratories, Inc. Preliminary Report # 5*, dated August 16, 1967, pollution of the Passaic River by the Lockwood Street storm sewer was observed. An "[i]nternal inspection of the storm sewer on Lister Avenue (between Lockwood St. and gate . . .) revealed a heavy discharge of pollutant into the storm sewer through eroded openings in the sewer (north side) walls. The openings were spaced irregular over a distance of 30 to 40 feet along the wall; the first openings starting at approximately 75 feet west of Manhole Y . . . . Tests and observations indicated that the sanitary sewer on Lister Avenue has corroded and eroded its way into the storm sewer."

In addition, the following tests and observations were also made:

1. "Flow in the sanitary sewer (as observed at Manhole A) was to the east -- it should have been to the west. . . .
2. Manhole B, sanitary sewer, is clogged -- no flow. Sewerage is N[ot] flowing pass this point.
3. Test of paint solids in the sanitary sewer same as in the storm sewer.
4. Dye placed in sanitary sewer (Manhole A) observed six minutes later at storm sewer Manhole Y.
5. Actual observation of pollutant and dye flowing into storm s[ewer] through eroded wall openings."

Newark Testing Laboratories, Inc. suggested that a "temporary solution of this condition would be to clean out the Lister Ave. sanitary sewer, and if possible, prohibit the disc[harg]ing of paint solids into the sanitary sewer." According to the report, "the paint solids, [in] part, are composed of polymers which tend, especially with . . . flows, to coalesce and clog the sewer" (PAS-00055352-53).

Direct Release

Benjamin Moore has only one discharge pipe that leads directly to the Passaic River. This 14-inch discharge pipe is the outfall for the backup stormwater discharge system, which is activated manually only when a certain level of stormwater accumulates in the pump house that exceeds the capacity of the normal stormwater discharge system. It is a backup since it provides an alternative if the primary stormwater discharge system is not working, as well as an emergency discharge system that supplements the primary system under flood conditions. The primary stormwater discharge system consists of a sump pump and discharge pipe which empties into the Newark City Stormwater Discharge System's 60 inch outfall to the Passaic River on the extreme eastern part of the Benjamin Moore property (PAS-00055012-13). Available file materials did not provide information on any discharge permits that may have been associated with the Benjamin Moore discharge pipe or the City of Newark 60 inch outfall.

While the 60-inch outfall is technically on the BMC Plant's property, this system and outfall is part of the Newark stormwater discharge system and is owned and maintained by the City of Newark, which has an easement across Benjamin Moore's property for this purpose. Neither the direct (to the Passaic River) / emergency discharge system

nor the normal stormwater discharge system is connected to any process on the property. The sole function of both systems is to discharge stormwater and any water that might collect within the property through rain, infiltration, or flood (PAS-00055013).

Spills

According to Benjamin Moore's Supplemental Response, "In its continuing investigation, Benjamin Moore has discovered records of several incidents when small spills or leaks occurred in which low specific gravity liquids were released to the Passaic River" (PAS-00055014). These incidents are described below:

- Inadvertent discharge related to the Order Benjamin Moore received on August 15, 1969, from the NJDOH. According to Benjamin Moore's Supplemental Response, on August 15, 1969, the Water Pollution Control Program (WPCP) of the NJDOH issued an administrative order to Benjamin Moore. In response to a Benjamin Moore inquiry for the specific details on which the order was based, in a September 4, 1969 letter the State stated that the alleged violation was based on "pollution of the Passaic River in terms of odor, turbidity, color, biochemical oxygen demand, chemical oxygen demand, ether soluble matter and suspended solids" (PAS-00055008; PAS-00055021-22, 26). As described above, Benjamin Moore resolved the inadvertent discharge by connecting three pipes in Building 11 to the sanitary sewer system (PAS-0005500-099; PAS-00055049). The copy of the order and related correspondence did not list any OU COC (PAS-00055021-22, 26).

- "On March 23, 1978, the Coast Guard notified Benjamin Moore that a Coast Guard helicopter had noticed a spill from the plant in the River. Investigation with the Coast Guard found a 55-gal drum had been punctured approximately amid ships" and part of its contents had migrated to the Passaic River. The Coast Guard saw the material floating on the surface. There is no record of the contents of the drum. However, the fact that material was floating on the surface shows it was lighter than water, and would not have contained materials that would find themselves in the river sediment" (PAS-00055014-15). According to the Site Assessment, the spilled substance "could not have contained materials that would accumulate in sediments in the River" (PAP-00725052). The associated spill report is labeled as an "Oil Spill" Report (PAS-00055068-70).

- At 12:50 PM, July 8, 1980, a valve malfunction spilled about 3,000 gallons of wash solvent. Although this was contained by the retaining dike around the tanks, about 25-50 gallons allegedly leaked from the dike into the Passaic River. Benjamin Moore reported the incident to the PVSC, the NJDEP, the Coast Guard, and called in environmental spill specialists who used absorbent pads to collect the spill where possible (PAS-00055015; PAS-00055073-74). According to the Site Assessment, "Given the date of the release, the only COC that could have been contained in the wash solvent was naphthalene, but the presence, if at all, would have been insignificant" (PAP-00725055).

6. Regulatory History/Enforcement Actions

Inspections

According to the Site Assessment, waste manifests and notes from Resource Conservation and Recovery Act (RCRA) and NJDEP inspections conducted from 1978 until 1994 demonstrated that Benjamin Moore was disposing waste containing lead and mercury offsite, confirming that Benjamin Moore was not disposing waste to the PVSC (PAP-00725055).

No additional information regarding inspections pertaining to the COCs were found in the available file materials.

Violations

According to Benjamin Moore's Supplemental Response, on August 15, 1969, the WPCP of the NJDOH issued an Administrative Order to Benjamin Moore pursuant to the provisions of R.S. 58:12-2. In response to a Benjamin Moore inquiry for the specific details on which the order was based, in a September 4, 1969 letter the State stated that the alleged violation was based on "pollution of the Passaic River in terms of odor, turbidity, color, biochemical oxygen demand, chemical oxygen demand, other soluble matter and suspended solids" (PAS-00055008; PAS-00055021-22, 26).

Permits

According to the Site Assessment, the BMC Plant maintain the following permits and registrations:

RCRA (EPA ID NJD002453242): Benjamin Moore filed a RCRA Part A Hazardous Waste Permit Application with the USEPA on November 10, 1980 and was consequently listed as a Treatment, Storage, and Disposal (TSD) facility. In correspondence dated July 27, 1983, the NJDEP stated that Benjamin Moore would be delisted from a TSD facility to generator status. In addition, the NJDEP removed storage in tanks (S02) activity from Benjamin Moore's Part A application of record, leaving only storage in containers (S01) activity. The BMC Plant was officially reclassified as a generator (EPA ID NJD002453242) on December 8, 1986 and has be listed accordingly ever since (PAP-00725057).

Sewer Connection (20403111) and NJDPES (NJ0030414): Initially, Benjamin Moore had a NJPDES Discharge to Surface Water (DSW) permit to discharge non-contact cooling water into the Passaic River. After April 30, 1982, the BMC Plant redirected the cooling water into recirculated cooling water systems. The bleed off from these systems is now directed to the sanitary sewer and is treated by PVSC. Benjamin Moore also has a Sewer Connection Permit, which allows them to discharge cooling water and all other discharges from the plant to the PVSC system. There are two discharge lines going into the PVSC system: one outlet discharge is hooked-up from the central laboratory building and the second hook-up is connected to the scrubber water from the Vehicle Plant (PAP-00725057).

NJPDES (NJ0066788): Benjamin Moore maintains a NJPDES permit for discharge to surface water of boiler blow down and compressor blow down. Benjamin Moore submitted its permit application in 1987 (15-BenjaminMoore). Due to the Clean Water Act amendments, NJDEP asked Benjamin Moore to reapply when amendments were finalized. NJDEP issued the discharge permit in 1993 (PAP-00725057).

Current NPDES Permit (NJG117897) and Basic Industrial Stormwater General Permit (NJ0088315): The BMC Plant operates under a general NPDES permit effective February 1, 2018 that expires January 31, 2023. The storm sewer is protected from chemical contamination on-site by secondary containment of the various tanks and chemical handling areas (PAP-00725057-58).

Air Permit (NJ0000003401305067): The BMC Plant operates under a synthetic minor emission Clean Air Act ("CAA") permit (PAP-00725058).

Remedial Action Permit (RAP180001): A Remedial Action Permit for Soils was established for the BMC Plant on May 7, 2018 to address contamination in soil, primarily due to the presence of Historic Fill (PAP-00725058).

Classification Exception Area (CEA): A CEA encompasses the entire BMC Plant to a depth of 50 feet bgs. The CEA was established on May 8, 2018. Specifically, the CEA addresses the historical fill contaminants in groundwater, including arsenic, benzo(a)anthracene, benzo(a)pyrene, and cadmium, that are present in groundwater due to historic fill at concentrations greater than the New Jersey Groundwater Quality Standards (GWQS) (PAP-00725058).

According to a PVSC application for a sewer use permit, approximately 8,183,761 gallons of sanitary waste was discharged to the PVSC under permit No. 20403112 (PAS-00055118-119).

PVSC Permit 20403112 was effective April 14, 1991 to April 14, 1996 (PAP-00478629) and April 14, 1996 to April 14, 2001 (PAP-00478645). From 1991-1996, volume was measured quarterly for outlet 20403111-43700-0201 and semiannually for outlet 20403112-43700-0201. From 1996-2001, volume was measured monthly; however no limits were specified for volume. Limits were specified for lead in the 1991-1996 permit: daily maximum of 690 ug/L; monthly average 320 ug/L (PAP-00478638) for outlet 20403112-43700-0201. The permit from 1996-2001 specified monthly averages (0.54 mg/L for lead, 3.02 mg/L for copper, 0.080 mg/L for mercury) and threshold values (0.029 mg/L for lead, 0.092 mg/L for copper, 0.001 mg/L for mercury) for both outlets from July 1, 1997 to April 14, 2001 (PAP-00478649).[8]

PVSC Permit 20250002 was effective April 1, 2006 to March 31, 2011 (PAP-00478666) and April 1, 2016 to March 31, 2021 (PAP-00478687). Two outlets were identified as an industrial waste outlet and a sanitary/domestic waste outlet. Measurements for volume were collected monthly, but no limits were specified for volume in both outlets (PAP-

[8] This Report was revised to include documents received on May 26, 2020. The additional documents did not change Benjamin Moore's previous certification.

00478668-71, 89-92). The permit from 2006-2011 specified monthly averages (0.54 mg/L for lead, 3.02 mg/L for copper, 0.080 mg/L for mercury) and threshold values (0.029 mg/L for lead, 0.092 mg/L for copper, 0.001 mg/L for mercury) for the industrial outlet 20250002-1 (PAP-00478671). The permit from 2016-2021 updated the limits to daily maximums (1.3 mg/L for lead, 3.98 mg/L for copper, 0.06 mg/L for mercury) and threshold values (0.1 mg/L for lead, 0.4 mg/L for copper, 0.006 mg/L for mercury) for the industrial outlet (PAP-00478692).[9]

7. Response Actions

Characterization Activities

The following is a list of response action documents identified in the available file material:

- Remedial Action Report, Benjamin Moore, Block 2438: Lots 34, 40, and 62, Newark, Essex County, New Jersey, Program Interest No. G000002021, NJDEP Case Tracking No. 01-12-12-0056-19, dated February 2018 (PAP-00724492).

- Site Assessment, Benjamin Moore & Co. ("Benjamin Moore") 134 Lister Avenue Newark, New Jersey ("BMC Plant") Lower Passaic River Planned Allocation of Responsibility for Operable Unit 2 ("OU2"), dated April 16, 2019 (PAP-00725041).

Remedial Activities

Benjamin Moore engaged Ramboll to conduct investigation and remediation of three AOCs: AOC-1 (PCB area), AOC-2 (Historic Fill), and AOC-3 (Historic Fill contaminants in groundwater). According to the 2018 RAR, "during June and July 2001, Benjamin Moore installed a new water line for the fire sprinkler system at the facility. The line was installed in a trench dug on the western portion of the site." During the excavation of the trench, contractors recommended sampling for PCBs because of the concern of impact from the nearby Diamond Alkali facility. Ramboll submitted a Site Investigation in 2002. A small area of PCB-contaminated soil prompted a 2002 Memorandum of Agreement (MOA) with the NJDEP under the voluntary cleanup program to delineate PCBs in soils (PAP-00724499).

A fire-water sprinkler failure at the BMC Plant occurred in December 2007 south of Building 11, initiating an investigation into Historic Fill that was consolidated with Ramboll's then-ongoing investigation at the BMC Plant. According to the Site Assessment, "As described in subsequent [Ramboll] reports, although the initial characterization of AOC 1 targeted PCBs, it was concluded that historic fill is present site-wide and ubiquitous in this portion of Newark". The Historic Fill AOCs were added to the existing case (PAP-00725061).

[9] This Report was revised to include documents received on May 26, 2020. The additional documents did not change Benjamin Moore's previous certification.

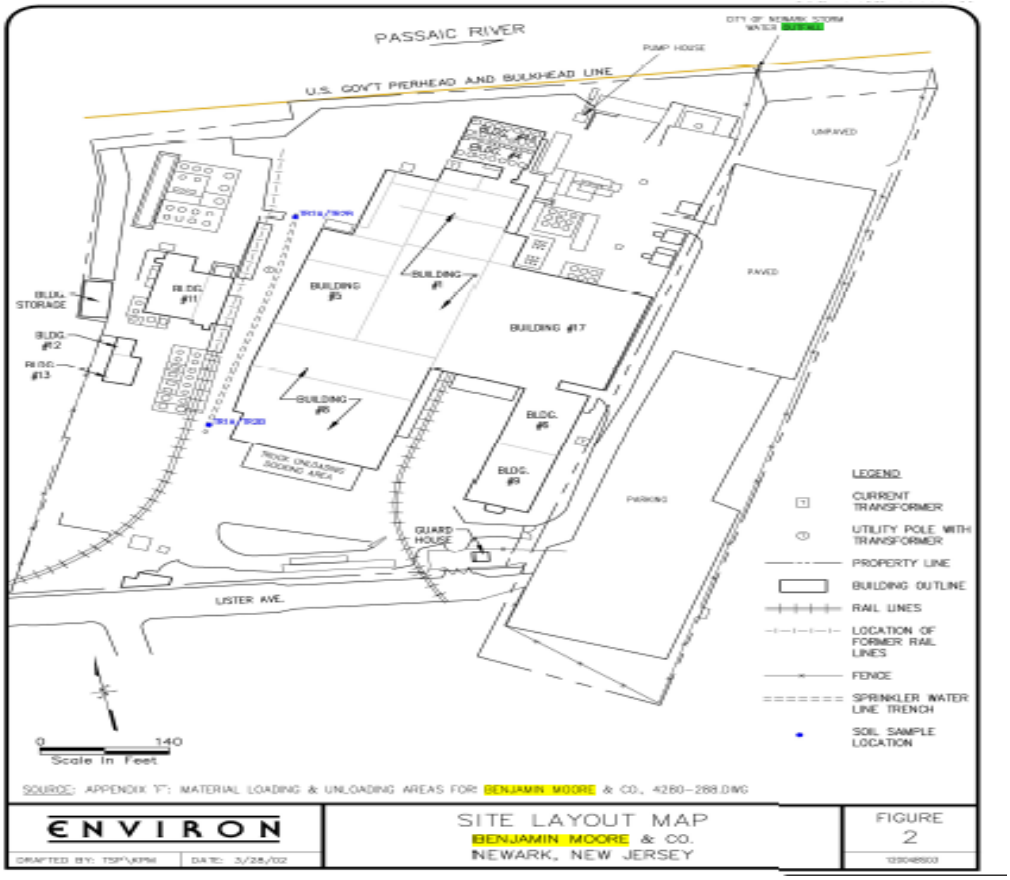
Ramboll submitted a Remedial Investigation Report/ Remedial Action Work Plan in 2007. The presence of Historic Fill identified in 2007 lead to a Remedial Action Workplan Addendum submitted in May 2008, which "proposed to contain-in-place PCB-impacted soils and site-wide historic fill soils with a deed restriction and engineering control (i.e., a cap.)." (PAP-00724497). A deed notice was recorded on November 17, 2017. The 2018 RAR was submitted in February 2018. Subsequently, Ramboll applied for a Remedial Action Permit for Soils on Benjamin Moore's behalf "to address contamination in soil, primarily due to the presence of historic fill" (PAP-00725058). The NJDEP established the permit on May 7, 2018. A CEA was also established on May 8, 2018. Benjamin Moore's LSRP issued a Remedial Action Outcome (RAO), signaling the remediation was complete, on June 25, 2018 (PAP-00725061).

Sewer

There is no information regarding sewer sampling in the available file material

Soil

Ramboll conducted investigations and remediation of two relevant AOCs:

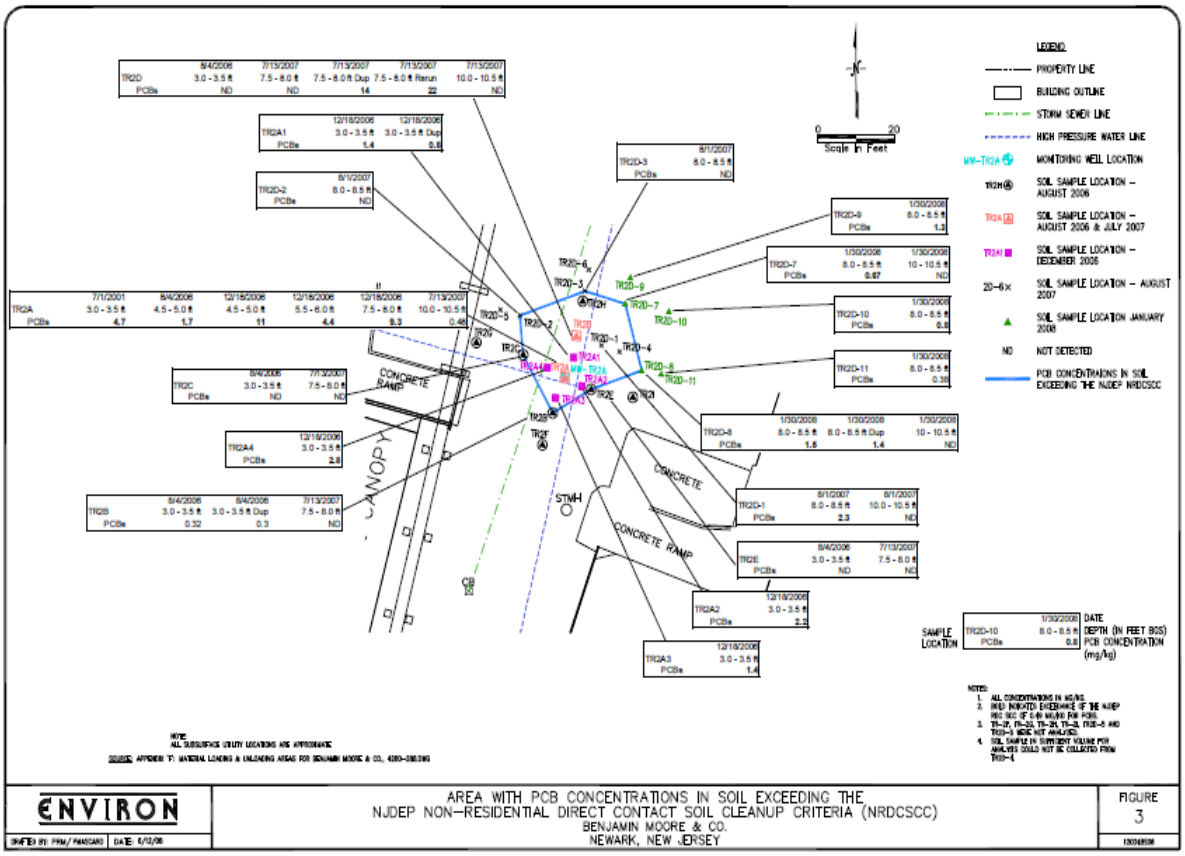


(PAP-00724586)

Further information on these investigations is provided below:

AOC -1: PCB Area

According to the Site Assessment, ENVIRON conducted an initial AOC-specific soil investigation and limited soil removal in the western portion of the BMC Plant in 2001 to address PCB impacts to soil (PAP-00725061). During this investigation, "Ramboll collected four soil samples (TR1A, TR1B, TR2A and TR2B) from each end of the sprinkler line trench. These samples were analyzed for PCBs . . . . PCBs were not detected in samples TR1A, TR1B or TR2B." (PAP-00724499). However, Aroclor-1242 was detected in one sample (TR2A at 4.7 mg/kg; 3-3.5 ft bgs) above the then-applicable Non-Residential cleanup standard. PCB-impacted soils in the location and vicinity of sample TR2A were removed and placed into two 55-gal drums, which were disposed off-site at CWM Chemical Waste Services, LLC landfill in Model City, NY (PAP-00724662; PAP-00725061).



PAP-00724662

The 2018 RAR notes that "Benjamin Moore received correspondences from the NJDEP, dated November 1, 2004 and June 19, 2007, requiring delineation of the PCB impacts identified in the vicinity of TR2A. Soil samples were collected in August 2006, with supplemental sampling in December 2006, July 2007, and August 2007. . . . The

delineation study concluded that the extent of PCB contamination extended to a maximum depth of approximately 10 ft bgs over a 510 square-foot area. The results of this delineation study suggested that given historic fill conditions in the region, coupled with only the sporadic occurrence of PCBs at low concentrations," the identified PCBs were attributed to historic fill (PAP-00724500). This position was approved by Benjamin Moore's LSRP and accepted by the NJDEP. "Benjamin Moore received approval for the [Remedial Investigation Report/Remedial Action Work Plan] and [Remedial Action Work Plan] Addendum in a February 14, 2012 correspondence from the NJDEP" (PAP-00724500). According to the 2018 RAR, "[t]he majority of the site is covered with asphalt pavement or concrete and is surrounded by a 100-year flood wall, preventing storm water from reaching the underlying contaminated soil or the Passaic River" (PAP-00724499-50). According to the Site Assessment,, "[g]iven the location of contamination in soils below an asphalt cap at the BMC Plant, within the 100-year flood wall, and not in proximity to a pathway to the River, it is not possible for the limited area of soil impact to migrate to the Passaic River" (PAP-00725062).

AOC-2: Pervasive Historic Fill

As described above, a fire-water sprinkler failure at the BMC Plant occurred in December 2007 south of Building 11, initiating an investigation that was consolidated with ENVIRON's then-ongoing investigation at the BMC Plant. Soil samples were collected and analyzed for Priority Pollutant VOCs with a 10-compound library search (VOC+10), Priority Pollutant Base Neutral SVOCs with a 15-compound library search (BN+15), Priority Pollutant metals (PP metals), Priority Pollutant pesticides (PP pest), Total Petroleum Hydrocarbons (TPHCs), and PCBs (PAP-00724500). Benzo(a)anthracene (0.93 mg/kg) and benzo(b)fluoranthene (1.1 mg/kg) concentrations exceeded the Residential Direct Contact (RDC) Soil Cleanup Criteria (SCC) and RDC Soil Remediation Standards (SRS). Benzo(a)pyrene exceeded the Non-Residential Direct Contact (NRDC) SCC and NRDCSRS concentration standards. Naphthalene was detected in concentrations greater than the RDCSRS and the NRDCSRS. Additionally, concentrations of lead (2,200 mg/kg) exceeded the RDCSRS, the RDCSCC, the NRDCSCC and the NRDCSRS (PAP-00724501).

According to the Site Assessment, with exception of antimony and chromium, the contaminants are within the range of Target Contaminant Concentrations in Typical Historic Fill Material (PAP-00724501). Although not a listed contaminant in the former Table 4-2, Ramboll stated ''[b]ased on the SVOC contaminant mix, this detection [of naphthalene] was likely due to historic fill'' (PAP-00724507). The LSRP of record agreed with this position in issuing a RAO for the historic fills and the NJDEP accepted this position by issuing a RAP for Soils (PAP-00725061). Thus, the metals and PAH compounds identified in the soil samples from Benjamin Moore are attributed to historic fill (PAP-00724501).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

BEROL CORPORATION

Facility Name, Address and Size: Berol Corporation, 41 Dickerson Street, Newark, NJ. The site is less than 2 acres (PAP-00103021); based on data from four years between 1975 and 1995, the facility had between 60 and 120 employees working 1 shift per day (PAP-00102592; PAP-00102612; PAP-00102656; PAP-00102695).

1. **Business Type:** Berol is the successor by merger to Faber-Castell Corporation ("Faber"), which operated a manufacturing facility at 41 Dickerson St, Newark, NJ between 1919 and 1996. In the early decades, Faber manufactured rubber bands and erasers at the facility. Over the years, Faber's manufacturing included other rubber and vinyl products, inks, and paint (PAS-00048587).

2. **Time Period of Ownership/Operations**

   Operator: 1919 to 1996 (PAS-0041518)
   Owner: 1919 to 1997 (PAP-00102725)

3. **Operational History/COC Use and Presence at the Facility**

   Faber-Castell Corporation (Faber) was engaged in rubber manufacturing and ink manufacturing (PAP-00102592). From approximately 1919 to 1954, Faber-Castell manufactured pencil erasers and rubber bands at the main building (i.e., Building 1) utilizing rubber materials (PAP-0034742-47; PAP-00103015). The manufacturing process at the Facility included the weighing and mixing of raw materials (i.e., rubber and plastisols), milling, curing, rolling to form sheets, extruding product shapes, vulcanizing, cooling, cutting to size, tumbling to smooth the edges and size, printing and packaging for sale (PAP-00103015). As of 1954, rubber bands were no longer manufactured. However, vinyl eraser products started to be manufactured around 1954 in addition to the rubber erasers, until at least 1995. Processing of vinyl products was identical to the rubber, except that the vinyl underwent a curing process of in-place vulcanizing (PAP-00103015). Between 1969 and 1989, the Facility manufactured water-based carbon drawing inks and India Ink, produced and sold under the name Higgins Inks (PAP-00103015).

   The raw materials used at the Facility included plastisols, di-octyl phthalate (DoP), natural and synthetic rubber (polyvinyl chloride), abrasives, rubber fillers (calcium carbonate, and carbon black), water dyes, dispersants and water proofing agents (PAP-00102612, 26); PAP-00102642; PAP-00102697).

   In a 1995 PVSC Sewer Connection Permit Application, the manufacturing activities are described as: "small production, specialty compounds on lab two roll mill" and "experimental compounds on two roll mills and vinyl mixer." The primary raw materials listed included: synthetic rubber, fillers, calcium carbonate, diatomaceous earth, and pumice, sulfur accelerators, activators-vinyl resin, fillers and plasticizers. The Facility's products and services include specialty rubber for plates; specialty gaskets; material evaluation, rubber and vinyl; experimental development compounds (PAP-00102658).

Berol Corporation

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

In addition, presented below is a list, identified as a "Hazardous Substance Inventory" in the March 1995 Preliminary Assessment Report for Faber-Castell Corporation (PAP-00103026-28).

MATERIAL NAME	ANNUAL USAGE	STORAGE METHOD	LOCATION	REMAIN ONSITE
Camel-Carb (calcium carbonate, e.g. limestone)	750,000 lbs	50 lb paper bags	Store Room, warehouse	Yes All
Factice & Carter Bell French White Products (vulcanized vegetable oil & calcium carbonate)	520,000 lbs	50 lb cardboard cartons	Store Room, warehouse	Yes All
PLIOVIC Resin & GEON (vinyl chloride resins)	150,000 lbs	50 lb paper bags	Store Room, warehouse	Yes All
Carbon Black	15 lbs	5 lb paper bags	Store Room, warehouse	Yes All
Byrates Barium Sulfate & Hi-Sil (contains silica)	12,000 lbs	50 lb paper bags	Store Room, warehouse	Yes All
Thiurd & Monothiurad (tetra methyl thiuram monosulphide)	550 lbs	25 lb paper bags	Store Room, warehouse	Yes All
Zinc Oxide	2,500 lbs	50 lb paper bags	Store Room, warehouse	Yes All
Sulfur	10,000 lbs	50 lb paper bags	Store Room, warehouse	Yes All
TEA - DLC- A (triethanolamine)	12,000 lbs	50 lb paper bags	Store Room, warehouse	Yes All
Stan-Mag Mini Beads (naphthenic distillate and magnesium oxide)	17,000 lbs	50 lb paper bags	Store Room, warehouse	Yes All

MATERIAL NAME	ANNUAL USAGE	STORAGE METHOD	LOCATION	REMAIN ONSITE
Santiguard Prevulcanization Inhibitor [N-(cyclohexylthio)-phthalimide]	2,900 lbs	50 lb paper bags	Store Room, warehouse	Yes All
Tellura Oil (naphthenic distillates)	71,000 lbs	AST	AST, former UST	Yes All
Palatinol - 711 (plastizer)	4,000 gal	2 ASTs	AST, former USTs	Yes All
Diethylene Glycol	135 lbs	55 gal drum	Boiler Room	Yes All
Akrosperse Green & Blue Pigments (copper compound)	3,000 lbs	10 lb paper bags	Store Room, warehouse	Yes All
Kerosene	10 gal	5 gal cans	Store Room, warehouse	No longer present
Higgins Ink	200,000	Mixing vats	2nd floor Bldg. 2	Yes All
Labeling inks	100 gal	5 gal can	packaging	Yes All
Fuel Oil	XX	USTs	former USTs	No longer present
Misc. grease and lubricating oils	150 gal	55 gal drums	Maintenance Dept.	Yes All
Waste Oil	50 gal	55 gal drum	Maintenance Dept.	Yes All
Acetone	50 gal	5 gal can	Store Room, warehouse	No longer present
Di-n-octyl-phthalate	175,000 gal	UST	former USTs	No longer presents

MATERIAL NAME	ANNUAL USAGE	STORAGE METHOD	LOCATION	REMAIN ONSITE
Naphtha	100 gal	UST	former UST	No longer present
Antimony	5,000 lbs	10 lb paper bags	Store Room, warehouse	No longer present
Asbestos	X	X	on pipes, etc.	Yes

4. Identified COCs

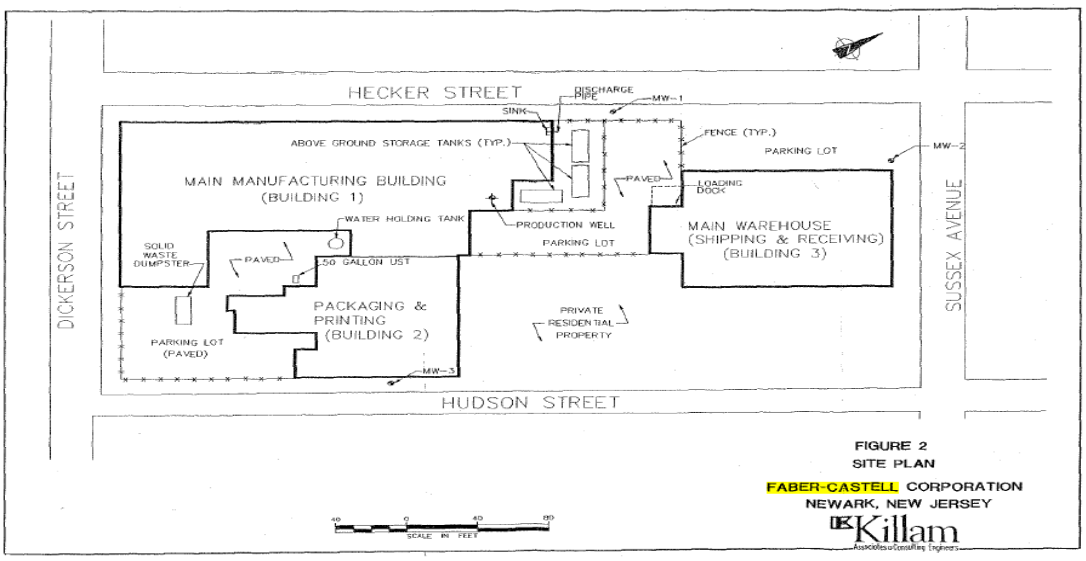
- PAHs (stored and used)
- Copper (stored and used)

PAHs

Certain materials used at the Facility contained petroleum hydrocarbons, which may have contained PAHs. Petroleum products, which may have contained PAHs, were used as fuel oil, lubricating oil, and in the rubber manufacturing process. They were stored in drums, USTs, and ASTs as described in the summary below (PAP-00103027-28):

- Product: Telura oil (napthenic distillates); Annual Usage: 71,000 lbs; Storage Method: AST, former UST;
- Product: Kerosene; Annual Usage: 10 gal; Storage Method: 5 gal cans;
- Product: Fuel Oil; Annual Usage: N/A; Storage Method: USTs (until removed);
- Product: Miscellaneous Grease and Lubricating Oils; Annual Usage: 150 gal; Storage Method: 55 gal drums;
- Product: Waste Oil; Annual Usage: 50 Gal; Storage Method: 55 gal drums;
- Product Name: Naptha; Annual Usage: 100 gal; Storage Method: UST (until removed);

According to the *PAR and RI Report*, dated March 1995, Killam Associates observed and documented the removal of the UST systems in approximately 1994 (PAP-00103043), when three ASTs were installed at the Faber site to replace the removal of the USTs (PAP-00103035). Each AST had a secondary containment structure, was located on concrete pads surrounded by asphalt pavement, and had above-ground piping (PAP-00103035). Presented below is a figure showing the location of these ASTs:



PAP-00103064

Three Areas of Environmental Concern (AECs) were identified at Faber in a Remedial Investigation conducted in 1995. These areas include: the former Naphtha UST previously located in the courtyard area between the Main Manufacturing Building and Packaging & Printing Building; stained areas on compromised asphalt in the courtyard area; and a sink drain pipe discharge (located at the northeast corner of the Main Manufacturing Building near the ASTs). Laboratory analytical results identified bis(2-ethylhexyl)phthalate in soil samples from borings SB-3 at >790 milligrams per kilogram (mg/kg) and SB-4 at >2600 mg/kg. Elevated soil levels of benzo(a)anthracene (20 mg/kg at SB-6), benzo(b)fluoranthene (34 mg/kg at SB-6), benzo(k)fluoranthene (7.5 mg/kg at SB-3), benzo(a)pyrene (16 mg/kg at SB-6), indeno(1,2,3-cd)pyrene (7.8 mg/kg at SB-4), and dibenzo(a,h)anthracene (6 mg/kg at SB-6) were also identified (PAP-00103053-58, 64-66).

Copper

As mentioned in Section 3, Operational History/COC Use and Presence at the Facility, Faber used Akrosperse Green and Blue Pigments, which contain a copper compound. According to the *Preliminary Assessment Report and Remedial Investigation Report for Faber-Castell Corporation, ISRA Case No. 94569* prepared by Killam Associates dated March 1995 (PAR and RI Report), Faber used 3,000 lbs of Akrosperse Green and Blue Pigments annually. The pigments were stored in 10-lb bags in the Store Room in the Warehouse (PAP-00103027). There is no information regarding copper releases in the available file material.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Benzo(a)anthracene	20 mg/kg
Benzo(a)pyrene	16 mg/kg
Benzo(b)fluoranthene	34 mg/kg
Benzo(k)fluoranthene	7.5 mg/kg
Dibenzo(a,h)anthracene	6 mg/kg
Indeno(1,2,3-cd)pyrene	7.8 mg/kg

5. COC Pathways

Sanitary Sewer

According to the *PAR and RI Report* dated March, 1995, sanitary discharges from each of the three buildings was directed to the municipal sanitary sewer system, which discharged to the Passaic Valley Sewerage Commission (PVSC) interceptor (PAP-00103015). Presented below is a figure showing the location of the main sanitary line and the sanitary system piping (PAP-00103031). The stormwater at the facility was collected in stormwater drains located in the courtyard and then discharged to the combined municipal sanitary sewer system (PAP-00103031, PAP-00103035).

Industrial discharges only occurred from Building 1 and Building 2 and were also directed to the municipal sanitary system (by permits discussed in Section 6). The industrial discharges were comprised of steam condensation, boiler blow down and contact and non-contact cooling water. Other than sanitary waste, no solids were discharged with the industrial waste. Industrial waste collection sumps were located in each building and were monitored and reported on a monthly basis to the sewerage authority (PAP-00103015). The discharge limitations listed in the Facility's 1995 Draft PVSC Sewer Connection Permit included monthly monitoring requirements for biological oxygen demand, total suspended solids, and wastewater volume (PAP-00102676). There were no known discharge limitations or permit violations related to any PAHs. The 1995 Draft PVSC Sewer Connection Permit also included monitoring requirements for metals, at local limits for users in the area for copper, lead and mercury, at Outlet No. 20407462-41900-0201 and Outlet No. 20407463-41900-0201 (PAP-00102679-80).

The majority of raw materials and the finished product at this facility were in solid form. Waste from the processes were placed in various containers (fiber drums, plastic totes, etc.). The solid waste was then either recycled back into the process or discarded as a

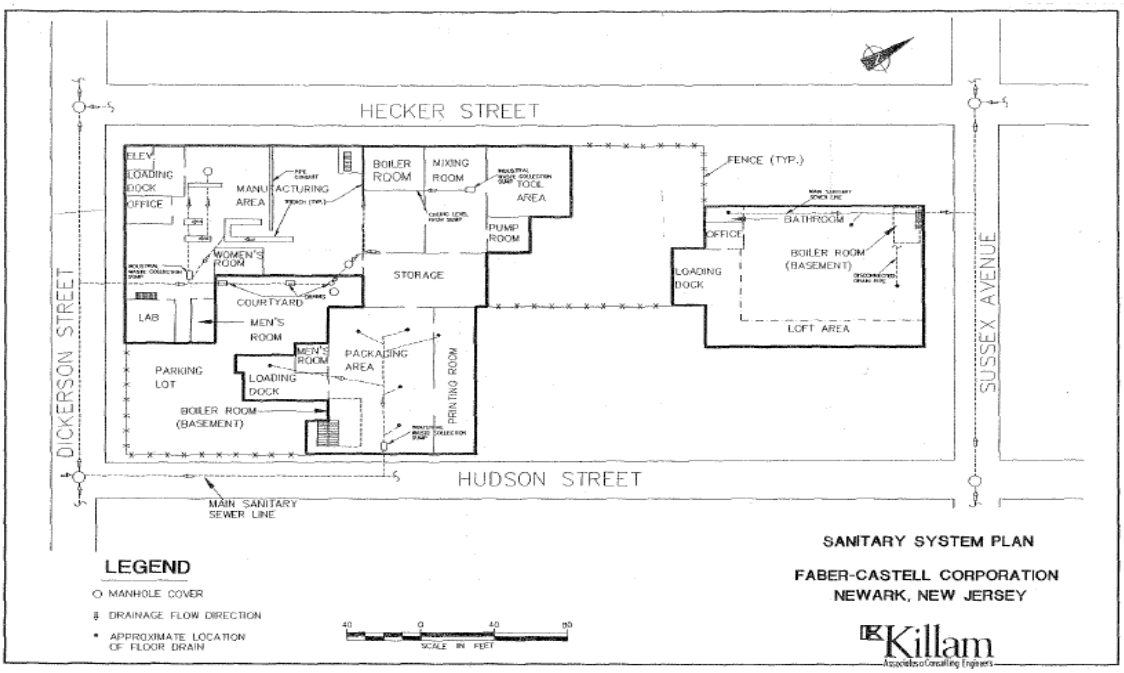
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

solid, nonhazardous waste. A roll-off waste container for the solid waste was maintained in the parking area between buildings 1 and 2. The container was emptied by Sisborro Disposal, Inc. and monitored by the Essex County Utility Authority (PAP-00103016). A letter from Killam Associates stated that over 150 tons of waste was generated during the 1995 operating year under waste manifest number NJA2260178. According to the IC form submitted to NJDEP "waste resulted from Soil Cleanup – Not from normal operations (PAP-00455499). Separately, Uniform Hazardous Waste Manifests from March 21, 1997, after manufacturing operations at the Facility ceased indicated that 11 pounds of "Waste Mercury: Compound Solid N.O.S 6.1 UN2025 PKG: II and 21 pounds of "Waste Mercury 8 UN280 PKG: II were transported offsite (PAP-00445934-35).

There are no direct outfalls from the Facility to the Passaic River. Prior to 1924 (i.e., between 1919 and 1924), the Facility is believed to have discharged to the public sewer system, which in turn discharged to the Passaic River at Clay Street (PAP-00348975; PAP-00349305, 12; PAP-00349764-65).

After the construction of the PVSC interceptor in 1924, the street sewers on Sussex Avenue, Dickerson Street and Hudson Street discharged to the PVSC interceptor at Clay Street (PAP-00349762; PAP-00349853). The PVSC interceptor discharged to the PVSC treatment plant (PAP-00349628). The Clay Street CSO chamber opened during certain wet weather conditions to allow excess combined sewer flow to overflow to the Passaic at the Lower Passaic River Study Area ("LPRSA") (PAP-00349628).

Based on an October 1995 PVSC Sewer Connection Permit Application, the annual wastewater discharge into the City of Newark combined sewer system was 7,537,216 gallons, of which 1,540,000 was sanitary wastewater (PAP-00102657).



(PAP-00193031)

6. Regulatory History/Enforcement Actions

Permits

In 1980, Berol submitted a PVSC Sewer Connection Application, which was titled a "Renewal Application" (PAP-00102612). PVSC Sewer Connection Applications were also submitted in 1985 (PAP-00102640) and 1990 (PAP-00425704). The facility applied for Sewer Connection Permit No. 20402123 in 1985, which was later superseded (PAP-00102640). The facility was issued PVSC Sewer Connection Permits for Permit No. 20402123 in 1981 and 1991 (PAP-00425689, PAP-00425724). In 1995, a sewer connection permit application was submitted and the Facility was assigned Sewer Connection Permit No. 20407463 (PAP-00102674). A PVSC Sewer Connection Permit was issued on November 9, 1995 with an expiration date of November 9, 2000 (PAP-00102674; PAP-00425739). The permit specified one domestic wastewater outlet and two industrial wastewater discharge outlets, which are summarized below (PAP-00102676-80):

- Outlet No. 20407461-41900-0201, domestic outlet (Sussex Avenue)
- Outlet No. 20407462-41900-0201, industrial wastewater outlet located in a pit in the rubber manufacturing area on the first floor of Building No. 1 (Dickerson Street)
- Outlet No. 20407463-41900-0201, industrial wastewater outlet located in a pit in the packaging area on the first floor of Building No. 2 (Hudson Street)

The discharge limitations listed in the Facility's discharge permit included monthly monitoring requirements for biological oxygen demand, total suspended solids, and wastewater volume (PAP-00102676). There were no known discharge limitations or permit violations related to any PAHs noted in the available references. The 1995 PVSC Sewer Connection Permit also included monitoring requirements for metals at local limits for users in the area, including copper, lead and mercury, at Outlet No. 20407462-41900-0201 and Outlet No. 20407463-41900-0201 (PAP-00425744,45). The monthly average discharge limitations and threshold value for Outlets 20407462-41900-0201 and 20407463-41900-0201 are presented below in a tabular format:

Outlet No. 20407462-41900-0201 and Outlet No. 20407463-41900-0201

PVSC Local Limits	Discharge Limitations		Monitoring Requirements		
Parameter	Monthly Average(mg/l)	Threshold Value (mg/l)	Measurement Frequency	Sample Type	Reporting Period
Copper	3.02	0.092	Monthly	24 hr. comp	Monthly
Lead	0.54	0.029	Monthly	24 hr. comp	Monthly
Mercury	0.080	0.001	Monthly	24 hr. comp	Monthly

(PAP-00102679-80)

Violations

No violations were identified in the available file material.

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- Killam Associates (Killam). *Discharge Investigation and Corrective Action Report*. NJDEPE Case Number 91-11-18-1142-12. June 1992, PAP-00102964;
- Killam Associates (Killam). *Preliminary Assessment Report and Remedial Investigation Report for Faber-Castell Corporation, ISRA Case No. 94569.* March 1995, PAP-00103011;
- Killam Associates (Killam). *Remedial Investigation Report, Remedial Action Report and Industrial Site Recovery Act Report for Faber-Castell Corporation, ISRA Case No. 94569.* May 1996, PAP-00103083;
- Killam Associates (Killam). *Addendum to the Remedial Investigation Report, Remedial Action Report and Industrial Site Recovery Act Report for Faber-Castell Corporation, ISRA Case No. 94569.* May 1996a, PAP-00103260

Remediation Activities

Sewer

No sewer sampling data was identified in the available file material.

Soil

Killam's Preliminary Assessment identified potential AECs that were addressed at the Facility (PAP-00103035-36). The AECs were assessed to determine the integrity of the structures involved and visual indicators of potential contamination (i.e., discoloration and/or staining) and where contamination was suspected to be present soil samples were collected and analyzed for petroleum hydrocarbons, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs), including PAHs. When soil concentrations of petroleum hydrocarbon-related contaminants, including PAHs were above the New Jersey Department of Environmental Protection (NJDEP) Soil Cleanup Criteria (SCC), the impacted soils were excavated and disposed. The field evaluation, soil sampling and remediation activities are summarized below:

Naptha UST in the courtyard area: Approximately 30 tons of soil was excavated from the Naphtha UST area. The tank size was believed to be between 30 and 55 gallons. The tank was removed in February 1995, but it had not been used since the 1970s. The UST was located in the courtyard adjacent to Building 2 (PAP-00103032; PAP-00103093).

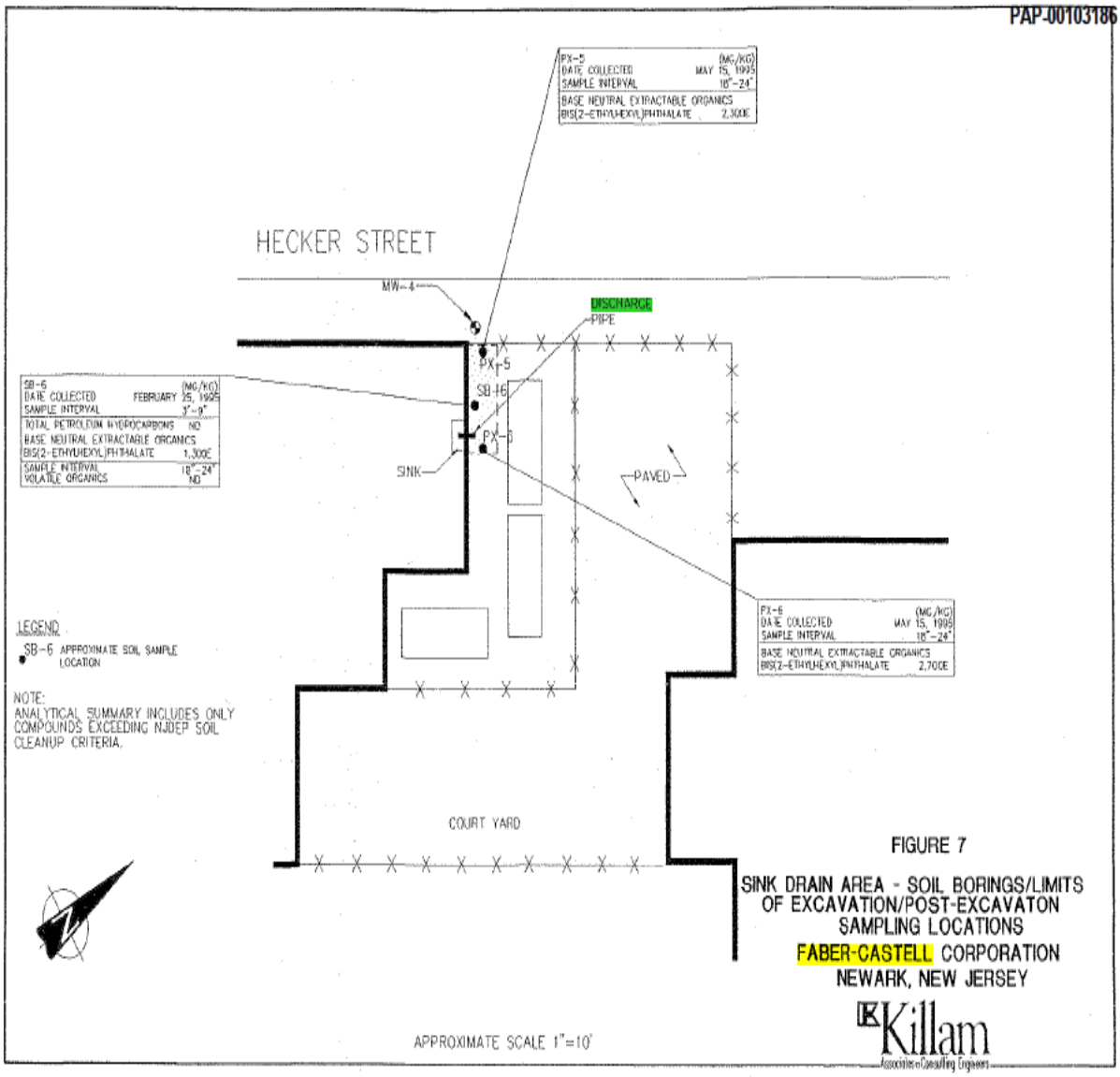
Stained areas on asphalt/concrete of compromised integrity in the courtyard area: On February 10, 1995, Killam obtained samples from the courtyard area by installing test pits (PAP-00103094). The laboratory analytical results identified elevated concentrations of benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene. Approximately 130 tons of soil were excavated from the courtyard area to a depth of 18 inches below grade. In 1995, additional excavation of the courtyard area to a depth of 36 inches below grade took place; approximately 97 tons of soil from the courtyard area was removed. After the 1995 excavation, sampling showed no compounds exceeding the NJDEP Soil Cleanup Criteria (SCC) (PAP-00103095–96).

Killam obtained soil samples from the sink drain pipe discharge from February 1995 to March 1996 (PAP-00103187). Available references did not state the timeframe in which this unit operated. Elevated concentrations of several base-neutral compounds above NJDEP SCC were noted, including: benzo(a) anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd) pyrene and dibenzo(a,h)anthracene (PAP-00103096). The PAH concentrations detected in soil samples collected from the sink drain pipe area are presented below in a tabular format (PAP-00103187):

Sample Identification	SB-6	PX-5	PX-6	SS-5	SS-6	SW-3	SS-1
Constituents (mg/kg)							
Benzo(a)anthracene	20	ND	ND	0.17	ND	ND	--
Benzo(a)pyrene	16	ND	ND	0.19	ND	ND	--
Benzo(b)fluoranthene	34	ND	ND	ND	ND	ND	--
Benzo(k)fluoranthene	ND	ND	0.009	0.34	ND	ND	--
Dibenz(a,h)anthracene	6	ND	ND	ND	ND	ND	--
Naphthalene	13	ND	ND	ND	ND	ND	--
Fluoranthene	67E	ND	ND	0.33	ND	ND	--
Indeno(1,2,3-cd)pyrene	4.4	ND	ND	ND	ND	ND	--

ND – Non-detect; E – Estimated Value; -- indicates that samples was not analyzed for this compound

Presented below is a figure of the Sink Drain Area – Soil Borings/Limits of Excavation/Post-Excavation Sampling Locations (PAP-00103186).



In March 1995, approximately 1.5 tons of soil was excavated from this area to a depth of 18 inches below grade. In July 1995, additional excavation of the area was conducted to a depth of 36 inches below grade; approximately two tons of soil was removed (PAP-00103096-97). One post-excavation soil sample was collected of the side wall opposite the discharge point and was submitted for analysis. On March 11, 1996, Killam installed a soil boring (SS-1) adjacent to the excavation to delineate the contamination. Based on the data presented on the table above (PAP-00103187), it appears that only bis(2-ethylhexyl)phthalate was detected at a concentration of 0.130 mg/kg, which was below the NJDEP Soil Cleanup Criteria (SCC) of 49 mg/kg (PAP-00103187). It appears that this sample was only submitted for analysis of bis(2-ethylhexyl)phthalate as this was the only compound detected above NJDEP SCC in SW-3. As such, the noted contamination has been delineated to be in a small area.

8. Summary of Asserted Defenses

Some or all of Berol Corporation's releases of hazardous substances to the Lower Passaic River, if any, were "federally permitted releases" within CERCLA Section 107(j), 42 U.S.C. § 9607(j), and resulting response costs or damages, if any, may not be recovered under CERCLA.

Pursuant to CERCLA Section 107(b), 42 U.S.C. § 9607(b), Berol Corporation is not liable for the releases or threatened releases of hazardous substances from the Facility, if any, because such releases or threatened releases were caused solely by: an act of God; an act of war; or the acts or omissions of persons or entities other than Berol Corporation, for whom Berol Corporation is not responsible.

Berol Corporation is not a successor to any person or entity that owned or operated any portion of the Facility property other than Faber-Castell Corporation (f/k/a A.W. Faber-Castell Pencil Company, f/k/a A.W. Faber, Inc.). Specifically, Berol Corporation is not a successor to any person or entity that owned or operated any portion of the Facility property either before or after Faber-Castell Corporation's ownership and operation of that portion of the Facility property.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

CAMPBELL FOUNDRY COMPANY

Facility Name, Address and Size: Campbell Foundry Company (CFC)**,** 800 Bergen Street, Harrison, NJ 07029 (PAS-00012484); 2.6 acres (PAP-00070190). As of 1993, 110 employees worked at the facility (PAS-00012487). The available references did not include information on the typical work shifts.

1. **Business Type:** The CFC facility (facility) manufactured grey cast iron manhole covers, storm drain and sewer gratings, as well as other cast iron products for private and municipal use (PAS-00012487).

2. **Time Period of Ownership/Operations**

   Operator: 1927 to Present
   Owner: 1927 to Present

   CFC has owned portions of the site since 1927 (PAP-00070200-01).

3. **Operational History/COC Use and Presence at the Facility**

   CFC operated as an iron foundry from 1927 through 2003. From 2003 until present, the site has been used for storage, office operations, and finishing work for foundry products manufactured elsewhere (PAP-00070201).

   Until 2003, the facility manufactured grey cast iron manhole covers, sewer gratings and other cast iron products by melting scrap iron. Examples of the scrap iron utilized for this purpose are engine blocks, broken machinery and old household radiators. Feedstock material was stored in a pile on the southeastern portion of the site (PAP-00073042).

   The facility was divided into three areas including two areas for the molding and casting operation and one for milling and maintenance. Large kettles of molten iron were transported between the two molding areas via a derrick-type crane. Scrap iron was melted in a large furnace and molten iron was poured into wooden, aluminum and sand-filled molds and cooled. Once poured, the castings were allowed to cool, were shaken out to remove the foundry sand, and then were separated for reuse or disposal. Final cast iron products were machined and drilled onsite. The pieces were painted by being dipped into two open tanks, one for primer and one for final paint. The tanks were phased out of the production process in approximately 1989 due to more stringent air emissions standards. Finished pieces were stored offsite at a stockyard in Kearny (PAP-00073042).

Campbell Foundry Company

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



(PAP-00073060)

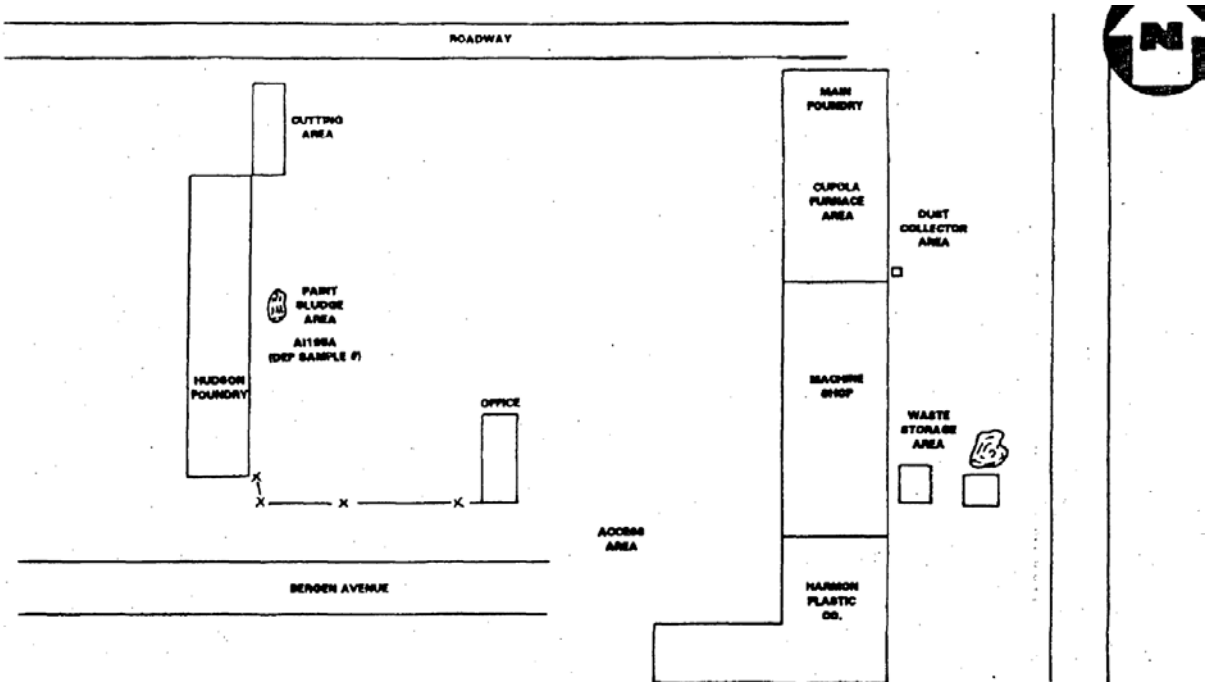
Campbell Foundry Company

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

Metallic cupola dust was collected in 100-pound bags from air pollution devices during smelting operations. The locations of these devices were not specified in the available references. However, a Dust Collector Area is identified on a site layout plan as being located outdoors to the east of the Cupola Furnace Area. The dust contained lead, cadmium, and chromium and was, therefore, considered hazardous waste. Until 1992, the dust was bagged daily and shipped offsite to a fill site located in Kearny, New Jersey or Republic Environmental Systems, a licensed disposal facility, in Hatfield, Pennsylvania. Approximately 7,500 pounds per week of metallic cupola dust was generated by former operations. As of 1992, a screw conveyor was installed to transport the bag house dust from the hoppers to the 30-cubic-yard covered roll-off container, which was then disposed of (when full) at a licensed disposal facility (PAP-00070191; PAS-00012555, PAS-00012519).



(PAS-00012519)

A 1981 RCRA Generator Inspection form notes that the only hazardous waste onsite was waste cupola dust, and CFC was transporting this waste to a fill site it owned in Kearny, New Jersey (PAS-00012552; PAS-00012555). A June 1982 follow-up Hazardous Waste Investigation notes that at this time CFC was disposing of the cupola dust at a treatment storage and disposal facility (TSDF) in Honeybrook, Pennsylvania. The bags being used for the storage of the dust were noted to be 4 ply and strong enough to hold the cupola dust without spillage (PAS-00012563). However, an August 1983 inspection form notes that in the storage area, two bags were split open and dust had spilled on the soil. The storage area appears to have been located outdoors to the east of the Machine Shop and Cupola Furnace Area (PAS-00012567; PAS-00012570, PAS-00012519). A September 1983 Report of Phone Call noted that the spilled dust was cleaned up (PAS-00012578).

According to a 1992 *Final Draft Environmental Priority Initiative Preliminary Assessment Report*, there had been minor spills of paint sludge, lubricating oil, and metallic cupola dust, but these spills were immediately cleaned by CFC personnel and, therefore, there was no potential for these contaminants to enter groundwater (PAP-00072081; PAP-00072085).

4. Identified COCs

- PCBs (detected)
- PAHs (generated, detected)
- Copper (stored and detected)
- Lead (generated, stored, potentially released, and detected)
- Mercury (detected)

PCBs

PCBs were detected and delineated in a small, discolored gravel area at the southern end of the facility, which is opposite from the storm sewer drains present at the northern end of the facility. Based on review of available reports it appears that the source of PCBs was a minor discharge of hydraulic oil from onsite equipment, which did not migrate to or impact the sewer (PAP-00073048-50, 52-54; PAP-00073437-40). The maximum concentration of total PCBs (2.35 mg/kg) was detected in a soil sample collected from AOC E2 (PAP-00073471).

PAHs

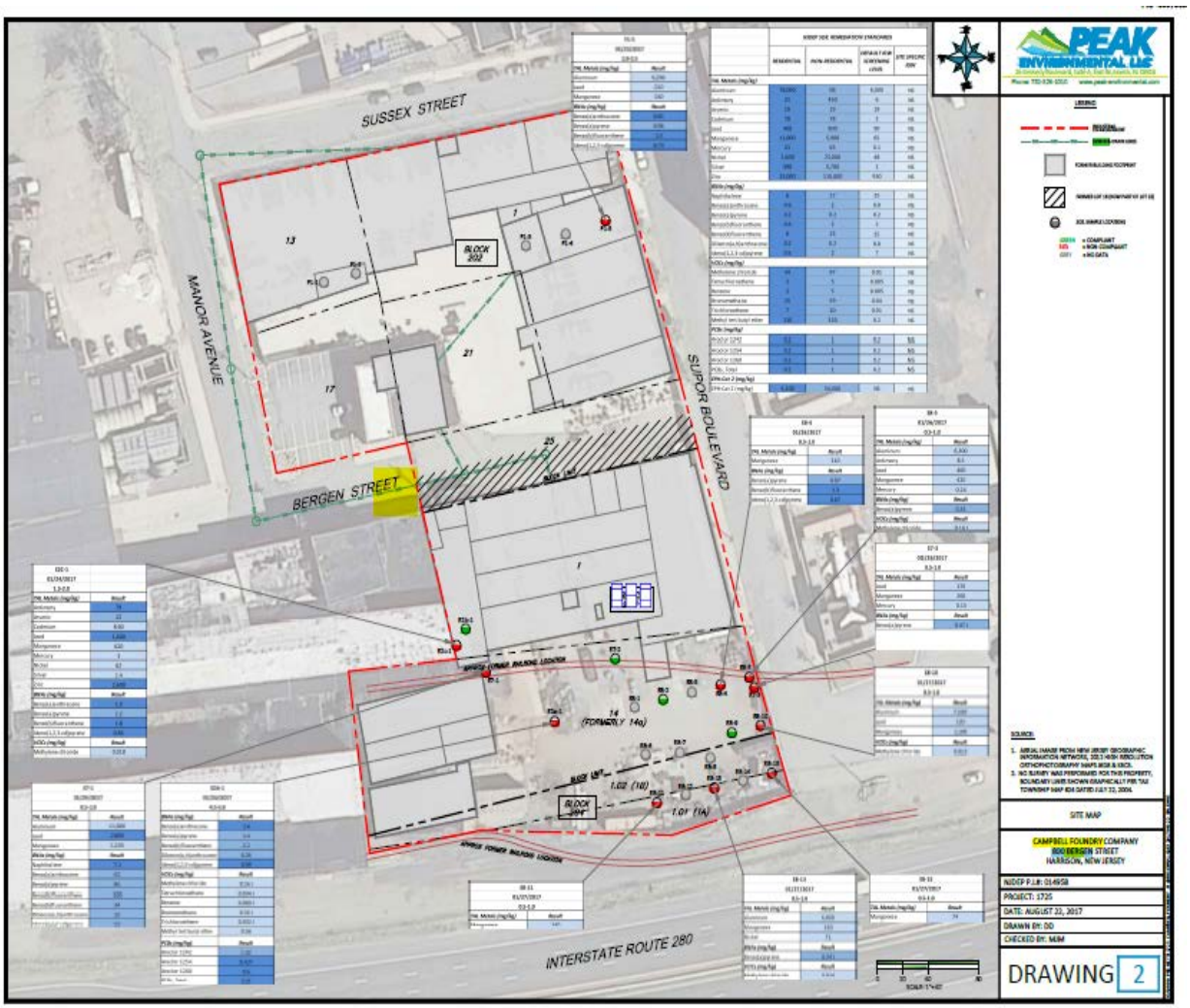
PAHs (as part of cupola dust) were byproducts of the manufacturing processes. While, fuel storage tanks were located at the facility and used in foundry operations, a site inspection conducted by Peak Environmental LLC on July 10, 2014 noted no discharges from these tanks and therefore no further action was needed (PAP-00070214-15). Both low and high molecular weight PAHs were detected in soil samples collected at the facility during a January 2017 sampling event at the following concentrations (PAP-00073557):

PAH Concentrations			
Constituents E	**Maximum Detected**	**AOC**	**Sample ID**
Benzo(a)anthracene	62 mg/kg	AOC E7	E7-1
Benzo(a)pyrene	86 mg/kg	AOC E7	E7-1
Benzo(b)fluoranthene	100 mg/kg	AOC E7	E7-1
Benzo(k)fluoranthene	34 mg/kg	AOC E7	E7-1
Dibenz(a,h)anthracene	15 mg/kg	AOC E7	E7-1
Indeno(1,2,3-cd)pyrene	60 mg/kg	AOC E7	E7-1

The above figure (PAP-00073486) presents the locations of these AOCs.

Copper

Along with lead, copper was also stored as part of scrap metal used to make cast iron manhole covers at the southeastern portion of the facility. Based on review of analytical data, copper was detected at a maximum concentration of 380 mg/kg from AOC E2 (Discolored Areas) sample (E2C-1) located in the southwest of the facility collected at a depth of 1.5-2.0 feet below grade surface (bgs) on January 24, 2017(PAP-00073468). Copper was also detected in soils collected from other AOCs (AOC E7 (Former Rail Lines), AOC E8 (Former Scrap Metal Storage Area), and AOC F1 (Former Foundry Operations) at concentrations between 18 mg/kg from AOC E8, sample EB-15 to 270 mg/kg from AOC E8, sample EB-13 (PAP-00073468). The figure below (PAP-00073486) presents the locations of these AOCs. It should be noted that the detections of copper are not presented on the figure below because the concentrations were below the NJDEP residential direct contact soil remediation standards.



(PAP-00073486)

Lead

Lead was stored at the southeastern portion of the facility as part of scrap metal that was used to make cast iron manhole covers (PAP-00073442-45). In addition, lead (as part of cupola dust) was a byproduct of the manufacturing processes (PAP-00070209).

As mentioned in Section 3, Operational History/COC Use and Presence at the Facility, in 1983, bag house dust collected from the cupola furnace spilled onto the ground. In response to this spill incident, soil in the bag house spill area was initially sampled in 1997 for metal analysis and lead was detected at a concentration of 696 milligrams per kilogram (mg/kg). This concentration was above the New Jersey Department of Environmental Protection (NJDEP) Soil Cleanup Criteria applicable at that time (PAP-00070210). Additional soil samples were collected in 1997, delineating the impacted soils. An asphalt engineering control was installed to cap the impacted soils and on September 29, 2005, the NJDEP issued a restricted-use no further action (NFA) letter for this area of concern (AOC) formerly identified as AOC 4. The concentration of lead in the deed-restricted area ranged from 6.1 to 5,850 mg/kg (PAP-00070210).

Mercury

Based on review of available reports, it appears that mercury was not used at the facility. However, mercury was detected in soil at a maximum concentration of 3 mg/kg collected from AOC E2 (Discolored Areas), sample E2C-1 located in the southwest of the facility at a depth of 1.5-2.0 feet bgs on January 24, 2017 (PAP-00073468). Mercury was also detected in soils collected from other AOCs (AOC E7 (Former Rail Lines), AOC E8 (Former Scrap Metal Storage Area), and AOC F1 (Former Foundry Operations) at concentrations between 0.02J mg/kg from AOC E8, sample EB-11 to 0.24 mg/kg from AOC E8, sample EB-5 (PAP-00073468). The above figure (PAP-00073486) presents the locations of these AOCs. These concentrations were below the NJDEP Soil Cleanup Criteria applicable at that time.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to the *Remedial Investigation Report for Campbell Foundry Company*, prepared by Peak Environmental LLC, dated September 2017, Peak identified site-wide Historic Fill as an additional AOC. The Historical Information Review, which was conducted during the site investigation phase of the project, stated that since 1947 the site has been developed with structures on the property. In addition, marshlands were present to the south. It was also noted that the topographic gradient changed slightly from 1947 to 1958. During this same period, a structure was built on the western portion of the site. It appears that these changes are indicative of fill being brought onsite for redevelopment purposes (PAP-00073054). Soil borings conducted by Peak Environmental during site investigation revealed the presence of historic fill materials throughout the site, generally extending to a depth of 4.5 to 5 feet below ground surface. Metals and semi-volatile organics which are typical fill related contaminants, were detected within the historic fill materials at concentrations that exceed the Default Impact to Groundwater Soil Screening Level (DIGWSSL), and in some cases the NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRS) and Non-Residential Direct Contact Soil Remediation Standards (NRDCRS) (PAP-00073050; PAP-00073054).

The levels of PAHs, copper, lead and mercury detected at the site is soils are presented in the table below (PAP-00073049).

COCs found in Historic Fill	
COC	**Max Detected Concentration**
Lead	2,800 mg/kg
Mercury	3 mg/kg
Benzo(a)anthracene	62 mg/kg
Benzo(a)pyrene	86 mg/kg
Benzo(b)fluoranthene	100 mg/kg
Benzo(k)fluoranthene	34 mg/kg
Dibenzo(a,h)anthracene	15 mg/kg
Indeno(1,2,3-cd)pyrene	60 mg/kg

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

According to the *Preliminary Assessment Report*, dated May 2015, John Campbell had stated that sanitary waste generated at the former industrial buildings and existing office building has always discharged to the public sewer system (PAP-00070209).

Storm sewer drains are present on the northern portion of the site in the concrete and asphalt paved areas (see map below). The drains discharge to the city sewer system. According to the 2015 Preliminary Assessment Report, there is no evidence of hazardous materials or petroleum products being discharged to the storm sewers; COCs were detected on-site in the southeastern portion of the property while the storm sewers were located on the northern portion of the site (PAP-00070216). In addition, the facility is located in an industrial area and the nearest surface water body (i.e., Passaic River) is located approximately 2,000 feet southeast of the site (PAP-00071995; PAS-00012486).

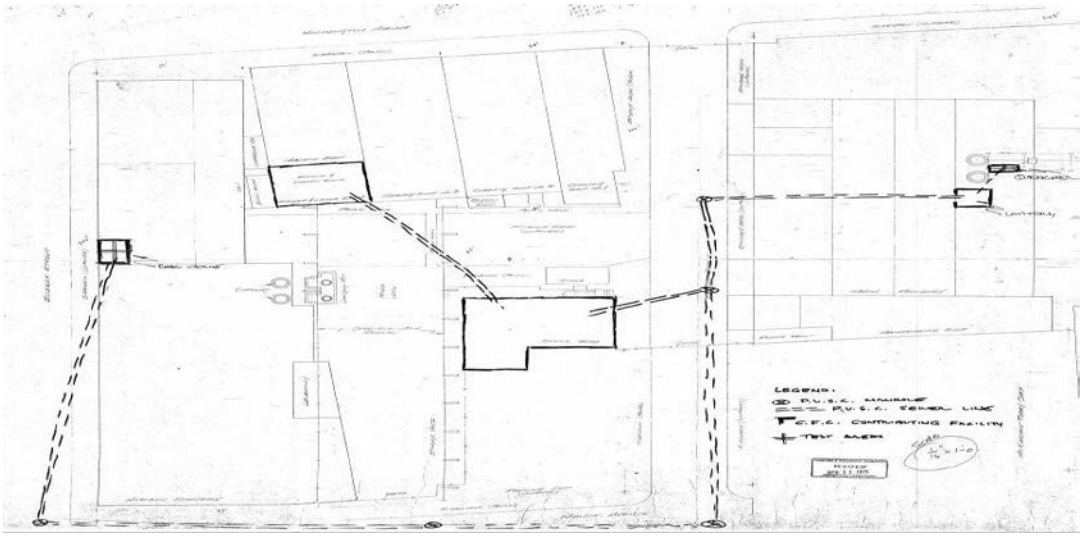
The 1975 NPDES Permit for the PVSC included the combined sewer outfall located at Worthington Avenue in Harrison, New Jersey as one of the "permitted" discharge point to the Passaic River. The CFC Bergen Street site is located in the Worthington Avenue combined sewer overflow (CSO) district (PAS-00012495).

The overflow for the Worthington Avenue CSO District, which the Campbell Foundry is located within, leads to an "open ditch leading to the Passaic River." Both the district outlet sewer and the outfall sewer to the river are 24-inch diameter vitrified tile pipe sewers. PVSC reports the following related to overflow and regulator operation: "Under normal dry weather flow conditions, the flow is diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow enters the interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River." (PAS-00012496-97).

PVSC documentation states that the facility was first added by PVSC to its annually compiled inventory of "industrial users" in 1985/1986 (PAS-00108551, PAS-00108554). However, the Bergen Street site was reported by PVSC to have a "zero discharge" in the 1987/1988 industrial user inventory (PAS-00108627). In the 1986/1987 compilation, PVSC reported that the CFC Bergen Street site in Harrison discharged an average daily flow to the PVSC system of 0.015 MGD (million gallons per day). The Campbell Foundry facility was categorized by PVSC at that time as being a "foundry" (PAS- 00012497; PAS-00108465).

PVSC reported that Campbell Foundry was not in compliance with federally established pretreatment standards for companies categorized as being in the "metal molding and casting" industry, specifically 40 CFR § 464.35 Sub-Part C, which concern discharges of pollutants generated by "dust collection scrubber operations" associated with a metal molding and casting source. Those specific federal standards serve to establish limits on the discharge to a publicly owned treatment works (POTW) of copper and lead, along with other contaminants. The 1986/1987 PVSC report did not state which of the above-listed pollutants or combination of pollutants were not in compliance by Campbell Foundry in its PVSC discharge permit limits; it simply states that the site was not in

compliance. According to the report, Campbell Foundry was "projected" to be in compliance as of September 15, 1987 (PAS-00012497; PAS-00108531). The 1987/1988 PVSC report includes Campbell Foundry in a table titled "Companies with Zero Discharge" which is included in Form AR-4A (PAS-00108627). Per Section V of the 1987/1988 PVSC report: "Form AR-4A contains a list of categorical users who would be covered but are not because they have zero discharge" (PAS-00108618). Campbell Foundry was not included in Appendix A of the 1987/1988 PVSC report which lists active violations (PAS-00108690).



(PAP-00070225)

6. Regulatory History/Enforcement Actions

Permits

There is no information regarding permits in the available file material.

Inspections and Violations

Summarized below are several administrative violations cited for CFC:

- In 1983, CFC was cited by NJDEP for several violations including, but not limited to, spilling hazardous waste (cupola dust) on the ground (PAS-00012571). An Administrative Consent Order was issued on December 14, 1983, by NJDEP for the above-referenced violations (PAS-00012488).

- In 1983, the NJDEP Division of Waste Management issued an administrative order to CFC for reasons that included, but were not limited to, hazardous waste containers were found to be in poor condition with two of the containers split open and the hazardous waste spilled on the ground; those containers were not securely closed and were not stored in a manner that minimizes the risk of the container rupturing or leaking (PAP-00070212).

No additional AOCs were identified from review of the enforcement actions. All violations associated with the former foundry operations were resolved (PAP-00070213).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Remedial Investigation Report*, dated November 1992 (PAS-00012678)
- *Remedial Investigation Report*, dated June 1998 (PAS-00032166)
- *Remedial Action Work Plan and Proposed Classification Exception Area*, dated October 2000 (PAS-00032052)
- *Preliminary Assessment Report*, dated May 2015 (PAP-00070186)
- *Site Investigation Report*, dated August 2017 (PAP-00073429)
- *Remedial Investigation Report*, dated September 2017 (PAP-00073039)

Sewer

There is no information regarding sewer sampling data in the available file material.

Soil

PCBs were detected in a discolored 450-square-foot gravel area at the southern end of the facility including low-level residual PCB impacts in soil, specifically Aroclors 1242, 1254, and 1260. The contamination was detected to a depth of 7 feet bgs (below ground surface) (PAP- 00073048-52). Based on the location of the site in relation to the water table, the highest seasonal level of the saturated zone of the aquifer of concern is estimated to be 10 feet below the ground surface (PAS-00012526).

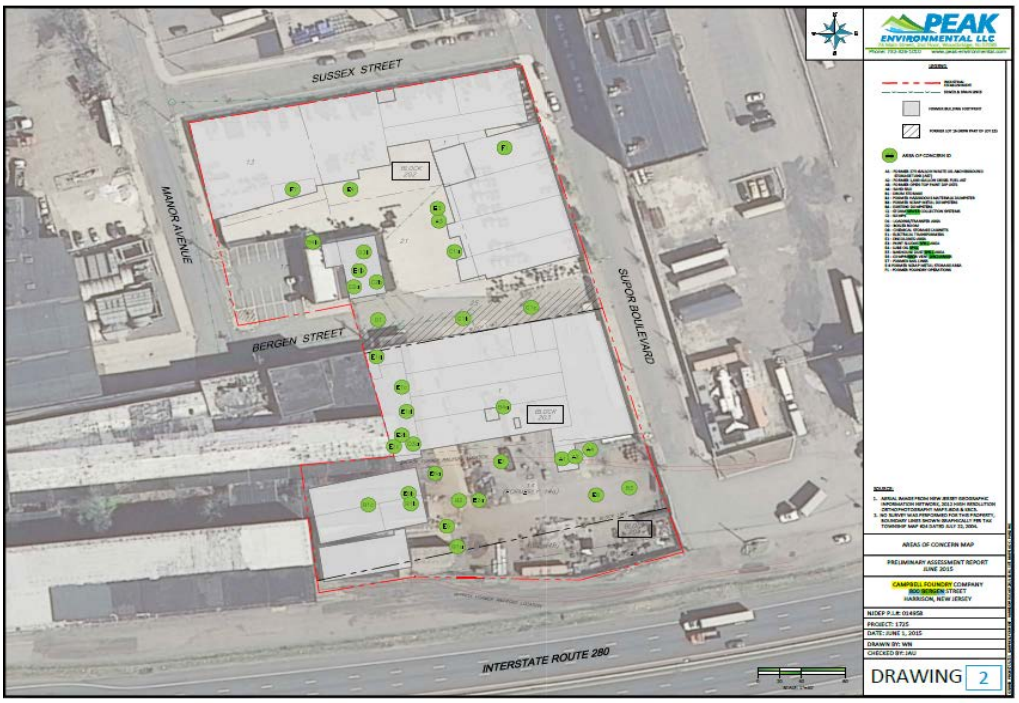
Soil borings, advanced by Peak Environmental during Site and Remedial Investigations, showed the presence of non-indigenous fill materials throughout the facility, generally extending to a depth of 4.5 to 5 feet bgs (PAP-00073054). Examples included metallic, wood, gravel, and brick fragments in the majority of soil borings analyzed (PAP-00073447-48; PAP-00073044; PAP-00073054; PAP-00073266; PAP-00073271). According to the Peak Environmental Site Investigation Report, dated August 2017, PAHs, lead and mercury were all confirmed to be present in the non-indigenous historic fill (PAP-00073448).

According to a *Final Draft Environmental Priority Initiative Preliminary Assessment Report*, dated June, 1992, a release of contaminants to the groundwater and surface water had not occurred and was not suspected. Runoff from the site was noted to flow into the storm drains surrounding the site. All storm drains in the area of the facility lead to combined sewers which discharge into a publicly owned treatment plant. The above cited report stated that these sewers do not discharge directly to surface water; therefore, there is no migration pathway from the site to surface water. The nearest downslope surface water was noted to be the Passaic River (PAS-00012521-30).

As mentioned in Section 4, the soil at the bag house (former AOC 4) was initially sampled in 1996 for metals analysis, including lead (696 mg/kg), which was detected above the NJDEP Soil Cleanup Criteria applicable at that time. Additional soil samples were collected in 1997 and elevated lead concentrations were identified in seven samples. In order to eliminate exposure, an asphalt cap was installed (see deed restricted area). The deed area consists of approximately 8,500 square feet in surface area and concentrations of lead in this area ranges from 6.1 to 5,890 mg/kg. A NFA letter was also issued by the NJDEP for this AOC (AOC 4) at the CFC on September 29, 2005 (PAP-00070217-18).

Remedial Activities

Peak Environmental conducted a site inspection on July 10, 2014. During this site inspection 22 AOCs were identified. The AOCs are presented on the figure below (PAP-00070226). NFA was required for 13 of the AOCs; an Unrestricted Use NFA letter was issued on September 27, 2005, for three AOCs; a restricted-use NFA letter conditional upon the placement of a Deed Notice was issued on September 29, 2005, for one AOC (PAP-00070213-18). Five AOCs (Chemical Storage Cabinets (AOC D3), Discolored Area (AOC E2), Former Rail Lines (AOC E7), Former Scrap Metal Storage Area (AOC E8), and Former Foundry Operations (F1) were recommended that further investigation be conducted (PAP-00073043).



PAP-00070226

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

CANNING GUMM, LLC

Facility Name, Address and Size: Frederick Gumm Chemical Co. Inc. (Gumm); 538 Forest Street, Kearny, New Jersey; 40,000 square feet (PAS-00015855); 0.75 acres since 1969; 200 work days per year (PAS-00015855); One shift per day (PAS-00015855); Up to 50 workers (PAS-00015823).

According to the Remedial Action Work Plan, dated March 2019 (2019 RAWP), the site was split into six property blocks and lots after operations terminated in 2002. The Town of Kearny lots are as follows:

- Block 179, Lot 9.01 (538 Forest Street)
- Block 179, Lot 9.02 (542 Forest Street)
- Block 179, Lot 10.01 (254 Laurel Avenue)
- Block 179, Lot 11.01 (258 Laurel Avenue)
- Block 179, Lot 12.01 (262 Laurel Avenue)
- Block 179, Lot 13.01 (266 Laurel Avenue) (PAP-00272835)

1. **Business Type:** Compounding of chemical cleaners for the metal finishing industry (PAS-00015814; PAS-00015823).

2. **Time Period of Ownership/Operations**

Operator: Frederick Gumm Chemical Co. Inc. (~1933 to 1998)
Canning Gumm, LLC (1998 to 2002)
Owner: Clepo Inc. (~1933 to present)

1933: The Frederick Gumm Chemical Co. Inc. was incorporated in the State of New Jersey on April 15, 1933, with its principal office located in Hoboken, New Jersey (PAS-00016360-62).

1970: A D&B, Inc. Report, dated February 18, 1994 stated Frederick Gumm started the company in 1933 and was succeeded by Frederick J. Gumm as President and Chief Executive Officer in 1970. Robert Sizelove was elected Treasurer and Executive Vice President at the same time. Robert J. Lee was elected Controller in 1985 (PAS-00016341).

1981: The Certificate of Incorporation was restated and amended on July 30, 1981 and identified a Board of Directors and changed the location of Gumm to Lyndhurst, New Jersey (PAS-00016365).

1988: The Certificate of Incorporation was restated and amended on December 19, 1988 and identified a Board of Directors and changed the location of Gumm to the 538 Forest Street, Kearny, New Jersey site (PAS-00016376-81).

1990: A D&B, Inc. Report, dated February 18, 1994 identified Dipsol-Gumm Ventures of Kearny, New Jersey as a Joint Venture of Gumm. The company was started in 1990 and operated a manufacturing zinc plating line (PAS-00016341).

1998: On March 2, 1998, W. Canning U.S.A., Inc. was merged into Gumm (PAS-00016386) through a Stock Purchase Agreement (PAP-00273368), and the merged company was amended to become Canning Gumm, Inc. (PAS-00016389). The Board of Directors for Canning Gumm, Inc. were identified as Frederick J. Gumm, Robert S. Sizelove, and two members from W. Canning plc. in Birmingham, England (PAS-00016392-93). A press release from MacDermid, Incorporated (MacDermid) stated that W. Canning plc. was acquired by MacDermid on December 2, 1998 (PAS-00016346). A report on the cash offer from MacDermid to W. Canning plc. stated the entire capital stock of Gumm was acquired by W. Canning plc. and W. Canning U.S.A., Inc. on March 2, 1998 (PAS-00016709). It is also noted that a lease between Gumm as the tenant and Clepo, Inc. as the landlord for the 538 Forest Street, Kearny, New Jersey site is dated March 2, 1998 (PAP-00273366).

1999: Canning Gumm, Inc. became Canning Gumm, LLC, a Delaware limited liability company, with a business address of 245 Freight Street, Waterbury, Connecticut, based on a Certificate of Merger, dated April 1, 1999 (PAS-00016395).

2000: The site was vacant and Clepo, Inc. granted FGCC Kearny, LLC access to the for site remediation purposes (PAS-00016571). The Certificate of Formation stated FGCC Kearny, L.L.C. was formed April 18, 2000 as a New Jersey Limited Liability Company (PAP-00402699).

2005: MacDermid references the cleanup at the 538 Forest Street site in their Annual Report, but states the owners of the site have primary responsibility for the cleanup costs that exceed the deferred purchase price (PAS-00016428).

The 538 Forest Street, Kearny, New Jersey site was stated to be owned and operated by Gumm in a 1983 letter to New Jersey Department of Environmental Protection (NJDEP) (PAS-00016276). Although it is unclear exactly when Clepo, Inc. took ownership of the site (PAP-00272951), the file material stated that Clepo, Inc. of Kearny, New Jersey owned the facility at least since the 1980s through the present. A summary of this supporting information is as follows:

- According to a 1986 Passaic Valley Sewerage Commissioners (PVSC) Application for a Sewer Connection Permit, dated October 20, 1986, the owner of the site was identified as Clepo, Inc. at the same Forest Street address (PAS-00015855).

- A Certificate of Occupancy, dated September 2, 1987 also identified the owner of the site as Clepo, Inc. (PAS-00015870), and a letter from Gumm to PVSC, dated May 7, 1987 stated that the property was rented from Clepo, Inc. (PAS-00016693).

- In addition, the parent company was listed as Clepo Inc. in a 1989 and a 1990 Toxic Chemical Release Inventory (PAS-00015906, 6247).

- A D&B, Inc. Report, dated February 18, 1994 identified Clepo, Inc. as an affiliated company that was incorporated in 1965 and operated as a real estate holding company for the premises (PAS-00016341).

- A 2000 PVSC Application for a Sewer Use Permit stated the site was vacant and identified Clepo, Inc. of Haddenfield [sic] Road in Cherry Hill, New Jersey as the owner of the site (PAS-00016571).

- The 2019 RAWP stated that each of the parcels with the exception of Block 179, Lot 13.01 are currently owned by Clepo, Inc. Block 179, Lot 13.01 has been redeveloped with a multi-family two-story residence (PAP-00272835).

Operations

According to an undated Release & Pollution Prevention Report for 1992, operations began at the Kearny site in June 1939 (PAS-00016130). A User Change/Pretreatment Checklist, dated March 24, 1988 stated that operations may have begun in 1938 (PAS-00016283). The available records state the 538 Forest Street, Kearny, New Jersey location was operating in 1951, when the Kearny Fire Department inspected the delivery of solvents to the site (PAS-00015800). Several other requests for combustible material permits from the Kearny Fire Prevention Bureau state the site was operating at this location in 1952, 1953, 1955, and 1960 (PAS-00015802, 804, 806, 808).

According to a 2000 PVSC Sewer Use Permit application, the site was vacant and Clepo, Inc. granted FGCC Kearny, LLC access to the site for remediation purposes (PAS-00016571). The PVSC Sewer Use Permit, dated November 1, 2000, allowed discharge of pretreated groundwater through one outlet from November 1, 2000 to October 31, 2005 (PAS-00016613-33). Two Agreements dated November 1, 2005 and November 1, 2006 state FGCC Kearny, LLC would be discharging low strength wastewaters directly to the sanitary sewer from groundwater cleanup or similar operations at the 538 Forest Street, Kearney, New Jersey site (PAS-00016559, 601). An April 5, 2019 letter of authorization from NJDEP allowed discharge to groundwater at the site for in-situ remediation of contaminated groundwater (PAP-00272808).

3. Operational History/COC Use and Presence at the Facility

Gumm blended powder and aqueous raw materials to produce cleaners for the metals finishing industry (PAP-00272835; PAS-00015823, 6005). Raw materials such as alkalis, caustic soda, liquid and powdered acids, surfactants, soaps, detergents, and abrasives were used to make cleaners, acid salts, abrasive tumbling compounds, and paint strippers (PAS-00015823; PAS-00016286). By 1993, the aqueous cleaning products were either sodium hydroxide or sulfuric acid based (PAS-00016103). According to a NJDEP Memorandum, dated December 1, 1993, the site only manufactured one product: a sulfuric acid based brass brightener comprised mostly of

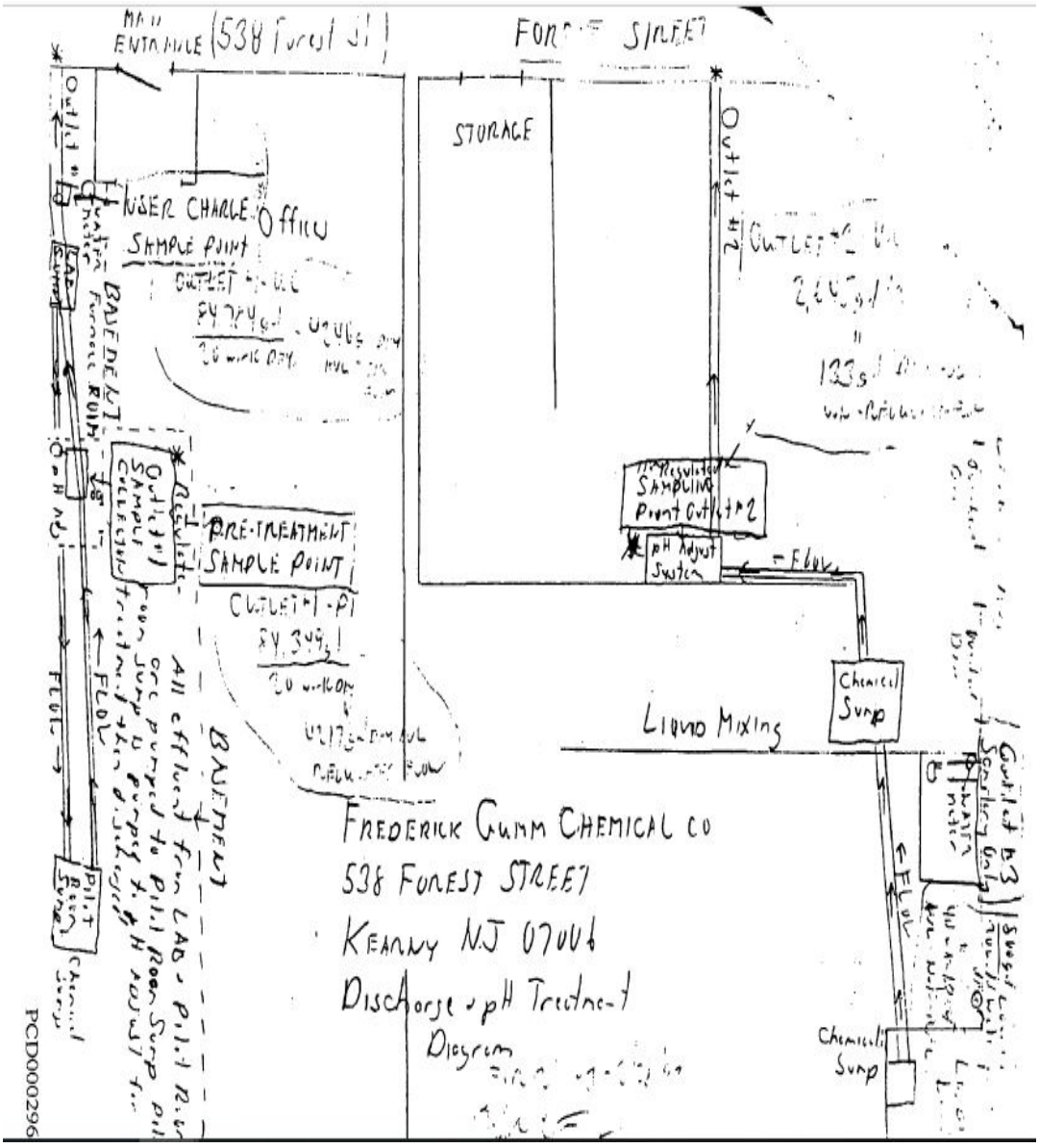
ferric sulfate, sulfuric acid, 1,3-diethylthioyurea, and surfactants. These components were blended inside of a single 330-gallon tank, which was then emptied into either drums or totes (PAS-00016177).

Gumm also operated a small research laboratory on metal finishing processes (PAS-00015823, 6103). In addition, a pilot room was used to occasionally plate one or two metal pieces for a customer in order to prove the process (PAS-00016263).

The site was inspected by the NJDEP in 1983, 1987, and 1993, and it was observed that the site was not generating hazardous wastes (PAS-00015839; PAS-00015881; PAS-00016177). Rinsing of the 330-gallon blending tank generated wastewater, which was discharged to the PVSC (PAS-00016177). According to a letter from Gumm to PVSC, dated March 6, 1991, the company did not discharge any Resource Conservation and Recovery Act (RCRA) hazardous wastes to the PVSC, with the exception of those chemicals that were already reported as a categorical user under 40 CFR 403.12 (b) (PAS-00016261). These chemicals are not identified, but monitoring at this time included metals such as copper, lead, and mercury [see Section 5 (Identified COCs)].

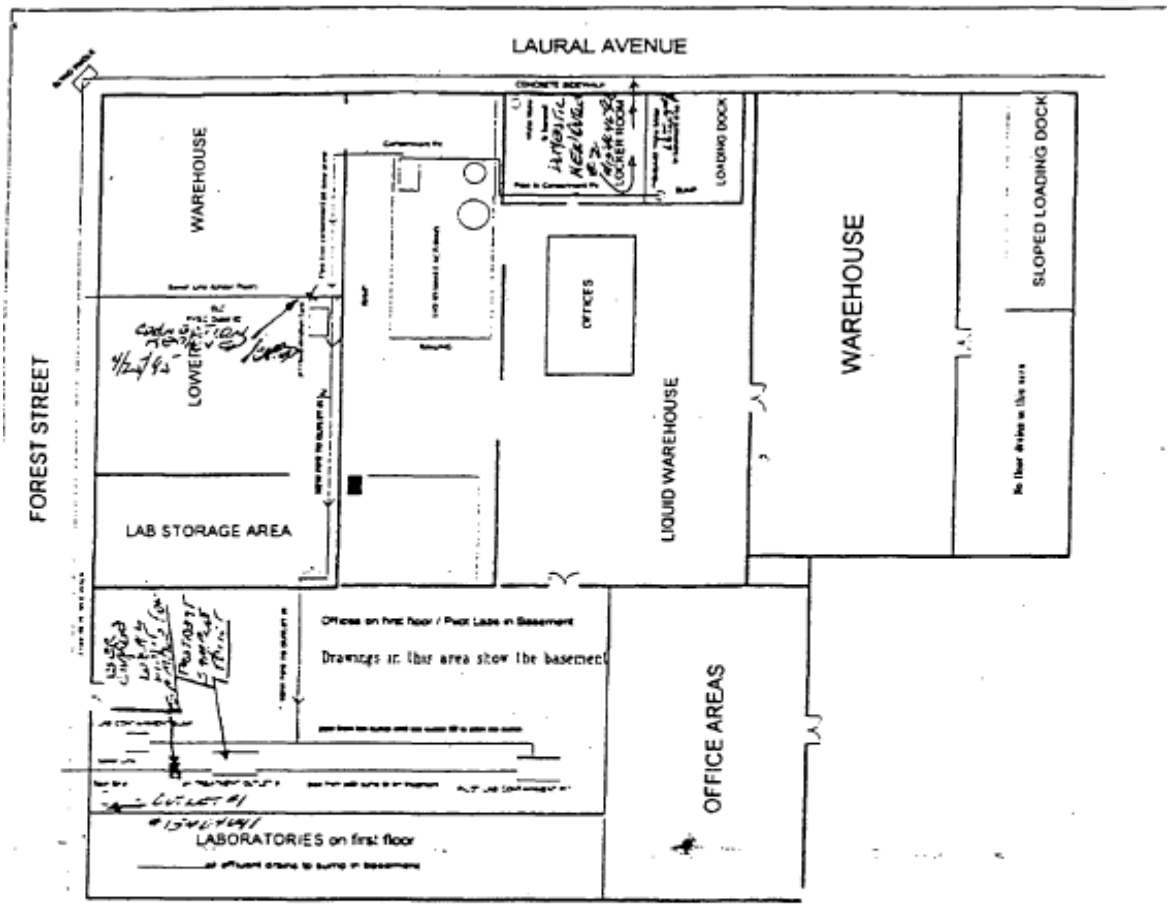
A Waste Effluent Survey, dated March 14, 1972, stated that the site discharged its process water to the PVSC sanitary sewer in 1971 (PAS-00015824). According to the Preliminary Assessment Report, dated August 30, 2004 (2004 PAR), sanitary/industrial discharge from the site was to an onsite septic system from 1960 to 1977 (PAP-00272953). Further information for industrial discharge practices prior to 1960 was not available in the file material.

Gumm obtained multiple sewer permits from the PVSC to discharge their wastewater to the sanitary sewer. A letter from Gumm to the PVSC, dated July 28, 1983 states that the Kearny site operated under permit No. 15404090 from the PVSC, effective date April 21, 1982 (PAS-00016276). Subsequent permit applications and correspondences to PVSC identify up to three outlets to the sanitary sewer. A PVSC letter, dated April 15, 1987 states Outlet No. 1 was from the laboratory and research areas, Outlet No. 2 was from the manufacturing area, and Outlet No. 3 was from the employee sanitary facilities (PAS-00015874-75). According to a PVSC Sewer Connection Permit application, dated October 18, 1991, the outlets were numbered 15404091 (Outlet No. 1), 15404092 (Outlet No. 2), and 15404093 (Outlet No. 3 - sanitary only) (PAS-00016006-13). A diagram of the facility shows Outlet No. 1 and Outlet No. 2, which were located along Forest Street, and Outlet No. 3. The diagram also shows the liquid mixing area.



(PAS-00016110)

Subsequent information identified two outlets from the facility. A Sewer Connection Permit allowed discharge to the PVSC from 1992 to 1997 and identified Outlet No. 1 (15404091-33206-0151) and Outlet No. 2 (15404092-33206-0151) (PAS-00016062-4). In addition, according to a 1993 Toxic Organic Management Plan, all effluent from the production area was discharged through Outlet No. 2 (No. 15404092-33206-0151), and the effluent from the wet analysis and pilot plating laboratory was discharged through Outlet No. 1 (No. 15404091-33206-0151) (PAS-00016103). The following diagram from the 1992 PVSC permit stated it was revised in 1995 and shows Outlet No. 1 in the same location as the previous diagram. However, Outlet No. 2 appeared to now be located on Laurel Avenue, where Outlet No. 3 had been located.



(PAS-00016072)

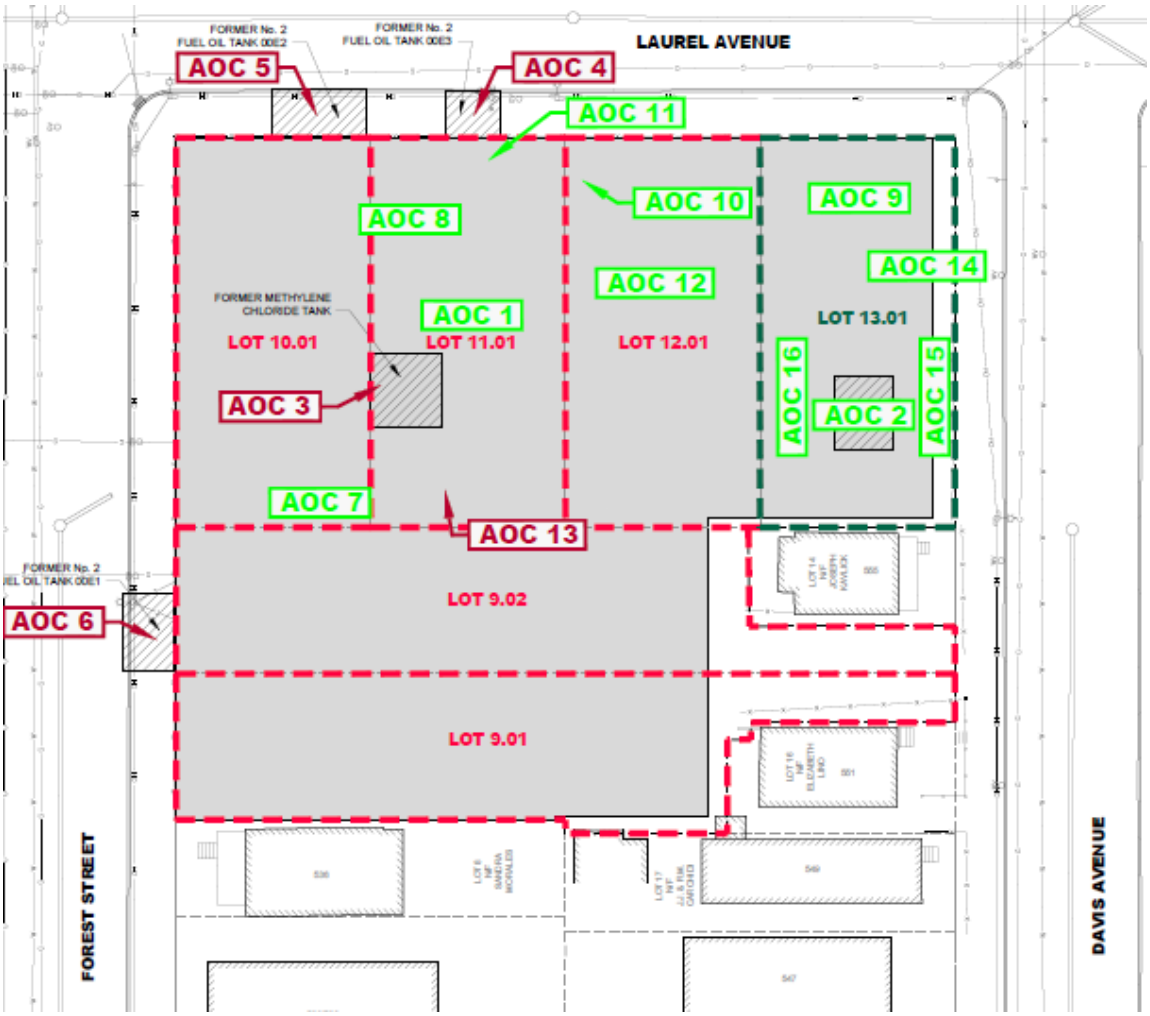
Sampling and analyses of the effluent was performed in 1982. Although a letter from Gumm to PVSC, dated July 28, 1981 stated that Gumm did not expect heavy metals to be in the production area discharge (PAS-00016263), samples of the effluent collected in 1982 detected copper (0.12 ppm) and lead (0.18 ppm) (PAS-00016267). Later samples collected in 1982 and 1983 did not detect lead, but detected copper (0.04 to 0.28 ppm) (PAS-00016272, 74). A 1986 PVSC Sewer Connection Permit application, dated October 20, 1986 stated that copper was “suspected to be present” in the effluent and lead was “suspected to be absent.” According to this application, all other contaminants of concern (COCs) were “known to be absent” in the discharge water

(PAS-00015855-68). Copper and lead were out of compliance one time according to the 1987 Baseline Monitoring Report, dated June 29, 1987 (PAS-00015895). According to a letter from PVSC to Gumm, dated March 10, 1987, the effluent from the plating laboratory was categorized as a Metal Finishing Point Source (PAS-00016703), and monitoring of the effluent began with a Baseline Monitoring Report in 1987 (PAS-00016695). Elevated lead was detected in effluent samples in 1982, 1987, 1988, 1989, 1990, 1991, and 1994 [see Section 6 (Regulatory History/Enforcement Actions)] (PAS-00015895-97, 5921, 5956, 5992, 5996, 6183, 6185-86; PAS-00016267, 6279, 6289). In responses to the violations, a September 16, 1991 letter from Gumm to PVSC stated that they did not use lead in their production area (PAS-00015898, 998) or analytical or plating laboratories (PAS-00016281), but stated that lead may be entering the wastewater system from experiments in their laboratory (PAS-00016291).

According to chemical inventories from 1987 to 1993, lead compounds, mercury, and copper cyanide were stored in the laboratory. The liquid mixing area had lead compounds and cupric sulfate (PAS-00016078, 80; PAP-00273472, PAP-00273482; PAP-00273493; PAP-00273571, 79-80; PAP-00273581, PAP-00273596-8, 619-21; PAP-00273699, 709-10, 716, 722; PAP-00273701, 9, 18, 26).

Up to eight underground storage tanks (USTs) had been present at the site, storing High Flash, AMSCO 460 solvent, Stoddard solvent, methylene chloride, and No. 2 fuel oil. The methylene chloride and two of the No. 2 fuel oil USTs were stated to have leaked. The USTs were all removed by 1990 (PAS-00015946).

In addition, as discussed in the 2019 RAWP, 16 Areas of Concern (AOCs) related to methylene chloride and No. 2 fuel oil contamination were identified in 2004 (PAP-00272840). The figure below of the AOCs was provided in the 2019 RAWP. The AOCs in green have No Further Action (NFA) status, while the red AOCs required further action or evaluation. The former No. 2 fuel oil USTs are AOCs-3, -4, and -5. Soil samples collected from Lots 10.01 and 11.01 detected PAH compounds (naphthalene and 2-methylnaphthalene) at depths of approximately seven feet below ground surface (bgs) to the depth of the groundwater table at 17.5 feet bgs (PAP-00272845, 2937). Two PAH compounds [benzo(a)pyrene and benzo(a)anthrancene] were detected in soil samples collected from Lots 9.01, 9.02, and 12.01 (PAP-00272872-3, 2937).



(PAP-00272935)

4. Identified COCs

- PAHs (detected)
- Copper (used, stored, detected)
- Lead (stored, detected)
- Mercury (stored)

PAHs

As stated in the Revised Discharge Investigation and Corrective Action Report, dated August 23, 1990, post-removal samples for the Stoddard Solvent and High Flash Solvent tanks did not state a release had occurred and/or there were no holes in the tanks at the time of removal. However, this report stated USTs with Heating Oil No. 2 were removed in 1990 with a reported release suspected (PAS-00015946).

According to the 2019 RAWP, soil samples containing concentrations of PAHs (naphthalene and 2-methylnaphthalene) extended from approximately seven feet bgs to the depth of the groundwater table at 17.5 feet bgs (PAP-00272845). Two PAH

compounds [benzo(a)pyrene and benzo(a)anthrancene] were detected at concentrations exceeding screening levels in soil samples collected from Lots 9.01, 9.02, and 12.01 (PAP-00272872-3, 2937). See the discussion below for the Historic Fill.

Copper

As reported in a letter to the Kearny Department of Combustibles from Gumm, dated May 2, 1980, minimal quantities of copper cyanide were required for their business (PAS-00015831).

According to a June 29, 1987 letter to the PVSC from Gumm, copper was detected in effluent samples, but was only noted to exceed the PVSC criterion one time (in 1987). Gumm responded that the source of the copper was likely samples analyzed as a service to customers. To minimize copper contamination, Gumm reduced the sample size used in the analyses and returned the unused portion of the sample to customers (PAS-00015895). The following table lists the copper concentrations in effluent samples collected:

Copper Concentrations in Effluent Samples		
Sample Date	**(mg/L)**	**Reference**
7/6/1981	0.10	PAS-00016265
5/24/1982	0.12	PAS-00016267
8/17/1982	0.28	PAS-00016272
11/15/1982	0.04	PAS-00016274
6/25/1987	4.535	PAS-00016314-6, PAS-00015899-901
	2.044	
	0.162	
9/25/1991	0.13	PAS-00016000-1
11/15/1994 (analysis date)	0.124	PAS-00016223
	0.022	
11/11/1994	0.019	PAS-00016224
11/15/1994	0.085	
11/16/1994	0.029	PAS-00016225
11/17/1994	0.027	

According to chemical inventories from 1987 through 1993, the liquid mixing area stored cupric sulfate. Starting in 1989, copper cyanide was stored in the laboratory (PAP-00273472, PAP-00273493; PAP-00273581; PAP-00273592, 616; PAP-00273699, 716; PAS-00016078-96). Based on an undated PVSC Slug Loadings Control Information, copper was stored in DOT approved containers at the facility (PAS-00016179-80).

Lead

Lead was detected in multiple effluent samples collected at the site from 1982 to 1994 (PAS-00015895-7, 5921, 5956, 5992, 5996, 6183, 6185-6; PAS-00016267, 6279, 6289). The maximum detected concentration of lead was 3.44 milligrams per liter (mg/L) on

January 19, 1994 (PAS-00016185). Several violations of the PVSC lead discharge criteria occurred [see Section 6 (Regulatory History/Enforcement Actions)] and Gumm noted in response to these violations that lead was not used in their production processes (PAS-00015898, 998) or analytical or plating laboratories (PAS-00016281), but stated that lead may be entering the wastewater system from experiments in their laboratory (PAS-00016291). Wastewater discharge volumes are discussed in Section 5 of this report.

The following table lists the lead concentrations in effluent samples collected:

Lead Concentrations in Effluent Samples		
Sample Date	**(mg/L)**	**Reference**
5/24/1982	0.18	PAS-00016267
6/25/1987	1.175	PAS-00016314
1/29/1988	1.22	PAS-00016289
1/27/1989	3.13*	PAS-00015921
10/9/1989	0.055	PAS-00015926
7/18/1990	2.04	PAS-00015956
7/20/1990	1.27	PAS-00015956
7/19/1991	0.596**	PAS-00015992
9/25/1991	0.038	PAS-00016000-1
1/19/1994	3.44	PAS-00016185
11/15/1994 (analysis date)	0.004	PAS-00016223
	0.015	
11/11/1994	0.042	PAS-00016224
11/15/1994	0.005	
11/16/1994	0.054	PAS-00016225
11/17/1994	0.006	

*No units specified
**Weekly average concentration

According to chemical inventories from 1987 through 1993, lead compounds were stored in the laboratory and the liquid mixing area (PAP-00273482; PAP-00273571, 79-80; PAP-00273596-7, 619-20; PAP-00273701, 9, 18, 26; PAS-00016078-96). Based on an undated PVSC Slug Loadings Control Information, lead was stated to be stored in Department of Transportation (DOT) approved containers at the site (PAS-00016179-80).

Mercury

According to chemical inventories from 1987 through 1993, mercury was stored in the laboratory as mercuric sulfate, mercuric chloride, and mercury (PAP-00273472, PAP-00273580; PAP-00273597-8, 620-1; PAP-00273709-10, 27; PAS-00016078-96). Mercury was not detected in effluent samples collected in 1994 (PAS-00016223-5). Previous effluent samples were not analyzed for mercury.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs detected at the site in soils are presented in the table below (PAP-00274019).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Benzo(a)anthracene	1.6 mg/kg
Benzo(a)pyrene	1 mg/kg
Benzo(b)fluoranthene	1 mg/kg
Benzo(k)fluoranthene	0.95 mg/kg
Dibenzo(a,h)anthracene	0.21 mg/kg
Indeno(1,2,3-cd)pyrene	0.58 mg/kg

5. COC Pathways

Sanitary Sewer

As stated in a Memorandum report of a Hazardous Waste Inspection, dated December 1, 1993, the blending process utilized by Gumm did not generate hazardous wastes; however, a rinsing of the blending tank did create wastewater that was discharged into

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 41 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

the PVSC sanitary sewer under permit No. 15404093 (PAS-00016177). The presence of metals in this effluent were monitored for as discussed in Section 4, Identified COCs.

A Waste Effluent Survey, dated March 14, 1972, listed 445,000 gallons of used water that was discharged to the PVSC sanitary sewer in 1971. This survey also stated that no water was discharged to storm sewers, rivers, or ditches (PAS-00015824).

According to the 2004 PAR, sanitary/industrial discharges from the site were to an onsite septic system from 1960 to 1977 (PAP-00272953). Information for previous discharge practices of the process wastewater was not available in the file material.

According to a letter to PVSC from Gumm, dated July 28, 1981, Gumm estimated the total daily discharge from the production and laboratory areas each as 473 gallons per day, totaling 946 gallons per day (PAS-00016263). A PVSC Application for a Sewer Connection Permit, dated October 20, 1986 stated that Gumm discharged an estimated 1,048,787 gallons of process water to the sanitary sewer in 1985 (PAS-00015856). The application identified only one outlet No. 15404090, which discharged 4,920 gallons daily (PAS-00015859).

A letter to the PVSC from Gumm, dated April 15, 1987, defined three outlets and approximated the total volumes discharged to the PVSC from each outlet in 1986 based on readings from the two water meters (Laurel Avenue and Forest Street) and estimates of water usage: Outlet No. 1 was from the laboratory and research areas, which used an estimated 85% of the reading from the Forest Street water meter, or 631,540 gallons; Outlet No. 2 was estimated as 35% of the reading from the Laurel Avenue meter (50% was estimated to go into the product and 15% was estimated to be sanitary use), or 250,073 gallons of process waste water plus any rain water from a roof drain; and, Outlet No. 3 was from the employee sanitary facilities and was an estimated 15% of the Laurel Avenue water meter reading, or 107,174 gallons (PAS-00015874-5). According to a 1991 PVSC Sewer Connection Permit application, the wastewater was discharged to the combined sewer over the period from July 1, 1990 to June 30, 1991. The daily flow for each outlet was listed as 3,000 gallons for 15404091 (Outlet No. 1), 1,000 gallons for 15404092 (Outlet No. 2), and 150 gallons for 15404093 (Outlet No. 3) (PAS-00016005-7).

According to a 1992 Release & Pollution Prevention Report, dated June 1993, water was discharged to the publicly owned treatment works (POTW) sewer and not to any surface water, navigable waters, tributary system, or groundwater (PAS-00016131).

According to an undated Toxic Organic Management Plan, which was to be implemented by April 1, 1993, all effluent from the production area was discharged to the PVSC through Outlet No. 2 (No. 15404092-33206-0151) at an average volume of 400 gallons per day. The effluent from the wet analysis and pilot plating laboratory was discharged through Outlet No. 1 (No. 15404091-33206-0151). An average of 4,300 gallons per day was discharged through this outlet. The pH of both effluents was monitored and a constant pH adjustment system was used for both outlets (PAS-00016103).

A sewer use permit No. 15220027 from the PVSC allowed discharge of pretreated groundwater through one outlet (No. 15220027-1) to the PVSC Treatment Works from 2000 to 2005 (PAS-00016613-15). This was after operations at the site ceased. The application for the permit stated the groundwater was contaminated with methylene chloride and would be pretreated prior to discharge to the combined storm sewer system (PAS-00016586). Two agreements dated November 1, 2005 and November 1, 2006 stated that FGCC Kearny, LLC would be discharging non-hazardous low strength wastewaters generated from groundwater cleanup or similar operations at the Forest Street site (PAS-00016559-60, 602-3).

The Ivy Street CSO is located approximately one mile from the former site location (PAS-00015795). The CSO served as the largest collection area among all of the Kearny-Harrison overflows, covering an area of 607 acres. The Ivy Street CSO discharged directly into Frank's Creek, which ran from the CSO discharge point approximately one mile before entering the Passaic River in an area subject to tidal influence and historic navigational dredging (PAS-00016434).

Spills

As reported by an undated PVSC Slug Loadings Control Information Report, the production area and the laboratory had lined containment pits that were designed to hold any releases that may have occurred. There were no floor drains in the warehouse, manufacturing or laboratory areas that led directly to the sewer; instead, these pits were pumped to pH treatment and discharge points (PAS-00016179).

The Revised Discharge Investigation and Corrective Action Report, dated August 23, 1990 noted Gumm had three USTs that were found to have leaked in 1990. These tanks contained methylene chloride and No. 2 fuel oil (PAS-00015946). In addition, LNAPL indicative of No. 2 fuel oil was found in three site monitoring wells (PAS-00016200-1, 204). According to the 2019 RAWP, soil samples containing concentrations of PAHs extended from approximately seven feet bgs to the depth of the groundwater table at 17.5 feet bgs (PAP-00272845).

6. Regulatory History/Enforcement Actions

Inspections

Inspections of the Kearny site performed by NJDEP in 1983, 1987, and 1993 determined that there were no hazardous wastes generated at the site (PAS-00015836-49, 878-93). The EPA ID NJ0002175636 had been assigned in 1981 (PAS-00016043-44) and the company elected to keep it for emergencies and in case they needed a change in generator status (PAS-00015836-49, 5878-93, 6177).

Violations

Several violations for elevated metals concentrations in effluent samples were noted in the file material. The following table includes the dates of the relevant violations,

concentrations detected, and the outlet or PVSC permit number noted in the violation. In addition, the responses made by Gumm to address the exceedances are also included.

Violations					
Violation Date	**COC**	**mg/L**	**Permit No.**	**Response**	**References**
6/29/1987 8/3/1987	Copper Lead	NS	NS – BMR Deficiency List	To minimize copper contamination, will reduce sample size and return unused sample to customers. Lead was not used in the analytical or plating laboratories. Testing to see if lead was from water pipes.	PAS-00015895-6 PAS-00016279-81
6/25/87-7/21/87	Lead	0.43 1.18	15404090-3306-0151	Pretreatment monitoring report notes they were out of compliance for lead. Lead was not used in the process and was resampled.	PAS-00015897-8 PAS-00016312-4
1/29/1988	Lead	1.22	NS	Lead was not used in metal plating processes, but it was possible lead could come from experiments in the laboratories.	PAS-00016289-91
1/27/1989	Lead	3.13	15404093	No response in the file material, but high result was noted in a memorandum not a notice of violation. Units were not specified.	PAS-00015921
7/18/1990	Lead	2.04 1.27	15404093 (Outlet No. 1)	Unknown accidental discharge. Subsequent sampling did not exceed.	PAS-00015956-60
7/19/1991	Lead	0.596	15404092	Lead was not used in production area where exceedance occurred. Possibly a one-time occurrence due to floor washing.	PAS-00015992, 96-98
2/3/1994	Lead	3.44 0.74 0.66	15404091	Furnace had leaked and sump pump stopped, leading to flooding of the basement. Lead found in pipes/repair of furnace.	PAS-00016185-88

NS= Not specified
BMR= Baseline Monitoring Report

Permits

According to a July 28, 1983 letter to the NJDEP, Gumm operated under permit No. 15404090 from the PVSC, effective date April 21, 1982. The letter states that analysis for metals was performed at Gumm's own laboratory; results of a "typical analysis" were lead at 0.00 ppm and copper at 0.04 ppm. Since metals concentrations were consistently below these levels, the analyses were discontinued effective April 1, 1983, with the approval of PVSC (PAS-00016276-7).

According to a PVSC Sewer Connection Permit application, dated October 20, 1986, the site discharged to the sanitary sewer through outlet No. 15404090 that contained industrial waste (PAS-00015858). A letter from Gumm to PVSC, dated April 15, 1987 describes three outlets that the site discharged wastewater through: the employee sanitary facilities (Outlet No. 3); the production area (Outlet No. 2); and, the laboratory and research facilities (Outlet No. 1) (PAS-00015874). As defined in the 1991 PVSC application, Outlets No. 1 (15404091) and No. 2 (15404092) contained industrial waste with constant pH monitoring and adjustment, and Outlet No. 3 (15404092) was sanitary only and did not contain industrial waste (PAS-00016003-19). The permits associated with these applications were not available in the file material.

The PVSC Sewer Connection Permit No. 15404092 was effective April 21, 1992 through April 21, 1997, and defined two outlets from the site to the PVSC treatment works. The permit defined limits for the concentrations of contaminants in the wastewater, and stated Outlet No. 1 was required to be monitored for lead (daily maximum of 0.6 mg/L) and other contaminants (PAS-00016058-64).

According to a 2000 PVSC Sewer Use Permit application, the site was vacant and Clepo, Inc. granted FGCC Kearny, LLC access to the facility for site remediation purposes (PAS-00016571). The permit No. 15220027 from the PVSC allowed discharge of pretreated groundwater that was contaminated with methylene chloride through one outlet to the sanitary sewer from 2000 to 2005 (PAS-00016573, 613-34). Two agreements dated November 1, 2005 and November 1, 2006 state FGCC Kearny, LLC would be discharging non-hazardous low strength wastewaters generated from groundwater cleanup or similar operations at the Forest Street site (PAS-00016559-60, 602-3).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- A Remedial Investigation Soil Sampling Report, dated September 16, 1993 concluded that soil concentrations of total petroleum hydrocarbons did not exceed the NJDEP cleanup criteria (PAS-00016138-43).

- From 1998 to 2004, remedial investigation activities characterized soil, groundwater, and LNAPL, as well as installed a free product recovery system, according to the 2019 RAWP. The site building was demolished in 2002 and 2003 (PAP-00272839-40).
- According to the NJDEP Site Remediation Program Cover Certification Form, a Preliminary Assessment Report (PAR), Remedial Investigation (RI) Report, and Remedial Action Work Plan were all submitted in 2004 (PAP-00272804). The 2004 PAR concentrated on the one lot (Block 179, Lot 13.01) that was planned to be sold. The 2004 RI Report identified 16 AOCs related to methylene chloride and No. 2 fuel oil contamination (PAP-00272840).
- A 2008 Supplemental RI Report included the collection of soil samples for analysis of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs), with the goal of additional horizontal and vertical delineation of methylene-chloride impacted soils, according to the 2019 RAWP (PAP-00272840-1). The 2008 Supplemental RI Report is provided as Appendix A to the 2019 RAWP (PAP-00273972).
- The Remedial Investigation Report, dated April 2016 (2016 RI Report) defined the extent of contamination related to methylene chloride and LNAPL (PAP-00273799).
- The 2019 RAWP summarized the previous investigations (PAP-00272838-41) and proposed remedial activities for the PAH contamination in soil and LNAPL in groundwater (PAP-00272874-5).

Soil

The 2016 RI Report identified petroleum hydrocarbons in vadose zone soils at the northern site boundary at Laurel Avenue and along the western site boundary at Forest Street, consistent with the locations of free-phase LNAPL. In addition, concentrations of PAHs (naphthalene and 2-methylnaphthalene) are present in vadose zone soils at the locations of the free-phase LNAPL (PAP-00273799).

As summarized in the 2019 RAWP, AOCs-04, -05, and -06 were identified as the former No. 2 fuel oil USTs. Results from the 2004 RI and 2008 Supplemental RI Report state naphthalene concentrations in soil exceeded the direct contact soil remediation standard (SRS), while 2-methylnaphthalene was not reported at concentrations above the direct contact SRS. Concentrations extended from approximately seven feet bgs to the depth of the groundwater table at 17.5 feet bgs (PAP-00272845). In addition, one PAH compound [benzo(a)pyrene] was detected above the SRS, while two PAH compounds [benzo(a)pyrene and benzo(a)anthrancene] were detected above the impact-to-groundwater standard in soil samples collected from Lots 9.01, 9.02, and 12.01 (PAP-00272872-3, 2937).

A NFA Letter for soils on one lot (Block 179, Lot 13.01) at the site was issued by NJDEP on September 28, 2010 (PAP-00265070-1). This approximately 5,000 square feet portion of the site was sold by Clepo, Inc. after the preliminary assessment for this lot was performed in 2004 (PAP-00272948, 65).

Sewer

Effluent from the site was discharged to the PVSC, and characterization of the effluent began in 1982 (PAS-00016267). The maximum concentration of lead in effluent was 3.44 mg/L detected on January 19, 1994 (PAS-00016185), and the maximum concentration of copper was detected at 4.535 mg/L in 1987 (PAS-00016314-6). Based on water usage in 1986, it was estimated that the site discharged 631,540 gallons from the laboratory facilities through Outlet No. 1 and 250,073 gallons of process waste water from Outlet No. 2 (PAS-00015874-5). In 1993, an average of 4,300 gallons per day was discharged through Outlet No. 1, and an average volume of 400 gallons per day was discharged through Outlet No. 2, according to an undated Toxic Organic Management Plan (PAS-00016103).

Remedial Activities

The leaking No. 2 fuel oil USTs were removed in 1990 and LNAPL was found in multiple monitoring wells (PAS-00015946, 6204). The 2016 RI Report identified petroleum hydrocarbons in vadose zone soils at the northern site boundary at Laurel Avenue and along the western site boundary at Forest Street, consistent with the locations of free-phase LNAPL. In addition, concentrations of PAHs (naphthalene and 2-methylnaphthalene) are present in vadose zone soils at the locations of the free-phase LNAPL (PAP-00273799).

According to the 2019 RAWP, the proposed RA to address the PAHs contamination in soil for the impact-to-groundwater is establishment of institutional controls and construction of a low-permeability cap engineering control (PAP-00272874-5).

8. Summary of Asserted Defenses

Canning Gumm asserts that the site's discharges to the PVSC system were federally permitted discharges with very limited deviations. COC releases related to USTs at the site are subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) petroleum exclusion.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

CBS CORPORATION

Facility Name, Address and Size: CBS Corporation (CBS) successor to Westinghouse Electric Corporation (Westinghouse), 95 Orange Street, Newark, New Jersey, Block 47, Lot 40 (PAP-00086829) covered 3.45 acres (PAS-00009660). A 1971 Westinghouse Environmental Control Survey noted that at the time, the plant operated two shifts per day five days a week and employed 1,400 (PAS-00009765). According to a 1972, Waste Effluent Survey, Westinghouse Electric Corp. employed the same number of people, but increased production to three shifts per day, five days a week (PAS-00009660). In 1981, the plant employed 500 employees working two shifts (PAS-00009825).

1. **Business Type:** Westinghouse manufactured various types of electrical equipment including relays, meters, communication channel equipment, analog and digital instruments, sensing devices and transducers, instrument auxiliaries, multiplying resistors and portable instrument transformers and computer systems for relay control. Operations included metal punch presses, stamping, cutting, grinding, milling, drilling, plating, finishing, tumbling, degreasing, spray painting, photo developing and printing (PAP-00347544).

2. **Time Period of Ownership/Operations**

   Operator: 1889 – December 1984 (PAP-00347542)
   Owner: 1891 – December 1983 (PAP-00347543)

   1884: United States Electric and Lighting Company first operated in the eastern portion of the block (now known as University Avenue). The western portion of the block was residential with some industrial properties along Lackawanna Avenue (PAP-00086834).

   1889: Reportedly George Westinghouse leased the plant in 1889 and later purchased both the operations and property in 1891 (PAP-00086834).

   1891: George Westinghouse purchased additional parcels on the block and expanded production. The facility became the Newark Works comprising Block 47, Lot 40 (PAP-00086834).

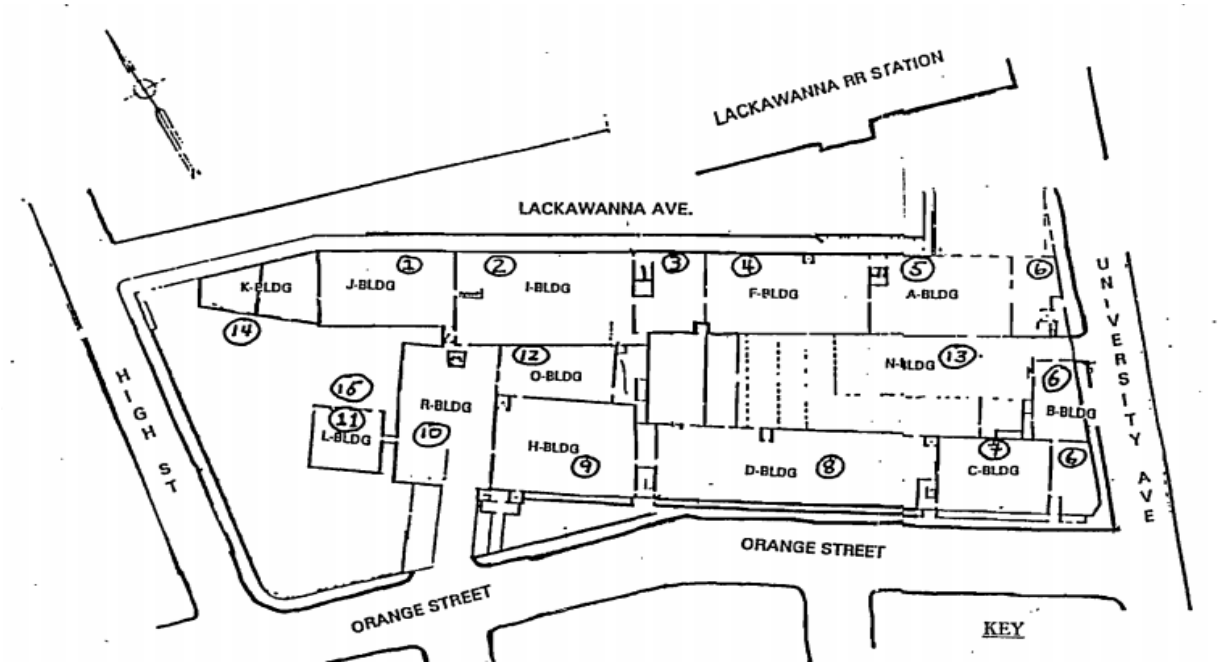
   1895: Operations at Newark Works ceased (PAP-00086834).

   1900s: Newark Works restarted manufacturing at the facility during World War I and produced communication equipment (PAP-00086834).

   1920s: The facility primarily produced protective relays and watt meters and became the Meter Division. It later became the Relay-Instrument Division, and Westinghouse constructed additional buildings into the 1970s that covered 3.45 acres (PAP-00086834).

   1960s: Westinghouse continued to expand its operations through the twentieth century and underwent a plant modernization in the early 1960s (PAP-00347553).

1983: In 1983 Westinghouse ceased operations at the site and the property was sold to New West. New West leased to a variety of commercial and industrial tenants, and the buildings fell into disrepair with the last tenant leaving by 2000 (PAP-00086835).



(PAP-00347546)

The construction years of several buildings are as follows (PAP-00347469; PAP-00347779, 804):

Building A: 1884	Building F: 1894	Building O: 1959
Building B: 1885	Building H: 1911	Building P: 1966
Building C: 1885	Building I: 1911	Building R-1967
Building D: 1904	Building J: 1890	

3. Operational History/COC Use and Presence at the Facility

Early operations at the facility included manufacturing of street railway motors and controllers, arc lamps, volt meters and amp meters. Production later included a wide range of electrical devices, such as electrical meters/instruments, heating apparatuses, recording devices, protective relays, automotive generators, oscillographs, fan motors and radio speakers. A radio broadcast station, WJS, was once located in the buildings (PAP-00086834). The facility operated a variety of plating and steel cleaning operations; however, only those involving or potentially involving the allocation COCs are discussed in this Facility Data Report (PAS-00009739-40; PAS-00009731-32, 35; PAS-00009733-34, 37; PAS-00009725-53)

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A 1972 Westinghouse Waste Effluent Survey documented production of electrical machinery and equipment at an average production rate of 15,000 to 20,000 units per month. The parts were fabricated in the press or machine shops, and assembled into complete units (PAS-00009660). A 1971 Environmental Control Survey for Westinghouse noted that the facility generated 1 ton of sludge and metal scrap every 20 days; one ton of plastic waste every 40 days; one ton of garbage every 10 days; and one ton of wood waste every five days. These solid wastes were disposed off-site at a private landfill (PAS-00009770).

According to August 1982 air permit applications, operations at the site included steam treating steel with naphthenic base oil (PAS-00009721-22).. According to *Components of Paraffin-Base and Naphthenic-Base Crude Oil and Their Effects on Interfacial Performance,* naphthenic-base crude oil contains the PAHs napthalene, phenanthrene and chrysene (https://m.scirp.org/papers/95601).

According to a 1980 Westinghouse Environmental Control Survey, the copper plating process consumed between 70 and 90% of the chemicals; however, the system flushed between 10 and 30% of the chemicals and 100% of the rinse (PAS-00009815). According to an August 1982 Air Pollution Control Permit Application, copper plating operations started in 1960 (PAP-00425611).

According to Westinghouse's 1997 response to an EPA Request for Information, Westinghouse also had an oil and metal chip removal process that used an emulsifiable solvent cleaner to remove heavy oil films, solid dirt and loose metallic chips from metals. Suitable parts were placed in a barrel and tumbled for 2 minutes. Excess cleaning solution was drained before transferring wet parts out of the solution and into a water rinse (PAS-00009754).

Besides degreasing and copper plating, a 1981 Industrial Hygiene Audit Report noted that other processes included: a spray painting operation anda machining operation that used cutting oils; and a coil winding operation that incorporated hand soldering (PAS-00009828). The report did not document specific COC use; however, paints can contain heavy metals and cutting oils can contain PCBs. For example, the report states that personal air samples should be obtained from painters in order to document any exposure to lead if any lead based paints were used; as well as noting that individuals conducting hand soldering were also required to have personal air samples for lead (PAS-00009830-31).

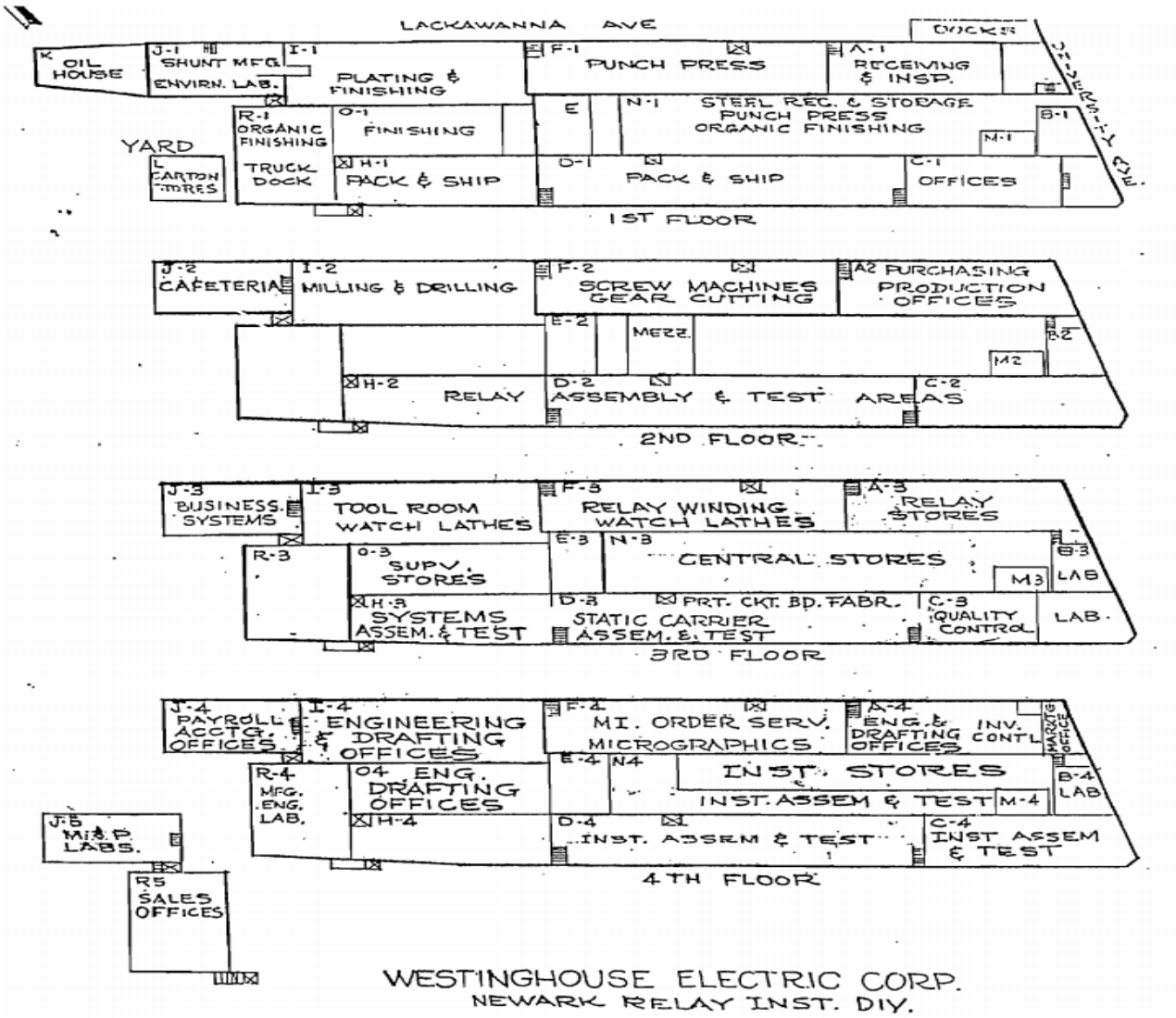
The facility shutdown operations in 1983 (PAS-00009760). A November 1983 letter from Florida Plating, Inc., discussed the removal of: Plating solutions contained in drums;; copper bussing; a 20-foot-long paint booth; and other plating inventory from the Westinghouse facility (PAS-00009698-100).

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Facility Data Report



Buildings A, F, I, J and K Schematics (PAP-00347545)

According to the May 2002 *Interim Remedial Investigation Report*, the following storage tanks were located on the former Westinghouse Property.

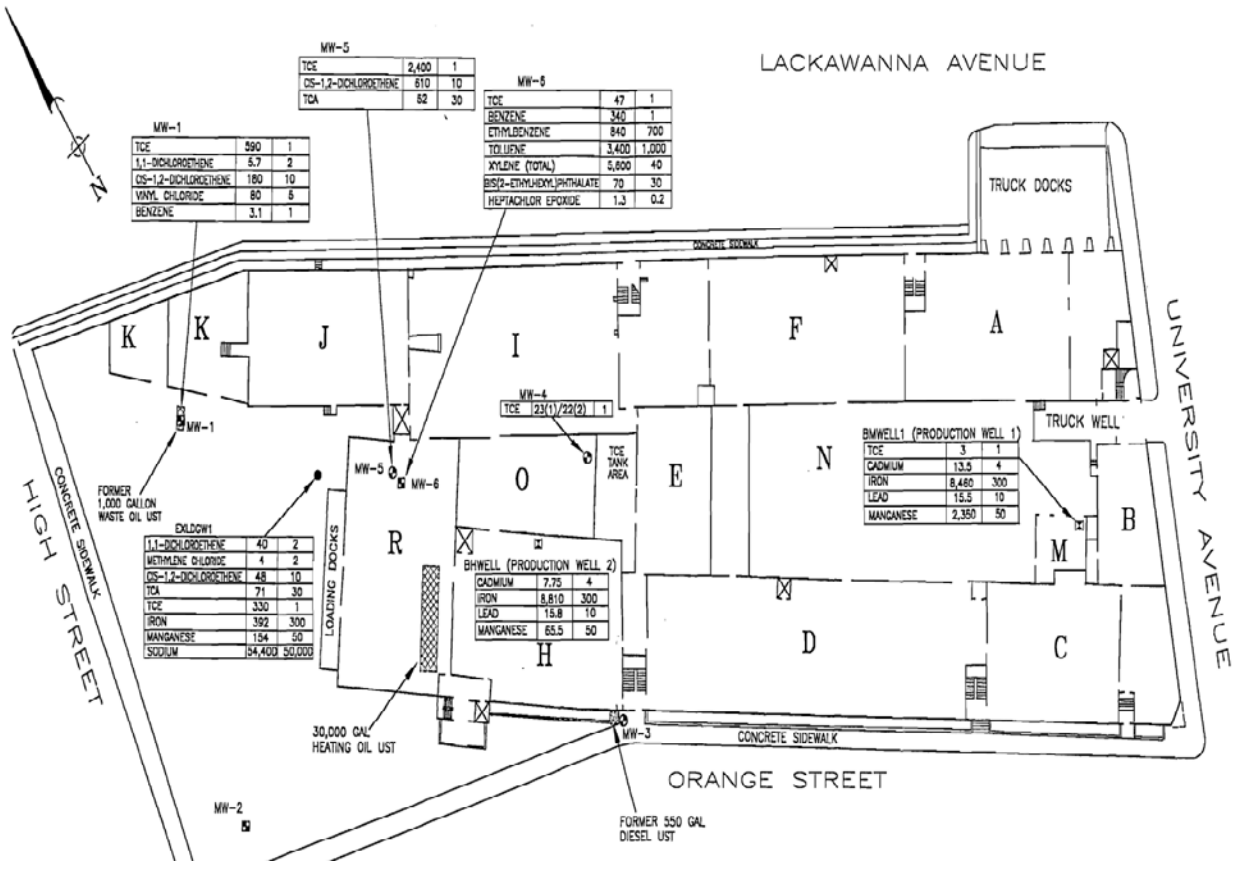
- On May 15, 2001, a 550-gallon diesel UST and a 1,000-gallon waste oil UST were removed from the site. The 550-gallon diesel UST was located between Building H and the sidewalk along Orange Street, and the 1,000-gallon waste oil UST was just south of Building K (PAP-00347919). According to the *Preliminary Assessment Report* (PAR), the diesel UST was previously used to fuel a former Cummings Generator. Contaminated soils were encountered in the excavation area and were removed. Groundwater was not encountered (PAP-00347920). According to the 2003 remedial Investigation Report, based upon the results of post-excavation soil sampling, no residual contamination or compounds of concern at levels exceeding the corresponding NJDEP soil cleanup criteria were detected at the 550-gallon diesel fuel and gasoline USTs (PAP-00348130).

- Based on the historical Westinghouse maps, and the *Preliminary Assessment Report* (PAR), a 1,000-gallon waste oil UST was located in the exterior yard, south of Building K and on May 15, 2001 was removed. Contaminated soils were encountered in the excavation area and were removed and stockpiled on-site (PAP-00347921).

- A former gasoline UST was located south of Building K and west of the 1,000-gallon waste UST and was reportedly removed sometime in the early 1990s by New West. Following collection of the post-excavation soil samples, no lead was detected above the NJDEP Soil Cleanup Criteria and fill was therefore returned to the excavation (PAP-00347923-24).

- A single-wall steel UST was located in Building R and was reportedly installed by Westinghouse in 1951. Heating oil from the tank was pumped to the boiler through a pump room located west of Building H. Upon construction of Building R in 1967 the fuel pump system was moved into the basement of Building H and the overhead piping ran from the pump to the boiler room along the ceiling in the basement of Building H between February 18 and 25, 2002 the tank was removed in small sections. No evidence of contamination was observed (PAP-00347924-25; PAP-00347469).

The locations of USTs are provided on the map below (PAP-00348019).



4. Identified COCs

- PCBs (use, detected)
- PAHs (detected)
- Dieldrin (detected)
- DDx (detected)
- Copper (used, detected)
- Lead (possible use, detected)
- Mercury (detected)

PCBs

According to the Monsanto PCB Sales Summary, Westinghouse Newark, NJ purchased 24,000 pounds of Transformer Inerteen PPO in 1961, 2,696 pounds in 1962, and 735 pounds of Transformer Pyranol A13B3B in 1970 (PAP-00304328, 31). Note: As Westinghouse had multiple properties in Newark, it is not certain that the Newark, NJ address refers to the Orange street property. A Monsanto Material Safety Data Sheet for PCBs reported that Inerteen was a registered trademark of Westinghouse Electric Corporation and used as a dielectric fluid that may have contained varying amounts of PCBs as well as other components including chlorinated benzenes (PAP-00316328, 335). According to the February 25, 1976, *PCB in the United States Industrial Use and Environmental Distribution* by EPA, Inerteen was Westinghouse's trade name for a 60 percent PCB mixture and Pyranol was General Electric's trade name for a 70 percent mixture (PAP-00293934).

In an October 30, 1979 letter regarding the Newark R-I Division, Westinghouse noted "We have a number of oil filled transformers, none over 330 gallons each, but in total over 1,320 gallons, located in several vaults in the basement of our building" (PAS-00009808).

According to a December 13, 1983 Letter, all samples collected in the Plant Area showed less than 50 parts per million (ppm) PCBs and the EPA considered concentrations of less than 50 ppm as non PCB (PAS-00009693-97).

According to an Environmental Review of Westinghouse, conducted August 29-30, 1983, in connection with the closing and disposition of the plant, two unlabeled 55-gallon drums containing PCB capacitors were located near the A-1 area and were not in an approved PCB storage location (PAP-00347867). Test equipment in the Engineering Lab (C-3) contained 21 large PCB capacitors, which were to be removed in early December (PAP-00347868).

According to the April 30, 1992 *Report of Preliminary Interior Sampling*, PCB concentrations were detected in samples of concrete chips collected from the basement areas previously used for maintenance, printing and magnetic assembly and ranged from 0.66 mg/kg to 1.8 mg/kg. No PCBs were detected in the sample from the transformer room (PAP-00347638-40).

The 1998 PAR reported the following Transformers:

- Building E Transformer Vault – contained at least 17 pre-1929, oil filled transformers in the transformer room, adjacent to the boiler room. Oil staining was apparent on the floor next to Transformer A-2 and a floor drain was evident next to transformer B-2. According to a February 28, 1999 letter, Prestige Environmental, Inc. sampled the oil from the transformers in the Transformer Room at the Orange Street Property, and the sampling results showed that the oil from those transformers was non-PCB-containing. (PAP-00347695).

- Building D – Near the 20/20 instrument warehouse contained three small transformers with a 6" floor drain evident in this area. Photographs from the 1998 PAR depict intact transformers (PAP-00347601).

- Building D – In a closet, across from a former paint spray room, a transformer was located on the concrete floor, and a floor drain was evident below it. The unit was listed as 170 gallons, oil cooled. Photographs from the 1998 PAR depict intact transformers (PAP-00347602).

- Building D – Two wall mounted black transformers were located on the north wall, near the former printing area.

- Orange Street Transformer Vault – A transformer vault was identified under the sidewalk along Orange Street, adjacent to Building D. The type, number, and status of these transformers was not identified (PAP-00347571).

According to the 1998 *Preliminary Assessment Report,* the preliminary interior sampling and analysis by Paulus, Sokolowski and Sartor (PS&S) on April 30, 1992 detected 9.3 to 23 mg/kg PCBs in the oily material from the wooden flooring on the second floor of one of Westinghouse's former buildings (PAP-00347555).

According to the May 2002 *Interim RIR*, the following PCB concentrations were found on the Westinghouse Facility (PAP-00347980-8001,8014).

PCB Concentrations	
Location	**Max**
Waste UST (soil)	9.01 mg/kg
Boiler Pit (soil)	0.19 mg/kg
Loading Dock Areas (soil)	0.42 mg/kg
Trenches (soil)	0.7 mg/kg
Dry Wells (soil)	12 mg/kg
Incinerator Area (soil)	0.34 mg/kg
Core Samples (concrete floor)	1.9 mg/kg

According to the 2010 *Soil RIR*, PCBs were detected in AOC 13 between November and December 2008 at 2.6 mg/kg in sample I1A at 0.5 to 1 foot bgs, 270 mg/kg in sample I1B at 3 to 3.5 feet bgs and 47 mg/kg in sample I1C at 6 to 6.5 feet bgs. The PCB-contaminated soil was removed, along with the lead contaminated soil from AOC13 (PAP-00086846).

The 2010 *Soil RIR* also reported that soil with PCBs that exceeded RDC/NRDC SCC was identified in 2008 in AOC I3 Floor Drains and Piping and AOC I4 Floor Trenches. PCB concentrations ranged in concentrations of 0.5 mg/kg Aroclor-1254 in soil sample I12D collected between 9 and 9.5 feet bgs and 11 mg/kg Aroclor-1254 in soil sample I12A collected between 0.5 and 1 foot bgs. (PAP-00086879). Soil sample DWS2-4 for the Dry Well (AOC O3) collected in 2001 at 4 feet bgs also contained 12 mg/kg Aroclor-1260 (PAP-00086881). The areas with PCB concentrations above the RDC/NRDC SCC after excavation were to be addressed by engineering and institutional controls (PAP-00086855, 59).

PAHs

According to the May 2002 *Interim RIR*, the following PAH concentrations were found on the Westinghouse Facility (PAP-00347979-92, 8014-15).

PAH Concentrations		
PAH	**Max**	**Location**
Benzo(a)anthracene	2.4 mg/kg	Incinerator Area
Benzo(a)pyrene	6.7 mg/kg	Garage Area
Benzo(b)fluoranthene	2.2 mg/kg	Drywells
Benzo(k)fluoranthene	3.8 mg/kg	Incinerator Area
Dibenzo(a,h) anthracene	0.89 mg/kg	Incinerator Area
Indeno (1,2,3-cd) Pyrene	2.2 mg/kg	Incinerator Area

According to the March 2008 *Summary Report on Soil Investigation & Interim Remedial Actions*, PAH concentrations from borings collected 0-7.5 feet bgs in the paved yard soil (former residential dwellings) contained PAHs (PAP-00348399, 429). The maximum concentrations presented below are from one sample (Y-22) collected from 1-1.5 feet deep beneath the asphalt surface with all sampling in the following figure.

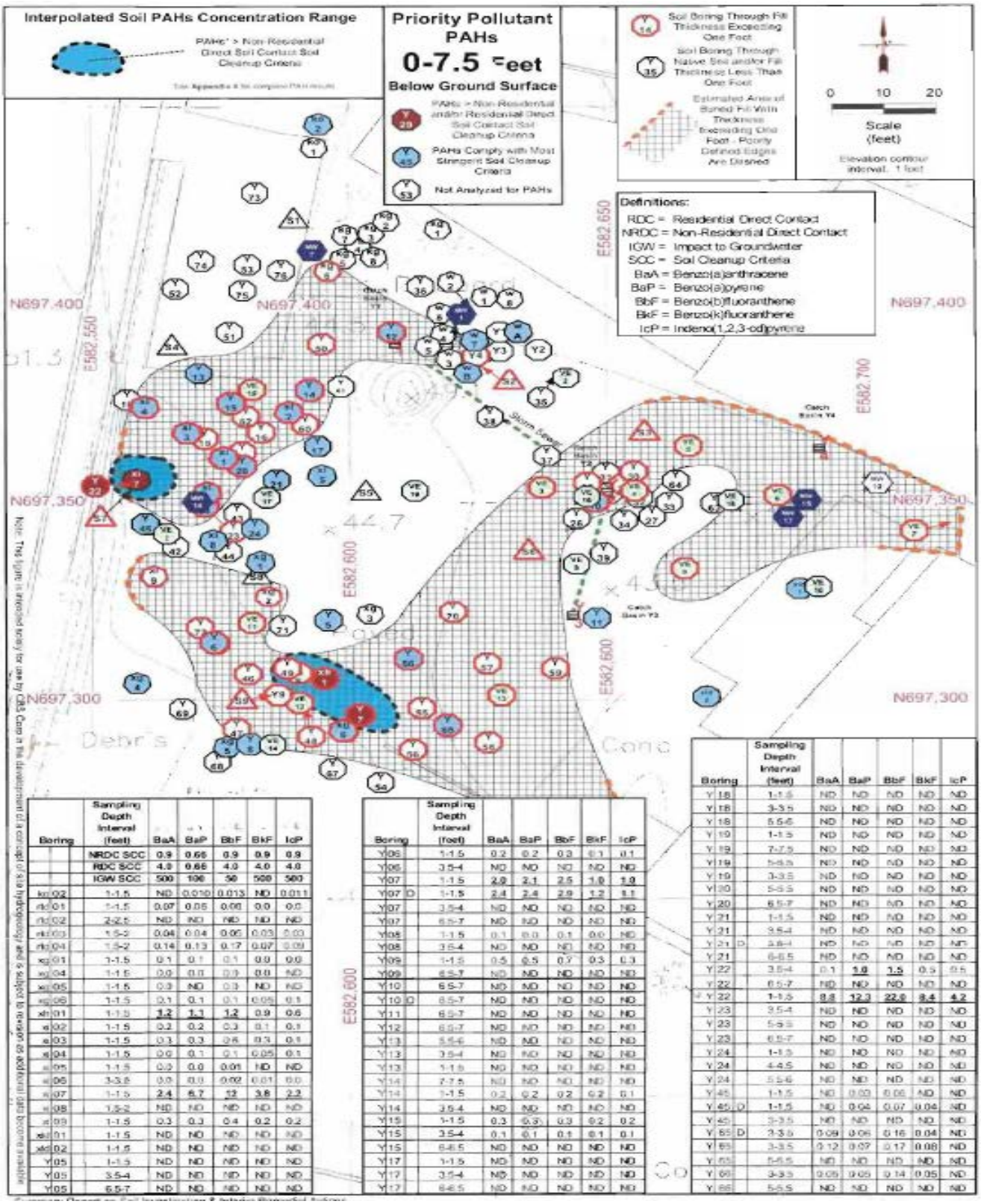
PAH Concentrations	
PAH	**Max**
Benzo(a)anthracene	8.8 mg/kg
Benzo(a)pyrene	12.3 mg/kg
Benzo(b)fluoranthene	22.0 mg/kg
Benzo(k)fluoranthene	8.4 mg/kg
Indeno (1,2,3-cd) Pyrene	4.2 mg/kg

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Boring	Sampling Depth Interval (feet)	BaA	BaP	BbF	BkF	IcP
	NRDC SCC	0.9	0.66	0.9	0.9	0.9
	RDC SCC	4.0	0.66	4.0	4.0	4.0
	IGW SCC	500	100	50	500	500
kj 02	1-1.5	ND	0.010	0.013	ND	0.011
rk 01	1-1.5	0.07	0.05	0.06	0.0	0.0
rk 02	2-2.5	ND	ND	ND	ND	ND
rk 03	1.5-2	0.04	0.04	0.05	0.03	0.03
rk 04	1.5-2	0.14	0.13	0.17	0.07	0.09
xj 01	1-1.5	0.1	0.1	0.1	0.0	0.0
xj 04	1-1.5	0.0	0.0	0.0	0.0	ND
xj 05	1-1.5	0.3	ND	0.3	ND	ND
xj 06	1-1.5	0.1	0.1	0.1	0.05	0.1
xh 01	1-1.5	1.2	1.1	1.2	0.9	0.6
e 02	1-1.5	0.2	0.2	0.3	0.1	0.1
e 03	1-1.5	0.3	0.3	0.6	0.3	0.1
e 04	1-1.5	0.0	0.1	0.1	0.05	0.1
e 05	1-1.5	0.0	0.0	0.01	ND	ND
e 06	3-3.5	0.0	0.0	0.02	0.01	0.0
e 07	1-1.5	2.4	6.7	12	3.8	2.2
e 08	1.5-2	ND	ND	ND	ND	ND
e 09	1-1.5	0.3	0.3	0.4	0.2	0.2
xd 01	1-1.5	ND	ND	ND	ND	ND
xd 02	1-1.5	ND	ND	ND	ND	ND
Y 05	1-1.5	ND	ND	ND	ND	ND
Y 05	3.5-4	ND	ND	ND	ND	ND
Y 05	6.5-7	ND	ND	ND	ND	ND

Boring	Sampling Depth Interval (feet)	BaA	BaP	BbF	BkF	IcP
Y 06	1-1.5	0.2	0.2	0.3	0.1	0.1
Y 06	3.5-4	ND	ND	ND	ND	ND
Y 07	1-1.5	2.0	2.1	2.5	1.0	1.0
Y 07 D	1-1.5	2.4	2.4	2.9	1.2	1.1
Y 07	3.5-4	ND	ND	ND	ND	ND
Y 07	6.5-7	ND	ND	ND	ND	ND
Y 08	1-1.5	0.1	0.0	0.1	0.0	ND
Y 08	3.5-4	ND	ND	ND	ND	ND
Y 09	1-1.5	0.5	0.5	0.7	0.3	0.3
Y 09	6.5-7	ND	ND	ND	ND	ND
Y 10	6.5-7	ND	ND	ND	ND	ND
Y 10 D	6.5-7	ND	ND	ND	ND	ND
Y 11	6.5-7	ND	ND	ND	ND	ND
Y 12	6.5-7	ND	ND	ND	ND	ND
Y 13	5.5-6	ND	ND	ND	ND	ND
Y 13	3.5-4	ND	ND	ND	ND	ND
Y 13	1-1.5	ND	ND	ND	ND	ND
Y 14	7-7.5	ND	ND	ND	ND	ND
Y 14	1-1.5	0.2	0.2	0.2	0.2	0.1
Y 14	3.5-4	ND	ND	ND	ND	ND
Y 15	1-1.5	0.3	0.3	0.3	0.2	0.2
Y 15	3.5-4	0.1	0.1	0.1	0.1	0.1
Y 15	6.5-7	ND	ND	ND	ND	ND
Y 17	1-1.5	ND	ND	ND	ND	ND
Y 17	3.5-4	ND	ND	ND	ND	ND
Y 17	6.5-7	ND	ND	ND	ND	ND

Boring	Sampling Depth Interval (feet)	BaA	BaP	BbF	BkF	IcP
Y 18	1-1.5	ND	ND	ND	ND	ND
Y 18	3-3.5	ND	ND	ND	ND	ND
Y 18	5.5-6	ND	ND	ND	ND	ND
Y 19	1-1.5	ND	ND	ND	ND	ND
Y 19	7-7.5	ND	ND	ND	ND	ND
Y 19	5-5.5	ND	ND	ND	ND	ND
Y 19	3-3.5	ND	ND	ND	ND	ND
Y 20	5-5.5	ND	ND	ND	ND	ND
Y 20	6.5-7	ND	ND	ND	ND	ND
Y 21	1-1.5	ND	ND	ND	ND	ND
Y 21	3.5-4	ND	ND	ND	ND	ND
Y 21 D	3.5-4	ND	ND	ND	ND	ND
Y 21	6-6.5	ND	ND	ND	ND	ND
Y 22	3.5-4	0.1	1.0	1.5	0.5	0.5
Y 22	6.5-7	ND	ND	ND	ND	ND
Y 22	1-1.5	9.8	12.3	22.0	9.4	4.2
Y 23	3.5-4	ND	ND	ND	ND	ND
Y 23	5-5.5	ND	ND	ND	ND	ND
Y 23	6.5-7	ND	ND	ND	ND	ND
Y 24	1-1.5	ND	ND	ND	ND	ND
Y 24	4-4.5	ND	ND	ND	ND	ND
Y 24	5.5-6	ND	ND	ND	ND	ND
Y 45	1-1.5	ND	0.03	0.06	ND	ND
Y 45 D	1-1.5	ND	0.04	0.07	0.04	ND
Y 45	3-3.5	ND	ND	ND	ND	ND
Y 65 D	3-3.5	0.09	0.06	0.16	0.04	ND
Y 65	3-3.5	0.12	0.07	0.17	0.08	ND
Y 65	5-5.5	ND	ND	ND	ND	ND
Y 66	3-3.5	0.05	0.05	0.14	0.05	ND
Y 66	5-5.5	ND	ND	ND	ND	ND

(PAP-00348429)

PAH exceedances identified in the 2010 *Soil RIR,* located in AOC A3 Loading Dock are provided in the following table (PAP-00086875).

Boring ID:	New Jersey	New Jersey	New Jersey	A4	A4
Sample ID:	Residential	Non-Residential	Impact to	A4	A4A
Sample Depth:	Direct Contact	Direct Contact	Ground Water	1'-1.5'	2.5'-3.0'
Sampling Date:	Soil Cleanup	Soil Cleanup	Soil Cleanup	11/5/2008	12/9/2008
Sampled by[a]:	Criteria	Criteria	Criteria	CRC	CRC
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)[b]					
Benzo(a)anthracene	0.9	4	500	1.2	17
Chrysene	9	40	500	--[c]	16
Benzo(b)fluoranthene	0.9	4	50	0.98	8.7
Benzo(k)fluoranthene	0.9	4	500	1.1	12
Benzo(a)pyrene	0.66	0.66	100	1	12
Indeno(1,2,3-cd)pyrene	0.9	4	500	--	4.4
Dibenz(a,h)anthracene	0.66	0.66	100	--	2.1

Notes:
(a) "Sampled by" abbreviations are as follows:
CRC = Cummings/Riter Consultants, Inc.
(b) "mg/kg" is milligrams per kilogram, or parts per million.
(c) "--" indicates result is in compliance with soil cleanup criteria.

Sample BHTRS1 collected in 2001 at 2.5 feet bgs contained 2.7 mg/kg benzo(a)pyrene, 1.4 mg/kg Benzo(a)anthracene and 1 mg/kg Benzo(b)fluoranthene in AOC H2 Floor Trenches (PAP-00086878).

PAH exceedances identified in the 2010 Soil RIR located in AOC N4 Floor Drains are provided in the following table (PAP-00086880).

Boring ID:	New Jersey	New Jersey	New Jersey	N1	BNFDS1	BNFDS1	BNFDS1
Sample ID:	Residential	Non-Residential	Impact to	N1	BNFDSIA[c]	BNFDS1B (DUP)[d]	BNFDS1C
Sample Depth:	Direct Contact	Direct Contact	Groundwater	15.5'-16'	3'-3.5'	5.5'-6'	7.5'-8'
Sampling Date:	Soil Cleanup	Soil Cleanup	Soil Cleanup	12/11/2008	11/11/2008	12/12/2008	12/12/2008
Sampled by[a]:	Criteria	Criteria	Criteria	CRC	CRC	CRC	CRC
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)[b]							
Benzo(a)anthracene	0.9	4	500	2.1	5.6	4.6	8.1
Benzo(b)fluoranthene	0.9	4	50	1.7	4.7	2.6	5
Benzo(k)fluoranthene	0.9	4	500	1.9	4.7	3.6	6.5
Benzo(a)pyrene	0.66	0.66	100	1.7	4.4	3.2	6
Indeno(1,2,3-cd)pyrene	0.9	4	500	--[e]	1.2	1.5	3
Dibenz(a,h)anthracene	0.66	0.66	100	--	--	--	1.1

Notes:
(a) "Sampled by" abbreviations are as follows:
CRC = Cummings/Riter Consultants, Inc.
(b) "mg/kg" is milligrams per kilogram or parts per million.
(c) Results are from a duplicate sample. Results from the original sample were in compliance with soil cleanup criteria.
(d) Duplicate sample collected at this location. The higher result of the original and duplicate sample is presented.
(e) "--" indicates result is in compliance with soil cleanup criteria.

One of 19 samples from AOC O3 contained soil with PAH exceeding SCC concentrations ranging between 0.94 mg/kg Dibenzo(a,h) anthracene in sample DWS2-4 collected in 2001 at 4 feet bgs and 8.9 mg/kg benzo(a)anthracene collected between 18 and 18.5 feet bgs in sample BODWS1A (PAP-00086881).

According to the 2010 *Soil RIR*, two of the 38 soil samples exceeded the NRDC SCC for select PAHs in AOC I3. PAH concentrations in these samples ranged from 0.86 mg/kg benzo(a)pyrene in sample I15B collected at 3 to 3.5 feet bgs to 0.96 benzo(k)fluoranthene in sample 12A, C, D collected at 0.5 to 1 feet bgs. NRDC SCC

exceedances in AOC I3 are proposed to be addressed by engineering and institutional controls (PAP-00086855). PAHs exceeding RDC and/or NRDCC SCC in sample BHTRS1 collected from the floor trenches (AOC H2) of Building H in 2001, were also proposed to be addressed by engineering and institutional controls (PAP-00086854).

Dieldrin

According to the 2002 *Interim Remedial Investigation Report (RIR)*, soil samples taken next to floor drains and trenches contained maximum concentrations of 0.034 mg/kg aldrin (BEFDS1 collected from 3.5 in bgs on July 11, 2001), and 0.036 mg/kg dieldrin (BHTRS1 collected from 2.5 in bgs on July 10, 2001) (PAP-00347986-88).

According to the 2010 *Soil Remedial Investigation Report (RIR),* dieldrin was not detected in soil beneath Buildings D, J, K, M, R and T based on the 2001 sampling (PAP-00086927).

The 2001 sampling showed two detection instances of dieldrin occurred during dual column analysis when the percent difference between the quantitated concentrations on the two columns were greater than 40%: at Building I in sample BITRS2 collected on October 9, 2001 from 2.5 feet below ground surface (bgs) contained 0.011 mg/kg and Building O in dry well sample DWS4-6 collected on June 13, 2001 from 6 ft bgs containing 0.023 mg/kg (PAP-00086971; PAP-00087019).

DDx

According to the 2002 *Interim RIR*, soil sample BEBPS1 collected on July 11, 2001 from adjacent to one of the boilers located in Building E contained 0.0093 mg/kg 4-4'-DDE and 0.001 mg/kg 4,4'-DDT (PAP-00347983). The analytical results indicated that all detected parameters were below the applicable NJDEP Soil Cleanup Criteria. On October 8, 2001, a second boring (BITRS2) was advanced in the trench to the water table and contained a maximum concentration of 0.15 mg/kg 4, 4'-DDE, 0.22 mg/kg 4, 4'-DDT (difference between dual column analyses was greater than 40%) in sample BITRS2 collected from 18 inches bgs on October 9, 2001 (PAP-00347987). Soil sample BOFDS1B collected on October 9, 2001 from 8 inches bgs contained 0.034 mg/kg 4,4' DDE, 0.0098 mg/kg 4,4'-DDD (difference between dual column analyses was greater than 40%), and 0.012 mg/kg 4,4'- DDT (difference between dual column analyses was greater than 40%) (PAP-00347988). Drywells contained max concentrations of 0.8 mg/kg (difference between dual column analyses was greater than 40%) 4, 4'-DDD, 0.043 mg/kg 4, 4'-DDT (difference between dual column analyses was greater than 40%) and 0.24 mg/kg 4,4'-DDE (PAP-00347989).

According to the 2010 Soil RIR, 0.046 mg/kg 4, 4'-DDT was detected in soil sample BDFDS1 collected 1.5 feet bgs from Building D in 2001 (PAP-00086927). Concentrations of DDT were below RDC/NRDC SCC in Buildings D, E, H, I, J, K, M, O and R (generally non-detect), building N was not analyzed (PAP-00086971-77, 84, 94; PAP-00087016-19, 33). Please see map at the end of this section for sampling locations.

Copper

According to a 1981, Selected Substance Report Westinghouse brought in 163,500 lbs. per year of copper of which 82,788 was shipped off site as (or in) product. The estimated maximum inventory in 1981 was 211,328 lbs. (PAP-00425588).

According to the March 1998 *PAR,* copper cyanide was used in the Electroplating Area of Building I on the first floor from 1960 through 1983 (PAP-00347554).

According to the 1998 *PAR,* the preliminary interior sampling and analysis by Paulus, Sokolowski and Sartor (PS&S) on April 30, 1992 detected 20,300 mg/kg of copper in a residual material sample from the plating room. Sampling of the oily material from the wooden flooring on the second floor contained elevated levels of copper (29,100 mg/kg) (PAP-00347555).

According to the May 2002 *Interim RIR*, the following copper concentrations were found on the former Westinghouse Facility (PAP-00347979-92, 996-8001, 8014-15, 8020).

Copper Concentrations	
Location	**Max**
TCE Tank Area (soil)	86 mg/kg
Waste UST (soil)	40.7 mg/kg
Boiler Pit (soil)	103 mg/kg
Loading Dock Areas (soil)	42.3 mg/kg
Drum and Waste Storage Areas (soil)	35.2 mg/kg
Trenches (soil)	843 mg/kg
Drywells (soil)	5,050 mg/kg
Incinerator Area (soil)	1,210 mg/kg
Garage Area (soil)	268 mg/kg
Core Samples (concrete floor)	6.040 mg/kg

According to the March 2008 *Summary Report on Soil Investigation & Interim Remedial Actions*, copper concentrations from borings collected 0-10 feet below ground surface near the former incinerator ranged from 11.1 mg/kg-2,330 mg/kg (PAP-00348398, 427).

AOC T8 Former Garage contained copper that ranged between 1,270 mg/kg in soil sample Y-14 collected between 1.0 and 1.5 feet bgs in Historic Fill and 2,330 mg/kg in soil sample Y-23 collected between 5 and 5.5 feet bgs (PAP-00086887).

The 2010 *Soil RIR* noted that copper concentrations in soil exceeding RDC/NRDCC SCC in Building I (AOC I3 and I4 – floor drains, piping and trenches) and AOC T8 (Former Garage) are to be proposed to be addressed with engineering and institutional controls (PAP-00086855-56, 63).

According to a 1972 Waste Effluent Survey, copper was not detected in Westinghouse industrial waste effluent (detection limit of <0.1 mg/L) (PAS-00009662). A 1981 Sewer Application contained an analysis of industrial waste showing it contained 1.05 mg/L copper (PAS-00009872).

Lead

According to an Environmental Review of Westinghouse conducted August 29-30, 1983, "Paints used in these systems (water paint booths N-1 and R-1) included a variety of lacquers and enamels with some possibly containing lead and/or chrome" (PAP-00347867). Additional documents confirming lead-based lacquers and enamels were not identified in the available file material.

According to the 1998 *PAR,* the preliminary interior sampling and analysis by Paulus, Sokolowski and Sartor (PS&S) on April 30, 1992 detected 4,140 mg/kg of lead (B-3) in a residual material sample from the plating room (Building I). The oily material from the wooden flooring on the second floor (Building F) in areas formerly containing machining, milling and drilling also contained elevated levels of lead (4,800 mg/kg) (PAP-00347555).

According to the May 2002 *Interim RIR*, the following lead concentrations were found on the former Westinghouse Facility (PAP-00347979-92, 996-8006).

Lead Concentrations	
Location	**Max**
TCE Tank Area (soil)	96.6 mg/kg
Waste UST (soil)	97.1 mg/kg
Former Gasoline UST (soil)	69.5 mg/kg
Boiler Pit (soil)	62.9 mg/kg
Loading Dock Areas (soil)	386 mg/kg
Drum and Waste Storage Areas (soil)	45.8 mg/kg
Next to a Floor Drain (soil)	4,030 mg/kg
Drywells (soil)	2,440 mg/kg
Incinerator Area (soil)	1,290 mg/kg
Garage Area (soil)	222 mg/kg
Core Samples (concrete floor)	15.8 mg/kg
Basement (TCLP)	17.3 mg/L
First Floor (TCLP)	33 mg/L
Second Floor (TCLP)	4 mg/L

According to the March 2008 *Summary Report on Soil Investigation & Interim Remedial Actions*, lead concentrations from borings collected 0-10 feet below ground surface near the former incinerator ranged from ND to 11,400 mg/kg in soil sample Y-23 collected between 3.5 and 4 feet bgs from Historic Fill in AOC T8 (Former Garage) (PAP-00348398, 427; PAP-00086887).

According to the 2010 *Soil RIR*, between November and - December 2008, lead was identified in AOC D2 at a maximum level of 8,280 mg/kg in sample D6A collected between 1 and 1.5 feet bgs. Thirty cubic yards of contaminated soil were excavated from the AOC to a depth of 3.5 feet bgs. AOC I3 contained 502 mg/kg lead in sample I1C that warranted excavation of 35 cubic yards of soil to a depth of 8 feet bgs. In addition, 609 mg/kg lead in sample R1A was identified in AOC R2. High TCE concentrations in this area also warranted the excavation of 50 cubic yards of contaminated soil to a depth of 11 feet bgs (PAP-00086846).

According to the 2010 *Soil RIR*, post-excavation sampling identified remaining lead concentrations in soil ranged between 1.3 mg/kg in AOC I3 collected between 6 and 6.5 feet bgs in sample PE-I1-ESW and 336 mg/kg in AOC D2 in sample PE-D6-SSW collected between 2.5 and 3 feet bgs (PAP-00086874).

AOC D2 Floor Drains/Trenches contained lead at 637 mg/kg in sample D7A collected between 1 and 1.5 feet bgs and 874 mg/kg in sample D8A collected at the same level (PAP-00086876). Both samples originated from materials identified as Historic Fill (PAP-00086849).

AOC E2 Floor Drains/Trenches, contained lead above the RDC SCC at a concentration of 1,380 mg/kg in sample E2B collected between 3.5 and 4 feet bgs on November 6, 2008 (PAP-00086877). Lead (609 mg/kg) was found in sample I2B between 3.0 and 3.5 feet bgs at AOC I3 (PAP-00086879). As noted in the table above, 2,440 mg/kg lead was found in soil sample DWS2-4 collected 4 feet bgs in AOC O3 (PAP-00086881).

AOC T7 Incinerator soil contained 404 mg/kg in soil sample EXICS2 collected from materials identified as Historic Fill at 1 foot bgs. As noted in the table above1,290 mg/kg lead was found in soil sample EXICS6 from materials identified as Historic Fill collected at 3 feet bgs (PAP-00086886).

According to the 2010 *Soil RIR*, AOC D2 (floor drains and trenches), AOC E2 (floor drains/trenches), and AOC I3 (floor drains and piping) containing lead concentrations that exceeded RDC/NRDC SCC (D7A and D8A) were proposed to be addressed with engineering and institutional controls (PAP-00086852-53, 55).

According to a 1972 Waste Effluent Survey, Westinghouse's industrial waste effluent was non-detect for lead, with a detection limit of < 0.3 mg/L (PAS-00009662), and the facility sent 121,404,436 gallons of water/year to the sanitary sewer (PAS-00009661). A 1981 Sewer Application contained an analysis of industrial waste effluent showing it contained 1.18 mg/L lead (PAS-00009872).

Mercury

According to the May 2002 *Interim RIR*, the following mercury concentrations were found at the former Westinghouse Facility (PAP-00347979-92, 999-8006).

Mercury Concentrations	
Location	**Maximum Concentration**
TCE Tank Area (soil)	0.25 mg/kg
Waste UST (soil)	0.808 mg/kg
Boiler Pit (soil)	0.05 mg/kg
Loading Dock Areas (soil)	0.74 mg/kg
Drum and Waste Storage Areas (soil)	0.14 mg/kg
Next to a Floor Drain (soil)	32.9 mg/kg
Drywells (soil)	2.4 mg/kg
Incinerator Area (soil)	4.7 mg/kg
Garage Area (soil)	1.4 mg/kg
Core Samples (concrete floor)	10 mg/kg
Basement (TCLP)	0.006 mg/kg
First Floor (TCLP)	0.004 mg/kg
Second Floor (TCLP)	0.005 mg/kg

According to the 2010 *Soil RIR*, between November and December 2008, sampling found a maximum level of mercury on-site in AOC D2 of 25.4 mg/kg in sample D6A. The contamination was excavated during the removal of lead at AOC D2 (PAP-00086846).

Post-excavation samples collected only from AOC D2 identified remaining mercury concentrations that ranged between 3.5 mg/kg in sample PE-D6-Bott collected between 2.5 and 3.5 feet bgs and 41.6 mg/kg in sample PE-D6-SSW collected between 2.5 and 3 feet bgs (PAP-00086876). AOC D2 Floor Drains/Trenches contained mercury that ranged between 20.2 mg/kg in sample D8A at 1 to 1.5 feet bgs in material identified as Historic Fill and 41.6 mg/kg in sample PE-D6-SSW in a post-excavation sample collected at 2.5 and 3 feet bgs (PAP-00086876).

According to the 2010 *Soil RIR*, AOC D2, floor drains and trenches, containing mercury exceeding RDC/NRDC SCC were proposed to be addressed with engineering and institutional controls (PAP-00086852).

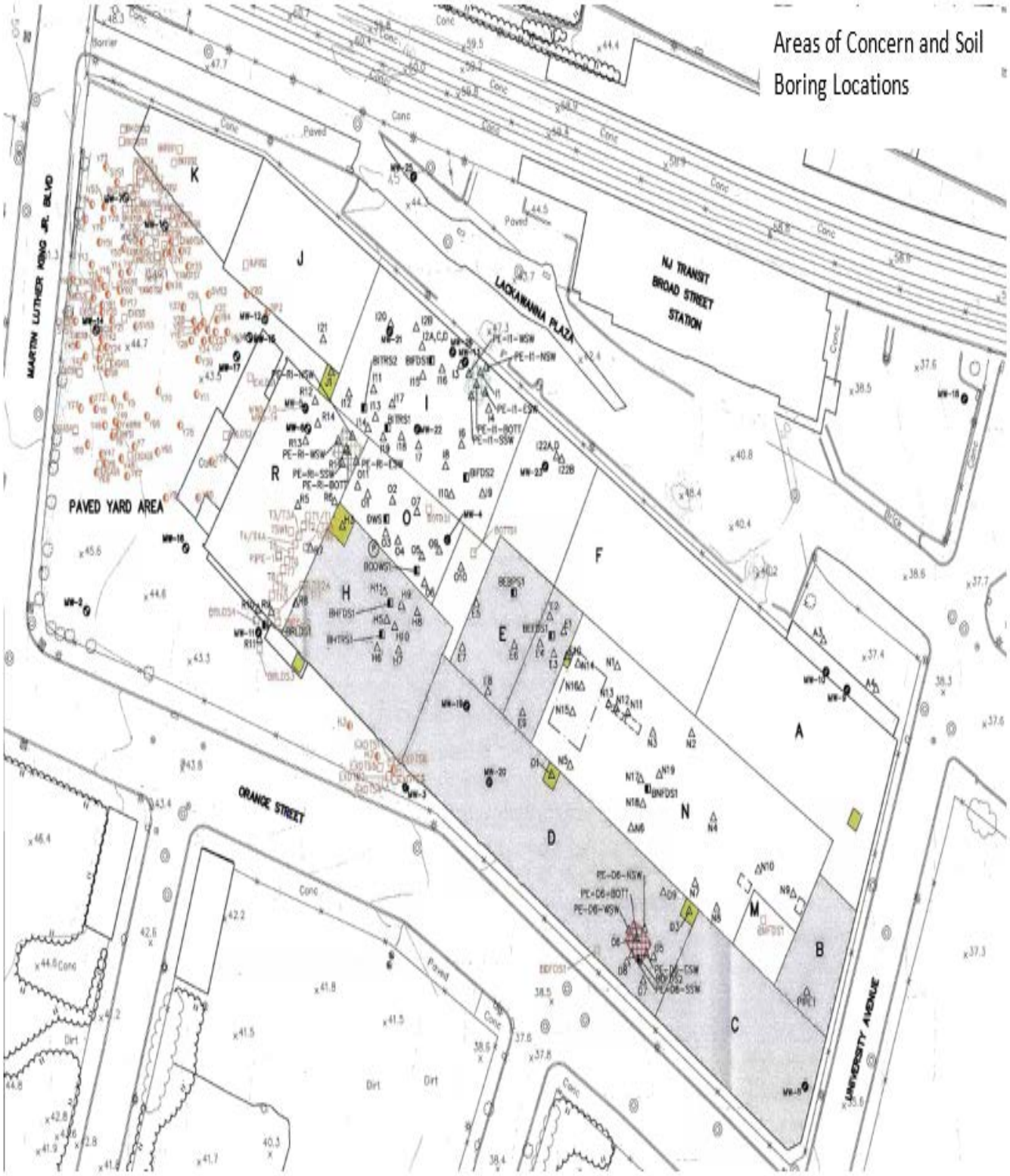
According to a 1972 Waste Effluent Survey, Westinghouse industrial waste contained 0.0007 mg/L mercury (PAS-00009662).

According to an August 5, 1981 Letter, PVSC requested that Westinghouse conduct a 3 month monitoring program from April 27, 1981 – July 24, 1981 for mercury for each discharge point (4). Results from the report are below (PAP-00425594-8).

Discharge Monitoring Report				
Discharge	05/27/1981	06/18/1981	07/14/1981	Volume Discharged (Gallons)
1	.0009	.0006	<.0005	5,638,000
2	.0008	.0014	.0048	805,000
3	.0019	.0008	<.0005	1,381,000
4	.0008	.0006	<.0005	3,682,000

CBS Corporation

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report



(PAP-00086896)

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soil soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	11,400 mg/kg
Copper	5,050 mg/kg
Mercury	41.6 mg/kg
Benzo(a)anthracene	8.8 mg/kg
Benzo(a)pyrene	12.3 mg/kg
Benzo(b)fluoranthene	22 mg/kg
Benzo(k)fluoranthene	8.4 mg/kg
Dibenzo(a,h)anthracene	0.89 mg/kg
Indeno(1,2,3-cd)pyrene	4.2 mg/kg
PCBs	270 mg/kg

According to the April 2016 *Groundwater Remedial Investigation Report*, approximately 95 percent of the site was covered by concrete slabs and asphalt pavement (PAP-00348813).

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to the 2010 *Soil RIR*, Historic Fill exists at the site and consisted of pieces of bricks and/or concrete block and wood fragments, along with cinders, slag, sand and coal in soil. Historic Fill thickness ranged between less than one-foot to approximately eight feet. It was noted in AOCs C, D, E, H, I, N, O, R and T. Samples of fill contained exceedances of SCC for metals and PAHs that were unrelated to site operations (PAP-00086848-49).

In early August 2019, NJDEP requested that the proposed Historic Fill CEA boundaries be "pulled back" to match site/property boundaries. CBS submitted a revised Historic Fill CEA to NJDEP. By letter dated September 6, 2019, NJDEP established a CEA/Well Restriction Area (CEA/WRA) for contamination in groundwater associated with the Historic Fill at the facility (PAP-00425522).

5. COC Pathways

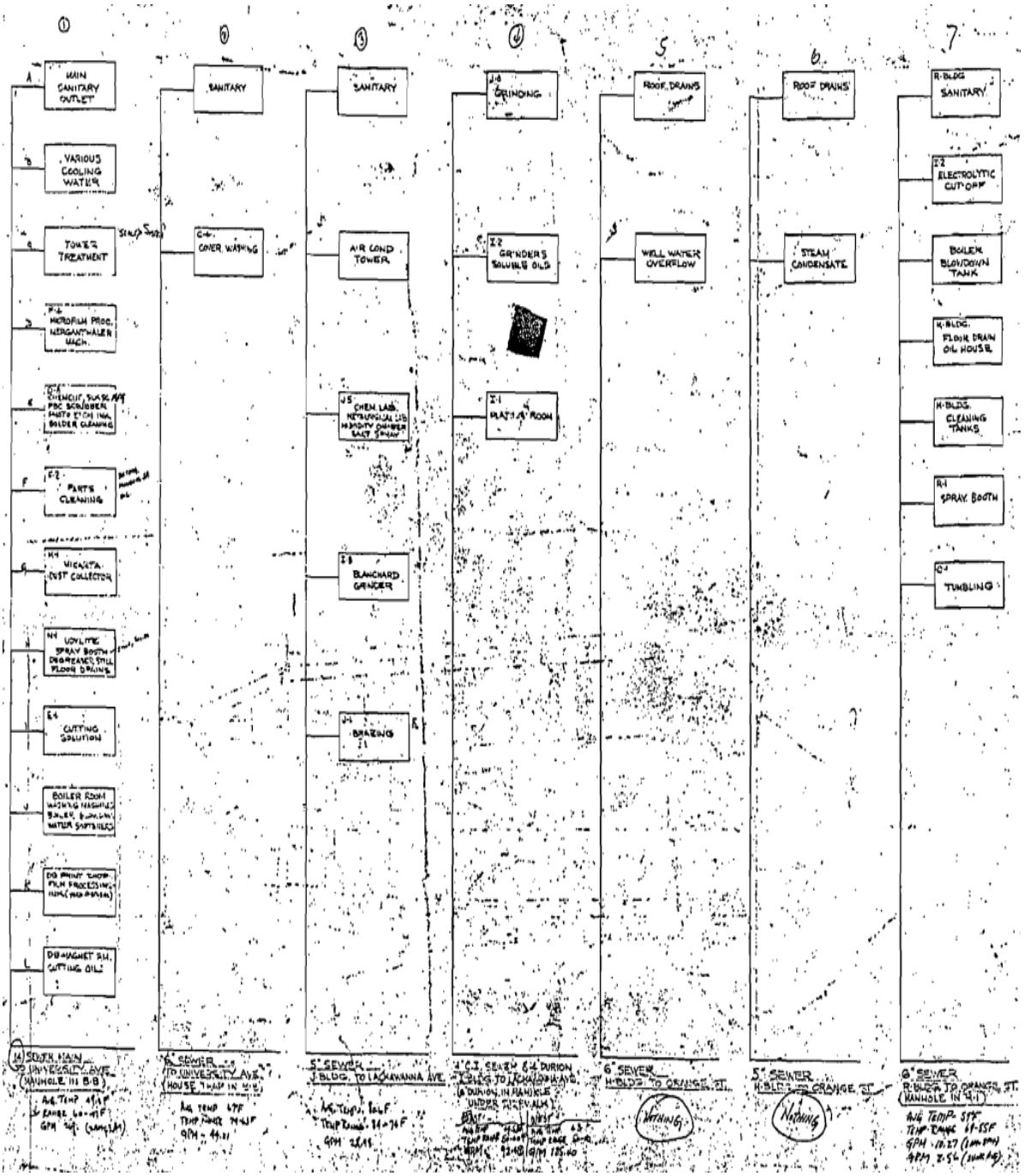
Combined Sanitary and Storm Sewer

According to a March 1998 *PAR*, the facility had a combined sanitary and storm sewer system which discharged to the PVSC. The buildings have been connected to the city sewer system since they were constructed (PAP-00347566).

The Westinghouse Sewer Discharges diagram below shows 7 discharge locations and shows sanitary, various cooling water, tower treatment, microfilm production, scrubber, parts cleaning, dust collectors, spray booths, degreasers, cutting solution, boiler room washing, print and cutting oil discharged to the main University Ave sewer via manhole in Building B with a flow of 269 GPM. Sanitary and cover washing waste was discharged to University Avenue through a 6-inch sewer with a flow of 44.21 GPM (PAP-00347682).

The Westinghouse Sewer Discharges diagram below also shows that sanitary, air condition tower, chemistry lab, and the blanchard grinder discharged to a 5-inch sewer on Lackawanna Avenue with a flow of 22.98 GPM. Grinding, grinder soluble oils and the plating room discharged to Lackawanna Ave with a flow of 92.48 GPM to the east and 185.40 GPM to the west (PAP-00347682).

The Westinghouse Sewer Discharges diagram below shows roof drains, well water overflow and steam condensate discharged to a 5-inch and 6-inch sewer to Orange Street. Note that flow rates were not provided in the diagram. Sanitary, electrolytic cut off, boiler blowdown tank, floor drain oil house, building cleaning tanks, spray booth, tumbling all discharged to the Orange Street sewer through a 6-inch sewer with a flow of 2.56 - 10.27 GPM (PAP-00347682).



(PAP-00347682).

Westinghouse's Waste Effluent Surveys, PVSC applications and Industrial Water Use Census document the following water usage (PAS-00009661, 861, 868; PAP-00347468).

Westinghouse Water Usage in gallons			
Reporting Year	**Sanitary Water**	**Well**	**Total Water Use**
1964	234,500,000	N/A	395,000,000
1971	121,404,436	91,400,000	213,804,436
1974	91,638,000	91,400,000	183,538,000
1980	38,528,732	52,128,000	90,656,732

According to a 1972 Waste Effluent Survey, the industrial waste effluent was non-detect for copper and lead (detection limits of 0.1 mg/L for copper and 0.3 mg/L for lead. The industrial waste effluent contained 0.0007 mg/L mercury (PAS-00009662).

According to the 1981 PVSC Sewer Connection Application, industrial waste effluent contained 1.05 mg/L copper, 1.18 mg/L lead and 0.001 mg/L mercury (PAS-00009872). According to a 1981, Selected Substance Report, Westinghouse discharged an estimated 0.252 million gallons per day to the PVSC POTW containing process water and domestic sewage with 1,548 lbs. per year of copper total discharge to the POTW (PAP-00425584, 588).

A 1971 Westinghouse Environmental Control Survey listed sources of water discharged to the sewer system as process, cooling, and sanitary operations. Cooling water was recycled, with 32,300 gallons per week of blowdown discharged to the sewer system. Water from air pollution control devices was discharged at a rate of 1,000 gallons per day. There was no treatment of wastewater prior to discharge to the sewer system until 1983. In 1983, pH adjustment was added to plating effluent (PAS-00009765-72).

A 1978 Elson T. Killam Heavy Metal Study reported a flow of 0.252 MGD and reported concentrations of copper (6.452 lbs/day / 3.07 mg/L), lead (0.132 lbs/day / 0.063 mg/L) and mercury (0.0008 lbs/day / 0 mg/L) (PAP-00348950).

Westinghouse held PVSC permit 20402052 in 1982 and was authorized to discharge from outlets 20402051-41900-0201 and 20402052-41900-0201 (PAS-00009884, 8, 9).

A 1982 letter reported that effluent sampling occurred at four principal discharges to the City system. Discharge No. 1 was to a city sewer on University Blvd; the second discharge was to a city sewer on Orange Street; and the remaining two connections discharged to a city sewer on Lackawanna Avenue (PAS-00009898).

According to a letter from CBS Corporation to EPA written in 2017, the site does not sit directly on the Passaic River, but is one-third of a mile from its banks near River Mile 5.7. The letter states that the plant was serviced by PVSC in the vicinity of the Clay Street CSO District. Sanitary, process and storm water flowed into PVSC for treatment and conveyance outside of the Passaic River (PAP-00088242).

Direct Discharge

There is no information regarding direct discharges in the available file material.

Spills

According to the March 1998 *PAR*, Technology Standards Associates (TSA) inspected the facility on July 17, 1996, August 13, 1996 and August 15, 1996 (12 years after Westinghouse operated) and reported staining on a concrete floor that lead to a floor drain nearby in one of Westinghouse's buildings. Another floor drain in the plating area had an oil-type staining on the concrete surrounding it (PAP-00347567). Oil staining and an actual puddle of oil was apparent on the concrete floor next to Transformer A2. Oil staining was also evident on the floor near the rear of the transformer room (PAP-00347568).

There is no information regarding spills during Westinghouse's tenure in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

According to the March 1998 *PAR*, Technology Standards Associates (TSA) inspected the facility on July 17, 1996, August 13, 1996 and August 15, 1996 (12 years after Westinghouse operated) noting many areas in the building are not used and were not lit very well, in particular the boiler room and finishing room, possibly hindering a complete inspection of the facility (PAP-00347560). The following inspection information was reported.

The Plating Room appeared to have antique restoration work performed in this area. Gloves, a 55-gallon drum of caustic soda, and a hose were apparent, along with staining on the concrete floor leading to a floor drain nearby. Another 55-gallon drum (unlabeled) and a hose on top of a floor drain were also observed in this room. The inspection of the I-1 Plating area revealed an area in the concrete floor, adjacent to Lackawanna Avenue, which was corroded. A white, granular material (similar to a salt) surrounded another floor drain nearby. Observation of a floor drain covered with a metal can revealed corroded lines under the floor. Another floor drain in the plating area had an oil-type staining on the concrete surrounding it (PAP-00347567).

The Finishing Room / Tumbling Trench inspection reported a large trichloroethylene degreaser located near the trench. Tumbling wastewaters generally contain metals, degreasing agents, and cleaners. The trench discharged to the sewer system (PAP-00347567).

Inspection of the Transformer Areas showed an eight-inch floor drain in the concrete floor adjacent to Transformer B2, in the transformer vault, Building E. Oil staining and an actual puddle of oil was apparent on the concrete floor next to Transformer A2. Oil staining was also evident on the floor near the rear of the transformer room. A six-inch floor drain was also observed in a transformer room in the basement of Building D. The room contained three transformers, and was located near the former 20/20 Instrument Room. Another floor drain was also observed under a transformer, located in a small room in the basement of Building D (PAP-00347568).

The engine room contained a series of trenches surrounding the main equipment in the room. At one time, Westinghouse generated its own energy. A 55-gallon drum of boiler treatment chemical was stored on top of, and leaking into a trench in the engine room. Miscellaneous oils in 55-gallon drums were also stored above the trenches. A leaking oil pump was observed on top of a trench in front of the active boiler in the engine room. Oil staining was also observed on the concrete floor in front of one of the inactive boilers (PAP-00347568).

During the inspection of Building R, a hose appeared to be used near a floor drain in Building R, where paint (mostly latex) was being stored. A floor drain filled with debris was also observed under a truck inside Building R (PAP-00347569).

Violations

There is no information regarding violations pertaining to the allocation COCs in the available file material.

Permits

A 1981 Generator Annual Hazardous Waste Report noted Westinghouse had a Generator's EPA ID Number of FNJD004383485 (PAS-00009834).

In 1981, Westinghouse applied for a PVSC Sewer Connection for discharge to the sanitary or combined sewer (PAS-00009867). By January 1982, PVSC granted Westinghouse a Sewer Connection Permit 20402052 with a requirement to report effluent measurements quarterly and daily sampling of Outlets Nos. 4 and 5 (PAS-00009884; 88-90).

In August 1982, Westinghouse applied for the first time for two Air Permits to Construct, Install or Alter Control Apparatus or Equipment and Certificates to Operate Control Apparatus or Equipment for two existing operational stacks (PAS-00009721-25).

7. Response Actions

Characterization Activities

According to the Groundwater Remedial Action Work Plan, the following characterization activities have taken place at the facility (PAP-00392898):

- Preliminary Assessment Report (PAR) (1998) (PAS-00347529
- Interim Remedial Investigation Report (2002) (PAP-00347906)
- Additional Site Investigation (2002)
- Remedial Investigation Report (2003) (PAP-00348116)
- Remedial Investigation Work Plan (2003)
- Remedial Action Work Plan for TCE in Paved Yard (2005)
- Remedial Investigation and Interim Remediation Status Summary (2005)
- Summary Report on Soil Investigation and Interim Remedial Actions (2008) (PAP-00348381)

- Soil Remedial Investigation Report (2010) (PAP-00086822)
- Soil Remediation Action Work Plan (2011) (PAP-00087890)
- Groundwater Remedial Investigation Report (2016) (PAP-00348805)
- Groundwater Remedial Action Work Plan (2019) (PAP-00392887)

Soil

According to the 2002 *Interim RIR,* USTs were removed and stored on-site for further evaluation. Residual product from each tank was collected separately in 55-gallon drums and stored on-site for evaluation and disposal. Similarly, contaminated soil was stockpiled on-site (PAP-00348122). Soil borings and installation of monitoring wells were conducted at areas of concern (concentrations are in respective COC section above) (PAP-00348122).

According to the March 2008 *Summary Report on Soil Investigation & Interim Remedial Actions*, soil investigations for the south of Building H and the Paved Yard included delineating the horizontal and vertical extent of soil contaminants detected above NJDEP Soil Cleanup Criteria (SCC) at accessible exterior areas of the property, improve horizontal and vertical delineation of metals, PAH, and PCBs that had been detected during previous sampling and investigate soil quality at potential points of environmental concern which had not been previously sampled (PAP-00348389). Concentrations of COCs are provided in the Section 4.

According to the 2011 *Soil Remediation Action Work Plan*, soil investigation and remedial action activities in this workplan focused on characterization, delineation and removal of contamination at the site (PAP-00087896). The workplan divided the site into AOCs designated by buildings (PAP-00087903-04).

According to the 2010 *Soil RIR,* CBS began investigation and remediation of the site under a Memorandum of Agreement (MOA) for Non-Residential properties effective March 21, 2003. The document delineated the extent of contaminants in the soil, identified COC pathways, and evaluated remedial action alternatives. CBS completed the soil remedial investigation within the NJDEP Voluntary Cleanup Program (PAP-00086829). The property is restricted to non-residential use with a Deed Notice (PAP-00086830). 500 samples collected from 175 soil borings between 2001 and 2009 showed that contamination was limited to the site property boundary. Exceedances of RDC SCC and NRDC SCC were proposed to be addressed with engineering and institutional controls for the entire site. PAHs and metals in soils were attributed to Historic Fill found throughout most of the site (PAP-00086831). A cover (i.e., building foundation, asphalt, soil, or other applicable material) would be placed over the site to promote the protection of public health and safety (PAP-00086832). VOCs were addressed with a two-phase vacuum extraction system installed and operated from June 2, 2005 – October 31, 2005 (PAP-00086843). A total of 171 tons of excavated material was disposed at an off-site disposal facility (PAP-00086847). The transformers located in AOCs D2 and E1 received approval for no further action in September 2003 (PAP-00086852-53). The property owner agreed to address contamination above RDC SCC with an institutional control (deed restriction) and areas that exceeded NRDC SCC with engineering controls. It was expected that engineering controls would encompass the

entire property with the future building constructed to qualify as the engineering control (PAP-00086867).

Remedial Activities

The AOCs with NFA's are summarized below.

AOC	FINDINGS	NFA REFERENCE
A1 – Organic Finishing Room and Floor Drains/Trenches	Floors intact; no floor drains or trenches present.	NFA approved on October 30, 2003 (PAP-00086851).
B1 – Floor Drains/Trenches	Floors intact; no floor drains/trenches present; soil in compliance with applicable SCC.	NFA approved on October 30, 2003 (PAP-00086851).
C1 – Floor Drains/Trenches	Floors intact; no trenches present.	NFA approved on October 30, 2003 (PAP-00086851).
D1 – Transformers, Paint Booth, and Battery Storage	Floors intact.	NFA approved on September 4, 2003 (PAP-00086852).
D3 – Elevator Shafts	Soil samples confirm compliance.	NFA approved on September 28, 2010.
E1 – Transformers	Floors intact.	NFA approved on September 4, 2003 (PAP-00086853).
H1 – Battery and Hazardous Material Storage	Floors intact; no floor drains present.	NFA approved on October 30, 2003 (PAP-00086854).
I1 – Possible UST	No tank found following geophysical survey.	NFA approved on October 30, 2003 (PAP-00086855).
I2 – Plating and Finishing Area	Floors intact.	NFA approved on October 30, 2003 (PAP-00086855).
J1 – Floor Drains and Piping and J2-Elevator Shaft	Soil in compliance with SCC; integrity of elevator shaft is questionable.	NFA approved on October 30, 2003 (PAS-00086856).
K1 – Hazardous Material Storage K2 – Floor Drains &Piping	Floors intact; soils in compliance with SCC.	NFA approved on October 30, 2003 (PAP-00086856).
M1 – Floor Drains and Piping	Soil in compliance with SCC.	NFA approved on October 30, 2003 (PAP-00086857).
N3 – Hazardous Material Storage	Floors intact.	NFA approved on October 30, 2003 (PAP-00086858).
O2 – Finishing/Tumbling Room Trench	Trench bottom intact.	NFA approved on October 30, 2003 (PAP-00086859).
O4 – Hazardous Material Storage	Floors intact.	NFA approved on October 30, 2003 (PAP-00086859).
T4 – Former Gasoline UST through T6 – Loading Dock West of the R-Building	Tank removed in 1990s; soil samples in compliance with SCC.	NFA approved on September 4, 2003 (PAP-00086862).

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

8. Summary of Asserted Defenses

To the extent it is determined that a gasoline or oil release occurred at the Facility during the Relevant Time Period and impacted the Passaic River with COC(s), CBS will assert the CERCLA petroleum exclusion (42 U.S.C. §9601(14)).

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

CELANESE CORPORATION OF AMERICA (CNA HOLDINGS, LLC)

Facility Name, Address and Size: Celanese Corporation of America, Ancillary Facility, 226 Rome Street, Newark, New Jersey (the "Ancilary Facility"). According to a 1950 map, the Ancillary Facility consisted of Blocks 2052, 2059, 2060, and 2061 (PAP-00111380). Note: At some point in time the blocks were consolidated into Block 2052, Lot 1. No information on the number of employees and shifts was available in files reviewed.

1. **Business Type:** The Ancillary Facility, was the support facility for the Main Plant at which various operations were conducted, including material storage, equipment maintenance and power supply (PAP-00106193).

2. **Time Period of Ownership/Operations**

   Operator: 1920s to 1957
   Owner: 1920s to 1962

   1941: According to the 2017 Pre-Litigation Settlement of Civil Litigation between the City of Newark and CNA (successor to HNA Holdings Inc., f/k/a Hoechst Celanese Corporation) (2017 Pre-Litigation Settlement), in the early 1900s Celluloid Corporation owned most if not all of Block 2052, Lot 1. In March 1941, the Celluloid Corporation merged with Celanese Corporation of America (PAP-00110788).

   1952: On May 13, 1952, Celanese Corporation of America conveyed to Atlantic-Roseville Corporation property that begins at the intersection of St. George Street and Rome Street, formerly Berlin Street. The deed did not give block or lot numbers, just metes and bounds (PAP-00111300-301).

   1953: On April 6, 1953, Atlantic-Roseville Corporation conveyed the same property back to Celanese Corporation of America (PAP-00111298-299).

   1957: On May 14, 1957, Celanese Corporation of America conveyed to Rome-Charles Corporation a tract of land that began at the intersection of St. Charles Street and Rome Street (PAP-00111334-335). The deed did not give block or lot numbers, just metes and bounds, but this appears to be the Lindol Plant. Note: The deed pertaining to this conveyance was not located during the review of the available file material. This information was obtained from the 1962 deed noted below.

   1962: On December 20, 1962, Celanese Corporation of America conveyed to Continental Bulk Systems, Inc., property that was encompassed by St. George Street, Rome Street, and McGregor Street with the exception of the land previously conveyed to Rome-Charles Company in 1957 (PAP-00111334-335). The deed did not give block or lot numbers, just metes and bounds and was in poor quality so no details were ascertained from the deed.

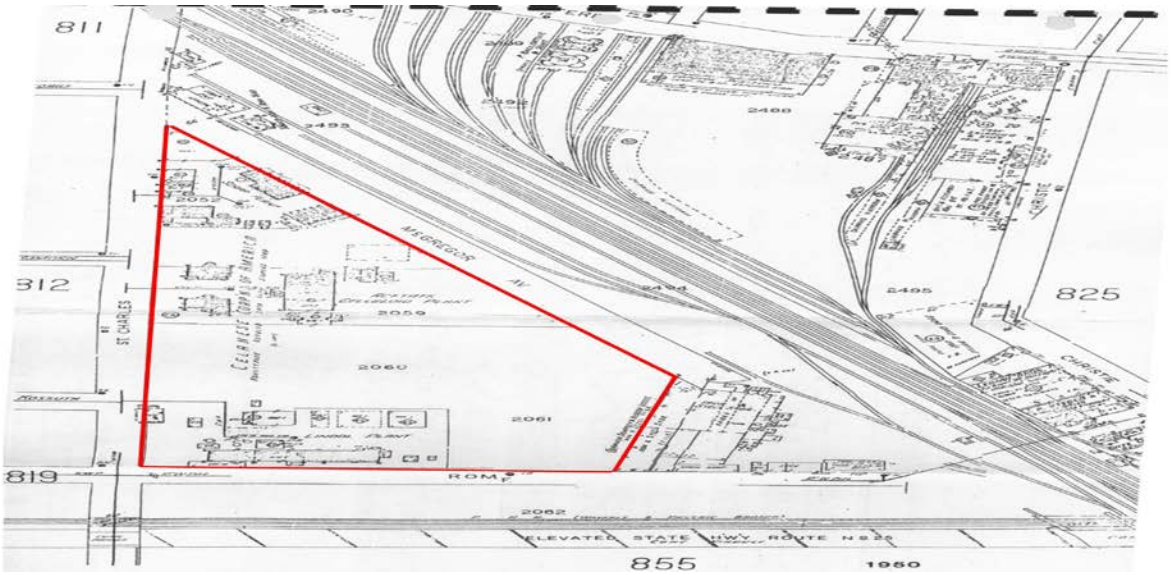
1966: On May 2, 1966, Charter Bulk Service, Inc., formerly Continental Bulk Services, Inc. sold the property they purchased from Celanese Corporation of America to the City of Newark. The deed states that the property was known as Block 2052, Lot 1 (PAP-00111292-93). In addition, in 1966 the company changed its name to Celanese Corporation (PAP-00110788).

According to the 2017 Pre-Litigation Settlement, once Block 2052, Lot 1 was conveyed to the City of Newark in the 1960s, the City began construction of the Ironbound Recreation Center which entailed the Ironbound Pool, Skating Rink, Ironbound Bleachers, Ironbound Aquatic Center, and the Newark Ironbound Stadium Football Field and Playing Fields (PAP-00110788-89).

1987: In February 1987, Hoechst Corporation purchased Celanese Corporation and changed the name to Hoechst Celanese Corporation, later known as HNA Holdings, Inc. (PAP-00110788).

3. Operational History/COC Use and Presence at the Facility

The Ancillary Facility included the Lindol Plant, the Acetate Celluloid Plant, and the Scrap Plant as shown in the map below.



(PAP-00111380)

Lindol Plant

According to the *Phase II Site Investigation Ironbound Pool Site*, prepared by Dresdner, Robin and Associates, dated April 1990 (1990 DRA Phase II SI), around 1915, Celluloid invented Lindol as a camphor replacement. Similar to camphor, Lindol is a clear or white solid with a low melting point; when liquid, it is colorless. Lindol was one of the raw materials commonly used in the manufacture of celluloid and cellulose acetate. The Lindol Plant on Rome Street primarily manufactured tricresyl phosphate, but also tri-2,4-dimethylphenol phosphate, tri-phenol phosphate, and tri-orthophenol phosphate. Raw

materials included phenol, persilicic acid, phosphoric acid, potassium permanganate, oxalic acid, magnesium chloride, cresylic acids, sulfuric acid and caustic soda. The by-products from these operations were limited to hydrochloric acid, light fraction hydrocarbons and still ends. The manufacturing process generally included condensation of the raw materials, preliminary purification, final purification, dehydration, decolorization and filtration. In addition, Celanese produced Lindol for hydraulic fluid usage beginning around 1945 (PAP-00111370-72). According to the 1990 DRA Phase II SI, there is little documentation of the Lindol Plant operations due to several organizational changes over the years (PAP-00111370).

The 1990 DRA Phase II SI stated that the major processing steps for production of Lindol are as follows:

- condensation of the raw materials,
- preliminary purification,
- final purification,
- dehydration,
- decolorization, and
- filtration (PAP-00111372)

According to the 1990 DRA Phase II SI, the Pool Site was located where the Celanese Lindol Plant was utilized to produce Lindol. A 1931 Sanborn map showed development of the site and surrounding area. A facility on the map was labeled “The Celluloid Corp. Lindol Plant” and a 200 feet by 50 feet row of structures was constructed fronting Rome Street with five additional structures immediately northwest as part of the Lindol Plant (PAP-00111366-67).

Acetate Celluloid Plant and Scrap Plant

The interpretation of a 1931 Sanborn Map in the 1990 DRA Phase II SI stated that the Acetate Celluloid Plant was in Block 2059 and was constructed sometime between 1908 and 1931. The Scrap Plant was in a triangular parcel northwest of the Acetate Celluloid Plant that contained seven small structures on Block 2052 (PAP-00111367). See the 1950 map at the beginning of this report for the locations of the areas described.

An August 11, 1968 aerial photograph showed that the Acetate Celluloid Plant and Scrap Plant had been demolished to allow the construction of the present-day Ironbound Recreation Center, including the playing fields. In the 1968 aerial photograph, the foundations of the Ironbound Recreation Center were visible (PAP-00111369).
No operational information for the two plants was identified in the available file material.

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

According to the 1986 EPA Preliminary Assessment (PA) of the Tidewater Bailing property (1986 EPA PA), EPA stated that the property around Ironbound Stadium had been damaged because of releases of substances by Tidewater Baling (PAP-00108517). The COCs detected on Tidewater Bailing property consisted of PCB-1254 at a concentration of 87 ppm; PCB-1248 at a concentration of 190 ppm; lead at a concentration of 4,200 ppm. The EPA PA stated that the Tidewater Bailing's method of disposal was to dump it on the ground (PAP-00108514).

According to the 1991 Ironbound Football Field SI, the PCB concentrations were detected as follows:

- PCB contamination exceeding a concentration of 1 mg/kg was found at the surface (0-6 inches below ground surface (bgs)) at only one sampling location at a concentration of 2.6 mg/kg. This sample was located within 40 feet of the soil sample collected at 4 inches bgs which contained a PCB concentration of 19 mg/kg. There were also PCB detections in the northeast corner of the football field with concentrations between 1-19 mg/kg at a depth of 0-6 inches bgs. No other surface contamination of the field was found at a depth of 0-6 inches bgs (PAP-00107990).

- The PCB concentrations of samples in the two subsurface contamination areas ranged from 5.0 mg to 32.8 mg/kg with the exception of one sample that was found to contain 120 mg/kg PCBs (PAP-00107991).

The 1991 Ironbound Football Field SI concluded that the source of the PCB contamination could not be determined conclusively based on the data available. However, the report stated that Newark officials had observed surface water runoff from the adjacent Tidewater Baling facility and the adjacent railroad property draining into the wet area and onto the field over many years and that the Tidewater Baling facility had a history of PCB contamination (PAP-00107993).

According to the *Remedial Investigation Report (Historic Fill) Ironbound Pool, Playing Fields, Football Field, Block 2052, Lot 1*, prepared by Dresdner Robin dated November 2007 (2007 DRA RIR), analytical results for the Ironbound Pool and Playing Fields showed that in June 1994, Aroclor-1248 detections ranged between 1.6 mg/kg in soil sample SB22/2-2.7 collected from 2-2.7 feet bgs (PAP-00199037) and 0.31 mg/kg in soil sample SB21/3-4 collected 3-4 feet bgs (PAP-00199019). Aroclor-1260 was found at a concentration of 0.19 mg/kg in soil sample SB22 collected between 2-2.7 feet bgs (PAP-00199037).

According to the December 17, 2004 *Summary of Remedial Investigations, Ironbound Pool, Playing Fields, Football field,* prepared by Langan Engineering, the following PCB concentrations were detected in January 1992 sampling.

Ironbound Recreational Center Football Field PCB Concentrations (mg/kg)										
PCB	**F-1 0-6”**	**F-2 0-6”**	**F-3 0-6”**	**F-4 0-6”**	**F-5 6-15”**	**F-6 6-15”**	**F-7 6-15”**	**F-8 6-15”**	**F-9 6-15”**	**F-10 6-15”**
Aroclor 1248	0.846	ND	1.33	0.818	0.558	3.49	ND	ND	ND	2.27
	F-11 0-6”	**F-12 0-6”**	**F-13 0-6”**	**F-14 0-6”**	**F-15 6-15”**	**F-16 6-15”**	**F-17 6-15”**	**F-18 6-15”**	**F-19 6-15”**	**F-20 6-15”**
Aroclor 1248	0.672	2.48	ND	0.338	0.463	1.61	3.53	0.431	0.69	0.447

(PAP-00112099)

Ironbound Recreational Center Football Field PCB Concentrations

Contaminant	Residential Surface Soil Cleanup Criteria (mg/kg)	Non-Residential Surface Soil Cleanup Criteria (mg/kg)	Proposed Recreational Cleanup Criteria (mg/kg)	S-1 4'
Polychlorindated Biphneyls (PCBs)	0.49	2	6.28	19 R/NR

Contaminant	Residential Surface Soil Cleanup Criteria (mg/kg)	Non-Residential Surface Soil Cleanup Criteria (mg/kg)	Proposed Recreational Cleanup Criteria (mg/kg)	EP-004-D 6-15"	EP-005-D 6-15"	EP-006-D 6-15"	EP-009-D 6-15"	EP-009-S 0-6"	EP-010-D 6-15"	EP-011-D 6-15"	EP-012-D 6-15"
Polychlorindated Biphneyls (PCBs)	0.49	2	6.28	29 R/NR	5 R/NR	120 R/NR	31 R/NR	2.6 R/NR	16.1 R/NR	11 R/NR	1 R

Contaminant	Residential Surface Soil Cleanup Criteria (mg/kg)	Non-Residential Surface Soil Cleanup Criteria (mg/kg)	Proposed Cleanup Criteria (mg/kg)	SS-2 0-6"	SS-3 0-6"	SS-6 0-6"	SS-7 0-6"	SS-8 0-6"	SS-9 0-6"
Polychlorindated Biphneyls (PCBs)	0.49	2	6.28	.5 R	.64 R	2.32 R/NR	.56 R	3.9 R/NR	1.13 R

R = Exceeds Residential Cleanup Criteria
NR = Exceeds Non-Residential Cleanup Criteria

(PAP-00112100)

According to the 2011 *Soil Remedial Investigation Report, Proposed Sand Soccer Court of Ironbound Football Field*, stated that Aroclor-1248 concentrations greater than 10 ppm were identified at three soil sampling locations:

- FF-SB17 – 11 ppm at a depth of 2-2.5
- FF-SB16 – 53 ppm at a depth of 3-3.5 feet
- FF-SB15 – 140 ppm at a depth of 2-2.5 feet (PAP-00199197-98).

PAHs

According to the *Summary of Remedial Investigations - Ironbound Pool, Playing Fields, Football Field Block 2052, Lot 1* prepared by Dresdner Robin dated December 17, 2004 (2004 DRA RI Summary), extensive soil and groundwater investigations were conducted at the Ironbound Pool property following the discovery of contamination at the site in 1987 (PAP-00111711, 14).

Sampling at the Ironbound Pool area was conducted during a Phase II Investigation and a summary of the PAH concentrations were cited in the undated *Remedial Investigation Report* as follows (PAP-00111865).

Ironbound Pool PAH Concentrations (ug/kg)					
PAH	**S-7 0-4 feet**	**S-10 13-14 feet**	**S-11 0-5 feet**	**S-12 5-12 feet**	**S-13 1-2 feet**
Anthracene	ND	ND	ND	ND	2,500
Acenaphthylene	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	1,400
Benzo(a)anthracene	1,000	ND	1,200	ND	4,490
Benzo(b)fluoranthene	1,900	ND	2,700	ND	8,240
Benzo(k)fluoranthene	ND	ND	ND	ND	ND
Benzo(a)pyrene	1,000	ND	1,700	ND	5,930
Chrysene	1,200	ND	1,500	ND	4,890
Fluoranthene	2,100	ND	2,300	770	9,570
Fluoranthene	ND	ND	ND	ND	1,600
Indeno(1,2,3-cd)pyrene	ND	ND	730	ND	2,800
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	2,300
Phenanthrene	1,400	640	1,800	ND	8,300
Pyrene	1,700	460	2,200	820	7,880

According to the 2004 DRA RI Summary, investigations of the surface soils of the Playing Fields were conducted in 1991 and consisted of the collection of 10 soil samples. All samples were collected at the zero to two foot interval and were analyzed for PAHs and metals. Results of the analysis revealed the presence of PAHs and metals at concentrations that exceeded “the proposed (at that time) surface soil cleanup criteria for non- residential sites” (PAP-00111716). The following table shows the PAH concentrations.

Contaminant	Surfical Soil Cleanup Criteria			S-11 12"	S-12 1'-2'	S-13 12"
	Residential	Non-Residential	Recreational			
3,4-Benzofluoranthene (Benzo(b)fluoranthene)	.9	4	12	11.9 R/NR	15.0 R/NR	1.5 R
Benzo(a)anthracene	.9	4	12	5.5 R/NR	16.0 R/NR	.82
Benzo(a)pyrene (BaP)	.66	.66	1.26	5.9 R/NR	8.3 R/NR	.84 R
Benzo(k)fluoranthene	.9	4	12		14.0 R/NR	
Chrysene	9	40	120	6.3	12.0 R	.96
Dibenz(a,h)anthracene	.66	.66	1.26	1.6 R/NR	2.2 R/NR	ND
Indeno(1,2,3-cd)pyrene	.9	4	12	5.5 R/NR	4.7 R/NR	ND

R = Exceeds Residential Cleanup Criteria
ND = Substance not detected

(PAP-00112086)

The following table shows the PAH, depth of soil sample, and analytical results for sampling conducted in September 1990 at the Ironbound Pool Site and reported in the undated Remedial Investigation Report.

Ironbound Pool PAH Concentrations (ppb)		
PAH	**MW-13 3.5-4.0 feet**	**S-14 3.5-4.0 feet**
Benzo(a)anthracene	1,800	6,200
Benzo(b)fluoranthene	3,200	10,000
Benzo(k)fluoranthene	1,800	10,000
Benzo(a)pyrene	1,800	5,800
Indeno(1,2,3-cd)pyrene	780	3,100
Dibenzo(a,h)anthracene	360	530
Benzo(g,h,i)perylene	460	740

(PAP-00111843)

According to the 1995 *Subsurface Remedial Investigation Report for Ironbound Recreation Center, Playing Fields and Football Field, Block 2052, Lot 1* prepared by Dresdner Robin Environmental Management dated January 1995 (1995 DRA Sub RIR), analytical results showed the following concentration of PAHs in one sample (SB-14 depth of 8-9 feet) for “Investigation Area II” (the former Celluloid Plant):

- Benzo(a)anthracene 6.2 milligrams per kilogram (mg/kg)
- Benzo(b)fluoranthene 6.4 mg/kg
- Benzo(k)fluoranthene 2.4 mg/kg
- Benzo(a)pyrene 5.1 mg/kg
- Indeno(1,2,3-cd)pyrene 3.4 mg/kg
- Dibenzo(a,h)anthracene 1.0 mg/kg (PAP-00111477-78).

According to the December 17, 2004 *Summary of Remedial Investigations, Ironbound Pool, Playing Fields, Football field,* prepared by Langan Engineering, two discrete locations in the north corner of the Ironbound Pool property were found to have concentrations of carcinogenic polycyclic aromatic hydrocarbons (PAHs) above the “New Jersey State policy action guidelines” at the time of a 1991 remedial investigation. The 2004 DRA RI Summary stated that the sources of this contamination may be attributable to a former off-site asphalt mixing plant located next to this area or the former raw material storage tanks (PAP-00111715). The following PAH concentrations were reported during March 23, 1993 sampling.

Parameters Exceeding Cleanup Criteria Ironbound Recreation Center

Parameter	CASRN	Surface Soil Cleanup Criteria			Laboratory Analysis Results (mg/kg)							
		Residential	Non-Residential	Recreational	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
Benzo(a)anthracene	56-55-3	.9	4	12.6	.620	.300 J	.290 J	1.400^{R}	.420	.140 J	.053 J	.380
Benzo(b)fluoranthene	205-99-2	0.66	0.66	1.26	.730$^{R/NR}$	.390	.330	2.000$^{R/NR}$	.650	.240 J	.098 J	.780$^{R/NR}$
Benzo(a)pyrene	50-32-8	0.66	0.66	1.26	.600	.320 J	.340	1.400$^{R/NR}$	.460	.150 J	.057 J	.500

Parameter	CASRN	Surface Soil Cleanup Criteria			Laboratory Analysis Results mg/kg							
		Residential	Non-Residential	Recreational	SS-9	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15	Average
Benzo(a)anthracene	56-55-3	.9	4	12.6	.064 J	ND	ND	.058 J	.230 J	.370	.450	.340
Benzo(b)fluoranthene	205-99-2	0.66	0.66	1.26	.120 J	ND	ND	.100 J	.320 J	.530	.680$^{R/NR}$	.487
Benzo(a)pyrene	50-32-8	0.66	0.66	1.26	.062 J	ND	ND	.060 J	.220 J	.370	.490	.357

R = Exceeds Residential Cleanup Criteria
ND = Substance not detected

(PAP-00112093)

Copper

Sampling at the Ironbound Pool area was conducted during a Phase II Investigation and copper was detected at 121 mg/kg at a depth of 0-4 feet bgs and 133 mg/kg at a depth of 1-2 feet bgs (PAP-00111866).

According to the December 2011, *Soil Remedial Investigation Report Proposed Sand Soccer Court of Ironbound Football Field,* prepared by Weston the maximum concentration of copper detected at the proposed sand soccer court was in soil sample FF-SB13 collected on October 8, 2010 from 3-3.5 ft bgs at 420 mg/kg (PAP-00199191-95).

Lead

Sampling at the Ironbound Pool area (formerly the area of the Lindol plant) was conducted during a Phase II Investigation and lead was detected at 1,270 mg/kg at a depth of 0-4 feet and 386 mg/kg at a depth of 1-2 feet (PAP-00111866).

The December 17, 2004 *Summary of Remedial Investigations, Ironbound Pool, Playing Fields, Football field,* prepared by Langan Engineering, reported the following lead concentrations from sampling conducted on March 23, 1993 (PAP-00112093).

Ironbound Recreational Center Lead Concentrations (mg/kg)								
Metal	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
Lead	313	246	234	528	241	97	64.7	252
Metal	SS-9	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15	Average
Lead	30	12.5	10.1	54	175	36.2	288	172.1

According to the December 2011, *Soil Remedial Investigation Report Proposed Sand Soccer Court of Ironbound Football Field,* prepared by Weston the maximum concentration of lead detected at the proposed sand soccer court was in soil sample FF-SB10 collected on October 8, 2010 from 2-2.5 ft bgs at 794 mg/kg (PAP-00199191-95).

Mercury

Sampling at the Ironbound Pool area was conducted during a Phase II Investigation and mercury was detected at 2.27 mg/kg at a depth of 0-4 feet bgs and 1.99 mg/kg at a depth of 1-2 feet bgs (PAP-00111866).

The 2004 DRA RI Summary reported that at the Ironbound Pool Site (Sample S-23) mercury was detected as follows: 1.29 mg/kg at a depth of 5-5.5 feet bgs and 5.4 mg/kg at a depth 7-7.5 feet bgs (PAP-00111845).

According to the December 2011, *Soil Remedial Investigation Report Proposed Sand Soccer Court of Ironbound Football Field,* prepared by Weston the maximum concentration of mercury detected at the proposed sand soccer court was in soil sample FF-SB17 collected on October 7, 2010 from 3-3.5 ft bgs at 75.9 mg/kg (PAP-00199191-95).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead,

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current

copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00198948).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,270 mg/kg
Copper	420 mg/kg
Mercury	75.9 mg/kg
Benzo(a)anthracene	6.2 mg/kg
Benzo(a)pyrene	5.93 mg/kg
Benzo(b)fluoranthene	10 mg/kg
Benzo(k)fluoranthene	10 mg/kg
Dibenzo(a,h)anthracene	1.0 mg/kg
Indeno(1,2,3-cd)pyrene	3.4 mg/kg
PCBs	120 mg/kg

According to the 2007 DRA RIR, all 32 borings revealed that fill materials were generally present throughout the Site and ranged in depth from 0-6 feet below ground surface (bgs). The fill consisted of bricks, glass fragments, wood fragments, metal scraps, ash, rubble, concrete, rubber fragments, sand, and gravel. Underlying the fill material was a natural soil consisting of fine to medium-grained gray sand with thin interfingering silt and clay laminae. The thickness of this zone varied from 10 to 15 feet bgs. The physical characteristics of the fill material were consistent throughout the site (PAP-00198947).

5. COC Pathways

Sanitary Sewer

There is no information regarding sanitary sewers in the available file material.

Storm Sewer

There is no information regarding storm sewers in the available file material.

version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Direct Release

There is no information regarding direct release in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

An Agreement Regarding the Remediation of Soils at the Ironbound Recreation Football Field between City of Newark and CNA was signed on October 30, 2017 (PAP-00110794-806). CNA was to remediate all soils at the site contaminated with PCBs to a standard of 5 ppm, and if soils were comingled with other contaminations, CNA was to dispose of those soils at an appropriate off-site facility. Post-excavation sampling was to occur, and a 10-inch cap was to be installed over the affected areas (PAP-00110796).

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- *Phase II Site Investigation Ironbound Pool Site* dated April 1990 (PAP-00111363)
- *Site Investigation and Remedial Approach for The Newark Ironbound Stadium Football Field* dated May 1991 (date handwritten on document) (PAP-0107990)
- *Subsurface Remedial Investigation Report for Ironbound Recreation Center – Playing Fields and Football Field Block 2052, Lot 1 at St. Charles Street* dated January 1995 (PAP-00111456)
- *Summary of Remedial Investigations - Ironbound Pool, Playing Fields, Football Field Block 2052, Lot 1* dated December 17, 2004 (PAP-00111708)
- *Remedial Investigation Report – Historic Fill, Ironbound Pool, Play Fields, and Football Field* dated November 2007 (PAP-00198939)

- *Soil Remedial Investigation Report, Proposed Sand Soccer Court of Ironbound Football Field dated 2011 Tables 2A-2D Soil Sample Results Summary* (PAP-00199175)
- *Self-Implementing Work Plan On-Site Cleanup and Disposal of PCB Waste – Ironbound Football Field Site, 46-132 Saint Charles Place* (PAP-00110896)

As noted previously, on May 2, 1966, Charter Bulk Service, Inc., formerly Continental Bulk Services, Inc. sold the property they had purchased from Celanese Corporation of America in 1962 to the City of Newark (PAP-00111292-93). According to the 2017 Pre-Litigation Settlement, once Block 2052, Lot 1 was conveyed to the City of Newark in the 1960s, the City began construction of the Ironbound Recreation Center which entailed the Ironbound Pool, Skating Rink, Ironbound Bleachers, Ironbound Aquatic Center, and the Newark Ironbound Stadium Football Field and Playing Fields. The 2017 Pre-Litigation Settlement also noted that the City of Newark and CNA agreed to fund and manage certain investigative actions at the site in 1993 (PAP-00110788-89). Data from investigations associated with these facilities is presented below.

Remedial Activities

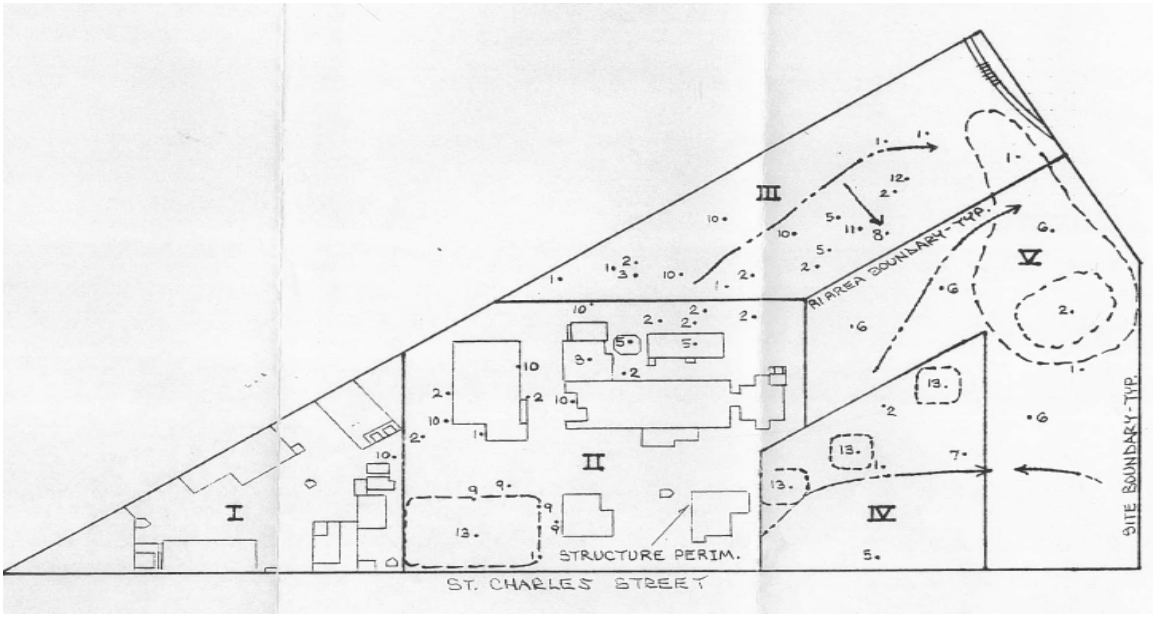
According to the *Site Investigation and Remedial Approach for The Newark Ironbound Stadium Football Field* dated May 1991, prepared by an unknown author (1991 Ironbound Football Field SI) for the ancillary property located at St. Charles and Rome Streets, since its construction, the Football Field had a history of poor drainage, and it is possible that PCB contaminated run-off from the adjacent sites could have puddled in the lower areas of the field. To correct the drainage issue, City of Newark placed top soil on several occasions in the low, poorly drained areas. According to the report, these areas represent collection ponds containing PCB contamination from uncontrolled runoff from an adjacent Tidewater Baling Corporation facility that flows along the Conrail Railroad spur (PAP-00107993-94). The report referred to an August 18, 1989 U.S. EPA Pollution Report that linked the PCB contamination near the scoreboard area with the Tidewater Baling Corporation and possibly Conrail (PAP-00107990). The cleanup plan was to excavate a kidney-shaped area and subsurface (6-15 inches bgs) contamination exceeding 5 mg/kg of PCBs (PAP-00107995).

As documented in the 1995 DRA Sub RIR, a subsurface remedial investigation was conducted pursuant to a Memorandum of Understanding executed on December 23, 1993 between City of Newark and the NJDEP. Five areas of investigation were identified. A figure showing the locations of the Investigation Areas is below.

- Investigation Area I - Former Scrap Plastic Plant encompasses approximately one area and is located at the western-end of the site
- Investigation Area II - Former Celluloid Plant encompasses approximately two and half acres and includes four former operational buildings, a former drum storage location, a tank trailer staging area, and two aboveground storage tanks
- Investigation Area III - Former "Backyard" Area encompasses approximately one and one-half acres and includes one former drum storage area and two former two aboveground storage tanks

- Investigation Area IV - Frontyard Staging Area encompasses approximately one acre comprised of one former aboveground storage tank and three former tank trailer staging areas
- Investigation of Area V - Former Coal Yard encompasses approximately two acres and does not contain any former operational structures (PAP-00111468).

The location of each area is presented below (PAP-00111547):



According to the 1995 DRA Sub RIR, the concentrations of all targeted parameters were below the NJDEP residential direct contact cleanup criteria with the exception of one sample (SB-14). The concentrations for benzo(a)anthracene (6.2 mg/kg), benzo(b)fluoranthene (6.4 mg/kg), benzo(k)fluoranthene (2.4 mg/kg), benzo(a)pyrene (5.1 mg/kg), indeno(1,2,3-cd)pyrene (3.4 mg/kg) and dibenz(a, h)anthracene (1.0 mg/kg) were all above the Residential Direct Contact Cleanup Criteria (PAP-00111478). No further investigation was recommended (PAP-00111477-78, 488).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

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CELANESE CORPORATION OF AMERICA (CNA HOLDINGS, LLC)

Facility Name, Address and Size: Celanese Plastics Company, 290 Ferry Street, Newark, New Jersey; portions of Block 2045, Lot 1; 17 acres. In 1972, Celanese had 665 employees working 3 shifts per day, 5 and 7 days per week (PAP-00105558).

1. **Business Type:** Manufacturing of plastic sheet and film (PAP-00105911).

2. **Time Period of Ownership/Operations**

Operator: 1890-1973
Owner: 1890-1973 (PAP-00105911) (PAP-00105911)

1871: The Celluloid Manufacturing Company was organized in Albany on January 28, 1871 (PAP-00105622).

1872: Celluloid Manufacturing Company operations were transferred to Newark, New Jersey (PAP-00105622).

1890: Celluloid Manufacturing Company operations began at 290 Ferry Street (PAP-00105911).

1941: Celluloid Corporation merged into the surviving corporation, Celanese Corporation of America (PAP-00105911).

1973: Celanese Corporation of America sold the facility to XCEL Corporation, which manufactured plastic sheet and film between January 1973 and July 1979 (PAP-00105911).

1979: Georgia Pacific was owner/operator of the site following XCEL, and manufactured plastic sheet and film similar to previous owners (PAP-00105949).

3. **Operational History/COC Use and Presence at the Facility**

Celluloid Manufacturing

The first step in the celluloid manufacturing process was to pretreat the cellulose feedstock. Throughout much of the plant's operation (at least until 1938), the primary source of cellulose was cotton. Cotton is the purest form of cellulose and contains approximately 90 percent cellulose prior to any purification steps (PAP-00105537).

The cellulose feedstock was then added to a nitration bath, where it was heated and mixed with sulfuric acid to form nitrocellulose. Occasionally phosphoric acid and/or oxalic acid were used in this process, depending on the iron content of the cellulose (PAP-00111231, PAP-00112731). The nitrocellulose was next either bleached (if whiteness or transparency of the product was desired) or treated with alcohol (PAP-00111231). Potassium permanganate, sulfuric acid, and hydrochloric acid were used during the nitrocellulose bleaching process (PAP-00107289, PAP-00108354). The most

common types of alcohol used in the celluloid manufacturing process were grain alcohols like methanol and ethanol (PAP-00107291). After bleaching (or after treatment with alcohol, if the final celluloid product did not need to be white or transparent), most of the water was removed from the nitrocellulose pulp by spinning in a centrifugal machine (PAP-00107611).

The next step was to mechanically mix nitrocellulose with a plasticizer (camphor and later Lindol) and any dyes or other specialty colorants and stabilizers that may have been required to achieve the desired properties and color of the celluloid end product in a grinding mill (PAP-00107612). Camphor was originally used as the plasticizer in the manufacturing of celluloid, but was phased out of use during World War I, when the camphor trade source was significantly interrupted and prices became highly variable. Lindol was used as a replacement for camphor in the celluloid manufacturing process (PAP-00111257).

Next, the ground nitrocellulose pulp was formed and pressed into cakes in a hydraulic press to remove moisture (PAP-00108360). The next step in the process was to break the cakes into pieces small enough for alcohol or other solvents to penetrate (PAP-00107294). "Seasoning" of nitrocellulose with alcohol occurred in a closed box called a "seasoning box." The alcohol, camphor (or Lindol), and nitrocellulose were agitated while additional alcohol was added to the boxes in order to increase penetration of the alcohol and decrease the time spent in the seasoning boxes. Acid dyes or stabilizers like urea could be added in the alcohol during this step (PAP-00107290). After alcohol penetration was complete, the entire mixture would enter a rolling mill for further mixing (PAP-00108376).

The next step in the process was referred to as "steeping" and could be accomplished by one of several mechanisms. In this process, the nitrocellulose was allowed prolonged contact with a camphor-alcohol solvent in order to change the macro-structure of the nitrocellulose fibers. Although it is possible to accomplish this transformation in a manual process that takes place within a steeping box, the more common method was to perform mechanical mixing in a kneading machine (PAP-00107462; PAP-00108496).

At this point, additional pigmentation of the celluloid product could be obtained by staining the celluloid with either mineral colors (e.g., cadmium yellows, cobalt blue, or natural black ochre) or organic colors (e.g., chrysoidine dyes) (PAP-00108373). Alternatively, if no additional pigmentation was required, the final stage was to dry and form the celluloid into sheets or blocks (PAP-00107560). The finished celluloid sheets or blocks were sold to off-site manufacturers for the production of various household items, including cuffs and collars, hats and trimmings, shoe protectors, and dominoes (PAP-00105612).

Cellulose Acetate Products

A 1972 Waste Effluent Survey described raw materials used as cellulose acetate flake, plasticizers, and solvents. According to this survey, casting operations involved mixing these materials together and casting onto a heated roll, stripping off, drying, and spooling up into rolls. In the extrusion process, pellet mixes of flake and plasticizer were

extruded as sheet or film product. This document notes a production rate of 90,000 pounds per day (PAP-0010555).

Scrap cellulose acetate from the main plant area was stored and recycled into pellets in the ancillary operations area located at 226 Rome (PAP-00111257).

Lindol Manufacturing

Around 1915, Celluloid invented Lindol as a camphor replacement. Similar to camphor, Lindol is a clear or white solid with a low melting point; when liquid, it is colorless (PAP-00112376). More information on this process can be reviewed in the Celanese 226 Rome Facility Data Report.

According to the September 1988 *Status Report on Cleanup Activities Main Plant Area for Georgia Pacific Corporation*, prepared by BCM, the following Underground Storage Tanks and contents were located on the facility (PAP-00198622).

UNDERGROUND STORAGE TANK INVENTORY

Tank No.	Capacity (gal)	Former Contents
1	10,000	Chronotex
2	10,000	Acetone
3	10,000	Acetone
4	10,000	Acetone
5	10,000	Acetone
6	3,800	Methanol and Acetone
7	3,800	Dimethyl Phthlate
8	10,000	Methyl Chloride
9	10,000	Methyl Chloride
10	10,000	Methanol
11	10,000	Methanol
12	5,000	Methyl Chloride
13	5,000	Methyl Chloride
14	5,000	Diethyl Phthalate
15	10,000	Diethyl Phthalate
16	10,000	Acetone
17	5,000	Methyl Chloride, Acetone, Methanol, Water
18	10,000	Diethyl Phthalate
19	10,000	Diethyl Phthalate
20	10,000	Methyl Chloride
21	10,000	Methyl Chloride/Methanol
22	10,000	Methyl Chloride
23	10,000	Methyl Chloride
24	10,000	Methyl Chloride/Methanol
25	5,000	Unknown

According to correspondence between Georgia-Pacific Corporation and NJDEP dated 1984, seven tanks were located under Building #47 of which Tank 6 was known to leak if filled above a certain level (PAP-00109264-67).

4. Identified COCs

- PCBs (detected)
- Dioxins and Furans (detected)
- PAHs (detected)
- Dieldrin (detected)
- DDx (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

According to the June 7, 1984 *Results of Soil Sampling Report* for Georgia Pacific Corporations prepared by The Earth Technology Corporation, PCBs (total as Arochlor 1260) was detected at 5.25 mg/kg from sample 9524 collected on May 30, 1984 (PAP-00106743).

According to an [Environmental Responsibility Cleanup Act] *ECRA Cleanup Program ECRA Case #84056B for Georgia-Pacific Corporation*, dated March 2, 1988, polymer extruded products sewer sediment sample (GPS-SS-1) contained 0.894 mg/kg Aroclor 1254 (PAP-00198682).

Dioxins and Furans

According to the November 1988 *Status Report on Cleanup Activities Main Plant Area for Georgia Pacific Corporation*, prepared by BCM, post-excavation soil samples collected on June 22, 1988, in the Building 47 Tank Vault Area contained 0.75 mg/kg dibenzofuran in sample T33 Dup and 0.63 mg/kg in sample T33, collected at 2 feet below ground surface (ft bgs) (PAP-00106407). The type of dibenzofuran was not specified.

PAHs

According to soil sampling results attached to a status report letter to NJDEP from The Earth Technology Corporation dated September 30, 1987, soil sample GPS-17 (1.5-2.0 ft bgs), collected on June 2, 1987, from the coal storage area, contained benzo(a)anthracene (0.422 mg/kg), benzo(a)pyrene (0.328 mg/kg), benzo(b)fluoranthene (0.567 mg/kg), benzo(k)fluoranthene (0.336 mg/kg), chrysene (0.426 mg/kg) and indeno(1,2,3-cd)pyrene (0.139 mg/kg) (PAP-00198694).

The Magazine Street sewer sediment sample (GPS-SS-2) contained benzo(a)anthracene (1.944 mg/kg), benzo(a)pyrene (2.308 mg/kg), benzo(b)fluoranthene (1.743 mg/kg), benzo(k)fluoranthene (2.657 mg/kg), chrysene (2.171 mg/kg), fluoranthene (3.214 mg/kg), phenanthrene (1.842 mg/kg), and pyrene (3.522 mg/kg) (PAP-00198711).

The following PAH concentrations were detected at the casting area process cooling towers (PAP-00198705).

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	GPS-S-1(0.5-1.0')	GPS-S-2(0.5-1.0')
ACENAPHTHENE	BMDL(3)	406
ANTHRACENE	448	669
BENZO(A) ANTHRACENE	1438	1963
BENZO(A) PYRENE	1314	1845
BENZO(B) FLUORANTHENE	1184	1859
BENZO(K) FLUORANTHENE	1180	1502
BENZO(GHT) PERYLENE	BMDL(3)	382
BIS(2-ETHYLHEXYL) PHTHALATE	BMDL(3)	BMDL(3)
CHRYSENE	1478	2023
DIBENZO(A,H) ANTHRACENE	BMDL(3)	ND
DIETHYL PHTHALATE	BMDL(3)	BMDL(3)
DI-N-BUTYL PHTHALATE	[1658](2)	[876](2)
FLUORANTHENE	3084	3854
FLUORENE	BMDL(3)	333
INDENO(1,2,3-CD) PYRENE	493	746
NAPHTHALENE	ND	BMDL(3)
PHENANTHRENE	1942	3437
PYRENE	2353	4252
TOTAL	14921	23271
NJDEP GUIDELINES	10000	10000

NOTES:

1. All results are in parts per billion (PPB)

According to the September 1988 *Status Report on Cleanup Activities Main Plant Area for Georgia Pacific Corporation*, prepared by BCM, the following max PAH concentrations were detected in soil samples collected on June 22, 1988, from the Building 47 Tank Vault Area: anthracene (2.522 mg/kg), benzo(a)anthracene (8.435 mg/kg), benzo(a)pyrene (2.152 mg/kg), benzo(b)fluoranthene (3.446 mg/kg),benzo (g,h,i)perylene (.652 mg/kg), benzo(k)fluoranthene (3.446 mg/kg), chrysene (3.457 mg/kg), dibenzo(a,h)anthracene (0.511 mg/kg), fluoranthene (10.511 mg/kg), fluorene (1.293 mg/kg), indeno(1,2,3-cd)pyrene (1.152 mg/kg), phenanthrene (15.533 mg/kg), and pyrene (15.685 mg/kg) (PAP-00198634-35). The post-excavation soil samples collected on July 29, 1988, had the following maximum concentrations detected: acenaphthene (.337 mg/kg), acenaphthylene (.256 mg/kg), anthracene (41.453 mg/kg), benzo(a)anthracene (1.256 mg/kg), benzo(a)pyrene (73.977 mg/kg), benzo(b)fluoranthene (49.471 mg/kg), benzo(g,h,i)perylene (9.639 mg/kg), benzo(k)fluoranthene (49.477 mg/kg), chrysene (.762 mg/kg), dibenz(a,h)anthracene (6.372 mg/kg), fluoranthene (101.860 mg/kg), fluorene (29.988 mg/kg)indeno(1,2,3-cd)pyrene (9.639 mg/kg), napthalene (29.384 mg/kg), phenanthrene (41.453 mg/kg), and pyrene (171.151 mg/kg) (PAP-00106409-10).

Post-excavation samples collected on August 24, 1988, from the solvent recovery system (SRS) underground storage tanks area had maximum reported concentrations of: anthracene (2.4 mg/kg), benzo(a)anthracene (6.03 mg/kg), benzo(a)pyrene (7.26 mg/kg), benzo(b)fluoranthene (5.95 mg/kg), benzo(g,h,i)perylene (1.8 mg/kg), benzo(k)fluoranthene (5.95 mg/kg), chrysene (7.76 mg/kg), dibenz(a,h)anthracene ( ),fluoranthene (21.8 mg/kg), fluorene (0.60 mg/kg), indeno(1,2,3-cd)pyrene (1.0 mg/kg), phenanthrene (2.0 mg/kg), and pyrene (7.85 mg/kg) (PAP-00106415-28).
According to the November 1988, *ECRA Case No. 84056A Cleanup Plan for the Main Plant Area, Georgia Pacific Corporation*, prepared by BCM, post-excavation soil samples were taken from the trench and analyzed. PAHs were detected at total concentrations of approximately 14 to 65 mg/kg in the Building 47 Vaulted Tanks (PAP-00106330).

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According to the Declaration of Environmental Restrictions (DER) made on December 2, 1994, by Georgia-Pacific Corporation, the following PAH concentrations have been found onsite (PAP-00198925):

TABLE-1 (Continued)
Summary of Soil Boring Analytical Results exceeding Residential Soil Cleanup Criteria
Georgia Pacific, Newark, New Jersey

Sample Point	T 33 2'	T 44 2'	T 33D 2'	NJDEP Residential Soil Cleanup Criteria
Sample Location	Bldg 47 Courtyard	Bldg 47 Courtyard	Bldg 47 Courtyard	
Sample Depth (feet)	12	12	12	
Sample Date	8/24/88	8/30/88	8/30/88	
Benzo(a)anthracene	6.837	1.0	8.435	0.9
Benzo(a)pyrene	1.891	--	2.152	0.66
Benzo(k)fluoranthene	2.837	--	3.446	0.9
Indeno(1,2,3-cd) pyrene	--	--	1.152	0.9

(PAP-00198926)

Sample Point	15S3	16S	16N	NJDEP Residential Soil Cleanup Criteria
Sample Location	SRS Area UGST	SRS Area UGST	SRS Area UGST	
Sample Depth (feet)	10	10	10	
Sample Date	8/24/88	8/30/88	8/30/88	
Benzo(a)anthracene	1.10	3.6	1.6	0.9
Benzo(a)pyrene	1.0	2.8	1.6	0.66
Benzo(k)fluoranthene	--	2.2	1.1	0.9
Indeno(1,2,3-cd) pyrene	--	--	1.0	0.9

Sample Point	T 2	T 3	T 7*	T 9*	NJDEP Residential Soil Cleanup Standard
Sample Location	Bldg 47 Courtyard	Bldg 47 Courtyard	Bldg 47 Courtyard	Bldg 47 Courtyard	
Sample Depth (feet)	10	10	10	10	
Sample Date	7/29/88	7/29/88	7/29/88	7/29/88	
Benzo(a)anthracene	1.256	--	1.786	1.195	0.9
Benzo(a)pyrene	1.302	73.977	0.881	1.149	0.66
Benzo(k)fluoranthene	0.998	49.477	--	--	0.9
Dibenz(ah)anthracene	--	6.372	--	--	0.66
Indeno(1,2,3-cd) pyrene	1.220	9.639	--	--	0.9

NOTES:
1. Sample depths are in feet below grade.
2. Concentrations are in parts per million.
3. "--" Not in exceedance of Residential soil clean up standards dated October 1993.
4. "*" Residual soil immediately above concrete slab.

(PAP-00198925-27)

Dieldrin

According to the June 7, 1984 *Results of Soil Sampling Report* for Georgia Pacific Corporations prepared by The Earth Technology Corporation, dieldrin was detected at 3.4 mg/kg from sample 9524 collected on May 30, 1984 (PAP-00106743, 881, 889).

According to the November 1988 *Appendix D Volume 3, Part 1 for the Main Plant Area Cleanup Plan*, dieldrin was detected in soil sample E814477 (0.019 mg/kg), sample E814479 (0.077 mg/kg) and E814480 (0.190 mg/kg) collected on October 7, 1988 from 1.0 - 1.5 ft bgs (PAP-00106868, 881, 889).

DDx

According to the June 7, 1984 *Results of Soil Sampling Report* for Georgia Pacific Corporations prepared by The Earth Technology Corporation, DDE, DDT and DDD was detected at 3.4 mg/kg, 3.44 mg/kg and 3.4 mg/kg respectively from sample 9524 collected on May 30, 1984 (PAP-00106743).

According to the November 1988 *Appendix D Volume 3, Part 1 for the Main Plant Area Cleanup Plan*, 4,4'-DDT was detected in soil sample E814477 (0.035 mg/kg), E814479 (0.068 mg/kg) and E814480 (0.066 mg/kg) collected on October 7, 1988 from 1.0 - 1.5 ft bgs (PAP-00106868, 881, 889).

Metals – Copper, Lead, and Mercury

According to soil sampling results attached to a status report letter to NJDEP from The Earth Technology Corporation dated September 30, 1987, soil sample GPS-17 (1.5-2.0 ft bgs), collected from the coal storage area, contained copper (134 mg/kg), lead (477 mg/kg) and mercury (13 mg/kg) (PAP-00198695). The report also noted copper (30.1 mg/kg) and lead (192 mg/kg) in soil sample GPS-26A (0-0.5 ft bgs) collected from the copper square yard (PAP-00198701). The Magazine Street sewer sediment sample (GPS-SS-2) contained copper (6,140 mg/kg), lead (424 mg/kg) and mercury (0.408 mg/kg) (PAP-00198711).

The following metal concentrations were also reported (PAP-00198703-08).

Powerhouse Cleaning Tank

III. PRIORITY POLLUTANT METAL (PPB)

METAL	GPS-33A(0-0.5')	GPS-33B (4-4.5')	NJDEP GUIDELINES
ANTIMONY	0.164	0.268	2.0
ARSENIC	1.69	3.08	20.0
BERYLLIUM	<0.500	0.605	1.0
CADMIUM	<0.500	0.592	3.0
CHROMIUM	16.8	30.0	100
COPPER	14.0	17.3	170
LEAD	26.0	35.7	100
MERCURY	<0.100	<0.100	1.0

Note that the heading on this table indicates that these results are in parts per billion (ppb), but that the NJDEP guidelines match those in the following tables, reported in parts per million (ppm) (PAP-00198703).

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Casting Area Raw Material Unloading

I. PRIORITY POLLUTANT METALS (PPM)

METAL	GPS-S-3(1.5-2.0')	GPS-S-4(1.5-2.0')	NJDEP GUIDELINES
Antimony	0.168	2.58	2.0
Arsenic	3.78	23.8	20.0
Beryllium	0.846	1.58	1.0
Cadmium	1.46	3.34	3.0
Chromium	22.0	108	100
Copper	29.3	35.1	170
Lead	73.1	597	100
Mercury	0.192	0.302	1.0

(PAP-00198707)

Building 199 Yard Finished Product Storage

I. PRIORITY POLLUTANT METALS (PPM)

METAL	GPS-S-5(0-0.5')	GPS-S-6(0-0.5')	NJDEP GUIDELINES
Antimony	<0.100	<0.100	2.0
Arsenic	2.95	1.86	20
Beryllium	0.829	<0.500	1
Cadmium	<0.500	<0.500	3.0
Chromium	23.0	<16.0	100
Copper	27.4	21.0	170
Lead	25.0	14.3	100
Mercury	<0.100	<0.100	1.0

(PAP-00198708)

Powerhouse Scrap Storage Area (ppm)

BORING NUMBER	DEPTH (FT)	SAMPLE NUMBER	COPPER	LEAD	MERCURY
-13	0 - 05.	GPS-13A	222	471	<0.100
	6 - 6.5	GPS-13B	61.3	281	<0.100
-14	0 - 0.5	GPS-14A	19.1	78.0	<0.100
	7.5- 8.0	GPS-14B	6.79	13.5	<0.100
-15	0 - 0.5	GPS-15A	160.0	74.9	0.943
	8 - 8.5	GPS-15B	3.53	9.72	<.100
-16	0 - 0.5	GPS-16A	19.5	77.7	0.381
	7.5- 8.0	GPS-16B	7.53	60.3	<0.100
B-10	0 - 0.5	GPS-10A	<2.00	1.92	<0.100
	4 - 4.5	GPS-10B	3.34	24.7	<0.100
B-11	0 - 0.5	GPS-11A	22.7	85.0	0.519
	6.5- 7.0	GPS-11B	6.3	55.8	<0.100

(PAP-00198875-76)

Diamond Alkali OU2 Allocation
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Powerhouse Underground Storage Tanks (ppm)

BORING NUMBER	DEPTH (FT)	SAMPLE NUMBER	COPPER	LEAD	MERCURY
B-1	0 – 0.5	GPS-1A	153	557	1.18
	6 – 6.5	GPS-1B	4.76	19.2	<0.100
	9.5–10.0	GPS-1C	4.14	4.09	<0.100
B-2	0 – 0.5	GPS-2A	27.5	219	0.414
	6 – 6.5	GPS-2B	33.6	198	0.393
	9.5–10.0	GPS-3C	12.4	23.4	<0.100
B-3	0 – 0.5	GPS-3A	19.4	12.3	0.279
	6 – 6.5	GPS-3B	10.3	25.1	0.229
	9.5–10.0	GPS-3C	3.8	4.28	<0.100
B-4	0 – 0.5	GPS-4A	36.4	348	0.100
	6 – 6.5	GPS-4B	222	917	1.26
	9.5–10.0	GPS-4C	<2.00	20.6	<0.100
B-5	0 – 0.5	GPS-5A	226	937	1.34
	6 – 6.5	GPS-5B	25.4	383	0.696
	9.5–10.0	GPS-5C	11.6	17.9	<0.100
B-6	0 – 0.5	GPS-6A	57.6	457	0.613
	6 – 6.5	GPS-6B	66.4	265	0.809
	9.5–10.0	GPS-6C	10.6	20.6	<0.100
B-7	0 – 0.5	GPS-7A	41.8	264	0.372
	3.5– 4.0	GPS-7B	119	348	1.15
B-8	0 – 0.5	GPS-8A	55.7	378	3.87
	6 – 6.5	GPS-8B	8.14	33.9	0.269
	9.5–10.0	GPS-8C	23.2	7.18	<0.100
B-9	0 – 0.5	GPS-9A	70.5	135	0.908
	6 – 6.5	GPS-9B	12.5	31.1	0.227
	9.5–10.0	GPS-9C	3.44	5.05	<0.100
B-34	0 – 0.5	GPS-34A	38.8	21.3	<0.100
	6.75–7.25	GPS-34B	6.65	7.69	<0.100
	9.5–10.0	GPS-34C	4.07	7.37	<0.100

(PAP-00198877)

According to the *ECRA Cleanup Program ECRA Case #84056B for Georgia-Pacific Corporation*, dated March 2, 1988, polymer extruded products sewer sediment sample (GPS-SS-1) contained copper (90.2 mg/kg), lead (2232 mg/kg) and mercury 0.253 mg/kg) (PAP-00198683).

According to January 1990 *Confirmatory Sampling Results Report for Georgia Pacific Corporation ECRA Case #84056*, prepared by Environmental Consultants, Inc., soil samples collected (0-6 inches bgs) on October 26, 1989, from the Raw Materials Unloading Area contained lead at concentrations of 240 mg/kg in sample RM-1, 160 mg/kg in RM-2, and 120 mg/kg in RM-3 (PAP-00110726). Boring logs associated with the samples describe soils containing bricks, cement chips and sandy fill in RM-1-3 (PAP-00110756-58).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs found in Historic Fill	
COC	**Max Detected Concentration**
Lead	937 mg/kg
Copper	226 mg/kg
Mercury	13 mg/kg
Benzo(a)anthracene	8.435 mg/kg
Benzo(a)pyrene	73.977 mg/kg
Benzo(b)fluoranthene	49.477 mg/kg
Benzo(k)fluoranthene	49.477 mg/kg
Dibenzo(a,h)anthracene	6.372 mg/kg
Indeno(1,2,3-cd)pyrene	9.639 mg/kg
PCBs	5.25 mg/kg

(PAP-00198634-35; PAP-00106409-10, PAP-00198926-27, PAP-00198695, PAP-00198877)

No information is available regarding when fill materials were placed on the facility site.

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

There is no indication from a review of provided documents that facility operations disturbed contamination located in historic fill.

According to the November 1988 *Cleanup Plan for the Main Plant Area, Georgia Pacific Corporation*, prepared by BCM, fill material was approximately 7 feet thick on the facility and consisted of sand, gravel and brick fragments (PAP-00106325). A Declaration of Environmental Restrictions was applied to a portion of the main plant area on December 2, 1994, where soil contaminated with PAHs had been covered with approximately 10 feet of clean fill material (PAP-00198920).

A Declaration of Environmental Restrictions was made on December 2, 1994, by Georgia-Pacific Corporation in Book 5345 on page 0585 and noted that 10 feet of clean fill material ("Soil Cap") had been placed over the Affected Area (2.187 acres) (PAP-00198920-21).

According to correspondence between Georgia-Pacific Corporation and NJDEP dated 1984, Building #47 was at one point under construction by Celanese (PAP-00109264-67).

5. COC Pathways

Sanitary Sewer

A May 19, 1972, Waste Effluent Survey completed by Celanese reported discharges were sent to the city sewers only with the following water usages (PAP-00105559).

Celanese 290 Ferry Water Usage in gallons			
Reporting Year	***Sanitary Water***	***Storm Sewer***	***Total Water Use***
1971	150,839,000	786,836,000	948,100,000

According to the 1972 PVSC Waste Effluent Survey, the facility had two outfalls to the sanitary sewer that had continuous 24-hour flow, seven days a week with peaks at noon and 4 p.m. on weekdays. Peak rates were estimated at 100 gallons per minute for 20 minutes. The Waste Effluent Survey states that effluent contained no metallic ions and no other COCs (PAP-00105560-61).

Storm Sewer

The January 1921 meeting minutes for the Board of Commissioners of Newark contained an objection to constructing a stormwater sewer to address surplus water in front of the Celluloid Company due to expense. A representative from Balbach Smelting & Refining Company suggested running a small drain down to the "Celluloid plant" (PAP-00111220).

Most facility storm sewers were tied into the PVSC system, except for several at the George Street-Magazine Street-Darcy Street corners that connected to the Magazine Street storm sewer. The Magazine Street storm sewer discharged into manmade

Pierson's Creek (Wilson Avenue) and flowed south toward Doremus Avenue into what is now Newark Bay via the Port Newark Channel (PAP-00198882; PAP-00198879).

According to a September 1982 *Spill Prevention Control and Countermeasure (SPCC) Compliance Inspection* for Georgia-Pacific, there were multiple storm drains along Magazine Street that empty into Pierson's Creek, which flows into Newark Bay (PAP-00198885). It was also noted that due to the proximity of facility storage tanks to local storm drains it is reasonable that oil, in harmful quantities could reach Newark Bay (PAP-00198886; PAP-00198879).

Direct Release

According to the June 30, 1989, *Final Draft Preliminary Assessment Report* (1989 PAR) for Georgia Pacific Corp., prepared by Nus Corporation, the nearest downslope surface water was the Passaic River, located approximately 1,500 feet north of the site. There was no apparent overland migration route from the site to the river because of the intervening roads, railroad tracks, and other urban development. The 1989 PAR report states that runoff from the site most likely entered nearby storm drains, which might discharge into the Passaic River" (PAP-00109277). The 1-year 24-hour rainfall was estimated to be 2.8 inches (PAP-00109278). *The History of the Newark Sewer System* states that 95 percent of homes and businesses were properly sewered by 1919, but all waste still flowed into the Passaic River (PAP-00111240).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Site Evaluation Submission, NJ Environmental Clean-Up and Responsibility Act, for the Georgia-Pacific Corporation* prepared by The Earth Technology Corporation, April 1984 (PAP-00105944)
- Results of Soil Sampling performed at the Georgia-Pacific Corporation's Polymer Materials Division Newark, August 22, 1984 (PAP-00106076)
- *Revised Soil Sampling and Analysis Program, Georgia Pacific Corporation Newark New Jersey*, February 1986 (PAP-00106191)
- *Revised Sampling and Analysis Program for Georgia Pacific Corporation* prepared by The Earth Technology Corporation, November 1986 (PAP-00106071)
- *Status Report of Cleanup Activities – Main Plant Area for Georgia Pacific Corporation, Newark, NJ,* September 1988 (PAP-00198613)
- *Main Plant Area Georgia Pacific Corporation ECRA Case No. 84056A Cleanup Plan,* November 1988 (PAP-00106299)
- *Preliminary Assessment Final Draft for Georgia Pacific Corp. Newark, NJ*, June 30, 1989 (PAP-00109271)

Remedial Activities

According to the September 1988 *Status Report on Cleanup Activities Main Plant Area for Georgia Pacific Corporation*, prepared by BCM, cleanup activities on site included the excavations of soils from the Building 47 Tank Vault, Courtyard, Underground storage Tanks 15 through 25, Unloading Area (Former Building 46) and Raw Material Unloading Area (PAP-00198614). A description of the cleanup in these areas is provided below with a location map at the end of this section.

Building 47 Tank Vault

The cleanup activities at the Georgia Pacific's Newark facility began with the removal of seven USTs and contaminated soil from a tank vault located in Building 47. Immediately following this removal action, the remaining 18 USTs and associated contaminated soil in the Building 47 courtyard, the alley between Buildings 45 and 43, and the solvent recovery system tank farm adjacent to Building 43 were removed (PAP-00198620). Following the tank and soil removal, the vault floor was decontaminated by pressure washing, and the resultant wastewater from decontamination was collected for offsite disposal (PAP-00198624). All soil and fly ash from the Building 47 Tank Vault was removed from the vault, handled as contaminated material, and later disposed of at Chemical Waste Management's Adams Center Landfill in Fort Wayne, Indiana (PAP-00198624).

Post-excavation soil samples were taken from the trench and analyzed, and PAHs were detected at total concentrations of approximately 14 to 65 mg/kg. No further investigation or remediation was recommended for this area since the PAHs were unrelated to compounds stored and used in the Building 47 vault storage tanks and the PAHs were relatively immobile in the subsurface environment (PAP-00106330).

Building 47 Courtyard

Four 10,000-gallon USTs numbered 8 through 11 and three 5,000-gallon USTs numbered 12 through 14 were located beneath a concrete pavement in the Building 47 courtyard (PAP-00198624). Most of the soils surrounding the tanks on the concrete pad were handled as contaminated soil and removed along with the tanks. The remaining soil on the pad was sampled during the post-excavation sampling effort to confirm that the soil was free of contamination. Preliminary analytical results from soil samples T6, T8, T9, and T10 confirmed that the soil in those areas did not contain significant concentrations of volatile organic compounds or methanol (PAP-00198626).

Wastewaters from tank decontamination operations and rainwater run-off that collected in the excavation were disposed of at DuPont's facility in Deepwater, New Jersey. Most contaminated soils and tank residues were disposed of at Chemical Waste Management's Landfill in Fort Wayne, Indiana. Following tank decontamination, all tanks were cut up and disposed of as scrap metal, at a reclamation facility. The Building 47 Courtyard project began on July 5, 1988, and was completed on August 8, 1988. The excavation was backfilled with clean fill material following receipt of preliminary laboratory results (PAP-00198626).

Six post-excavation soil samples (T1-T6) were taken from the north sidewall of the excavation approximately one foot above the concrete pad. Four additional soil samples were taken from the remainder of the excavation. The post-excavation samples collected on July 29, 1988, contained the following maximum concentrations: benzo(a)anthracene (1.256 mg/kg), benzo(a)pyrene (73.977 mg/kg), benzo(b)fluoranthene (49.477 mg/kg), benzo(k)fluoranthene (49.477 mg/kg), and indeno(1,2,3-cd)pyrene (9.639 mg/kg) in soils (PAP-00106409-10). No additional soil excavation or sampling was recommended in this area since the PAHs associated with the fly ash do not present an environmental concern, as they were not readily mobile in the subsurface environments and were to be covered with clean fill (PAP-00106331-32).

Underground Storage Tanks 15 through 25

UST 15 was located north of the Building 47 Courtyard and adjacent to Building 43. Tanks 16 and 17 were located in the alley between Building 43 and 45 and Tanks 18 through 25 were located adjacent to Building 43 and the solvent recovery system (PAP-00198627). All tank residues were removed, and the tank was decontaminated. After decontamination, the tank was excavated. All accessible contaminated soil adjacent to and below USTs 17 through 25 were removed. The removal of contaminated soil from the area created a large excavation to the water table 10 feet below grade. Preliminary analytical results from sample location 17E indicated that contaminants were still present in the soil. Additional soils in the vicinity of 17E were excavated after receipt of the preliminary analytical results. Additional post-excavation soil samples, labeled 17E2 and 17E2 duplicate, were collected to confirm contaminated soils were excavated (PAP-00198627).

Post-excavation soil samples were taken from 29 locations along the sidewalls of the three excavations and analyzed. The detected PAHs were primarily unrelated to any materials stored or used in the area (PAP-00106332). Post-excavation samples collected on August 24, 1988, from the SRS underground storage tanks area had the reported maximum concentrations: benzo(a)anthracene (6.03 mg/kg), benzo(a)pyrene (7.26 mg/kg), benzo(b)fluoranthene (5.95 mg/kg), benzo(k)fluoranthene (5.95 mg/kg), and indeno(1,2,3-cd)pyrene (1.0 mg/kg) (PAP-00106415-28). No further investigation or soil excavation was recommended at the SRS area since VOCs and semi-volatile detections were at generally acceptable concentrations (PAP-00106332). The PAHs detected were relatively immobile in the subsurface environment and were to be covered with clean fill (PAP-00106333).

Raw Material Unloading Area

Samples S3 and S4 from the 1987 sampling effort demonstrated that the soil below two off-loading pipes in the raw material unloading area between Building 45 and the cooling towers was contaminated with lead (73.1 and 597 mg/kg, respectively (PAP-00198707)), to a depth of 2 ft bgs. The contamination in this area was suspected to be present as a result of raw material unloading activities of (PAP-00198630). Georgia Pacific removed soil from this area creating an excavation 7 feet wide by 9 feet long to a depth of 2 feet below grade. The soil was later disposed of at Thermal Kem. The excavation was to be backfilled with clean fill material following receipt of analytical results (PAP-00198630). A post-excavation sample was collected on September 16, 1988, and analyzed based on the post-excavation sampling results, no additional investigation or remediation was recommended for the raw materials unloading station based on no known materials containing priority pollutant metals were managed at this location. The metal concentrations were similar to metal concentrations detected in other soil samples from this site and probably resulted from the extensive and long-term industrial history of the Newark area (PAP-00106313).

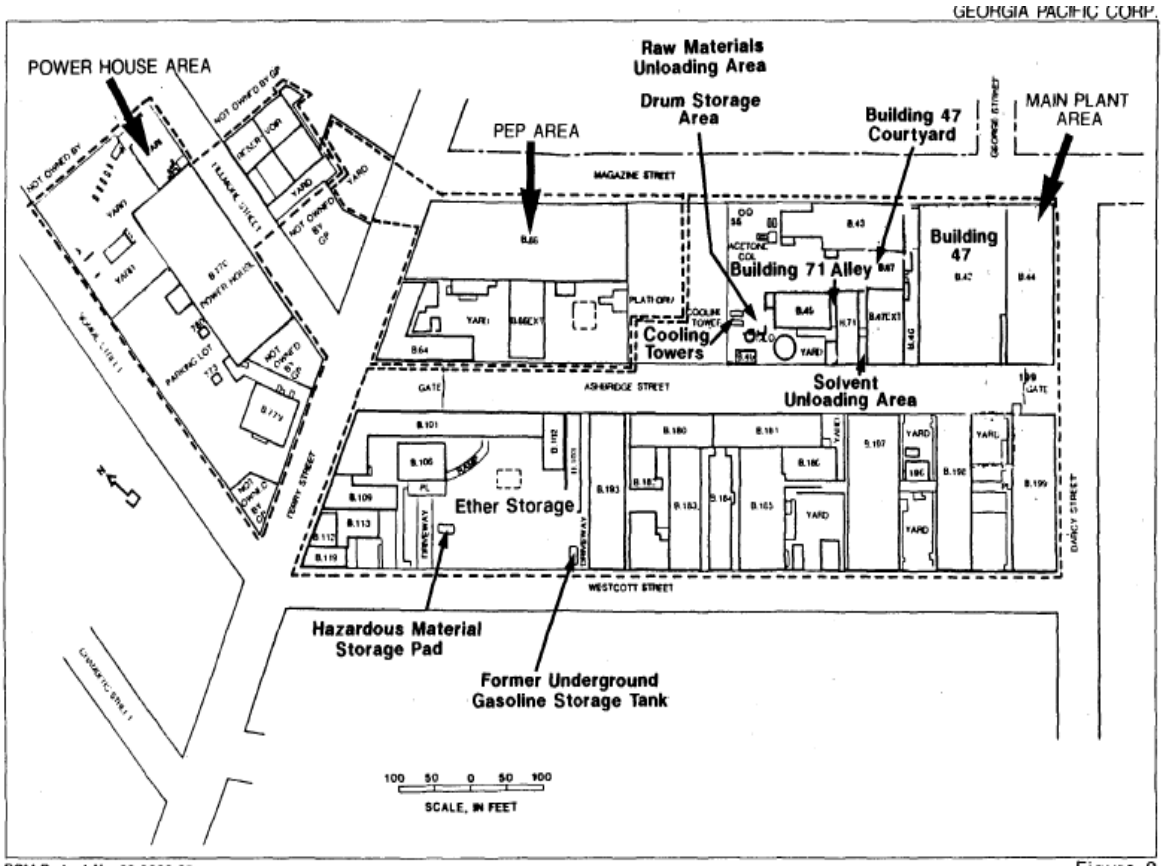


Figure 2
SITE MAP

(PAP-00106348)

According to the 1989 PAR, a recommendation of No Further Remedial Action Planned (NFRAP) was assigned to part of this site (13 acres) due to the absence of any potable supply wells or surface water intakes within 3 miles of the site and the planned ECRA cleanup under the direction of the NJDEP (PAP-00109281).

According to an October 12, 1989, NJDEP letter, no further remediation would be required in the areas where PAHs were present at depth below clean fill. However, additional, limited sampling was required in the area of sample GP-SB-2 to determine if this area was a “hot spot” (PAP-00109262).

According to the November 1989 *Final Cleanup Plan for Georgia Pacific Corporation*, prepared by TRC Environmental Consultants, Inc., Georgia-Pacific has completed a site-wide cleanup of the Newark Facility (PAP-00110278). The cleanup has resulted in the removal of 32 underground tanks, almost 9,000 tons of soil and over 125,000 gallons of groundwater from 16 distinct areas of potential environmental concern (PAP-00110280).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

CNA HOLDINGS LLC

Facility Name, Address and Size: Newark Terminal Facility; 354 Doremus Avenue, Newark, New Jersey; 27 acres (PAP-00025517). The number of employees was not identified in the available file material; operations occurred 24 hours a day, seven days a week (PAS-00070991).

1. **Business Type:** Chemical storage and transfer facilities (PAP-00025518-19)

2. **Time Period of Ownership/Operations**

Operator: 1954 to 1996
Owner: 1954 to 1996

1954: Celanese Corporation of America purchased the eastern portion of the site (subsequently referred to as the East Farm) from The Texas Company in 1954 (PAP-00021036; PAS-00070968; PAS-00070886). That same year, Celanese Corporation of America sold the property to The Prudential Insurance Company of America (Prudential Insurance), and began leasing the property from Prudential Insurance in 1954 (PAS-00070886).

1957: Celanese Corporation of America purchased several additional lots in 1957, 1966, and 1975, (including Lots 10 and 12 from the Newark Housing Authority) forming what was subsequently referred to as the West Farm of the site (PAS-00070968; PAP-00022174; PAP-00021039; PAS-00070968).

1980: Celanese Chemical Company, Inc., a subsidiary of Celanese Corporation of America, purchased the East Farm from Prudential Insurance (PAS-00070886; PAS-00070927-29).

1987: American Hoechst and Celanese Corporation of American merged to form Hoechst Celanese Corporation (PAS-00070886).

1988: Celanese Chemical Company, Inc. changed its name to Hoechst Celanese Chemical Group, Inc. in 1988 (PAS-00070886).

1995: Hoechst Celanese Chemical Group, Inc., merged with Hoechst Celanese Chemical Group, Ltd. (PAS-00070935). Hoechst Celanese Chemical Group, Ltd., is an affiliate of Hoechst Celanese Corporation (formerly Celanese Chemical Company, Inc.) (PAS-00070968). On December 31, 1995, ownership of the property was transferred to Hoechst Celanese Chemical Group, Ltd. (Celanese), a limited partnership comprised of Hoechst Celanese Texas Holdings, Inc. as general partner and Hoechst Celanese Chemicals, Inc. as limited partner (PAS-00070886). Hoechst Celanese Chemical Group, Inc. was the previous owner/operator (PAS-00070979).

1996: Operations ceased in July 1996 (PAS-00070968).

1998: Essex County Improvement Authority, an entity of the State of New Jersey, acquired the site on September 17 (PAP-00022169-93).

3. Operational History/COC Use and Presence at the Facility

According to the *Sampling Plan*, dated June 1987, the site consisted of two areas: the East Farm, a 7.5-acre lot situated east of Doremus Avenue and abutting Newark Bay; and, the West Farm, a 19.3-acre lot located west of Doremus Avenue (PAP-00021031). The facility was primarily used as a storage and transfer terminal for products manufactured at other off-site Celanese facilities. The products stored and transferred on-site included organic acids, acrylates, acetates, and glycols (PAP-00021143; PAP-00021031).

Chemicals arrived via tanker (water), tank car (railroad), and tank truck and were loaded into aboveground storage tanks via aboveground pipes. Outgoing chemicals were shipped to customers by tank truck and railroad tank cars. According to the *Sampling Plan*, dated June 1987, the loading areas were paved and fitted with drainage containment systems (PAP-0021032). As chemicals were transferred to storage tanks, chemical vapors were captured and scrubbed by a caustic solution that was then discharged to the sewer system (PAS-00071000).

In addition to its chemical transfer operations, Celanese manufactured formaldehyde and potassium acrylate on the West Farm (PAP-00021032). Celanese manufactured formaldehyde from approximately 1966 to April 1993, and it manufactured potassium acrylate for approximately one year between 1985 and 1986 (PAS-00070970). These products were manufactured as follows:

- Formaldehyde was produced by oxidizing methanol and purifying the product in an ion-exchange process. The formaldehyde solution was then transferred to the East Farm and blended with methanol to form various products. Wastes created in the formaldehyde production process were paraformaldehyde (a solid polymeric form of formaldehyde) which was filtered from solution, sulfuric acid and sodium hydroxide wastes from the ion exchangers, rinse solutions from cleaning the filters, and formaldehyde vapors. The vapors were sent to a scrubber, while the other wastes were flushed to the permitted sewer system (PAP-00021032).

- Potassium acrylate production involved the reaction of glacial acrylic acid with potassium hydroxide, and subsequent chilling (PAP-00021032).

According to the *Sampling Plan*, dated June 1987, a drumming operation also took place through January 1987 in the northern section of the East Farm warehouse where approximately 10,000 to 12,000 drums were filled each year with acrylates, acetates, and glycols. The filled drums were stored in the West Farm warehouse prior to shipment by truck to customers (PAS-00070971). Site drainage plans showed that floor drains from the drumming operation in Building B-1 were connected to the sewer system (PAP-00021038). The floor drains may have received discharges of acrylates, acetates and glycols beginning prior to 1965 and continuing until 1987 (PAS-00070972-73).

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd.*, dated October 18, 1996, dilute wastewaters containing "small amounts" of chemicals were discharged to the Passaic Valley Sewerage Commission (PVSC) system from 1966 to 1993 (PAS-00070971). This included paraformaldehyde-containing residues rinsed from filters, traces of formaldehyde and formic acid resulting from flushing of the ion exchange units, and traces of potassium acrylate generated during cleaning of potassium acrylate manufacturing equipment (PAS-00070970). In addition to manufacturing-related wastewaters, sanitary wastewater from lavatories, non-contact cooling water used in reactors in the methanol oxidation units, and wastewaters resulting from stripping of exhaust gases in the scrubbers were discharged to the PVSC system (PAS-00070972).

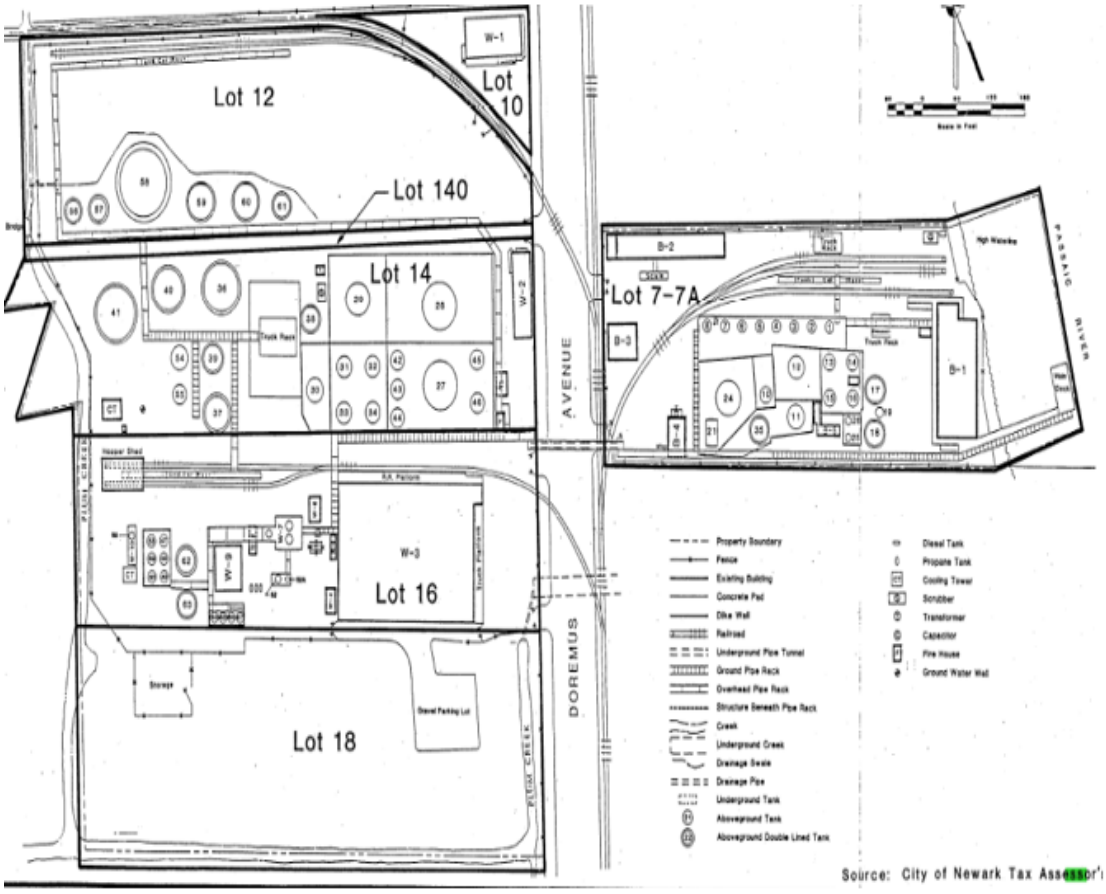
The only available documentation of OU2 contaminant of concern (COC) use or handling associated with Celanese operations are as follows:

- According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd*., dated October 18, 1996, the site had two aboveground storage tanks that held No. 6 fuel oil; one with a 63,000-gallon capacity and one with a 17,000-gallon capacity (PAS-00071012).

- According to waste disposal records from 1991, a waste shipment for off-site disposal was returned when laboratory analysis showed one drum of waste sump water contained >50.1 parts per million (ppm) and one drum of PCB lean water contained >37.2 ppm polychlorinated biphenyls (PCBs) (PAS-00071050; PAS-00071299-300). The source of the waste was not available in the referenced document. According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd*., dated October 18, 1996, three transformers were previously located at the site (removed in 1996); no PCBs were detected in the transformer fluid at the time of removal (PAS-00070977).

- The facility disposed of one shipment of five pounds of mercury and one shipment of 10 pounds of mercury in July 1996 during decommissioning activities (PAS-00071647; PAS-00071649).

A facility layout is depicted below.



(PAP-00021035)

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- DDx (detected)
- Mercury (detected)
- Copper (detected)
- Lead (detected)

PCBs

According to waste disposal records from 1991, a waste shipment for off-site disposal was returned when laboratory analysis showed one drum of waste sump water contained >50.1 ppm and one drum of PCB lean water contained >37.2 ppm PCBs (PAS-00071050; PAS-00071299-300). The source of the waste was not available in the referenced document. According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd.*, dated October 18, 1996, three Public Service Electric & Gas (PSE&G) transformers were previously located at the site (removed in 1996); no PCBs were detected in the transformer fluid at the time of removal (PAS-00070977).

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd.*, dated October 18, 1996, PCBs were detected in surface soil collected adjacent to the concrete pad that previously held three PSE&G transformers in the West Farm (PAS-00070977). Detected PCB concentrations ranged from 0.16 ppm to 30 ppm. It is noted that this area was located adjacent to a grated storm drain (PAS-00072608). According to the *Sampling Plan*, dated June 1987, collection sumps, floor drains, dike wall drainage valves, and the connecting drainage and sewage lines service the facility and all potentially contaminated runoff is directed to the sewer system (PAP-00021041-042).

In 1981, Aroclor 1254 was detected in a sample of "East Farm Effluent" [0.2 micrograms per liter (µg/L)] and "West Farm Effluent" (0.1 µg/L). All other PCB Aroclors in the sample were non-detect at 0.1 µg/L. (PAS-00071087). No other wastewater monitoring data for OU2 COCs were identified in the available file material.

Plum Creek, a small drainage stream, flows along the western and southern edges of the West Farm. The stream reaches Newark Bay after being diverted underground beneath a neighboring facility (PAP-00021031). According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, 15 sediment and seven surface water samples were collected from Plum Creek in 1988 (PAP-00026225-26). PCBs were detected as follows in concentrations of parts per billion (ppb) (PAS-00072645-49, 56):

Range of PCB Concentrations Reported in Plum Creek		
COC	**Sediment (ppb)**	**Surface Water (ppb)**
PCBs	1,200 – 9,200	15

According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, many of the compounds detected in Plum Creek sediment and surface water have apparent off-site sources located upstream of the site or appear to reflect the composition of the fill material at the site. The report goes on to state that because the levels of contaminants at most locations were de minimis relative to action levels and because several contaminants found in both the surface water and sediment on site have apparent off-site sources, Plum Creek was not recommended for further investigation (PAP-00026302).

PAHs

It is noted that the East Farm was originally owned by the Texas Company (Texaco), which operated a petroleum distribution facility on the site from approximately 1925 until 1954 (PAP-00021036).

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd*., dated October 18, 1996, the site had two aboveground storage tanks that held No. 6 fuel oil; one with a 63,000-gallon capacity and one with a 17,000-gallon capacity (PAS-00071012). In addition, PAHs were a component of heavy fuel oil that was used for boiler operation prior to the 1990s (PAP-0021397, PAP-0021339).

In 1981, naphthalene was detected in a sample of "East Farm Effluent" (21 µg/L) and "West Farm Effluent" (11 µg/L). The "Water Supply" sample had a naphthalene concentration of 1-9 µg/L (PAS-00071086). No other wastewater monitoring data for OU2 COCs were identified in the available file material.

Plum Creek, a small drainage stream, flows along the western and southern edges of the West Farm. The stream reaches Newark Bay after being diverted underground beneath a neighboring facility (PAP-00021031). According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, 15 sediment and seven surface water samples were collected from Plum Creek in 1988 (PAP-00026225-26). High and low molecular weight polynuclear aromatic hydrocarbons (PAHs) were detected in sediment and surface water samples (PAS-00072650-52). PAHs were detected at their highest concentrations in the sample collected upstream of the site (PAP-00026235). According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, many of the compounds detected in Plum Creek sediment and surface water have apparent off-site sources located upstream of the site or appear to reflect the composition of the fill material at the site. The report goes on to state that because the levels of contaminants at most locations were de minimis relative to action levels and because several contaminants found in both the surface water and sediment on site have apparent off-site sources, Plum Creek was not recommended for further investigation (PAP-00026302).

DDx

No records related to use or handling of dichlorodiphenyldichloroethane (4,4-DDD) or dichlorodiphenyldichloroethylene (4,4-DDE) were identified in the available file material.

In 1981, the "East Farm Effluent" and the "West Farm Effluent" were sampled. Pesticides were non-detect at 0.1 µg/L in the samples (PAS-00071087).

Plum Creek, a small drainage stream, flows along the western and southern edges of the West Farm. The stream reaches Newark Bay after being diverted underground beneath a neighboring facility (PAP-00021031). According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, 15 sediment and seven surface water samples were collected from Plum Creek in 1988 (PAP-00026225-26). 4,4-DDE was detected as follows (PAS-00072645-49, 56):

Range of 4,4-DDE Concentrations Reported in Plum Creek		
COC	**Sediment (ppb)**	**Surface Water (ppb)**
4,4-DDE	450 – 500	0.02 – 0.07

According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, many of the compounds detected in Plum Creek sediment and surface water have apparent off-site sources located upstream of the site or appear to reflect the composition of the fill

material at the site. The report goes on to state that because the levels of contaminants at most locations were de minimis relative to action levels and because several contaminants found in both the surface water and sediment on site have apparent off-site sources, Plum Creek was not recommended for further investigation (PAP-00026302).

According to a *Remedial Action Report, Buried Paint Waste-Contaminated Soils*, Essex County Correctional Facility, dated October 1999, during redevelopment of the site by the Essex County Improvement Authority in early December 1998, buried paint waste, as well as buried crushed drums, were discovered during excavation at the Retention Pond "D" area located in the northwest corner of the site on Lot 12, along Plum Creek (PAP-00023857). In the shallowest soil sample collected in this area (1.0 feet), 4,4-DDE [0.058 milligrams per kilogram (mg/kg)] and 4,4-DDD (0.018 mg/kg) were detected (PAP-00023872-78). The paint-waste impacted fill on Lot 12 (approximately 1,900 cubic yards) is consistent with third-party dumping that occurred while Lot 12 was owned by the Newark Housing Authority (PAP-00026335).

Copper

No records related to use or handling of copper were identified in the available file material.

In 1981, the “East Farm Effluent” and the “West Farm Effluent” were sampled. Copper was non-detect at 0.02 mg/L in the samples (PAS-00071088).

Plum Creek, a small drainage stream, flows along the western and southern edges of the West Farm. The stream reaches Newark Bay after being diverted underground beneath a neighboring facility (PAP-00021031). According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, 15 sediment and seven surface water samples were collected from Plum Creek in 1988 (PAP-00026225-26). Copper was detected as follows (PAS-00072645-49, 56):

Range of Copper Concentrations Reported in Plum Creek		
COC	**Sediment (ppb)**	**Surface Water (ppb)**
Copper	57,600 – 660,000	11 - 33

According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, metals were detected above the “action levels” at sediment sampling locations on Plum Creek both upstream of and adjacent to the site (PAP-00026226). It states that many of the compounds detected in Plum Creek sediment and surface water have apparent off-site sources located upstream of the site or appear to reflect the composition of the fill material at the site. The report goes on to state that because the levels of contaminants at most locations were de minimis relative to action levels and because several contaminants found in both the surface water and sediment on site have apparent off-site sources, Plum Creek was not recommended for further investigation (PAP-00026302).

Lead

No records related to use or handling of lead were identified in the available file material. However, according to a *Remedial Action Report, Buried Paint Waste-Contaminated Soils*, Essex County Correctional Facility, dated October 1999, during redevelopment of the site by the Essex County Improvement Authority in early December 1998, buried paint waste, as well as buried crushed drums, were discovered during excavation at the Retention Pond "D" area located in the northwest corner of the site on Lot 12, along Plum Creek (PAP-00023857). The paint-waste impacted fill on Lot 12 (approximately 1,900 cubic yards) is consistent with third-party dumping that occurred while Lot 12 was owned by the Newark Housing Authority (PAP-00026335). In the shallowest soil sample collected in this area (1.0 feet), lead (810 mg/kg) was detected (PAP-00023872-78).

In addition, according to a letter prepared by NJDEP, dated May 1, 2000, a second area of buried paint waste was identified in the southern portion of Lot 18 near Plum Creek during site redevelopment activities in 1998 (PAP-00023838).

In 1981, the “East Farm Effluent” and the “West Farm Effluent” were sampled. Lead was non-detect at 0.1 mg/L in the samples (PAS-00071088).

Plum Creek, a small drainage stream, flows along the western and southern edges of the West Farm. The stream reaches Newark Bay after being diverted underground beneath a neighboring facility (PAP-00021031). According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, 15 sediment and seven surface water samples were collected from Plum Creek in 1988 (PAP-00026225-26). Lead was detected as follows (PAS-00072645-49, 56):

Range of Lead Concentrations Reported in Plum Creek		
COC	**Sediment (ppb)**	**Surface Water (ppb)**
Lead	338,000 – 1,950,000	21 - 180

According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, metals were detected above the “action levels” at sediment sampling locations on Plum Creek both upstream of and adjacent to the site, and lead was detected in surface water above the “action level” in the upstream sample (PAP-00026226). It states that many of the compounds detected in Plum Creek sediment and surface water have apparent off-site sources located upstream of the site or appear to reflect the composition of the fill material at the site. The report goes on to state that because the levels of contaminants at most locations were de minimis relative to action levels and because several contaminants found in both the surface water and sediment on site have apparent off-site sources, Plum Creek was not recommended for further investigation (PAP-00026302).

Mercury

The facility disposed of one shipment of five pounds of mercury and one shipment of 10 pounds of mercury in July 1996 during decommissioning (PAS-00071647; PAS-00071649). The source of the waste was not available in the referenced document.

In 1981, mercury was detected in a sample of "West Farm Effluent" [0.0006 milligrams per liter (mg/L)]. It is noted that this concentration is less than that detected in the "Water Supply" sample (0.0020 mg/L) (PAS-00071088). No other wastewater monitoring data for OU2 COCs were identified in the available file material.

Plum Creek, a small drainage stream, flows along the western and southern edges of the West Farm. The stream reaches Newark Bay after being diverted underground beneath a neighboring facility (PAP-00021031). According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, 15 sediment and seven surface water samples were collected from Plum Creek in 1988 (PAP-00026225-26). Mercury was detected as follows (PAS-00072645-49, 56):

Range of Mercury Concentrations Reported in Plum Creek		
COC	**Sediment (ppb)**	**Surface Water (ppb)**
Mercury	200 – 3,200	Non-detect

According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, metals were detected above the "action levels" at sediment sampling locations on Plum Creek both upstream of and adjacent to the site (PAP-00026226). It states that many of the compounds detected in Plum Creek sediment and surface water have apparent off-site sources located upstream of the site or appear to reflect the composition of the fill material at the site. The report goes on to state that because the levels of contaminants at most locations were de minimis relative to action levels and because several contaminants found in both the surface water and sediment on site have apparent off-site sources, Plum Creek was not recommended for further investigation (PAP-00026302).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and

[1]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to the *Sampling Plan*, dated June 1987, at the surface, miscellaneous fill placed to bring the land surface above sea level was found to a maximum depth of 15 feet. This material consisted of rubble, construction debris, soil mixed with cinders and wood, and varying amounts of silts and gravel (PAP-00021044). The *Remedial Action Report for Soils and Proposal for Institutional and Engineering Controls*, dated May 1996, goes on to state that between 5 and 14 feet of historical fill materials covered the entire site, and that the physical character, distribution and chemical composition of the fill was documented in all major reports submitted to the New Jersey Department of Environmental Protection (NJDEP) (PAP-00021428).

According to a *Preliminary Assessment Report for Block 5060, Lots 10, 12, 14, 16, 18, 106, 116, and 140 and Block 5070, Lots 7 and 7a*, dated May 1, 1996, historical aerial photographs show that the site had been filled by 1947 (PAP-00021345).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00023872-78; PAS-00072548, 49, 51).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	24,700 mg/kg
Copper	5,980 mg/kg
Mercury	12 mg/kg
Benzo(a)anthracene	47 mg/kg
Benzo(a)pyrene	20 mg/kg
Benzo(b)fluoranthene	21 mg/kg
Benzo(k)fluoranthene	5.8 mg/kg
Dibenzo(a,h)anthracene	1.5 mg/kg
Indeno(1,2,3-cd)pyrene	9.6 mg/kg

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

5. COC Pathways

The site is situated on the west bank of Newark Bay, across from the tip of Kearny Point where the Passaic and Hackensack Rivers join to form Newark Bay (PAP-00021030). Plum Creek, a small tidal drainage stream, flows along the western and southern edges of the West Farm. The stream reaches Newark Bay after being diverted underground beneath a neighboring facility (PAP-00021031). Plum Creek drains several neighboring sites upstream of the Celanese site and is also tidally influenced (PAP-00021048).

Sanitary and Storm Sewer

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd.*, dated October 18, 1996, dilute wastewaters containing “small amounts” of chemicals were discharged to the PVSC system from 1966 to 1993 (PAS-00070971). This included paraformaldehyde-containing residues rinsed from filters and traces of formaldehyde and formic acid resulting from flushing of the ion exchange units and traces of potassium acrylate (PAS-00070970). In addition to manufacturing-related wastewaters, sanitary wastewater from lavatories, non-contact cooling water used in reactors in the methanol oxidation units, and wastewaters resulting from stripping of exhaust gases in the scrubbers were discharged to the PVSC system (PAS-00070972).

In addition, according to the *Sampling Plan*, dated June 1987, surface drainage was provided by a network of impoundment areas and collection sumps, which also discharged to the PVSC sewer. A portion of stormwater runoff entered the sewer via various sumps and catch pans. Diked and paved tank farms were drained by valves and sumps; unpaved areas drained by surface infiltration (PAP-00021042).

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd*., dated October 18, 1996, the PVSC first issued a sewer discharge permit to the facility on June 16, 1982 (Permit No. 20401052) (PAS-00070968). A copy of the permit was not identified in the available file material.

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd*., dated October 18, 1996, the site's effluent entered the PVSC system through one pipe on the East Farm and two pipes on the West Farm. One of the West Farm pipes received only the sanitary wastes from the main offices; the other two pipes discharged water from plant operations (PAS-00071098).

According to a *Selected Substance Report*, dated May 27, 1980, the average volume of wastewater discharged to the PVSC system was 50,000 gallons per day (PAS-00071742). According to discharge monitoring reports identified in the available file material, the following volumes of wastewater were discharged to the PVSC system in 1986 and 1991 (PAS-00071072-80; 238-39):

Wastewater Discharge Volumes		
Date	**Outfall 20401051 (gallons)**	**Outfall 20401052 (gallons)**
January 1st – March 31st 1986	1,866,370	4,112,230
April 1st – June 30th 1986	2,801,470	4,345,570
July 1st – September 30th 1986	1,586,200	936,510
October 1st – December 31st 1986	803,560	2,747,630
Date	**Outfall 20405611**	**Outfall 20405612**
April 1st – June 30th 1991	2,858,040	556,033

According to the *Sampling Plan*, dated June 1987, the sewer discharge is conveyed to the PVSC treatment works located approximately one mile south of the site on Doremus Avenue (PAP-00021042). Based on an undated site plan of sanitary and combined sewer configurations, along this short stretch of sewer between the facility and the PVSC treatment works, there are no outfalls to the Passaic River (PAP-00020848).

Direct Release

According to the *Sampling Plan*, dated June 1987, surface drainage was provided by a network of impoundment areas and collection sumps, which discharged to the PVSC sewer. A portion of stormwater runoff entered the sewer via various sumps and catch pans. Diked and paved tank farms were drained by valves and sumps; unpaved areas drained by surface infiltration. All other un-channeled rainwater runoff flowed into the natural drainage of Plum Creek or the Passaic River, or infiltrated into the ground (PAP-00021042). Due to extensive paving, most undirected runoff on the East Farm discharged to the Passaic River; because much of the West Farm was unpaved, it was reported that direct percolation into the soil occurred frequently. On the West Farm un-channeled stormwater drained westward to Plum Creek (PAS-00071091-92).

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd.*, dated October 18, 1996, a New Jersey Pollutant Discharge Elimination System (NJPDES) General Permit for the facility's stormwater discharges was issued on May 19, 1993 (Permit No. 0088315) (PAS-00070969). A copy of the permit was not identified in the available file material.

Spills

According to the *Sampling Plan*, dated June 1987, older Celanese employees related that in the mid-1970s, persons were sometimes seen dumping materials into Plum Creek north of the northwest corner of the Celanese property. Most of this activity occurred at night. Employees stated that a certain material deposited was a thick white liquid (PAP-00021048). It is unclear if these materials had the potential to contain OU2 COCs based on review of available file material.

On March 29, 1984, approximately 300 gallons of No. 6 fuel oil were released in the diked tank farm on the East Farm when Tank 21 was accidentally overfilled (PAS-00071104-105). Sampling data associated with this spill were not identified in the available file material.

In 1985, approximately 2,000 gallons of No. 6 fuel oil discharged from Tank 21. Approximately 125 tons of contaminated soil were removed from the area around the tank and disposed off-site (PAS-00071105). Sampling data associated with this spill were not identified in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspection in the available file material.

Violations

According to an Order, dated August 15, 1969, issued by the Department of Health of the State of New Jersey, Celanese was found to be discharging industrial waste and "other polluting matter" into the Passaic River, and was ordered to install and provide wastewater treatment and/or disposal facilities, and cease and desist discharging its industrial waste or other polluting matter from any sewer or drain into the waters of the Passaic River (PAS-00071180-81). It is unclear if OU2 COCs were associated with these discharges.

Subsequent to the 1988 Celanese Chemical Company, Inc. merger into Hoechst Celanese Chemical Group, Inc., the NJDEP initiated an *Administrative Consent Order* requiring implementation of a cleanup plan at the site (PAP-00021935-38).

On May 17, 1991, the facility received a Notice of Violation for failure to monitor their effluent for lead to comply with General Pretreatment Regulations. The letter states that lead must be tested for unless specifically exempted (PAS-00071202).

Permits

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd*., dated October 18, 1996, the PVSC first issued a sewer discharge permit to the facility on June 16, 1982 (Permit No. 20401052) (PAS-00070968).

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd.*, dated October 18, 1996, a NJPDES General Permit for the facility's storm water discharges was issued May 19, 1993 (Permit No. 0088315) (PAS-00070969).

Copies of these permits were not identified in the available file material.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989 (PAP-00026142);
- *Results of Phase II ECRA Sampling Plan and Proposed Phase III Investigation*, dated September 1990 (PAP-00020849);
- *Results of Phase III ECRA Sampling Plan*, dated February 1992 (PAP-00021150); and,
- *Remedial Action Report for Soils and Proposal for Institutional and Engineering Controls*, dated May 1996 (PAP-00021405).

Sewer

In 1981, the "East Farm Effluent" and the "West Farm Effluent" were sampled. Aroclor 1254 was detected in a sample of "East Farm Effluent" (0.2 µg/L) and "West Farm Effluent" (0.1 µg/L). All other PCB Aroclors in the sample were non-detect at 0.1 µg/L. (PAS-00071087). Naphthalene was detected in a sample of "East Farm Effluent" (21 µg/L) and "West Farm Effluent" (11 µg/L). The "Water Supply" sample had a naphthalene concentration of 1-9 µg/L (PAS-00071086). Mercury was detected in a sample of "West Farm Effluent" (0.0006 mg/L). It is noted that this concentration is less than that detected in the "Water Supply" sample (0.0020 mg/L) (PAS-00071088). No pesticides, copper, or lead were detected in the samples (PAS-00071087-88).

Plum Creek

According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.*, dated April 1989, 15 sediment and seven surface water samples were collected from Plum Creek in 1988 (PAP-00026225-26). The table below presents the range of OU2 COCs detected in sediment and surface water (PAS-00072645-49, 56):

Range of OU2 COC Concentrations Reported in Plum Creek		
COC	**Sediment (ppb)**	**Surface Water (ppb)**
Copper	57,600 – 660,000	11 - 33
Lead	338,000 – 1,950,000	21 - 180
Mercury	200 – 3,200	Non-detect
PCBs	1,200 – 9,200	15
4,4-DDE	450 – 500	0.02 – 0.07

High and low molecular weight PAHs were also detected in sediment and surface water samples (PAS-00072650-52) as follows:

Facility Data Report

PLUM CREEK SEDIMENT SAMPLES

Sample	Compound	Conc. (ppb)	Flag
700A-4001-SD01	Acenaphthene	1500	
700A-4001-SD01	Fluorene	1600	
700A-4001-SD01	Phenanthrene	9100	
700A-4001-SD01	Anthracene	2600	
700A-4001-SD01	Fluoranthene	13000	
700A-4001-SD01	Pyrene	4100	
700A-4001-SD01	Naphthalene	3000	
700A-4001-SD01	Benzo(a)Anthracene	3000	
700A-4001-SD01	bis(2-ethylhexyl)phthalate	5900	
700A-4001-SD01	Chrysene	3200	
700A-4001-SD01	Benzo(b)Fluoranthene	2600	
700A-4001-SD01	Benzo(a)Pyrene	2700	
700A-4001-SD01	Indeno(1,2,3-cd)Pyrene	1800	
700A-4001-SD01	Dibenz(a,h)Anthracene	550	J
700A-4001-SD01	Benzo(g,h,i)Perylene	1700	
700A-4002-SD01	Phenanthrene	1400	
700A-4002-SD01	Fluoranthene	3200	
700A-4002-SD01	Pyrene	1100	
700A-4002-SD01	bis(2-ethylhexyl)phthalate	47000	
700A-4002-SD01	Chrysene	870	J
700A-4002-SD01	Benzo(b)Fluoranthene	540	J
700A-4002-SD01	Benzo(a)Pyrene	41	J
700A-4003-SD01	Phenanthrene	240	J
700A-4003-SD01	Pyrene	440	
700A-4003-SD01	Naphthalene	120	J
700A-4003-SD01	Benzo(a)Anthracene	310	J
700A-4003-SD01	bis(2-ethylhexyl)phthalate	5000	
700A-4003-SD01	Chrysene	410	
700A-4003-SD01	Benzo(b)Fluoranthene	390	J
700A-4003-SD01	Benzo(a)Pyrene	260	
700A-4004-SD01	Phenanthrene	3800	
700A-4004-SD01	Anthracene	1300	
700A-4004-SD01	Fluoranthene	3600	
700A-4004-SD01	Pyrene	2900	
700A-4004-SD01	Naphthalene	370	J
700A-4004-SD01	Benzo(a)Anthracene	2300	
700A-4004-SD01	bis(2-ethylhexyl)phthalate	77000	
700A-4004-SD01	Chrysene	2800	
700A-4004-SD01	Benzo(b)Fluoranthene	1500	
700A-4004-SD01	Benzo(k)Fluoranthene	1400	

Sample	Compound	Conc. (ppb)	Flag
700A-4004-SD01	Benzo(a)Pyrene	1900	
700A-4004-SD01	Indeno(1,2,3-cd)Pyrene	1100	
700A-4004-SD01	Acenaphthylene	1400	
700A-4004-SD01	Benzo(g,h,i)Perylene	1100	
700A-4005-SD01	Fluoranthene	380	J
700A-4005-SD01	Pyrene	140	J
700A-4005-SD01	Benzo(a)Anthracene	270	J
700A-4005-SD01	bis(2-ethylhexyl)phthalate	1300	
700A-4005-SD01	Chrysene	270	J
700A-4005-SD01	Benzo(b)Fluoranthene	140	J
700A-4005-SD01	Benzo(a)Pyrene	140	J
700A-4006-SD01	Acenaphthene	1100	
700A-4006-SD01	Fluorene	1500	
700A-4006-SD01	Phenanthrene	12000	
700A-4006-SD01	Anthracene	3200	
700A-4006-SD01	Fluoranthene	14000	
700A-4006-SD01	Pyrene	10000	
700A-4006-SD01	Naphthalene	950	
700A-4006-SD01	Benzo(a)Anthracene	6600	
700A-4006-SD01	bis(2-ethylhexyl)phthalate	1500	
700A-4006-SD01	Chrysene	7300	
700A-4006-SD01	Benzo(b)Fluoranthene	4300	
700A-4006-SD01	Benzo(k)Fluoranthene	4400	
700A-4006-SD01	Benzo(a)Pyrene	5100	
700A-4006-SD01	Indeno(1,2,3-cd)Pyrene	2600	
700A-4006-SD01	Dibenz(a,h)Anthracene	990	J
700A-4006-SD01	Acenaphthylene	1100	J
700A-4006-SD01	Benzo(g,h,i)Perylene	2500	
700A-4007-SD01	Phenanthrene	570	J
700A-4007-SD01	Fluoranthene	1600	
700A-4007-SD01	Pyrene	570	J
700A-4007-SD01	Benzo(a)Anthracene	630	J
700A-4007-SD01	bis(2-ethylhexyl)phthalate	1700	
700A-4007-SD01	Chrysene	760	J
700A-4007-SD01	Benzo(b)Fluoranthene	440	J
700A-4007-SD01	Benzo(a)Pyrene	540	J
700A-4007-SD01	Indeno(1,2,3-cd)Pyrene	440	J
700A-4007-SD01	Acenaphthylene	320	J
700A-4007-SD01	Benzo(g,h,i)Perylene	350	J

Only naphthalene was detected in surface water at a maximum concentration of 5 ppb (PAS-00072650-52).

According to the *Presentation of ECRA Phase I Sampling Results and Proposed Phase II Sampling Plan for Hoechst Celanese Chemical Group, Inc.,* dated April 1989, many of the compounds detected in Plum Creek sediment and surface water have apparent off-site sources located upstream of the site or appear to reflect the composition of the fill material at the site. The report goes on to state that because the levels of contaminants at most locations were de minimis relative to action levels and because several contaminants found in both the surface water and sediment on site have apparent off-site sources, Plum Creek was not recommended for further investigation (PAP-00026302).

Soil

According to a *Remedial Action Report for Soils and Proposal for Institutional and Engineering Controls*, dated May 1996, soil samples were collected from numerous on-site test pits in 1988 to characterize the site. PCBs were detected at a concentration of 54 ppm in a sample collected at a depth of three feet below ground surface (bgs). The sample was collected from test pit TP-1, which was located in a non-operational area in the south-central portion the southern portion of the West Farm. The purpose of TP-1 was to characterize the historical fill materials in this area and to collect samples representing background soil conditions. PCBs were not detected at a depth of 0.5 feet bgs (PAP-00021424-26).

According to the *Response to Request for Information Hoechst Celanese Chemical Group Ltd.*, dated October 18, 1996, PCBs also were detected in surface soil collected in the area of three transformers in the West Farm that were owned and operated by PSE&G (PAS-00070977). Detected PCB concentrations ranged from 0.16 ppm to 30 ppm. It is noted that this area was located adjacent to a grated storm drain (PAS-00072608).

According to the *Results of Phase II ECRA Sampling Plan and Proposed Phase III Investigation*, dated September 1990, additional sampling was conducted to delineate soil contamination in 1990. Note that the concentrations of metals were reported in “µg/kg” as opposed to “mg/kg” as is typical. The table below presents the range of OU2 COCs detected in surface soil (zero to 0.5 feet bgs or 0.5 to one foot bgs) by area of environmental concern (AEC) (PAP-00020912-13, 45-47, 50, 55-56):

Range of OU2 COC Concentrations Reported in Surface Soil in 1990 (mg/kg)			
AEC	**Copper**	**Lead**	**Mercury**
AEC 11: Former Jan Packaging Area, located in northern section of West Farm where former owner, Jan Packaging, operated a chemical packaging facility	104 - 353	Not Reported	0.17 - 1.28
AEC 34: West Farm Drainage Ditch, a drainage ditch which receives stormwater runoff from a product storage area in the West Farm	144	409	1.1 mg/kg
AEC 36: Former Land Disposal Area, located in western portion of Lot 18, filled with construction debris and possibly filter solids from the formaldehyde production process	75.9 - 447	179 - 3,670	0.56 - 1.76

High and low molecular weight PAHs were also detected in surface soil at the following AECs:

- AEC 11
- AEC 12 – small area of stained soil located beneath an overhead pipe rack in the northwestern portion of the site
- AEC 17 – cooling water discharge area in West Farm
- AEC 21 – small area of stained soil beneath a pipe rack in the west-central portion of the West Farm
- AEC 28 – area of potential floor drain discharge from West Farm warehouse
- AEC 33 – suspected paraformaldehyde fill area in southwest portion of West Farm
- AEC 34
- AEC 36
- AEC 51 – former sink discharge pipe in East Farm
- AEC 57 – former ethyl acetate and acrylic acid spill area in East Farm
- AEC 59 – decommissioned underground sump tank location in the vicinity of the East Farm truck loading area (PAP-00020912-13, 17-18, 21, 24, 27, 29, 31, 42-43, 45-47, 50, 55-56, 77-78, 80, 83, 84, 87).

Maximum concentrations of PAHs in surface soil (0.5 to 1 foot bgs) were detected at AEC 59 (in ppb) (PAP-00020987):

Base/Neutral Compounds	
Acenaphthene	18000.00
Acenaphthylene	1400.00
Anthracene	40000.00
Benzo(a)Anthracene	82000.00
Benzo(a)Pyrene	62000.00
Benzo(b)Fluoranthene	68000.00
Benzo(g,h,i)Perylene	45000.00
Benzo(k)Fluoranthene	29000.00
bis(2-ethylhexyl)phthalate	7900.00 B(B=18)
Chrysene	77000.00
Di-n-Butylphthalate	ND
Dibenz(a,h)Anthracene	18000.00
Fluoranthene	91000.00
Fluorene	26000.00
Indeno(1,2,3-cd)Pyrene	40000.00
N-Nitrosodiphenylamine (1)	1500.00
Naphthalene	19000.00
Phenanthrene	95000.00
Pyrene	110000.00

It was concluded that metals and base neutral detections (i.e., PAHs) in some areas were associated with historic fill materials (exceptions being at AEC 51 and AEC 59 where PAH contamination was not attributed to fill) (PAP-00021328; PAP-00026097; PAP-00026112, 15).

According to the *Results of Phase III ECRA Sampling Plan*, dated February 1992, additional sampling was conducted to delineate soil contamination in 1991 (PAP-00021156-57). The table below presents the range of OU2 COCs detected in surface soil (zero to 0.5 feet bgs) by AEC (PAP-00021192-194, 199-201):

Range of OU2 COC Concentrations Reported in Surface Soil in 1991 (mg/kg)			
AEC	**Copper**	**Lead**	**Mercury**
AEC 11: Former Jan Packaging Area, located in northern section of West Farm where former owner, Jan Packaging, operated a chemical packaging facility	49 – 330	Not Reported	0.1 – 1.1
AEC 36: Former Land Disposal Area, located in western portion of Lot 18, filled with construction debris and possibly filter solids from the formaldehyde production process	Not Reported	1,600 – 1,900	Not Reported

High and low molecular weight PAHs also were detected in surface soil at AEC 11, AEC 36 (PAP-00021192-194, 199-201). It was concluded that metals and base neutral detections (i.e., PAHs) were associated with historic fill materials (PAP-00021328; PAP-00026097).

According to a *Remedial Action Report, Buried Paint Waste-Contaminated Soils*, Essex County Correctional Facility, dated October 1999, during redevelopment of the site by the Essex County Improvement Authority in early December 1998, buried paint waste,

as well as buried crushed drums, were discovered during excavation at the Retention Pond "D" area located in the northwest corner of the site on Lot 12, along Plum Creek (PAP-00023857). In the shallowest soil sample collected in this area (1.0 feet), the following OU2 COCs were detected (PAP-00023872-78):

COC	Shallowest Sample Concentration
4,4-DDE	0.058 mg/kg
4,4-DDD	0.018 mg/kg
Aroclor 1242	6.4 mg/kg
Aroclor 1254	3.1 mg/kg
Aroclor 1260	1.2 mg/kg
Copper	811 mg/kg
Lead	810 mg/kg
Mercury	0.25 mg/kg

The maximum concentrations of PCB Aroclors and DDx were detected in a sample collected from 2.5 feet. Lead and copper were detected at maximum concentrations in a sample collected at nine feet while mercury was detected at a maximum concentration in a sample collected at 8.5 feet (PAP-00023872-78). High and low molecular weight PAHs were also detected (PAP-00023866-71). The paint-waste impacted fill on Lot 12 (approximately 1,900 cubic yards) is consistent with third-party dumping that occurred while Lot 12 was owned by the Newark Housing Authority (PAP-00026335).

In addition, according to a letter prepared by NJDEP, dated May 1, 2000, a second area of buried paint waste was identified in the southern portion of Lot 18 near Plum Creek during site redevelopment activities in 1998. Test pits were installed to determine the extent of hazardous waste in this area. It was determined that hazardous waste was present in an area approximately 100 to 120 feet long by 40 to 45 feet wide, at depths ranging from just below the surface to approximately four to five feet in depth. One soil sample was collected from a pit. The sample was analyzed for PCBs, which were detected at a concentration of 0.24 ppm (PAP-00023838). A Classification Exemption Area fact sheet produced by NJDEP also notes the presence of historic fill at the site (PAP-00445908).

Remedial Activities

According to a *Remedial Action Report for Soils and Proposal for Institutional and Engineering Controls*, dated May 1996, soil samples were collected from numerous on-site test pits on Lot 18 in 1988 to characterize the site. PCBs were detected at a concentration of 54 ppm in a sample collected at a depth of three feet bgs. In April 1995, the soil contamination was delineated, and excavated for off-site disposal. The estimated volume of soil excavated was 117.3 cubic yards. It was reported that no post-excavation soil samples were collected, as the excavation extended vertically to the water table and horizontally to samples containing PCB concentrations below 2.0 ppm (PAP-00021424-26).

According to the *Remedial Action Report for Soils and Proposal for Institutional and Engineering Controls*, dated May 1996, of the AECs listed in the subsection above as being associated with OU2 COC contamination, excavation and off-site disposal of contaminated soil was conducted at AEC 21 (small area of stained soil beneath a pipe rack in the west-central portion of the West Farm) and 59 (decommissioned underground sump tank location in the vicinity of the East Farm truck loading area) (PAP-00021410). At AEC 21, the estimated volume of excavated soil was 6.7 cubic yards; it was reported that no post-excavation samples were collected as approved by NJDEP (PAP-00021416). The estimated volume of excavated soil and asphalt pavement at AEC 59 was 57 cubic yards; it was reported that no post-excavation samples were collected as approved by NJDEP (PAP-00021424).

According to a *Remedial Action Report, Buried Paint Waste-Contaminated Soils*, Essex County Correctional Facility, dated October 1999, during redevelopment of the site by the Essex County Improvement Authority in early December 1998, buried paint waste, as well as buried crushed drums, were discovered during excavation at the Retention Pond "D" area located in the northwest corner of the site on Lot 12, along Plum Creek (PAP-00023857). Remediation of Pond "D," which was concluded on May 6, 1999, including excavation of the pond to a depth of at least four feet below grade. Remediation also included the removal of the buried paint waste material, stained/oily historic fill material, and the crushed drums, with remedial action confirmation by field screening, post-excavation soil sampling and laboratory analysis to document the cleanup activity (PAP-00023886).

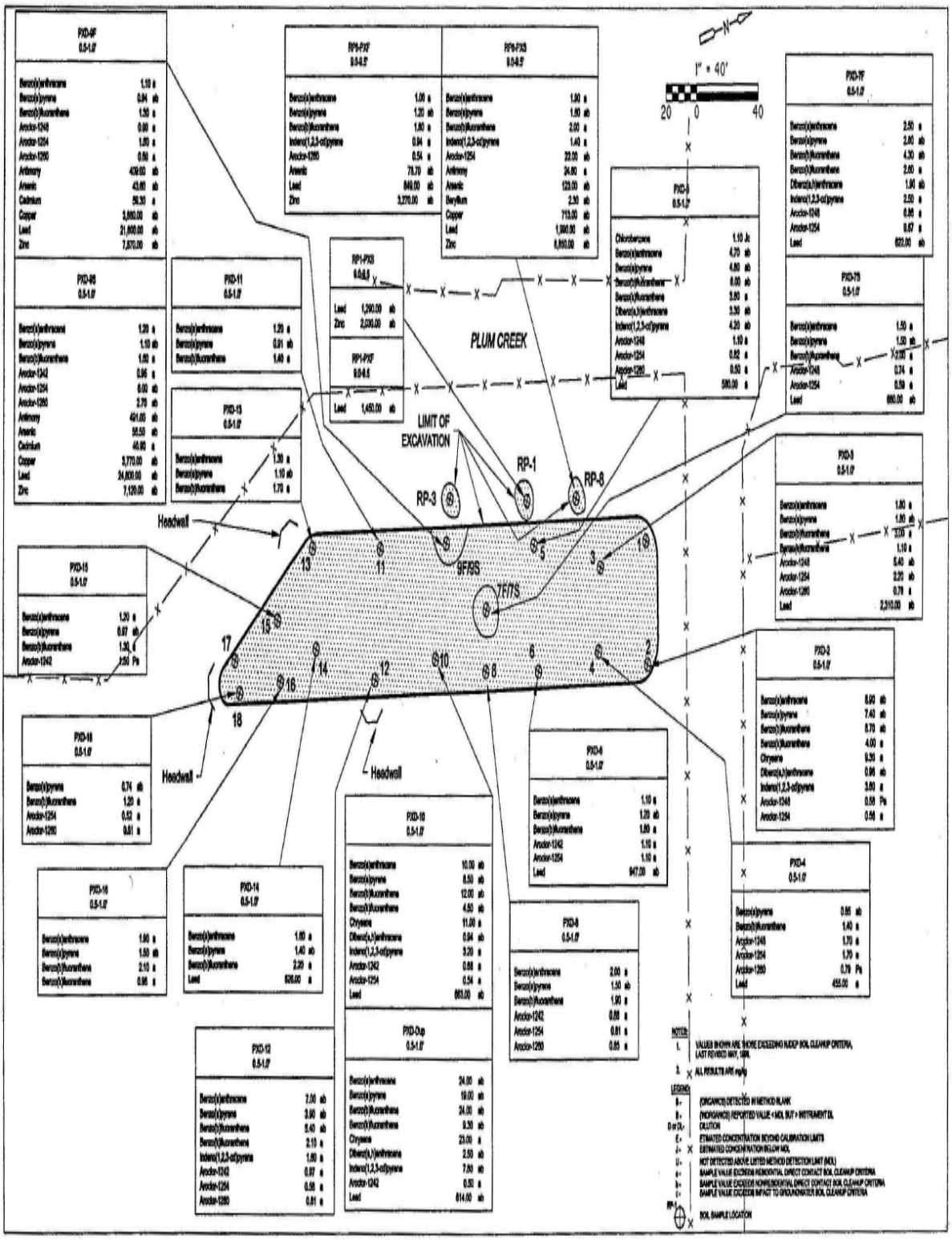
The post-excavation data are depicted below (PAP-00023892):

CNA Holdings LLC - 354 Doremus Ave

Diamond Alkali OU2 Allocation

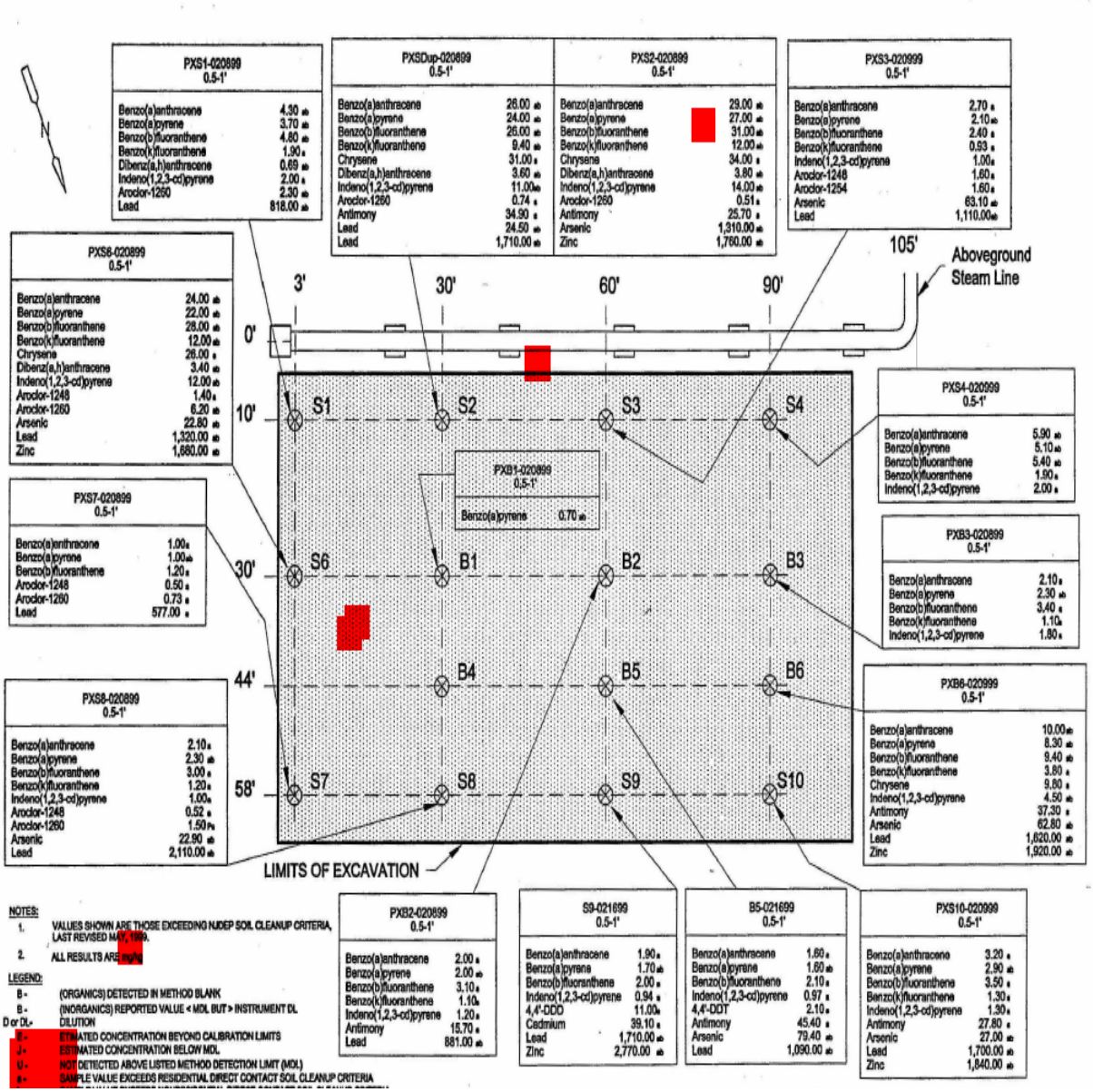
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Facility Data Report



In addition, according to a letter prepared by NJDEP, dated May 1, 2000, a second area of buried paint waste was identified in the southern portion of Lot 18 near Plum Creek during site redevelopment activities in 1998. Test pits were installed to determine the extent of hazardous waste in this area. It was determined that hazardous waste was present in an area approximately 100 to 120 feet long by 40 to 45 feet wide, at depths ranging from just below the surface to approximately four to five feet in depth. One soil sample was collected from a pit. The sample was analyzed for PCBs, which were detected at a concentration of 0.24 ppm (PAP-00023838). Excavation of this area was conducted in February 1999 and included post-excavation soil sampling (PAP-00023879).

The post-excavation data are depicted below (PAP-00023889):



The *Remedial Action Report for Soils and Proposal for Institutional and Engineering Controls*, dated May 1996, states that between five and 14 feet of historical fill materials covered the entire site, and that the physical character, distribution and chemical composition of the fill was documented in all major reports submitted to the NJDEP (PAP-00021428). Therefore, the entire site was proposed for a Declaration of Environmental Restriction for the following OU2 COCs (PAP-00021428-29):

- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(h)fluoranthene
- Dibenzo(a,h)anthracene
- Indeno(1,2,3-cd)pyrene
- 4,4-DDD (Dichlorodiphenyldichloroethane)
- 4,4-DDT (Dichlorodiphenyltrichloroethane)
- Copper
- Lead
- PCBs

In addition, fencing was proposed for Lot 18 of the West Farm to restrict worker access to PAH contamination in detected from zero to two feet bgs (PAP-00021433-34). Review of a *Remedial Action Report, Essex County Correctional Facility*, dated March 2004, shows that the site was redeveloped into the Essex County Correction Facility, and engineering controls consisting of a site-wide cap were implemented (PAP-00025691, 93).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Chevron Environmental Management Co.

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Facility Data Report

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY

Facility Name, Address and Size: Chevron Environmental Management Company (CEMC), Getty Newark Terminal, 86 Doremus Avenue, Newark, New Jersey; 14.5 acres (PAP-00339485). The available references did not include information on the number of site employees and typical work shifts.

1. **Business Type:** The Getty Newark Terminal is a 14.5-acre petroleum storage and distribution facility (PAS-00005953). A portion of the site lies adjacent to the bank of the Passaic River (PAP-00339485).

2. **Time Period of Ownership/Operations**

   Operator: Approximately July 1951 to December 1984
   Owner: Approximately July 1951 to December 1984 (PAP-00189227)

   According to the *Remedial Investigation Report for Former Getty Newark Terminal-Area A*, prepared by Leidos and dated July 2014 (2014 RI Report), the site operational history is as follows:

   1950: The Newark Terminal was constructed in approximately 1930 and operated as a petroleum storage facility by the Atlantic Refining Company until approximately 1950. In 1951, the Terminal was acquired by the Tidewater Associated Company (Tidewater) who operated the Newark Terminal as a petroleum storage facility (PAP-00066677, PAS-00107975).

   1960: In the 1960s Tidewater merged with Getty Oil Company and the facility was later operated by a Getty Oil Company subsidiary (known as Getty Refining and Marketing, Inc.) (PAP-00066677, PAS-00091764).

   1984: Getty Refining and Marketing, Inc. had its name changed to Texaco Refining and Marketing Inc. following Texaco Inc.'s acquisition of Getty Oil Company in 1984. In December 1984, title and interest in the property was transferred to Power Test Realty Company Limited Partnership, affiliated with Getty Properties Corporation and Getty Realty Corporation (PAP-00066677).

   1989: In 1989, Texaco Inc. undertook a restructuring which included the creation of a new Texaco Refining and Marketing Inc. (new TRMI) and the transfer of the then-operating refining and marketing assets from the old TRMI to the new TRMI. Old TRMI continued to be responsible for certain legacy issues. Its name was changed to TRMI Holdings Inc., which was later reorganized as TRMI-H, LLC (PAP-00066677).

   2001: In October 2001, Chevron and Texaco, Inc. merged (PAP-00066677).

   2011: From 1985 to 2011, Getty Terminals leased and operated a bulk fuel terminal at the site until entering bankruptcy in 2011 (PAP-00066678).

3. Operational History/COC Use and Presence at the Facility

The Getty Newark Terminal is a 14.5-acre petroleum storage facility located at 86 Doremus Avenue in Newark, Essex County, New Jersey (PAP-00339485). The property is bisected by Doremus Avenue with the portion located east of Doremus Avenue referred to as the "East Yard" and the portion west of Doremus Avenue referred to as the "West Yard." The site also includes "Area A," consisting of 2.5 undeveloped acres located south of the West Yard. Based on review of historic documentation and review of historic aerial photo documentation from April 1947, April 1959, January 1963, March 1969, May 1970, April 1973, and April 1978, it was determined that Area A was never used for petroleum or other operations and fill material has historically been placed across the property (PAP-00189228).

Petroleum products were received at the terminal via pipeline and stored in 11 above ground storage tanks (ASTs). Occasionally, products were received from barges at a loading dock on the Passaic River and piped into aboveground storage tanks (ASTs) (PAP-00066940).

11 ASTs Contents		
Material	**Quantity**	**Location**
Diesel Fuel	15,600 barrel (bbl)	Tanks 1, 3, and 4
No. 2 Fuel Oil	42,000 bbl	Tanks 5 and 8
Kerosene	5,200 bbl	Tank 2
Gasoline	204,000 bbl	Tanks 6, 7, 9, 10, and 11

(PAP-00066936)

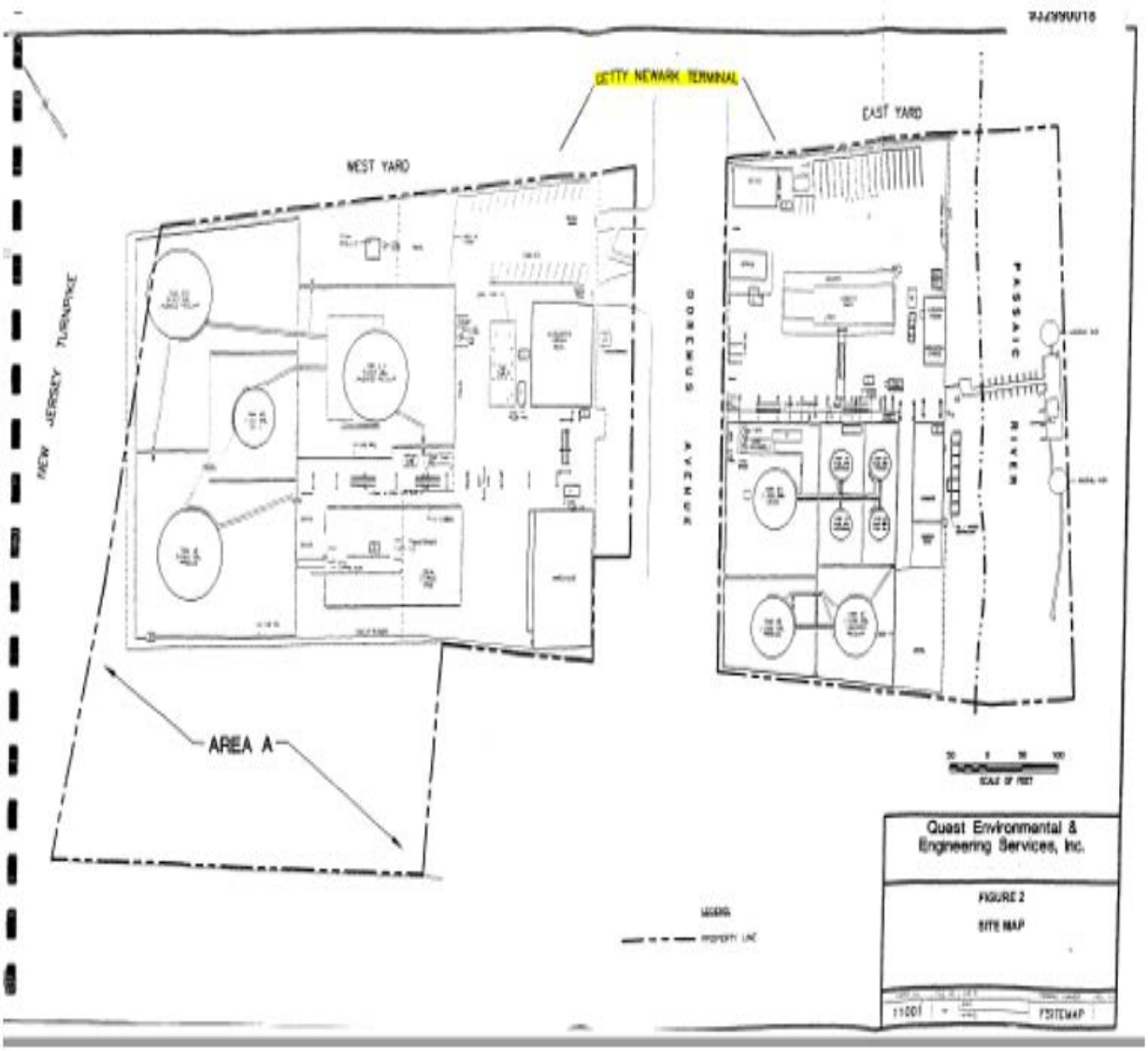
The terminal also utilized approximately eight underground storage tanks (USTs) in association with the bulk fuel terminal operations (PAP-00066943). Petroleum products were dispensed into tanker trucks for delivery off-site via a loading rack located in the East Yard (PAP-00066940, PAP-00067198).

Chevron Environmental Management Co.

Diamond Alkali OU2 Allocation

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Facility Data Report



(PAS-00107775)

4. Identified COCs

- PCBs (detected)
- PAHs (stored and released)
- Copper (detected)
- Lead (stored and released)

According to a *Remedial Action Assessment Report for Getty Newark Terminal* prepared by Quest Environmental & Engineering, dated May 12, 1998, ten areas of concern (AOCs) were identified which required additional remedial investigation or remedial action. One of the ten AOCs was groundwater contamination, and the primary contaminants of concern for groundwater are not relevant to the current allocation (PAS-00107625).
The remaining AOCs were:

East Yard

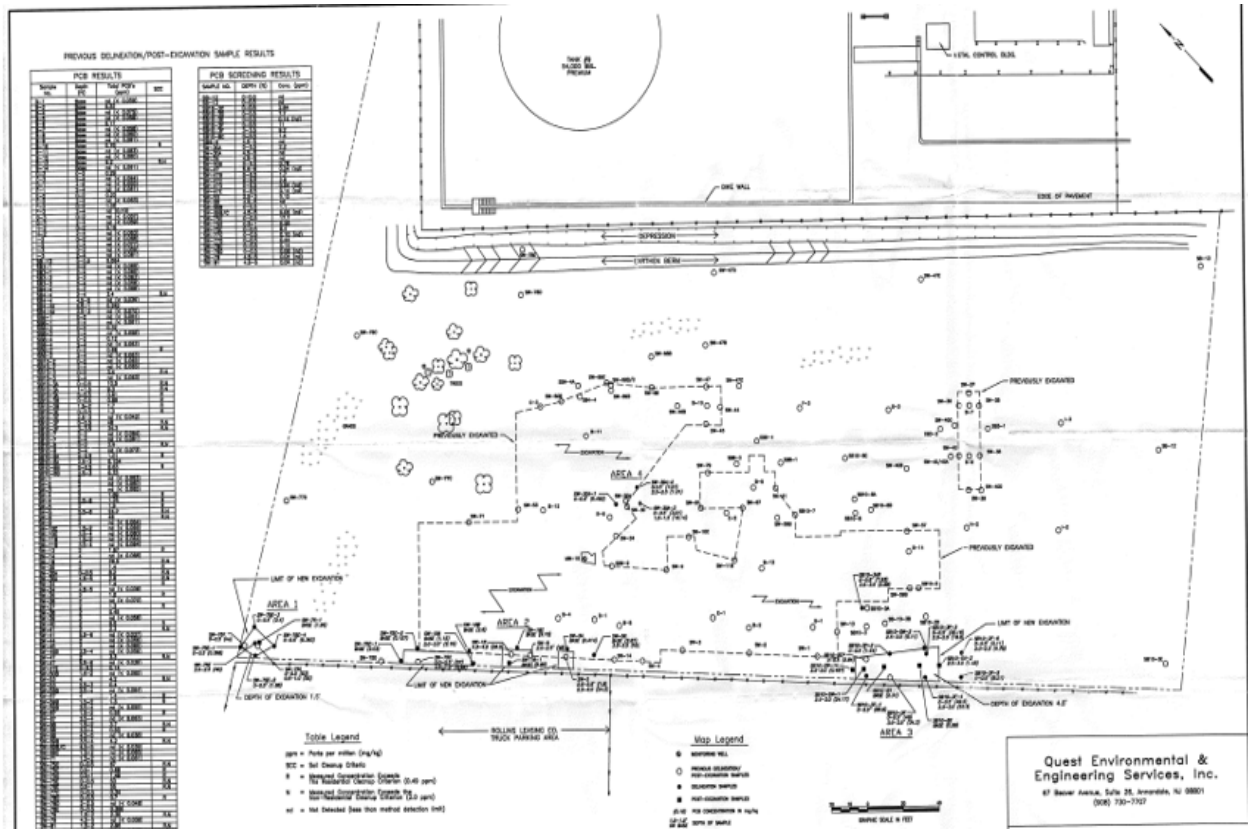
- Loading Rack Area
- Removed 1,000 Gallon No. 2 Fuel Oil Underground Storage Tank (UST)
- Pump and Bleeder Valves Area
- Fuel Additive Tank Pump
- Vapor Recovery Unit

West Yard

- Removed 550 Gallon Waste Oil UST
- 10,000 Gallon Aboveground Diesel Tank
- Area A
- Free Product Layer in Monitoring Well MW-18 (PAS-00107625).

PCBs

PCBs were first detected in Area A (adjacent to the West Yard) during excavation of soils in 1990. Soils were initially excavated from Area A to remediate concentrations of Total Petroleum Hydrocarbons and Lead. Waste classification sampling of the excavated soil revealed the presence of PCBs. Subsequent investigation of PCBs in remaining soil showed PCB concentrations exceeding the Nonresidential Soil Cleanup Criterion (SCC) of 2 mg/kg in areas within the central portion and along the southern perimeter of Area A (PAP-00066763). The highest concentrations were detected along the southwestern property boundary and in off-site sampling locations (PAP-00066682). Highest concentrations, ranging from 10 mg/kg to 67 mg/kg (Area 2; SW-75C at 0-0.5 ft) were detected along the southern perimeter. Historic aerial photographs revealed that Area A has undergone filling activities, which are the likely source of PCBs. Aerial photographs and the extent of PCB concentrations were previously presented in a report entitled Soil Sampling Results in Area A and East Yard Paved Area, Getty Petroleum Corp. Terminal, Newark City, Essex County, September 11, 1995, prepared by Quest Environmental, Inc. (PAP-00066682). In a letter dated December 6, 1996, New Jersey Department of Environmental Protection (NJDEP) accepted the evidence of historic fill and stated that no further action was required with regard to off-site sampling (PAP-00066682).



(PAP-00066777)

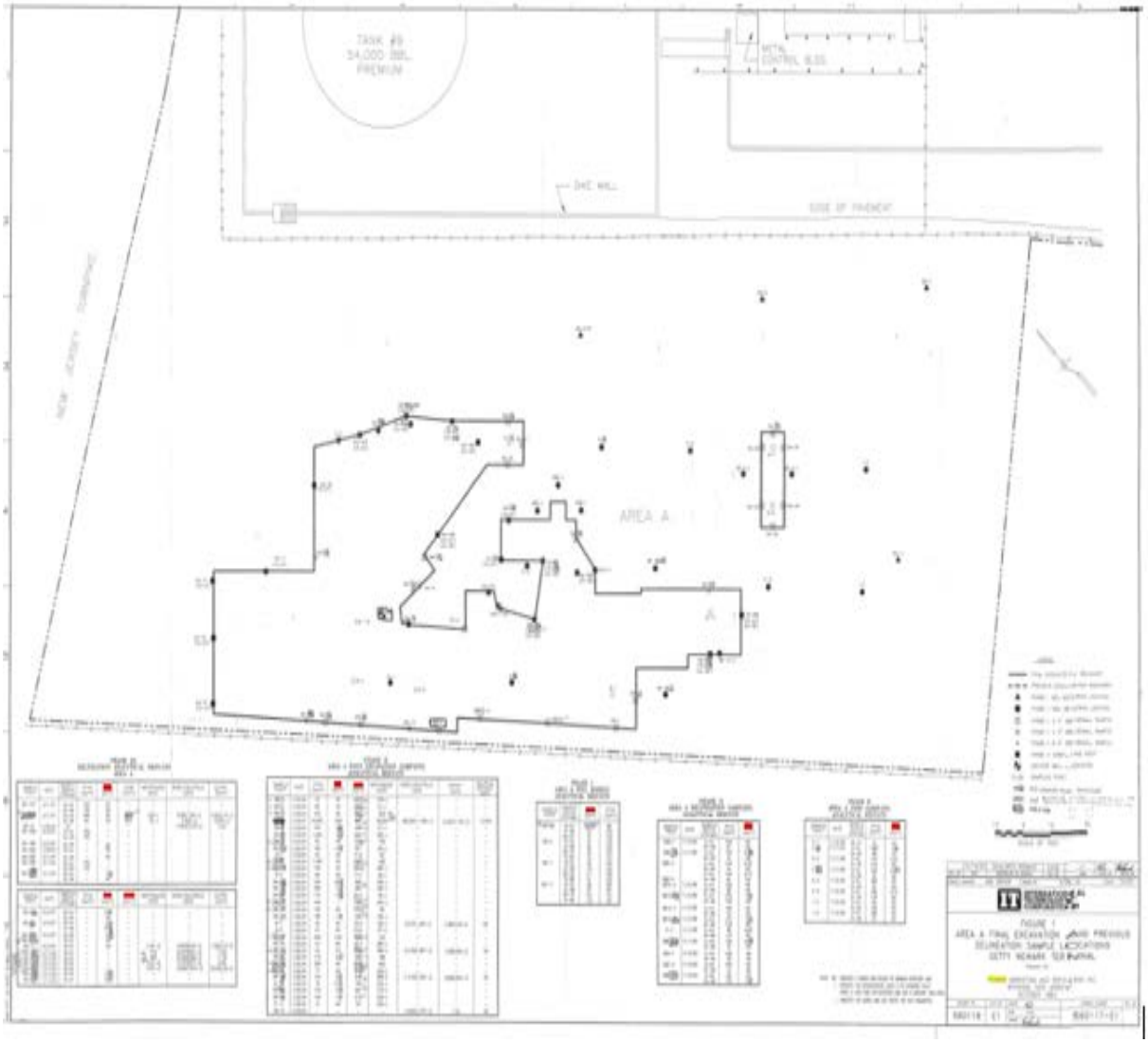
Quest collected soil samples to delineate four areas containing elevated PCB concentrations. Based on the delineation sample results, hot-spot areas of PCB concentrations exceeding 20 mg/kg were targeted for removal. The 20 mg/kg level was selected because it would ensure removal of PCB concentrations exceeding the Impact to Groundwater SCC of 50 mg/kg and would target removal of PCB concentrations greater than 10 times (one order of magnitude) the Non-Residential SCC of 2 mg/kg (PAP-00066682). Post-excavation soil sampling results show total PCBs ranging from 0.09 mg/kg in Area 3 (SB10-B1) at the base of the excavation to a maximum concentration of 24.17 mg/kg in Area 3 (SB10-SW-1) at a depth of 2.5-3.0 feet bgs (PAP-00066765-76).

According to the 2014 RI Report, horizontal delineation of PCBs in Area A is complete to the property boundary, and PCBs were vertically delineated in 2004, to a depth of 11.5 feet bgs in soil samples collected within the center of Area A from native soil underlying the fill (PAP-00066686-7). PCB-impacted soils remain on-site at concentrations ranging from 0.064 mg/kg to 10.5 mg/kg detected in SB10-3A. PCB concentrations decrease with increasing depth in the fill and are either not detected or detected below the Residential Direct Contact Soil Remediation Standards (RDCSRS) in samples collected in native soil beneath the fill (PAP-00066698).

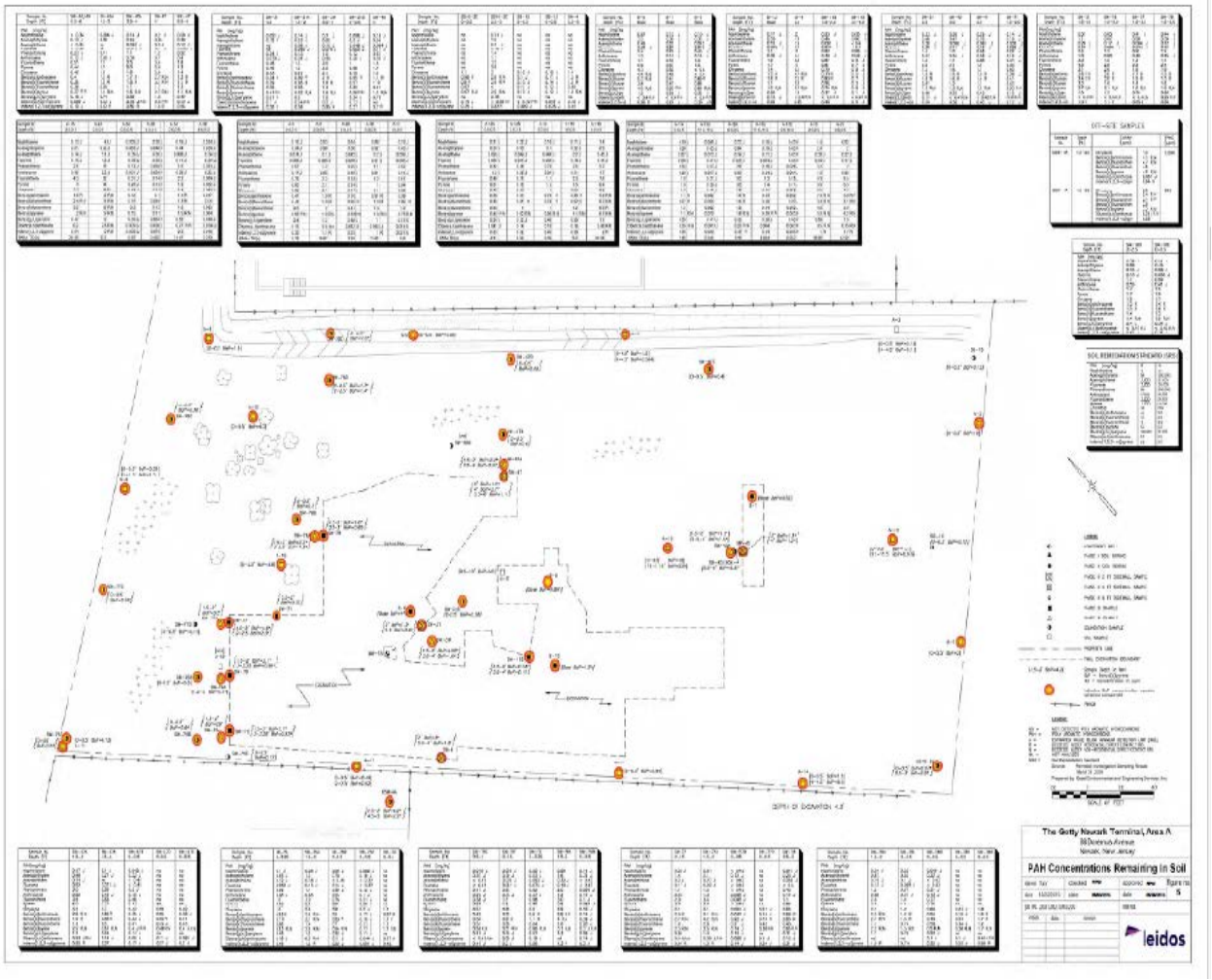
PAHs

Remedial investigations conducted between 1990 and 1995 showed soils with polycyclic aromatic hydrocarbons (PAHs) were detected at the Loading Rack Area (East Yard) (PAS-00107628). In addition, benzo(a)pyrene was also detected above cleanup criteria in one sample in the Tank Basin Area located in the East and West Yard. Several PAHs were detected in the Loading Rack Area and Area A located adjacent to the West Yard (PAS-00005099).

No PAHs were identified in soils during the 1990-1995 remedial investigation at the 1,000 Gallon No. 2 Fuel Oil UST, Pump and Bleeder Valves Area, Fuel Additive Tank Pump, and Vapor Recovery Unit (PAS-00107650-70). In addition, no PAHs were identified in the removed 550 Gallon Waste Oil UST, 10,000 Gallon Diesel Fuel AST, and Free Product Layer in Monitoring Well MW-18 (PAS-00107672, 78, 97).



(PAS-00005116)



(PAP-00066708)

According to the 2014 RI Report, horizontal delineation of PAHs in Area A is complete to the property boundary. PAH concentrations remaining on-site include the following (PAP-00066698, 716-723):

PAH Concentration Remaining in Area A (mg/kg)			
Constituent	**Sample Date**	**Min Concentrations**	**Max Concentrations**
Benzo(a)pyrene	2/24/04	0.11 (A-3B)	19 (A-2A)
Benzo(a)anthracene	2/24/04	0.047 (A-5B)	12 (A-2A)
Benzo(b)fluoranthene	2/24/04	0.13J (A-17B)	23 (A-2A)
Benzo(k)fluoranthene	2/24/04	0.042J (A-17B)	26 (A-2A)
Dibenz(a,h)anthracene	2/24/04	0.042J (A-17B)	2.8 (A-2A)
Indeno (1,2,3-cd)pyrene	2/24/04	0.043U (A-17B)	10 (A-2A)

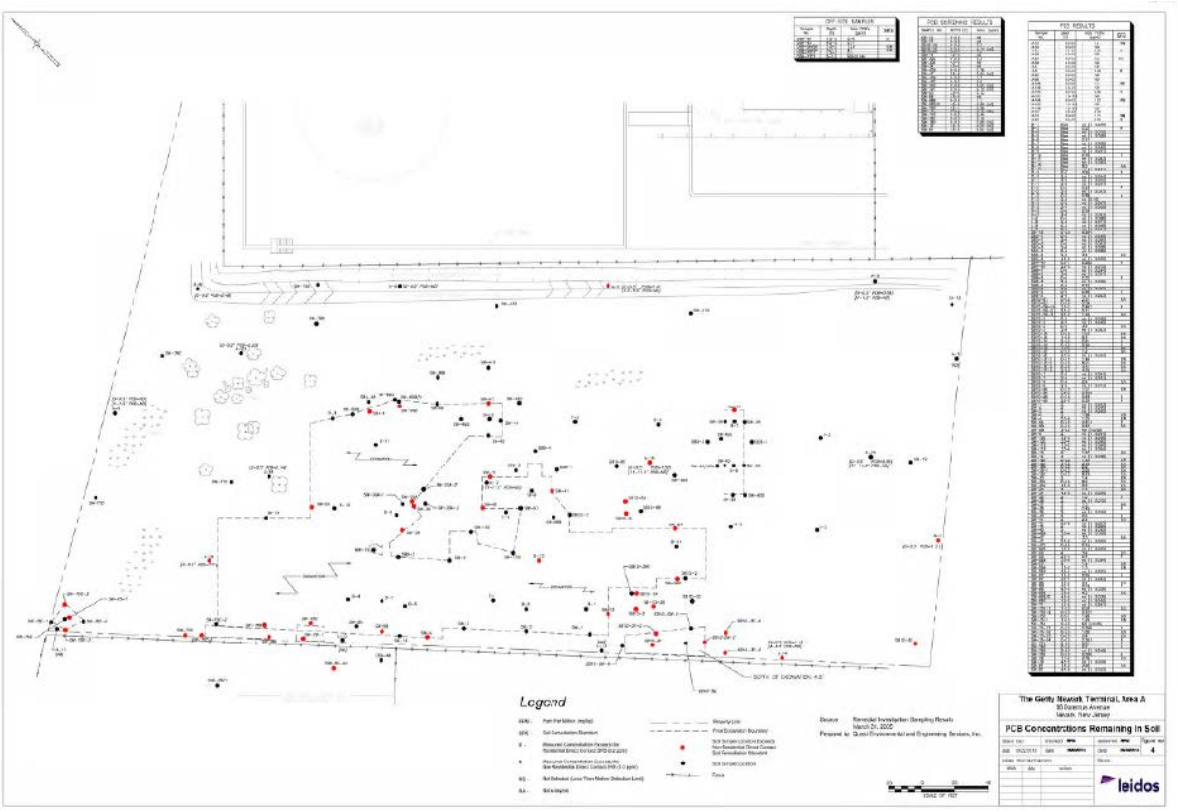
The vertical distribution of PAHs at the site did not show a consistent decreasing gradient from the surface; however, historic fill placement or atmospheric deposition of diffuse anthropogenic pollution prior to fill could be the source for some of the PAHs detected at the site (PAP-00066690, 98).

Metals- Copper and Lead

A letter dated October 30, 1993, from the new TRMI terminal superintendent to the Getty Terminals Corp. terminal manager stated that soils in the tank basin areas were previously remediated to the cleanup levels established in 1990; however, due to NJDEP's May 1993 revisions of cleanup criteria, some concentrations of lead exceeded the new criteria. Lead was detected at concentrations between 100 and 1,000 mg/kg (PAS-00005097-98).

Lead also exceeded the cleanup levels in the Loading Rack Area (East Yard) at concentrations between 100 to 6,430 mg/kg and in Area A at concentrations between 100 and 996 mg/kg (PAS-00005099).

According to the 2014 RI Report for Area A,. samples A-1A and A-2A, each taken at 0-0.5 feet bgs, were reported at 473 and 704 mg/kg, respectively, were below the Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS) of 45,000 mg/kg (PAP-00066720).



(PAP-00066707)

According to the 2014 RI Report, the source of lead and other priority pollutant metals is historic fill and delineation of historic fill is complete to the property boundary. As shown on the figure below, lead concentrations remaining in soil are less than the NRDCSRS of 800 mg/kg, with the exception of lead detected in sample (SW-6) at a concentration of 996 mg/kg and in sample SB4-4 at a concentration of 980 mg/kg. Vertical delineation of lead to the Residential Direct Contact Soil Remediation Standards (RDCSRS) in Area A is complete based on the concentrations detected in deep samples (A-15C, A-16C, A-17B) which were collected from 9-11.5 feet below ground surface (bgs) (PAP-00066692).

Historical Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	84,200 mg/kg
Copper	456 mg/kg
Mercury	5.3 mg/kg
Benzo(a)anthracene	3.5 mg/kg
Benzo(a)pyrene	3.7 mg/kg
Benzo(b)fluoranthene	2.3 mg/kg
Benzo(k)fluoranthene	4.4 mg/kg
Dibenzo(a,h)anthracene	0.66 mg/kg
Indeno(1,2,3-cd)pyrene	6.0 mg/kg

(PAP-00339532, PAP-00066698, PAP-00066720-21)

5. COC Pathways

Sanitary Sewer

There is no information regarding sanitary sewers in the available file material.

Storm Sewer

According to a letter dated June 4, 2004, regarding a Supplemental Request for Information from Chevron to EPA, to the best of Texaco's knowledge, surface runoff from the West Yard was collected by catch basins that were connected to the municipal wastewater collection system. Area A is a two to two-and-a-half-acre undeveloped portion of the Getty Newark Terminal (PAS-00107511, PAP-0006695). A topographically low area exists at the westernmost portion of Area A, which is adjacent to the New Jersey Turnpike. This low area may receive surface runoff from other portions of Area A and the New Jersey Turnpike property (PAS-00107511).

According to the information presented in the *Cleanup Plan for Newark Terminal*, prepared by IT Corporation and dated October 1989, the East Yard surface runoff was channeled to an oil/water separator located adjacent to the east side of the garage. Surface water drainage from the East Yard is directed to the separator where sediment and oil are removed by gravity from stormwater prior to being discharged to the Passaic River (PAP-00339501).

6. Regulatory History/Enforcement Actions

Inspections and Violations

To the best of CEMC's knowledge there were two minor releases of petroleum product directly to the Passaic River during CEMC's affiliates ownership/operation of the terminal occurring in 1982 and 1984. Both releases involved equipment malfunctions during product delivery at the receiving dock. Minor amounts (less than 4 gallons) of diesel and

gasoline respectively and de minimis amount of COCs, if any, contained therein reached the River (PAP-00067539-56; PAP-00066946-67).

According to a Preliminary Assessment / Site Investigation Report prepared by JM Sorge, Inc. dated March 2014, an oil/water separator was located on the East Yard adjacent to the Passaic River and discharged to the river under NJPDES Permit No. NJ0026034 (PAP-00084091). According to a September 8, 1980 Authorization to Discharge under National Pollutant Discharge Elimination System, NPDES Permit No. NJ0026034 took effect on October 31, 1980 (PAP-00066509).

Permits

According to a Preliminary Assessment / Site Investigation Report prepared by JM Sorge, Inc. dated March 2014, New Jersey Pollutant Discharge Elimination System (NJPDES) Permit NJ0026034 and was initially permitted in November 1985. This permit expired on January 31, 2014 (PAP-00084091).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Cleanup Plan, Newark Terminal, October 1989 (PAP-00339476)
- Tank Basin Remediation Report, Newark Terminal, January 1991 (PAS-00107561)
- Area A Closure Report, Newark Terminal, November 1991 (PAP-00066737)
- Area A Phase IV Soil Sampling Results, October, 1993 (PAS-00005100)
- Results Summary of Additional Phase V Soil Sampling, January 1994 (PAS-00005037)
- Remedial Action Workplan Addendum, October 12, 1994 (PAP-00339726)
- Soil Sampling Results, Area A and East Yard Paved Area, September 11, 1995 (PAP-00339794)
- Remedial Action Report for PCB Soils in Area A, Volume 1 Report, July 25, 1997 (PAP-00066760)
- Remedial Action Assessment Report, Getty Newark Terminal, May 12, 1998 (PAS-00107619)
- Remedial Investigation Work Plan for Area A, October 7, 2003 (PAP-00340057)
- Remedial Investigation Sampling Results for Area A, March 31, 2005 (PAP-00340011)
- Baseline Ecological Evaluation Report, February 23, 2006 (PAP-00066799)
- Addendum to the “Baseline Ecological Evaluation (BEE) Report, Feburary 2006”, March 12, 2006 (PAP-00066848)
- Remedial Action Work Plan Addendum, Getty Newark Terminal – Area A, August 21, 2013 (PAP-00189223)
- Preliminary Assessment/Site Investigation Report, March 2014 (PAP-00084072)
- Remedial Investigation Report, Former Getty Newark Terminal – Area A, July 2014 (PAP-00066671)

Sewer

There is no information regarding sewer sampling data in the available file material.

Soil

Three investigations (Phases I-III) were conducted at the site in the 1980s to screen for TPHC and lead, and the 1989 Cleanup Plan was the result (PAP-00339485).

Results from Phase I sampling (terminal-wide and Area A) showed that levels of lead for samples inside the dikes of the tank basins ranged from 36 mg/kg to 1,000 mg/kg. Soil samples from the stormwater discharge area contained lead levels ranged from 71 mg/kg to 2,700 mg/kg. Soil samples from the four soil borings contained lead levels ranging from 6.2 mg/kg to 320 mg/kg (PAP-00339506).

Phase III (terminal-wide and Area A) results for lead concentrations in the West Yard tank basins ranged from 3.5 mg/kg to 1,400 mg/kg (PAP-00339529). Concentrations in the East Yard tank basins ranged from 5.6 mg/kg to 2,000 mg/kg (PAP-00339530-31). Area A concentrations ranged from 1.3 mg/kg to 8,200 mg/kg (PAP-00339532).

The Phase IV investigation activities (Area A) were performed to further delineate the COCs identified from the results of the Phase II and Phase III investigations to revised cleanup criteria adopted by NJDEP in March 1993 and focused on PAHs and PCBs. Phase IV delineation soil samples showed that PCBs were detected at various locations within Area A. The presence of PCBs extended to the property boundaries, and the concentrations of PCBs in soil samples showed decreasing concentrations with depth. Additionally, PAHs were identified at various locations to a depth of four feet within the fill material at Area A (PAP-00066681, PAS-00005103).

The Phase IV soil investigation activities were summarized in a report prepared by IT, entitled: “Area A Phase IV Soil Sampling Analytical Results, Getty Newark Terminal, ISRA Case No. #84455” dated October 1993. Comments on this report were received from the NJDEP in a letter dated August 29, 1994. The NJDEP requested additional investigations in the areas where PCB levels exceeded the NJDEP residential soil cleanup criteria and the delineation of post-excavation samples which did not meet the revised February 1994 Residential Direct Contact Soil Cleanup Criteria (RDCSCC). Additionally, the NJDEP requested that viable evidence that the contaminated soil present in Area A is the result of past filling operations be submitted (PAP-00066681).

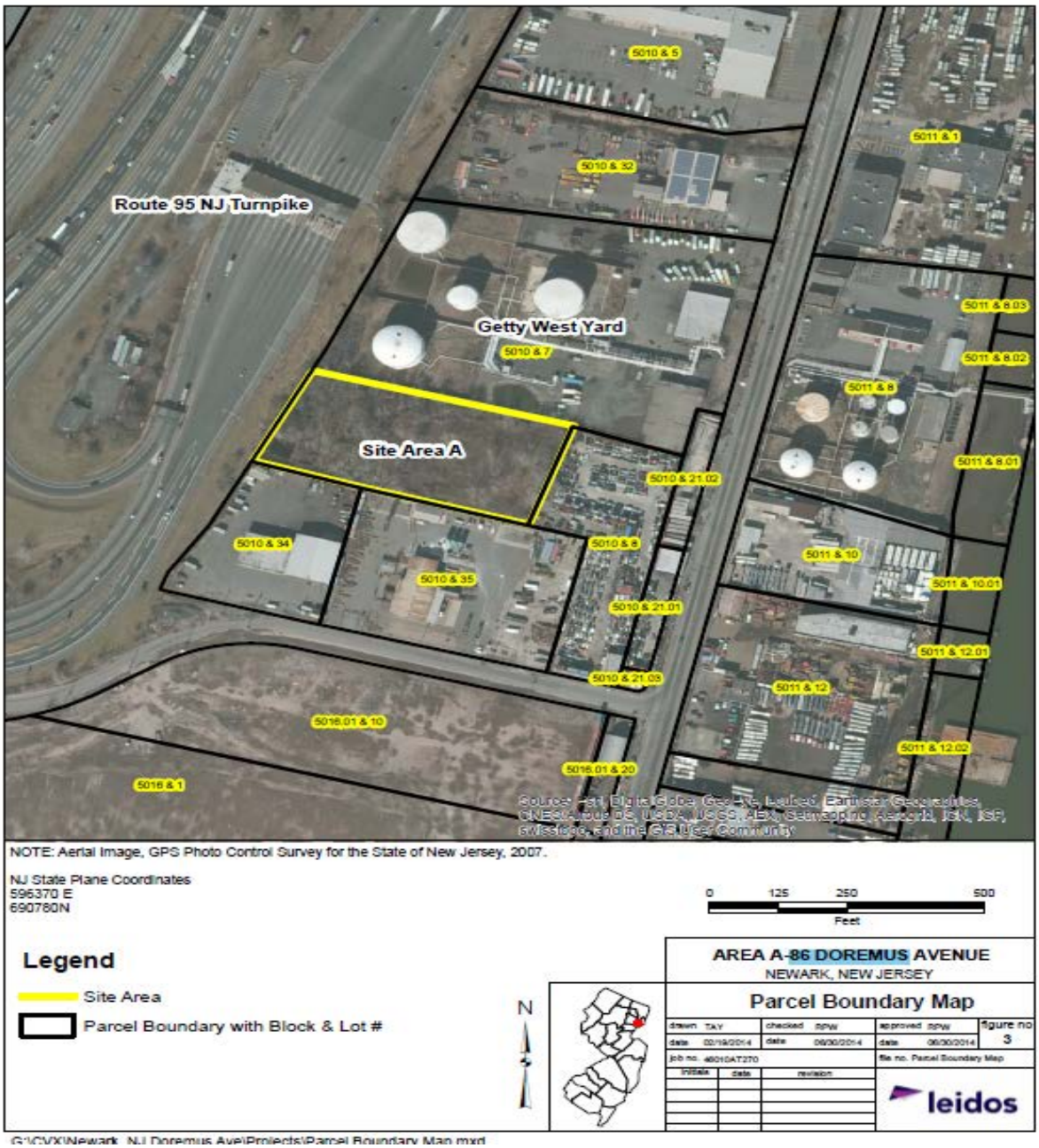
In October 1994, investigation activities included the collection of soil samples to delineate impacts within and outside the limits of Area A. A total of 36 samples were collected for horizontal and vertical delineation of PCBs in Area A and 25 samples for the horizontal and vertical delineation of PAHs. Additionally, six soil samples were collected from the property southwest of Area A (Block 5010, Lot 34) (PAP-00066681-82).

Chevron Environmental Management Co.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



(PAP-00066706)

Soil sampling results showed that the most elevated PCB concentrations existed in soil along the southwestern property boundary and in off-site sampling locations. PCB concentrations within Area A generally decreased from south to north. Concentrations within the interior were generally less than 2 ppm. PAHs were detected throughout Area A soils; however, higher PAH concentrations were detected within the southern portion of Area A and along the southern property boundary (PAP-00066682).

Elevated PAH concentrations were also detected in off-site soil samples, suggesting a possible historic fill-based off-site source. Investigative activities also included review of aerial photographs from the 1947, 1959, 1963, 1969, 1973, and 1982 which provided evidence of historic fill placement. In a letter dated December 1996, NJDEP accepted the evidence of historic fill and stated that no further action was required in regards to off-site sampling (PAP-00066682).

Remedial Activities

Remedial Activities completed in Area A include soil excavations completed in four phases. Phase I was conducted in 1988, Phase II and III were conducted in 1990-1991, and Phase IV in 1993 (PAP-00066679-81).

In May 1990, soil containing lead were delineated and excavated to site specific cleanup criteria. Reportedly, a waste characterization sample collected for disposal showed the presence of PCBs in soil. Subsequently, NJDEP requested additional investigation to evaluate the potential presence of historic fill in Area A and additional soil sampling to delineate PCB soil impacts (PAP-00066680).

Between November 1990 through January 1991 and May 1991 through September 1991, approximately 4,000 tons of lead and PCB impacted soil were excavated from Area A and disposed of off-site. Post excavation samples were collected as directed by NJDEP (PAP-00066680-81). Further removal of PCBs was performed in 1996 and 229 tons of soil was excavated and disposed of offsite (PAP-0006682). In a letter dated June 12, 1992 NJDEP declined the request for a No Further Action determination because post excavation sampling was not deemed sufficient to demonstrate cleanup to approved levels, and contamination levels along the southern property line were not considered to be fully delineated (PAP-00066681).

8. Summary of Asserted Defenses

Chevron asserts that

- “The petroleum exclusion exempts all releases of petroleum product at the site from CERCLA liability and would cover direct and indirect releases (stormwater and groundwater) to the River.

- CEMC’s affiliates are not current owners of the site and, as such, under CERCLA, would not be liable for releases/disposal occurring at the site prior to or after their ownership/operation.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

COATS & CLARK INC.

Facility Name, Address and Size: Clark Thread Company (Clark), 735 Broad Street, Bloomfield New Jersey. Clark owned 40-acres (PAP-00075263) located along the Third River on Broad Street.

1. **Business Type:** Clark treated cotton thread by bleaching and mercerizing processes (PAP-00075777).

2. **Time Period of Ownership/Operations**

   Operator: ~1922-Late 1940's (PAP-00075222)
   Owner: 08/10/1921 – 09/17/1947 (PAP-00075777, PAP-00075222; PAP-00079489; PAP-00080155)

   Clark owned the property while it operated the facility (PAP-00075222). According to an undated article in the Real Estate section of the Newark Evening News, Clark sold the 40-acre tract and buildings to Scientific Glass Apparatus Company, Inc. (SGA) and both companies operated in the building for a period of time. Clark was in the process of moving the Bloomfield operations south to Georgia to join its main facilities (PAP-00075263). A letter dated June 25, 1946, discussed moving package bleaching machinery to the Toccoa (Georgia) mill (PAP-00725690), while a letter dated December 23, 1946, discussed moving the nylon dyeing operations to the Pawtucket mill due to the impending closure of the Bloomfield mill (PAP-00726428). A May 2006 article in The New Town Crier, the Official Newsletter of the Historical Society of Bloomfield, stated that the Clark Bloomfield plant closed in 1949 and moved to Amstell, Georgia (PAS-00027121).

   Coats & Clark Inc. was identified as the successor to Clark Thread Company in a June 21, 2017 letter to the Environmental Protection Agency (PAP-00080438). An online article from the Coats website stated J. P. Coats and the Clark Thread Co. merged to become Coats & Clark Inc. in 1952 (PAS-00027111).

   According to a *Supplemental Remedial Investigation Report*, dated May 2014 (2014 Supplemental RIR), AFC Realty razed the buildings at the site in 1989. It is unclear if this company was related to Leo Realty, the owner of the site at that time. In addition, the 2014 Supplemental RIR stated Somerset Development LLC purchased the site in 2011 with plans for redevelopment (PAP-00079489). The Model Deed Notice included as Appendix 4 to the 2014 Supplemental RIR identified Somerset Development LLC as the owners of the property at that time (PAP-00080106). According to the March 2017 Remedial Action Report, construction of townhouses was initiated in 2012, but was stopped when the Township took ownership of the site (PAP-00080185).

   A Deed Notice for the property was filed February 2, 2017 and identified the Township of Bloomfield as the owner. The Deed Notice restricts the land use for certain areas of the property because historic fill (including exceedances of PAHs and lead) and historically-applied pesticide (chlordane) remains at the site (PAP-00080172-3). The site cannot be used for single family residences, childcare facilities, or schools (PAP-00080155-6).

The owner of the site was identified as Bloomfield Township on an application for Remedial Action Permit Application – Soil, dated March 30, 2017 (PAP-00080222).

3. Operational History/COC Use and Presence at the Facility

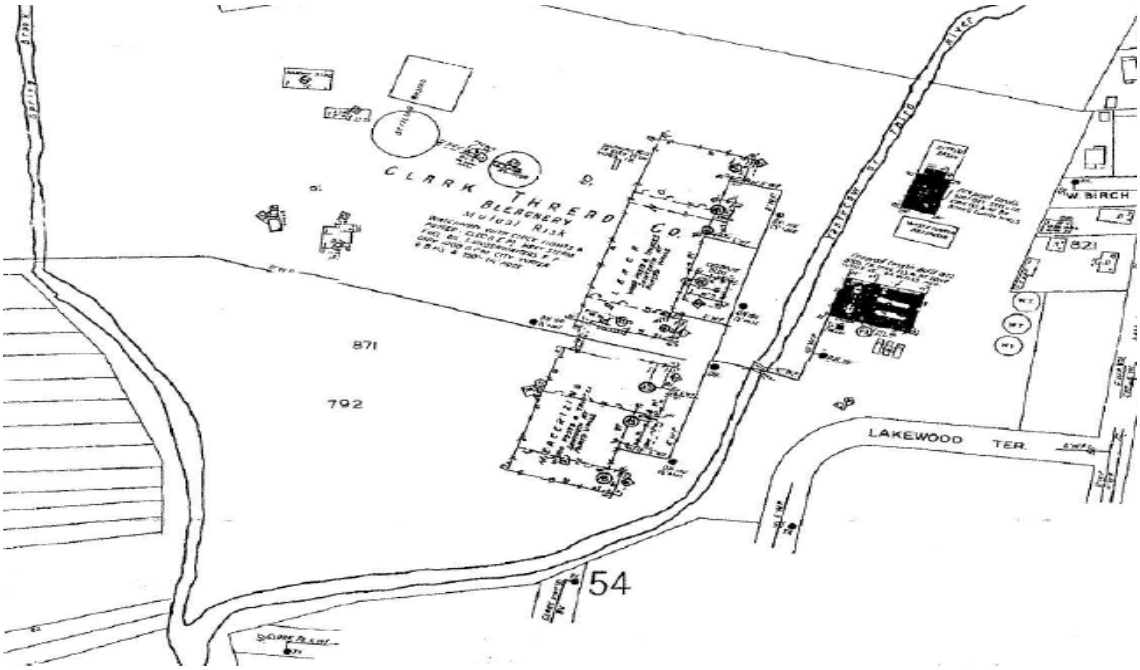
Clark operated a mill to process cotton threads by bleaching and mercerizing processes. During mercerizing, the cotton threads were treated with caustic soda (sodium hydroxide) to shrink the fibers and increase their absorbance of dye colors and luster (PAP-00075777, PAP-00080514). In addition, according to the *Preliminary Assessment Report*, dated August 17, 2000 (2000 PAR), Clark operated a small laboratory to conduct dye-fast testing, which would have used small amounts of dye (PAP-00080514). In addition, an article in The New Town Crier, the Official Newsletter of the Historical Society of Bloomfield, stated that boilfast dyes were developed and produced at the Bloomfield site (PAS-00027121).

The 2000 PAR stated that cotton threads were sent off-site for dye-house operations (PAP-00075223). However, a letter dated September 22, 1922 discussed a new dyehouse to be installed in Bloomfield, and stated that machinery and handboxes in use at the Newark and East Newark dyehouses could be transferred to Bloomfield (PAP-00725940-41). In addition, documentation from the Passaic Valley Sewerage Commissioners (PVSC), dated August 20, 1925, and a PVSC *Report on the Status of Pollutions from Industrial Establishments*, dated November 28, 1926, notted that the pollution from the Newark and East Newark mills was abated when Clark moved the dyeing and mercerizing operations to the Bloomfield plant (PAP-00128118; PAP-00129824). Further, an article written by Mr. Walter E. Hadley about Clark Thread Co. in February 1927 stated that the dyehouse, mercerizing, and bleaching departments were moved outside of Newark (PAP-00726263).

According to the *Phase II Environmental Site Assessment (ESA)*, prepared by EcolSciences, Inc. dated November 9, 1993 (1993 Phase II EA), the Sanborn map from 1938 (see figure below) showed Clark operated two separate mill buildings, with the southernmost used for the cotton mercerizing operations and building to the north used for thread bleaching operations. Other buildings on-site included a chlorine building to the east and a storage garage north of the main buildings. On the west side of the property, there was a wastewater treatment plant including a wastewater agitator tank and settling basins. Clark also owned property on the east side of Third River, which included a power plant for the mill and some of the thread processing operations. The 1950 Sanborn map showed that the two main mill buildings were connected at some point between 1938 and 1950 (PAP-00075778).

A cost estimate submitted to the Manufacturing Committee New York and dated July 31, 1939 identified a break in the sewer west of the Dye House that needed to be repaired. Waste from the Dye House was stated to be discharging into a brook (PAP-00725693). Although the brook is not identified in the cost estimate, two bodies of running water were located at the site. Based on the Sanborn map from 1938 (see figure below), the Third River ran through the site along the mill buildings. Spring Brook was also located at the western edge of the site and met with the Third River directly downstream of the site (PAP-00075242). According to the June 11, 2003, Remedial Investigation

Workplan, the Third River flows southerly past the site toward the confluence of the Third River and the Passaic River (PAP-00077783-84).



(Sanborn map from 1938; PAP-00075242)

According to a June 2004 Technical Review Panel (TRP) Decision Document, the chemicals believed to be used by Clark were sodium hydroxide, wetting agents, sulfuric acid, sodium hypochlorite and dyes. The sulfuric acid and sodium hydroxide were stored in exterior above ground storage tanks, while the rest of the chemicals were stored inside the plant. The sodium hypochlorite was stored in the chlorine building, located off the east side of the bleaching building. The exact storage location of the other chemicals was not known (PAP-00078074).

According to the article by Mr. Walter E. Hadley about Clark Thread Co. from February 1927, the wastewater treatment plant was to be installed due to the lack of a sewer system in Bloomfield. The treatment system consisted of a 55-foot wide and 7 to 10-foot deep circular settling tank. Lime and alum were added to produce a sludge that was pumped out onto a large area of land and allowed to dry. The liquid was discharged to a brook (PAP-00726263).

As reported by the 2000 PAR, water from an off-site pond was used to wash the treated and untreated thread. The used water was discharged via underground piping to a wastewater agitator tank and then pumped to settling basins located west of the building. The local Municipal Utilities Authority (MUA) handled sanitary waste (PAP-00080515).

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (used by subsequent operator, detected)

PCBs

No information for the use or presence of PCBs at the Clark Bloomfield facility was noted in the available file material. However, PCBs were detected at several Areas of Concern (AOCs) during remediation of the site. The maximum concentration of PCBs in site soil identified in the available references was 0.981 ppm at AOC 13/31 (Northeast Fill Area/ Raw Materials Storage Building), and was excavated in 2007 (PAP-00078776). A Draft Remedial Action Report and Remedial Action Workplan, dated February 1, 2010 (RAR RAW), concluded that the sporadic detections of PCBs at the Bloomfield site were not associated with site operations, but were likely the result of PCBs in historical building material formulations that were filled on site (such as caulk) (PAP-00079212). The 2010 RAR RAW noted that caulk used in buildings between 1950 and 1978 contained PCBs and concluded that the sporadic PCB exceedances "therefore may be associated with demolition debris from buildings constructed during this time period" (PAP-00079273).

According to the report on *Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor*, dated February 2005, standard industry practices for manufacturing of dyes and pigments could inadvertently produce PCBs in the order of micrograms/kilogram (µg/kg) (PAS-00027172). In addition, manufacturing of diarylide pigments and phthalocyanine crude and pigments produced or contained concentrations of PCBs that were high enough to cause concern with meeting the EPA's ban on materials containing 50 ppm PCBs proposed in 1978. It was further stated by testimony of the Dry Colors Manufacturer's Association (DCMA) that some pigment products contained more than 500 ppm PCBs at that time (PAS-00027247-50).

Information provided with DCMA's testimony in 1978 noted that diarylide yellow pigment was patented in 1911 and used commercially starting in 1938 (PAS-00027327). Also, phthalocyanine blue and green pigments were introduced in the United States in the early 1940s (PAS-00027357). According to the National Paint and Coatings Association, diarylide yellow pigments were used in the textile industry (PAS-00027346). However, the available references provided for Clark included lists of dyes purchased in 1941 (PAP-00726415-19) and basic colors of dyes used for nylon thread in 1945 (PAP-007264525-26). The phthalocyanine blue and green and diarylide yellow pigments were not identified as being used at the site in the available file material for Clark.

Dioxins and Furans

According to the report on *Pollution Prevention and Management Strategies for Dioxins in the New York/New Jersey Harbor*, August 2006, approximately 40% of textile dyes and pigments are chlorinated or brominated compounds, and these compounds can lead to the formation of dioxins during dyeing processes possibly due to the high

temperatures and alkaline conditions during dyeing. The report identified potential releases to the environment from use of the pigments, inks, and dyes and the use (including washing of textiles), disposal, or recycling of the products (PAS-00027168).

According to the 1980 EPA report titled Dioxins: Volume III, Assessment of Dioxin-Forming Chemical Processes, temperatures at 145 degrees Celsius and higher can generate dioxins (PAP-00725710). Temperatures noted in Clark's recipes for dyeing silk and cotton thread were at or below boiling (212 degrees Fahrenheit/100 degrees Celsius) or less than 100 degrees Celsius (PAP-00725680; PAP-00725689; PAP-00728342-414). Note: 212 degrees Fahrenheit is less than 145 degrees Celsius, or 293 degrees Fahrenheit.

A NJDEP Remedial Investigation Report form, dated May 6, 2014, noted that dioxins had not been detected in any site media (PAP-00079478-9).

PAHs

A NJDEP Remedial Investigation Report form, dated May 6, 2014, noted that site soil was contaminated with PAHs (PAP-00079478-9).

According to 2014 Supplemental RIR, a large area of the property was contaminated by PAH compounds that were not attributable to site-specific operations. Instead, the report stated contamination appeared to be related to the Historic Fill materials (both soil and construction debris) that were contaminated prior to being used at the site to elevate the property (PAP-00079510-11). (See discussion of Historic Fill below for concentrations.)

Copper

Several documents identified copper sulfate as used as part of the dyeing processes used by Clark. However, the documents are undated, so it is not clear when or for how long these processes were used. In addition, information regarding the use of these procedures at the Bloomfield site specifically was not found in the available references. For example,

- An undated letter titled "Diazo Black" identified "1/7 pounds" of copper sulfate used per 1,000 pounds of thread. The author and recipient of the letter were not identified (PAP-00725678-79).
- The process for dyeing yarn using the "O.N.T Method of Dyeing Logwood Black" by the Clark Thread Co. identified the "Fixing bath" consisting of 1,000 gallons of water and 7 pounds of copper sulfate (PAP-00725680).
- Procedures labeled "Laboratory – Anchor Mills" listed copper sulfate as used as part of the Aniline black dyeing method (PAP-00725683-84).
- Recipes for Aniline Black dyeing was provided in the *Dyeing With Coal-Tar Dyestuffs*, reprinted in 1947, and included copper sulfate and copper sulfide (PAP-00726424).

According to the Report of Martin Bide, Ph.D., Professor, Department of Textiles, Fashion Merchandising and Design, University of Rhode Island, Kingston, Rhode Island, dated April 2019, "After the year 1900, Clark Thread used virtually no copper or other metal salts, because alternatives to logwood and aniline black – namely, developed direct and sulfur dyes – were introduced around that year and were quickly adopted" (PAP-00726463). In addition, Dr. Bide stated that four direct dyes that were identified in 1941 purchase records contained copper, and that these dyes represented about 0.1% by weight of those dyes purchased (PAP-00726460).

A letter from J.&P. Coats, Ltd. to Clark in Newark, dated August 5, 1929, compared two dyeing procedures for "Diazo Fast Black C.G." used at the Newark plant (assumed to be dyed at Bloomfield based on the date) and at a Coats plant in Ferguslie. While the procedure at the Ferguslie used copper sulfate, it was noted that the Newark recipe did not (PAP-00726269).

Copper was detected in site soil at several AOCs. Copper was detected at a depth of 6 to 7 feet below ground surface (ft bgs) in historic fill below the parking lot in AOC 14 (1,880 ppm) and in AOC 20 (Broken Glass Fill Area) up to 3,000 ppm (PAP-00080469; PAP-00078116).

Lead

No information for the use or presence of lead at the Clark Bloomfield facility was noted in the available file material. Soil samples collected from several AOCs detected lead in site soil, including AOC 15 (Western Perimeter Fill Materials) up to 4,390 ppm (PAP-00080483). The 2010 Remedial Action Report attributed the elevated lead concentrations to historic fill (PAP-00079212). All soil results were below the NJDEP Historic Fill Database Summary maximum concentration of 10,700 ppm (PAP-00079273).

Mercury

No information for the use or presence of mercury at the Clark Bloomfield facility was noted in the available file material. However, mercury was used for thermometer manufacturing at SGA, the unrelated subsequent site operator. According to 2000 PAR, mercury was identified as hazardous material that was historically present at the facility (PAP-00080515).

Mercury was detected in site soil at several AOCs, including AOC 20 (Broken Glass Fill Area) up to 70.7 ppm (PAP-00078116).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP[1]. Based on the NJDEP Historic Fill Quadrangle No. 41 map, Historic Fill is located along the Third River and Spring Brook at the site, but when compared with the Sanborn map from 1938, Historic Fill does not appear to be located underneath the location of the mill building (PAP-00075242).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

The levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00080483; PAP-00078116; PAP-00078653; PAP-00078642)

COCs Found In Onsite Soils	
COC	**Max Detected Concentration**
Lead	4,380 mg/kg
Copper	3,000 mg/kg
Mercury	70.7 mg/kg
Benzo(a)anthracene	175 mg/kg
Benzo(a)pyrene	134 mg/kg
Benzo(b)fluoranthene	115 mg/kg
Benzo(k)fluoranthene	124 mg/kg
Dibenzo(a,h)anthracene	40.4 mg/kg
Indeno(1,2,3-cd)pyrene	89.9 mg/kg
PCBs	0.981 mg/kg

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 41 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The 2014 Supplemental RIR attributed the PAHs contamination at the site to the Historic Fill materials (both soil and construction debris) that were contaminated prior to being used at the site to elevate the property (PAP-00079510-11).

An application for a Remedial Action Permit by Bloomfield Township identified Historic Fill and historically applied pesticides are present at the site and impacting groundwater such that a deed notice is required (PAP-00080220-8).

5. COC Pathways

Direct Discharge

A report by the PVSC, dated August 20, 1925, identified the Bloomfield plant as operating a wastewater treatment plant that discharged treated water to the Third River (PAP-00128116, 18). Wastewater was treated with lime, alum, sulfuric acid, and bleach, then allowed to settle before discharging the water to the brook (PAP-00726263). The June 11, 2003 Remedial Investigation Workplan reported that the Third River was a tributary to the Passaic River and formed the southern and eastern borders of the site. The Third River flowed southerly past the Site toward the confluence of the Third River and the Passaic River (PAP-00077783-84).

According to the *Final Draft Site Inspection Report*, dated March 30, 1990 (1990 SIR), the site is mostly flat, but slopes towards the Third River behind the paved area east of the buildings with increasing steepness downstream. The Third River flows through Bloomfield, Belleville, and a series of ponds in Nutley before entering the Passaic River more than 10 miles downstream (PAP-00080798).

A cost estimate submitted to the Manufacturing Committee New York and dated July 31, 1939 noted a break in the sewer west of the Dye House needed to be repaired. Waste from the Dye House was stated to be discharging into a brook (PAP-00725693). Based on the 1938 Sanborn map, the two brooks at the site were the Third River and Spring Brook, which flowed into the Third River (PAP-00075242).

The 1990 SIR reported that in 1988, sediment and surface water samples were collected from locations upstream, midpoint (adjacent to the facility discharge pipe), and downstream from the facility. PAHs and lead were attributed to off-site sources as both upstream and downstream sediment and surface water samples detected these compounds (PAP-00080806-07). Lead was detected at 7 ppb upstream and 5.2 ppb in both the midpoint and downstream samples. In sediment samples, PAHs were stated to have uniform concentrations upstream and downstream, and lead was detected at 46.6 ppm upstream and 34.1 and 17.3 ppm in the midpoint and downstream samples, respectively. Mercury was detected in the downstream sediment sample (0.35 ppm), but was also detected in upstream (3.1 ppb) and downstream (0.4 ppb) surface water samples (PAP-00080807).

According to Appendix 12 in the *Amended Preliminary Assessment Report*, dated June 11, 2003 (2003 PAR), sediment samples were collected again in 2000 from the spillway, adjacent to the drainage pipe, and 10 feet below the downstream edge of the property. The samples were analyzed for priority pollutants, and elevated concentrations of

copper, lead, and mercury were detected. However, the highest concentrations were detected in the upgradient sample (copper at 45 ppm, lead at 247 ppm, and mercury at 0.547 ppm) compared to the downgradient sample (copper at 6.48 ppm, lead at 27.1 ppm, and mercury at 0.463 ppm), so the concentrations were not attributed to the site operations (PAP-00076114, 69).

According to the 2014 Supplemental RIR, investigation of the stream and sediments did not find direct impact to the Third River from the contamination identified on-site (PAP-00079496).

Sanitary Sewer

There is no information regarding sanitary sewers in the available file material.

Storm Sewer

There is no information regarding storm sewers in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

EPA performed a *Potential Hazardous Waste Site Preliminary Assessment* in 1982 in response to a complaint that mercury was disposed on-site in a shallow pit and surface water (PAP-00075885-8). An anonymous complaint dated January 27, 1984 alleged that unrelated subsequent site operator SGA was dumping mercury into the Third River next to their building (PAP-00075888, 96).

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

An application for a Remedial Action Permit by Bloomfield Township identified Historic Fill and historically applied pesticides as present at the site and impacting groundwater such that a deed notice is required (PAP-00080220-28).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Final Draft Site Investigation Report, dated March 30, 1990 (PAP-00080793)

- Phase I and Phase II Environmental Site Assessments were performed from 1992 to 1993 (PAP-00075414, 606, 766)
- Remedial Investigation Addendum Report, dated December 23, 1998 (PAP-00080455).
- A Preliminary Assessment Report, dated August 17, 2000 (PAP-00080511).
- Progress Reports from 2000 and 2001 (PAP-00082107, PAP-00082382).
- Amended Preliminary Assessment Report, dated June 11, 2003 (PAP-00075221)
- Site Investigation Work Plan, dated December 2003 (PAP-00077851).
- Technical Review Panel Decision Document, dated June 23, 2004, documenting 41 AOCs at varying stages of remediation or no action (PAP-00078073)
- Remedial Action Workplan, dated June 11, 2003, was prepared for the site to be addressed by Clark and SGA (PAP-00077781).
- Remedial investigations performed for Clark and SGA were reported in a Remedial Investigation Report No. 2 with Proposed Remedial Investigation/Action, dated April 14, 2006, and a Remedial Investigation Report No. 3 with Proposed Remedial Investigation/Action, dated January 18, 2007 (PAP-00078095, PAP-00078610).
- Remedial investigation results for the AOCs addressed by Leo Realty were reported in a Remedial Investigation Report/Remedial Action Workplan, dated September 2007 (PAP-00078766).
- Draft Remedial Action Report & Draft Remedial Action Workplan (PAP-00078936).
- NJDEP No Further Action (NFA) letter, dated May 4, 2012; unrestricted use to the following AOCs: 2, 5, 6, 7, 9, 10, 11, 13, 14, 16/28, 17, 18, 26a, 26B, 26C, 27, 29A, 29F, 30/38, 31, 35, 36, 39, 40, and 44 (PAP-00079474-5).
- A Supplemental Remedial Investigation Report, dated May 2014, summarized the status of the 44 AOCs and submitted a draft Deed Notice for the contamination to be left on-site (PAP-00079489).
- Remedial Action Report, dated March 2017 (PAP-00080184)

Soil

Investigations at the site have identified 47 Areas of Concern (AOCs) (PAP-00079478). The AOCs where COCs have been detected in site soil and are not specifically related to SGA operations are discussed in the following subsections. Note that the sampling was performed after Clark's operations and ownership of the site.

AOC 3 Concrete Pit

A concrete pit located behind the main building and 10 to 15 feet deep was noted during a 1988 site investigation (PAP-00080797). According to the 1993 Phase II EA, the concrete walls were apparently removed and backfilled with sand when the building was demolished (PAP-00075825).

The Draft Remedial Action Report from February 2010 (2010 Draft RAR), discussed soil sampling performed in 2005 and 2007 that detected PAHs (benzo(a)anthracene [4.41 ppm], benzo(b)fluoranthene [3.79 ppm], benzo(a)pyrene [4.27 ppm], indeno(1,2,3-cd)pyrene [2.62 ppm], and dibenz(a,h)anthracene [1.40 ppm]) above the NJDEP

residential soil remediation standards (SRSs). PCBs (0.213 ppm) were also detected above the residential SRS (0.2 ppm) (PAP-00078990). The 2014 Supplemental RIR stated the PCB contamination was excavated in 2013 (PAP-00079497).

AOC 8 Mercerizing Building

The Remedial Investigation Report No. 3, dated November 2006, (RI Report No. 3) discussed delineation of PAHs contamination in soil samples collected from the footprint of the former mercerizing building. Maximum concentrations of the exceeding PAHs are provided in the table below (PAP-00078639-41). The 2014 Supplemental RIR noted the residual PAHs contamination was related to Historic Fill and would be addressed by the Deed Notice (PAP-00079500).

Compound	RDCSCC	# of Samples > RDCSCC	Minimum Exceedance	Maximum Exceedance
Benzo[a]anthracene	0.9	5 (1)	1.15	5.5
Benzo[b]fluoranthene	0.9	4	0.949	3.54
Benzo[k]flouranthene	0.9	3	1.44	3.69
Benzo[a]pyrene	0.66	7 (7)	0.694	4.41
Indene[1,2,3-cd]pyrene	0.9	3	0.777	2.0
Dibenz[a,h]anthracene	0.66	1 (1)	0.789	0.789

All results given in parts per million
(1) = Number of samples exceeding the NRDSCC

(PAP-00078641)

AOC 10 Bleach House

According to the Technical Review Panel (TRP) Decision Document, PAHs were detected above residential RSRs in one soil sample collected in 2000 from within the building footprint: chrysene (10.8 ppm), benzo(a)anthracene (14.2 ppm), benzo(b)fluoranthene (15.2 ppm), benzo(k)fluoranthene (4.3 ppm), indeno(1,2,3-cd)pyrene (4.2 ppm), benzo(a)pyrene (11.6 ppm), dibenz(a,h)anthracene (1.3 ppm). The contaminated area was delineated and excavated (PAP-00078080).

The 2014 Supplemental RIR stated that exceedances of the SRS were still noted in the post-excavation samples, but these concentrations were attributed to Historic Fill, and the NJDEP Technical Review Panel approved no further action for this AOC on May 4, 2012 (PAP-00079500).

AOC 12 Southern Fill Area

As reported by the 2010 Draft RAR, three types of fill material were found in this area: glass fill, construction debris consisting of wood and brick, and roofing material. Soil samples detected isolated lead (707 ppm at TP-1) and widespread PAHs contamination. The areas of glass fill were excavated in 2007 (up to 25 cubic yards of soil at TP4 and 225 cubic yards at TP1 and TP2) to address the lead contamination, but sidewall samples still detected lead (455 to 1,770 ppm) and PAHs above the residential SRSs (concentrations at one location were slightly below the maximum concentrations reported below with the exception of benzo(a)anthracene at 170 ppm; PAP-00078992).

Exceeding concentrations in the west sidewall indicated that contamination extended off-site to the west (PAP-00078951-54).

In addition, as discussed in the 2006 RI Report No. 3, the fill was appeared to extend to the top of the bank of the adjacent Third River. The maximum PAH concentrations detected were at sample location TP1A (see table below; with the exception of benzo(a)anthracene, detected at 170 ppm in 2007; PAP-00078992). Samples collected from the base did not exceed the residential SRS, which was used to support the conclusion that contamination was related to the fill material. The 2014 Supplemental RIR noted contamination left on-site would be addressed by the deed notice (PAP-00079500-1).

Compound	RDCSCC	TP1A	TP3A	TP4A
Benzo[a]anthracene	0.9	144	50.1	1.99
Chrysene	9	145	51.4	< RDCSCC
Benzo[b]fluoranthene	0.9	115	42.6	1.76
Benzo[k]flouranthene	0.9	124	46.7	1.47
Benzo[a]pyrene	0.66	134	53.3	1.72
Indene[1,2,3-cd]pyrene	0.9	89.9	1.66	1.03
Dibenz[a,h]anthracene	.66	40.4	14.9	< RDCSCC

All results given in parts per million
Shaded results also exceed the NRDSCC

(PAP-00078642)

AOC 13 Northeast Fill Area/AOC 31: Raw Materials Storage Building

According to the 1993 Phase II EA, AOC 13, a 10,000 square foot fill area of brick rubble and soil, was Area IIB in 1993. Soil samples collected from the surface detected lead (285 mg/kg) and PAHs [phenanthrene (8.4 mg/kg), fluoranthene (15.0 mg/kg), pyrene (9.0 mg/kg), and chrysene (7.8 mg/kg)] (PAP-00075819).

According to a September 2007 Remedial Investigation Report/Remedial Action Work Plan (2007 RI Report), AOC 13 was combined with AOC 31 and several other AOCs of demolition debris and soil piles. This report discussed the combination and sorting of materials in AOC 15 Western Perimeter Fill Area, AOC 19 Soil Pile, AOC 21 Concrete and Soil Pile, AOC 23 Debris Piles at Mercerizing Building, and AOC 24 Debris Piles at Bleachery Building. These piles were formed in 1989 when the buildings were demolished by Leo Realty. The 2007 RI Report stated that the soil at AOC 13/31 was kept separate from the rest of the material because it contained PCBs slightly above the NJDEP Soil Cleanup Standard (PAP-00078772-73). The PCB contaminated soil (0.981 ppm) was excavated in 2007 (PAP-00078776).

AOC 14 Parking Lot Fill Area

According to the 1993 Phase II EA, the fill under the parking lot was reportedly soil obtained from construction of the Garden State Parkway in the 1950s (PAP-00075819). The fill was sampled and two hotspots of heavy metals contamination were found. Copper and lead were detected at maximum concentrations of 1,880 and 1,470 mg/kg, respectively, 6 to 7 feet bgs. PAHs were stated to be detected at trace concentrations (PAP-00075820). The 2014 Supplemental RIR noted additional PAHs were detected in

post-excavation samples, but attributed these concentrations to Historic Fill that would be addressed by the Deed Notice (PAP-00079502).

AOC 15 Western Perimeter Fill Materials

Also known as Area IV, this area was investigated in the 1993 Phase II EA. The fill area was 16,000 square feet and an average depth of 4 feet. Benzo(a)anthracene (21 mg/kg), chrysene (concentration not reported), benzo(b)fluoranthene (17 mg/kg) benzo(k)fluoranthene (14 mg/kg), benzo(a)pyrene (17 mg/kg) and lead (306 mg/kg) were detected above the "soil cleanup criteria" in the site soil (PAP-00075821).

The 1998 RI Addendum Report reported lead detected at 4,380 ppm in one sample collected as a delineation sample for the previous lead result (PAP-00080483).

AOC 16 & 28 Building Annex Fill Area/Process Vessels

The 1993 Phase II EA identified fill material extending to a depth of 4 ft bgs within the footprint of the former office annex. The material is described as brick rubble and soil. Soil samples collected from test pits in the fill material resulted in elevated concentrations of lead (123 ppm) and PAHs: phenanthrene (99 mg/kg), fluoranthene (140 mg/kg), pyrene (130 mg/kg), benzo(a)anthracene (68 mg/kg), chrysene (79 mg/kg), benzo(b)fluoranthene (44 mg/kg), benzo(k)fluoranthene (43 mg/kg), benzo(a)pyrene (55 mg/kg), and indeno(1,2,3-cd)pyrene (29 mg/kg) (PAP-00075822).

According to a Progress Report dated December 15, 2000, the building annex was constructed at some point between 1950 and 1977. Debris from the demolition of surrounding houses was used to fill the property for this construction. PAHs results from sampling of the fill exceeded the most stringent SCC, but samples from soil beneath the fill did not exceed, indicating contamination was confined to the fill material (PAP-00082114-15).

As reported by the Remedial Investigation Report No. 2 with Proposed Remedial Investigation/Action, dated April 14, 2006 (2006 RI Report No. 2), during excavation of the demolition debris, two cast iron vessels (AOC 28) were discovered. Sampling from under the vessels did not detect PAHs and had low levels of metals, and the RI Report No. 2 proposed no further action for the site (PAP-00078113-14, 30).

AOC 18 Historic Stream Channel

This area was identified from examination of historical aerial photographs. According to the 2006 RI Report No. 2, the 1948 photograph showed a drainage ditch that was not present in the 1940 or 1951 aerial photographs. Excavation of a test pit in the area found a small portion of soil that exhibited an odor, but no fluvial or fill material was identified (PAP-00078114). Sampling of this soil detected PAHs, including benzo(a)anthracene at 1.1 ppm, benzo(k)fluoranthene at 0.977 ppm, benzo(a)pyrene at 1.1 ppm, benzo(b)fluoranthene at 0.773 ppm, indeno[1,2,3-cd]pyrene at 0.604 ppm, and dibenz[a,h]anthracene at 0.295 ppm. The soil was excavated and the sample from the underlying soil did not exceed the residential SRS (PAP-00078114-15, 31).

AOC 20 Broken Glass Fill Area

As discussed in the 2006 RI Report No. 2, this area was 0.25 acres in the wooded northwest portion of the site. Soil samples collected in 1993 found elevated metals concentrations, including copper (3,000 ppm), lead (414 to 1,690 ppm), and mercury (19.9 to 70.7 ppm). This area was excavated in 2000 and 2001, and post-excavation samples did not detect concentrations above the residential SRS; therefore, no further action was proposed for this AOC (PAP-00078115-18, 33).

AOC 26: Waste Piping

According to the 2010 Draft RAR, several waste pipes were identified on-site during investigation of the pipe beneath the former concrete pit (AOC 3) on August 16, 2005. The results from a sample of solid material in this pipe (Pipe 1) detected elevated levels of mercury (103 ppm). Pipe 1 was removed in 2007 and found to terminate at the concrete box (AOC 44) (PAP-00078955). Soil samples of the surrounding material did not detect PAHs or PCBs, and metals concentrations were below the residential SRS (PAP-00078956). Pipe 13 was a terra cotta pipe encased in concrete that also contained sludge with elevated mercury (209 ppm). Surrounding soil did not contain elevated contaminant concentrations (PAP-00078961).

Additionally, the 2010 Draft RAR reported that Pipe 3 was a terra cotta pipe north of and parallel to Pipe 1. Three soil samples obtained from the 0-6 inches increment beneath the pipe detected PAHs benzo(a)pyrene (0.692 and 0.24 ppm), benzo(b)fluoranthene (0.630 ppm), and benzo(a)anthracene (0.805 ppm) above the residential SRS, but were noted to be addressed by the Deed Notice. Elevated mercury was also detected at 22.7 ppm and the impacted soil was removed. Post-excavation samples did not detect mercury above the residential SRS (PAP-00078957-8).

AOC 29: Loading/Unloading Areas

Several loading zones were identified for the various buildings that were used on-site. The 2006 RI Report No. 3 identified the following loading/unloading areas where COCs were investigated: AOC 29B (northeast corner of former bleach house), 29C (eastern side of former chlorine building), 29D (southeast corner of the former bleach house), 29E (northwest corner of the former mercerizing building), and 29G (southeast corner of the former mercerizing building) (PAP-00078643-49).
All areas showed detections of PAHs above the residential SRS. Maximum concentrations for AOC 29C, 29D, 29E, and 29G are shown below from the tables provided in the 2006 RI Report No. 3. PAHs contamination at AOC 29B was only up to 1.17 ppm (benzo[a]anthracene) (PAP-00078644). According to the 2014 Supplemental RIR, PCB contaminated soil of an unidentified concentration was removed from 29C (4 feet by 4 feet, and 4 feet deep) (PAP-00079505).

29C Loading/Unloading Area at the Eastern Side of Former Chlorine Building

Compound	RDCSCC	# of Samples > RDCSCC	Minimum Exceedance	Maximum Exceedance
Benzo[a]anthracene	0.9	5 (2)	1.45	37.6
Chrysene	9	1	28.5	28.5
Benzo[b]fluoranthene	0.9	5 (2)	1.17	26.8
Benzo[k]flouranthene	0.9	5 (2)	1.01	23.1
Benzo[a]pyrene	0.66	6 (6)	1.31	31.1
Indene[1,2,3-cd]pyrene	0.9	5 (2)	1.34	16.6
Dibenz[a,h]anthracene	0.66	2 (2)	2.4	6.9

All results given in parts per million
(2) = Number of samples exceeding the NRDSCC

(PAP-00078646)

29D Loading/ Unloading Area at the Southeast Corner of Former Bleach House

Compound	RDCSCC	# of Samples > RDCSCC	Minimum Exceedance	Maximum Exceedance
Benzo[a]anthracene	0.9	1	1.37	1.37
Benzo[b]fluoranthene	0.9	1	1.04	1.04
Benzo[k]flouranthene	0.9	1	0.91	0.91
Benzo[a]pyrene	0.66	2 (2)	.77	1.19

All results given in parts per million
(2) = Number of samples exceeding the NRDSCC

(PAP-00078648)

29E Loading/ Unloading Area at the Northwest Corner of Former Mercerizing Building (addressed by Deed Notice)

Compound	RDCSCC	# of Samples > RDCSCC	Minimum Exceedance	Maximum Exceedance
Benzo[a]anthracene	0.9	13 (5)	1.05	90.0
Chrysene	9	2 (1)	11.2	69.5
Benzo[b]fluoranthene	0.9	12 (4)	1.0	64.7
Benzo[k]flouranthene	0.9	12 (3)	1.09	43.3
Benzo[a]pyrene	0.66	13 (13)	.91	64.9
Indeno[1,2,3-cd]pyrene	0.9	11 (3)	1.03	29.5
Dibenz[a,h]anthracene	0.66	5 (5)	.71	9.44

All results given in parts per million
(1) = Number of samples exceeding the NRDSCC

(PAP-00078649)

29G Loading/Unloading Area at the Southeast Corner of Former Mercerizing Building

Compound	RDCSCC	# of Samples > RDCSCC	Minimum Exceedance	Maximum Exceedance
Benzo[a]anthracene	0.9	13 (2)	.93	18.2
Chrysene	9	1	13.0	13.0
Benzo[b]fluoranthene	0.9	12 (2)	1.1	11.0
Benzo[k]flouranthene	0.9	11 (2)	.96	12.7
Benzo[a]pyrene	0.66	15 (15)	.73	14.8
Indeno[1,2,3-cd]pyrene	0.9	7 (1)	.99	6.46
Dibenz[a,h]anthracene	0.66	2 (2)	1.34	2.64

All results given in parts per million
(2) = Number of samples exceeding the NRDSCC

(PAP-00078651)

AOC 32 Building Southwest of Mercerizing Building

According to the RI Report No. 3, surface samples collected from within the perimeter of the former building exceeded the residential SRS. Additional sampling to a depth of 3 ft bgs was performed in 2006 (PAP-00078652), and PAHs exceeded in these samples as well. The maximum reported concentrations are below:

Compound	RDCSCC	# of Samples > RDCSCC	Minimum Exceedance	Maximum Exceedance
Benzo[a]anthracene	0.9	11 (1)	1.05	175
Chrysene	9	1 (1)	115	115
Benzo[b]fluoranthene	0.9	10 (1)	1.21	102
Benzo[k]flouranthene	0.9	9 (1)	.902	116
Benzo[a]pyrene	0.66	15 (15)	.74	131
Indeno[1,2,3-cd]pyrene	0.9	9 (1)	.93	64.4
Dibenz[a,h]anthracene	0.66	1 (1)	17.5	17.5

All results given in parts per million
(1) = Number of samples exceeding the NRDSCC

(PAP-00078653)

AOC 34: Sump Pit

As discussed in the RI Report No. 3, a site map from 1951 identified a sump pit located in the basement. The area of the former sump pit was investigated in 2005 with soil samples collected from the surface (PAP-00078653). Benzo(a)pyrene was detected above the SRS and additional sampling to 3 ft bgs was performed in 2006. PAHs concentrations exceeded the residential SRS in 5 of 17 samples with maximum detections as follows (PAP-00078654):

Compound	RDCSCC	# of Samples > RDCSCC	Minimum Exceedance	Maximum Exceedance
Benzo[a]anthracene	0.9	3	.98	1.33
Benzo[b]fluoranthene	0.9	2	1.06	1.15
Benzo[k]flouranthene	0.9	1	1.0	1.0
Benzo[a]pyrene	0.66	5 (5)	.70	1.24

All results given in parts per million
(5) = Number of samples exceeding the NRDSCC

(PAP-00078654)

AOC 37: Dye Storage and Matching Room

As discussed in the 2014 Supplemental RIR, this room was part of the former Mercerizing Building. Characterization and delineation activities identified PAHs at concentrations above the residential SRSs beneath the footprint of the former building (PAP-00079508). The RI Report No. 3 noted that two soil samples were analyzed for metals and detected lead up to 53.5 ppm, copper up to 24.0 ppm, and mercury up to 0.397 ppm (PAP-00078735). Additional soil samples were collected and analyzed for PAHs, a maximum PAHs concentrations in soil sample were as follows:

Compound	RDCSCC	# of Samples > RDCSCC	Minimum Exceedance	Maximum Exceedance
Benzo[a]anthracene	0.9	6	1.21	3.03
Benzo[b]fluoranthene	0.9	6	.79	2.39
Benzo[k]flouranthene	0.9	5	1.12	2.22
Benzo[a]pyrene	0.66	6 (6)	1.1	2.74
Indeno[1,2,3-cd]pyrene	0.9	5	.92	1.4

All results given in parts per million
(x) = Number of samples exceeding the NRDSCC

(PAP-00078656)

AOC 41 & 42: Buried Asbestos/Parking Lot Area between AOC 1 and AOC 14

As identified by the 2014 Supplemental RIR, these AOCs were merged during remedial actions performed in 2007 due to their close proximity to each other. The 2014 Supplemental RIR stated that copper and PAHs were initially detected at concentrations above the applicable residential soil standards. The October 2007 excavation activities mitigated the metal-impacted soil (PAP-00079509).

AOC 43 Suspected Wastewater Treatment Tank West of Former Bleach House

According to the 2014 Supplemental RIR, the entire concrete base of the tank was observed to be of sound construction, with the exception of the area that had been removed during the previous remediation activities in AOC 14. The fill material (wood, metal and soil) overlying the tank removed for a total of 516.62 tons of soil removed and disposed from this AOC. Soil sampling did not detect concentrations above SRS (PAP-00079509).

Greenway Characterization

In 2012, surface soil sampling was performed to determine if the area adjacent to the former development was impacted by Historic Fill contamination. Lead was detected at 763 ppm, above the residential SRS, in one sample. A 4 feet by 4 feet area was excavated and lead was detected below the residential SRS. PAHs were also detected above the residential SRSs, but were noted to be addressed by the Deed Notice (PAP-00079510).

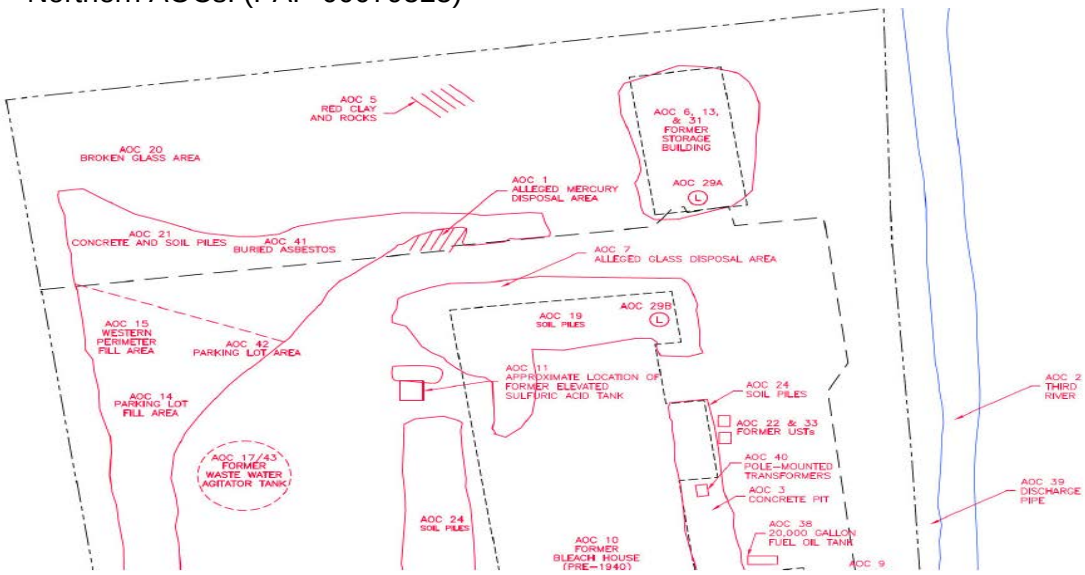
Coats & Clark Inc. (Bloomfield)

Diamond Alkali OU2 Allocation

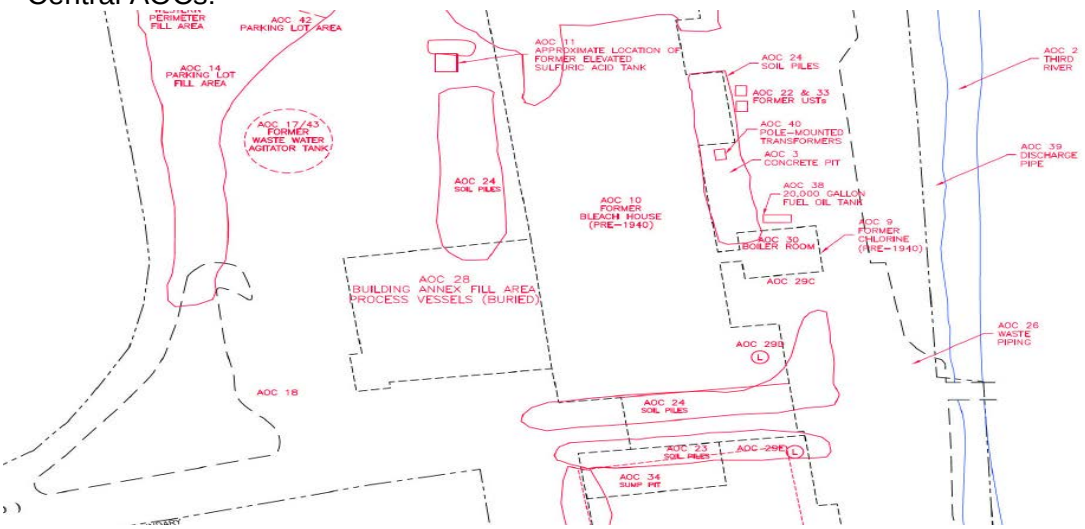
ADR Confidential

Facility Data Report

Northern AOCs: (PAP-00079525)



Central AOCs:



Southern AOCs:



Sediment and Surface Water

Sediment and surface water samples were collected in 1988 and 2000 from locations upstream, midpoint (adjacent to the facility discharge pipe), and downstream from the facility. It was concluded that surface water and sediment concentrations were not attributable to site conditions, because contaminants were detected in both upstream and downstream sediment and surface water samples. In addition, in 2000, the highest concentrations were detected in the upgradient sediment sample (copper at 45 ppm, lead at 247 ppm, and mercury at 0.547 ppm) compared to the downgradient sediment sample (copper at 6.48 ppm, lead at 27.1 ppm, and mercury at 0.463 ppm) (PAP-00080806-07; PAP-00076114, 169).

Remedial Activities

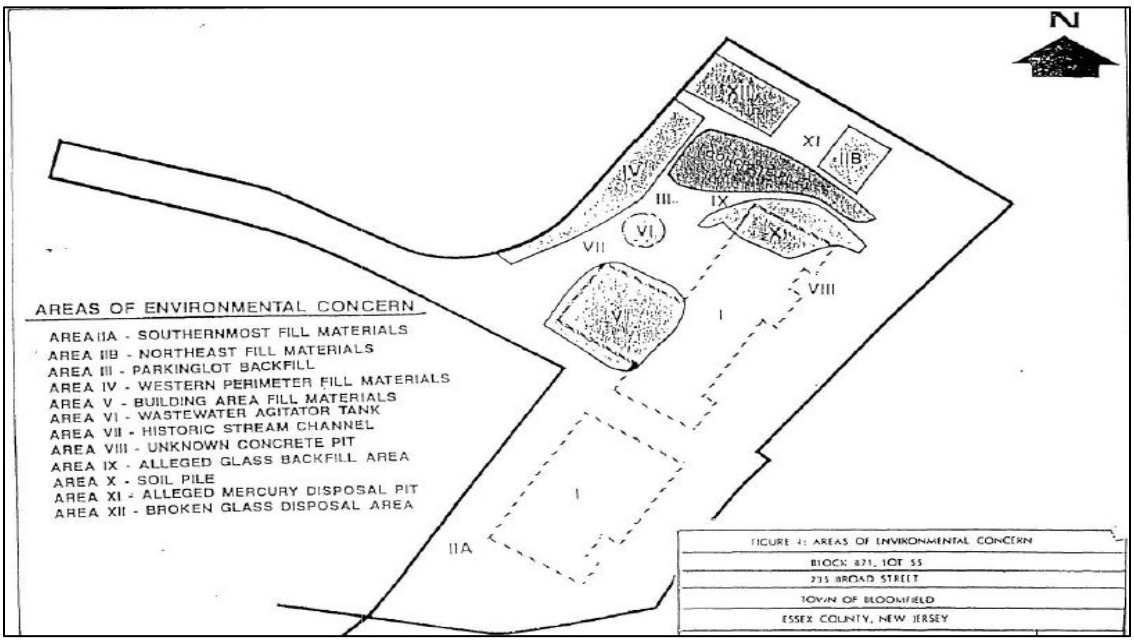
Investigation at the site was initiated in 1982 with a site inspection performed by the Environmental Protection Agency (EPA) in response to a complaint of previous on-site mercury disposal against SGA (PAP-00075885), the unrelated operator of the site after Clark. Another complaint was lodged in 1984, claiming the facility was discharging mercury into the Third River (PAP-0007588, 96). The subsequent inspection by NJDEP found that SGA was discharging cooling water and boiler blowdown to groundwater of the State (PAP-00075897). The facility then connected this discharge to the sanitary sewer (PAP-00075899).

In 1986, a Potential Hazardous Waste Site Preliminary Assessment was performed in response to the two complaints about mercury disposal at the site by SGA (PAP-00075883). The mercury disposal pit was noted to be a general dumping ground, as fragments of clay pipes and other wastes were observed (PAP-00075905). In addition, eight surface soil samples were collected along the Third River and analyzed for mercury. Only one sample collected near the Third River at the southern end of the site detected mercury at 0.04 mg/kg (PAP-00075918).

A Final Draft Site Investigation Report, dated March 30, 1990, documented the collection of five soil samples, three sediment samples, three surface water samples, and three groundwater samples during a site inspection performed July 26, 1988. The five soil samples were collected from areas of obvious disturbance at the northeast end of the site to address the mercury disposal pit (PAP-00080796); PAHs, lead, and mercury were detected in soil samples (maximums of 1.2 ppm, 87.8 ppm, and 0.68 ppm, respectively). Sediment and surface water samples were collected from locations upstream, midpoint (adjacent to the facility discharge pipe), and downstream from the facility. PAHs and lead were attributed to off-site sources as both upstream and downstream sediment (PAHs and lead) and surface water (lead) samples detected these compounds. Mercury was detected in the downstream sediment sample (0.35 ppm), but was also detected in upstream (3.1 ppb) and downstream (0.4 ppb) surface water samples (PAP-00080806-8).

Phase I and Phase II Environmental Site Assessments were performed from 1992 to 1993 and identified seven types of areas of concern: the former building foundations, areas of fill, former wastewater treatment plant, unknown concrete pit, glass backfill

area, soil pile, and the alleged mercury disposal area (PAP-00075791). Sampling of these areas was performed from July to September of 1993 (PAP-00075771). The 1993 Phase II EA identified twelve specific areas of environmental concern to investigate (see figure below) (PAP-00075791). Mercury, copper, and lead were detected in the broken glass area found on-site (PAP-00075845).



(PAP-00075791)

The Remedial Investigation Addendum Report, dated December 23, 1998, reported results for soil and groundwater samples collected from the fill to delineate metals and PAH contamination previously detected (PAP-00080459). A Preliminary Assessment Report, dated August 17, 2000, documented contamination at the site and identified areas of potential concern (PAP-00081270). Remediation of contaminated areas was performed and documented in Progress Reports from 2000 and 2001 (PAP-00082107, PAP-00082382).

In 2003, the Site Investigation Work Plan identified 38 Areas of Concern (AOCs) for the site (PAP-00077858-9). According to a Technical Review Panel Decision Document, dated June 23, 2004, there were 41 AOCs identified at varying stages of remediation or no action. A Memorandum of Agreement (MOA) had been executed October 28, 1993, with Leo Realty, the property owner/developer. This MOA was terminated and a second MOA was executed July 17, 2001, with Clark and SGA to address the contamination associated with their operations. A third MOA was executed August 6, 2003, with Leo Realty for several Areas of Concern (PAP-00078075).

A Remedial Action Workplan, dated June 11, 2003, was prepared for the site to be addressed by Clark and SGA (PAP-00077781). The AOCs to be addressed by Leo Realty included the areas associated demolition debris piles and with former USTs. A Site Investigation Workplan, dated December 2003, was prepared for these AOCs (PAP-00077856).

Results for the investigations performed for Clark and SGA were reported in a Remedial Investigation Report No. 2 with Proposed Remedial Investigation/Action, dated April 14, 2006, and a Remedial Investigation Report No. 3 with Proposed Remedial Investigation/Action, dated January 18, 2007 (PAP-00078095, PAP-00078610). Results for the AOCs addressed by Leo Realty were reported in a Remedial Investigation Report/Remedial Action Workplan, dated September 2007 (PAP-00078766).

In 2010, a Draft Remedial Action Report & Draft Remedial Action Workplan was prepared for ongoing remediation at several of the Clark and SGA AOCs (PAP-00078936). On May 4, 2012, the NJDEP issued a No Further Action (NFA) letter assigning unrestricted use to the following AOCs: 2, 5, 6, 7, 9, 10, 11, 13, 14, 16/28, 17, 18, 26A, 26B, 26C, 27, 29A, 29F, 30/38, 31, 35, 36, 39, 40, and 44 (PAP-00079474-5).

A Supplemental Remedial Investigation Report, dated May 2014, summarized the status of the 44 AOCs and submitted a draft Deed Notice for the contamination to be left on-site (PAP-00079489). The 2014 Supplemental RIR concluded that a large area of the property is contaminated with PAH compounds above the residential SRSs, and this contamination is not attributable to site-specific operations. Instead, the contaminants were suggested to be related to the use of fill materials (both soil and construction debris) that were contaminated prior to use at the site to level the property (PAP-00079510). All of the elevated concentrations of lead and PCBs in soil were delineated and removed through excavation activities in April of 2013. The low level metals and PAHs left in place were addressed with engineering and institutional controls (PAP-00079512).

A Remedial Action Report, dated March 2017, documented the engineering and institutional controls at the site, including a chain link fence, signage, and the Deed Notice (PAP-00080188).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

COATS & CLARK INC.

Facility Name, Address and Size: Clark Thread Company, 900 Passaic Ave, East Newark, New Jersey (East Newark mill); and 260 Ogden Street, Newark, New Jersey (Newark mill; note that Ogden Street is now McCarter Highway at this location; PAP-00726282). The facilities were located on either side of the Passaic River and across from each other (PAP-00726275) and were part of a single integrated mill that expanded from Newark to East Newark over time (PAP-00726430-31). The facilities ranged from 4.7 acres in 1865 to 17.1 acres in 1920 (PAP-00726273-86). There were 1,500 employees of Clark Thread Company in 1877 (PAP-00725688).

1. **Business Type:** Production of cotton thread, including combing, carding, spinning, winding, and twisting raw cotton into thread ("dry operations"). Thread was then washed, bleached, dyed and/or mercerized ("wet operations"), after which thread was finished and spooled for sale (PAS-00027138, PAS-00027119).

2. **Time Period of Ownership/Operations**

Operator: Clark Thread Company

Facility	From	To
Newark mill	1865	1947
East Newark mill	1880	1931

Owner: Clark Thread Company

Facility	From	To
Newark mill	1865	~1989
East Newark mill	1880	1935

Clark Thread Company (Clark) was started by George A. Clark and his brothers in 1865 as the Passaic Thread Co., according to *Records of The Clark Thread Co, thread manufacturers, Newark, New Jersey, USA*, from the University of Glasgow. The name was changed to Clark Thread Co. in 1866 (PAS-00027106). However, an undated document titled *History of the Clark Thread Company Newark in USA, Buildings Erected* noted that the original five-story Finishing & Spooling Mill was constructed on Passaic Street in Newark in 1860. The document listed the Spool Making Mill, Machine Shop, Cotton Stores, and Picker House as built at this location in 1865. In 1873, the Bleach & Dye House was built, and in 1880, an extended Spinning Mill & Dyehouse was constructed. According to this document, additional buildings were added to this mill complex through 1922 (PAP-00725685).

An article from a website on the Clark Thread Company Historic District, a U.S. National Historic Landmark District, identified the mill buildings in East Newark as built in 1875 (PAS-00027104). However, the undated document titled *History of the Clark Thread Company Newark in USA, Buildings Erected* noted the Spinning & Twisting Mills and Spool Making Mill on Passaic Avenue in East Newark were constructed in 1880. This document listed buildings constructed at this complex through 1922 and the “O.N.T” letters added to the stack in 1923 (PAP-00725686).

According to *Records of The Clark Thread Co, thread manufacturers, Newark, New Jersey, USA*, from the University of Glasgow, Clark merged with The Clark Mile-End Spool Cotton Co in 1917 (PAS-00027106).

A letter dated September 22, 1922, discussed a new dyehouse to be installed in Bloomfield (New Jersey), and noted that machinery and handboxes in use at the Newark and East Newark dyehouses could be transferred to Bloomfield (PAP-00725940-41).

An article on the history of the Borough of East Newark stated that Clark abandoned its East Newark operations in 1931 (PAS-00027135). An article on the Mt. Prospect neighborhood in East Newark from HelloChicago.com stated that Clark's East Newark operations were sold in 1935. This article also noted the operations were moved to the Clark plants in Georgia when the Newark factory was closed in 1947 (PAS-00027129).

A patent was submitted by Clark in the 1940s for a traveler for ring spinning and twisting frames used in textile manufacture. The address for Clark was the Ogden Street address in Newark (PAS-00027075).

An online article from the Coats website listed J. P. Coats and the Clark Thread Co. as merging to become Coats & Clark Inc. in 1952 (PAS-00027111). Sanborn maps from 1973 and 1989 included a building at the Newark site between Passaic Street and McCarter Highway labeled as the Coats & Clark, Inc. Research Lab (PAP-00726279-80).

3. Operational History/COC Use and Presence at the Facility

According to an article from the Coats.com website, in the 1860s, George Clark developed a six-cord, soft finished thread suitable for sewing machine use. The thread was called "Our New Thread," and became known as O.N.T., the trademark for the Clark Thread Company product (PAS-00027110).

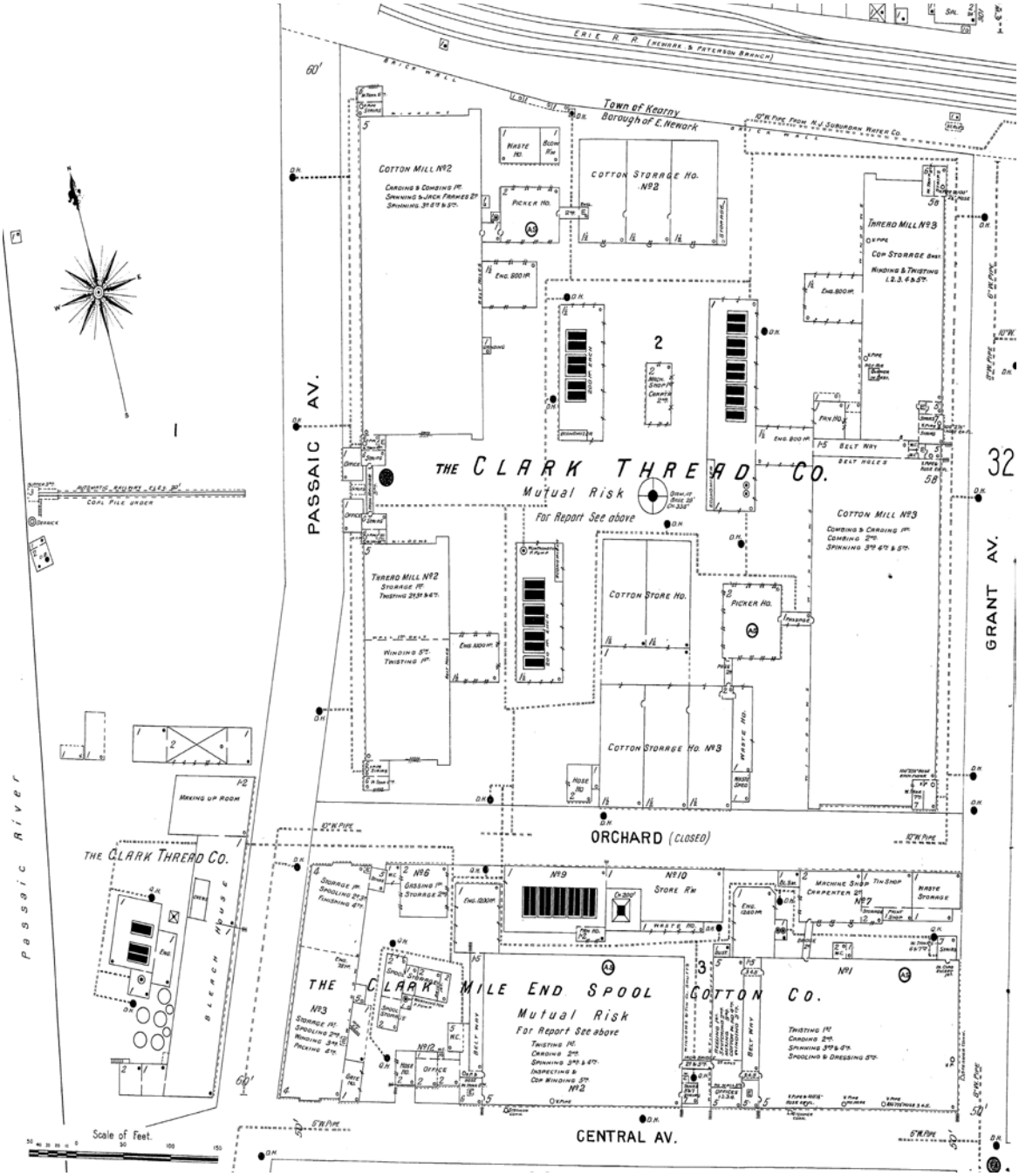
According to a Sanborn map from 1907 (see below), Clark operated the East Newark mill complex on Passaic Avenue just east of the Passaic River, west of Grant Avenue, and south of the Erie Railroad. The complex included a cotton mill for combing, carding, spinning, winding, and twisting, as well as the thread mill for twisting and winding. Additional buildings are labeled as cotton storage and picker houses, and a bleach house was located west of Passaic Avenue and near the Passaic River. The complex also included the Clark Mile End Spool Cotton Company, which contained spooling, twisting, carding, and spinning operations. A machine shop, tin shop, and waste storage area were located at Orchard and Grant Avenue (PAS-00027138).

Coats & Clark Inc. (Newark)

Diamond Alkali OU2 Allocation

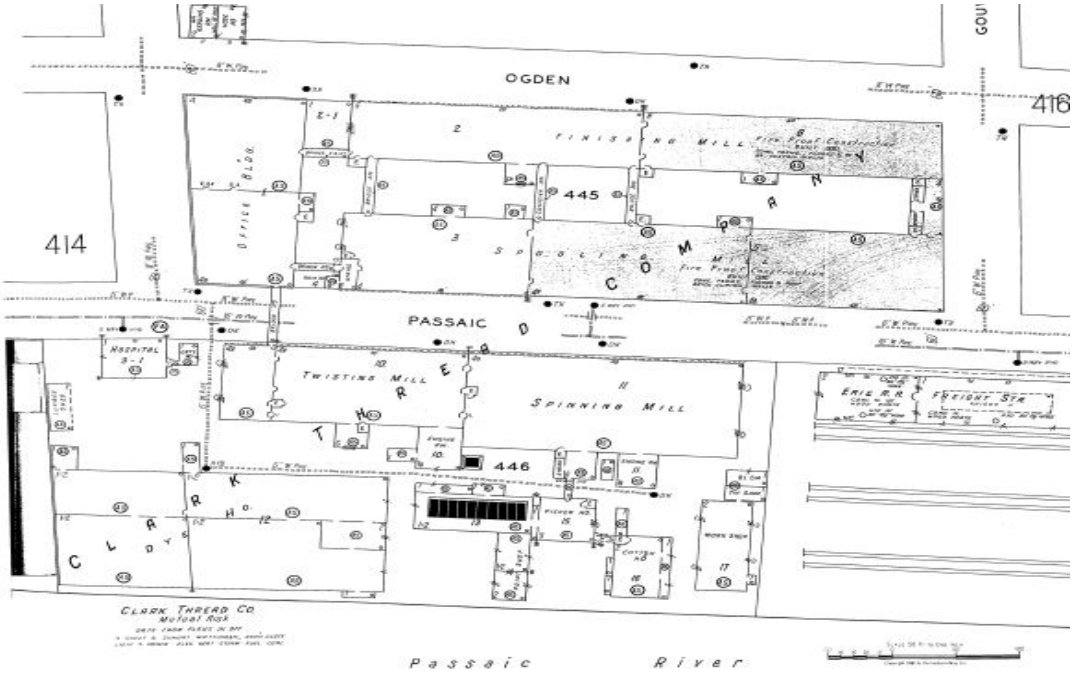
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Facility Data Report



(PAS-00027138)

According to a Sanborn map from 1931, Clark operated a mill complex on Ogden and Passaic Streets in Newark. This complex included a twisting mill, spooling mill, spinning mill, and finishing mill. In addition, the dye house was located along the west bank of the Passaic River. Other smaller buildings included the paint shop, picker house, cotton house, work shop, tin shop, and a hospital (PAS-00027119).



(PAS-00027119)

A letter to Mr. Clark, dated January 10, 1905, discussed the Bleaching Department at an unidentified mill softened 2,095,193 pounds of thread in 1901, 2,482,035 pounds of thread in 1902, and 1,679,228 pounds in 1903 (PAP-00725692).

Several documents identified copper sulfate as used as part of the dyeing processes. However, the documents are undated, so it is not clear when or for how long these processes were used. In addition, information for the use of these processes at the Newark and East Newark sites specifically is not available in the references. For example,

- An undated letter titled “Diazo Black” identified 1/7 pounds of copper sulfate used per 1,000 pounds of thread. The author and recipient of the letter were not identified (PAP-00725678-79).
- The process for dyeing yarn using the “O.N.T Method of Dyeing Logwood Black” by the Clark Thread Co. identified the “Fixing bath” as consisting of 1,000 gallons of water and 7 pounds of copper sulfate (PAP-00725680).
- Procedures labeled “Laboratory – Anchor Mills” listed copper sulfate as used as part of the Aniline black dyeing method (PAP-00725683-84).

A Passaic Valley Sewerage Commissioners (PVSC) report dated August 20, 1925 identified Clark Thread Newark and East Newark as one of the parties abating pollution to the Passaic River by moving its dyeing and mercerizing operations from Newark to Bloomfield, where it was noted that a treatment plant was in operation. The report noted that as of August 1925, "the removal has not been entirely accomplished but will shortly be complete" (PAP-00128116, 18).

A letter from the PVSC dated February 6, 1926, documented the companies that polluted the Passaic River. "Clark's Thread Mill" in Newark and East Newark was listed as a firm known to be polluting the river at that time. The company's business was noted to be dyeing thread, and the pollution was identified as "weak dye waste" (PAS-00027177-78). This was reported to be resolved by November 28, 1926, when the PVSC letter report noted Clark Thread had completed its move of wet operations to Bloomfield (PAP-00129824).

An undated newspaper article from The Independent Press stated that the East Newark plant used to spin the thread until the plant in Georgia opened in 1930. The article also stated that all thread was bleached and dyed at the Bloomfield plant and then finished and boxed for the market at the Newark plant since 1930 or earlier (PAP-00725687).

A Remedial Investigation Report, dated February 24, 2017 (2017 RIR), investigated a 2.16-acre area west of Passaic Avenue in East Newark along the Passaic River. The site was investigated for BASF Catalysts, LLC, (BASF) who had owned and operated a chemical processing plant for precious and non-precious metals at the site in 2006 (PAP-00080248, 58). Based on the 1907 Sanborn map, this site was the former location of the bleach house when Clark owned the site prior to selling the property in 1935 (PAS-00027129, 38).

The 2017 RIR stated that the investigation included semi-volatile organic compounds (SVOCs) as potential contaminants of concern because thread making operations often used aniline dyes that were coal-tar based. However, there was no specific information in the historical records indicating SVOCs were used in Clark's operations at its bleach house location that became the BASF site. In addition, according to the RIR, the July 2009 Preliminary Assessment (PA) identified over 140 Areas of Concern (AOCs), but none of the AOCs were associated with the pre-1935 mill complex operations (PAP-00080258). SVOCs may include PAHs.

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

PCBs

No information for the use or presence of PCBs at the Clark Newark facility was noted in the available file material. However, the 2017 RIR characterized and delineated PCB contamination in soil at the BASF site (former bleach house for Clark in East Newark). A cluster of detections was noted near the eastern property line (PAP-00080287). As reported in the 2017 RIR tables, the highest detection of PCBs in soil was 8.7 mg/kg (tables do not have Bates numbers; see p. 140 of 2017 RIR pdf). The RIR stated that none of the over 140 AOCs identified in the 2009 Preliminary Assessment were associated with the pre-1935 mill complex operations (PAP-00080258).

According to the report on Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor, dated February 2005, manufacturing of dyes and pigments could inadvertently produce PCBs in the order of micrograms/kilogram (µg/kg) (PAS-00027172). In addition, manufacturing of diarylide pigments and phthalocyanine crude and pigments produced or contained concentrations of PCBs that were high enough to cause concern with meeting the EPA's ban on materials containing 50 ppm PCBs proposed in 1978. It was further stated by testimony of the Dry Colors Manufacturer's Association (DCMA) that some pigment products contained more than 500 ppm PCBs at that time (PAS-00027247-50).

Information provided with DCMA's testimony in 1978 noted that diarylide yellow pigment was patented in 1911 and used commercially starting in 1938 (PAS-00027327). In addition, phthalocyanine blue and green pigments were introduced in the United States in the early 1940s (PAS-00027357). According to the National Paint and Coatings Association, diarylide yellow pigments were used in the textile industry (PAS-00027346). However, the available references provided for Clark included lists of dyes purchased in 1941 (PAP-00726415-18) and basic colors of dyes used for nylon thread in 1945 (PAP-00726425). The phthalocyanine blue and green and diarylide yellow pigments were not identified as being used at the site in the available file material for Clark.

Dioxins and Furans

According to the report on Pollution Prevention and Management Strategies for Dioxins in the New York/New Jersey Harbor, August 2006, approximately 40% of textile dyes and pigments are chlorinated or brominated compounds, and these compounds can lead to the formation of dioxins during dyeing processes possibly due to the high temperatures and alkaline conditions during dyeing. The report identified potential releases to the environment from use of the pigments, inks, and dyes and the use (including washing of textiles), disposal, or recycling of the products (PAS-00027168).

According to the 1980 EPA report titled Dioxins: Volume III, Assessment of Dioxin-Forming Chemical Processes, temperatures at 145 degrees Celsius and higher can generate dioxins (PAP-00725710). Temperatures noted in Clark's recipes for dyeing silk and cotton thread were at boiling (212 degrees Fahrenheit/100 degrees Celsius) or less than 100 degrees Celsius (PAP-00725680; PAP-00725689; PAP-00728342-414). Note: 212 degrees Fahrenheit is less than 145 degrees Celsius, or 293 degrees Fahrenheit.

PAHs

The 2017 RIR stated that thread making operations often used aniline dyes that were coal-tar based, so soil samples were analyzed for SVOCs. However, there was no specific information in the historical records indicating SVOCs were used in Clark's operations at its bleach house that became the BASF site (PAP-00080258). The results of soil samples collected from the BASF site stated only PAHs associated with Historic Fill exceeded the residential direct contact soil remediation standards. Since these concentrations were within the levels expected for Historic Fill, any PAHs contamination in soil was attributed to Historic Fill (PAP-00080272-73) (see discussion of Historic Fill

below for a comparison of concentrations). The 2017 RIR stated that none of the over 140 AOCs identified in the 2009 Preliminary Assessment were associated with the pre-1935 mill complex operations (PAP-00080258).

Copper

Several documents identified copper sulfate as used as part of the dyeing processes at Clark. However, the documents are undated, so it is not clear when or for how long these processes were used. In addition, information for the use of these procedures at the Newark and East Newark sites specifically was not available in the references. For example,

- An undated letter titled "Diazo Black" identified "1/7 pounds" of copper sulfate as used per 1,000 pounds of thread. The author and recipient of the letter were not identified (PAP-00725678-79).
- The process for dyeing yarn using the "O.N.T Method of Dyeing Logwood Black" by the Clark Thread Co. identified the "Fixing bath" as consisting of 1,000 gallons of water and 7 pounds of copper sulfate (PAP-00725680).
- Procedures labeled "Laboratory – Anchor Mills" listed copper sulfate as used as part of the Aniline black dyeing method (PAP-00725683-84).

The use of Diazo Black was discussed in a letter to Mr. J. O. M. Clark, dated May 10, 1905, but the location of the Dyeing Department that used this dye is not specified (PAP-00726437).

A letter from J.P. Coats to Clark in Newark, dated August 5, 1929, compared two dyeing procedures for "Diazo Fast Black C.G." used at the Newark plant and at a Coats plant in Ferguslie. While the procedure at Ferguslie used copper sulfate, it was noted that the Newark recipe did not (PAP-00726269).

A 1933 Light Fastness Report identified a group of "Benzo Fast Copper Colors" that had good light fastness. Identified colors included Diazo Black O.T. and several colors that were noted to be "aftertreated" with copper sulfate. The report was prepared by J.&P. Coats of Glasgow and was submitted with the subject line of "Newark and Pawtucket, Dyeing – Light Fastness Report for 1933," but it is unclear if the materials and colors tested came from or were used at Newark (PAP-00726287-92).

According to the *Manual for the Dyeing of Cotton and other Vegetable Fibres* from 1936, the "aftertreatment" process for direct dyes that used copper sulfate This process utilized a bath consisting of 1 to 3% copper sulfate, as well as acetic acid or formic acid. Goods were treated in the bath at elevated temperature (120 to 140 degrees Fahrenheit) for half an hour and then rinsed (PAP-00726339).

Recipes for Aniline Black dyeing was provided in the *Dyeing With Coal-Tar Dyestuffs*, reprinted in 1947, and included copper sulfate and copper sulfide (PAP-00726424).

According to the Report of Martin Bide, Ph.D., Professor, Department of Textiles, Fashion Merchandising and Design, University of Rhode Island, Kingston, Rhode Island,

dated April 2019, "After the year 1900, Clark Thread used virtually no copper or other metal salts, because alternatives to logwood and aniline black – namely, developed direct and sulfur dyes – were introduced around that year and were quickly adopted" (PAP-00726463).

Lead

No information for the use or presence of lead at the Clark Newark facility was noted in the available file material. However, soil samples collected from the BASF site in East Newark (former location of the Clark bleach house) detected lead. The maximum concentration of lead detected in site soil was 1,770 mg/kg (see pdf p. 140 of the 2017 RIR), but lead was noted to have been related to BASF site activities. Sampling of Historic Fill at the BASF site yielded a maximum concentration of 458 mg/kg (PAP-00080271-72). The 2017 RIR stated that none of the over 140 AOCs identified in the 2009 Preliminary Assessment were associated with the pre-1935 mill complex operations (PAP-00080258).

Mercury

No information for the use or presence of mercury at the Clark Newark facility was noted in the available file material. Soil samples collected from the BASF site in East Newark (former location of the Clark bleach house) detected mercury. The maximum concentration of mercury detected in site soil was 509 mg/kg. However, mercury was noted to have been found in drums and was listed on a waste inventory from the BASF site Preliminary Assessment (PAP-00080280-81, 369). The 2017 RIR stated that none of the over 140 AOCs identified in the 2009 Preliminary Assessment were associated with the pre-1935 mill complex operations (PAP-00080258).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP[1].

The portion of the Newark mill located east of Passaic Street and along the Passaic River was on Historic Fill. At the East Newark mill, Historic Fill was only found along the railroad tracks to the north and west of Passaic Avenue, along the Passaic River.

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals,

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

Sampling of soil at the BASF site (former bleach house at Clark's East Newark mill) was performed during the 2017 RIR (PAP-00080248, 58, 63).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00080280, 92).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,770 mg/kg
Copper	588 mg/kg
Mercury	509 mg/kg
Benzo(a)anthracene	8.31 mg/kg
Benzo(a)pyrene	7.41 mg/kg
Benzo(b)fluoranthene	9.11 mg/kg
Benzo(k)fluoranthene	3.09 mg/kg
Dibenzo(a,h)anthracene	1.01 mg/kg
Indeno(1,2,3-cd)pyrene	4.44 mg/kg

5. COC Pathways

Sanitary and Storm Sewer

There is no information regarding sewer systems in the available file material.

Direct Release

A letter from the PVSC dated February 6, 1926 documented the companies polluting the Passaic River. "Clark's Thread Mill" in Newark and East Newark was listed as a firm known to be polluting the river instead of using a treatment plant or connecting to the sanitary sewer. The company's business was noted to be dyeing thread, and the pollution was identified as "weak dye waste" (PAS-00027177-8).

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

A report by the PVSC, dated August 20, 1925, and a PVSC *Report on the Status of Pollutions from Industrial Establishments*, dated November 28, 1926, noted that the pollution from the Newark and East Newark mills was abated when Clark moved the dyeing and mercerizing operations to the Bloomfield plant (PAP-00128118; PAP-00129824).

According to the Report of Dr. Bide, effluent from the scouring, bleaching, and mercerizing processes did not contain any COCs (PAP-00726447-49). Further, it was stated that textile mills in general used very dilute aqueous processes in which the ingredients were present in dissolved form. In the 1873-1949 timeframe, 40 to 110 gallons of water were typically used to produce one pound of thread (PAP-00726443).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

A PVSC letter dated February 6, 1926 identified “Clark’s Thread Mill” in Newark and East Newark as polluting the river instead of using a treatment plant or connecting to the sanitary sewer (PAS-00027177-78). A PVSC report dated August 20, 1925 identified Clark Thread Newark and East Newark as one of the parties abating pollution to the Passaic River by moving its dyeing and mercerizing operations from Newark to Bloomfield. The report noted that as of August 1925, the removal has not been entirely accomplished but will shortly be complete'" (PAP-00128118). This was reported to be resolved by November 28, 1926, when the pollution at Clark Thread Mill, Newark was noted to be eliminated or abated as dyeing and mercerizing were moved to Bloomfield (PAP-00129824).

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- 2017 Remedial Investigation Report (PAP-00080258)

The 2017 RIR was performed on a portion of the East Newark mill, at the location of the former Clark bleach house and a metal processing plant owned by BASF. According to the 2017 RIR, none of the AOCs identified at this site were associated with the pre-1935 mill complex operations (PAP-00080258).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

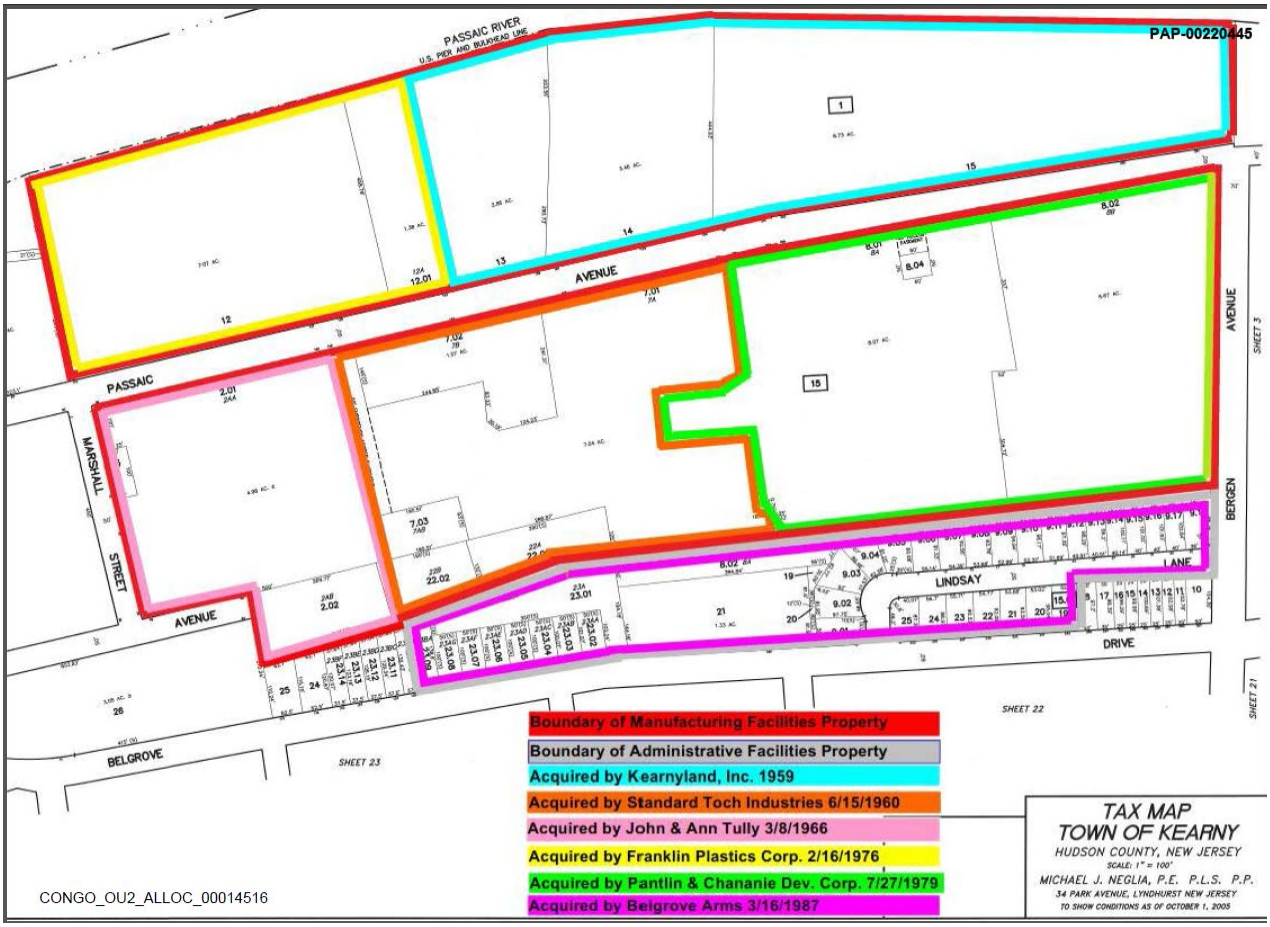
Congoleum Corp.

Diamond Alkali OU2 Allocation
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Facility Data Report

CONGOLEUM CORPORATION

Facility Name, Address and Size: The manufacturing facility formerly owned by entities named Congoleum located at 195 Belgrove Drive, Kearny, New Jersey, ("Kearny Facility") consisted generally of 6 parcels of property purchased over time (beginning in approximately 1886), and sold over time (beginning in 1959), with the last parcel being sold in 1987. All 6 parcels comprised approximately 66 acres (PAP-00233566-608). As reflected below in an Annotated 2005 Tax Map 5 of the parcels (outlined in **RED**) were used mainly in connection with manufacturing products (the "Kearny Manufacturing Facilities") and 1 parcel (outlined in **GREY**) was used for administrative purposes, housing an administrative building and a small lab. The Kearny Manufacturing Facilities were approximately 58.5 acres and the Kearny Administrative Facilities were approximately 7.5 acres (PAP-00724224).

The 2005 Annotated Tax Map shows that 4 of the Kearny Facility parcels were bordered by Belgrove Ave to the east, Passaic Avenue to the west, Bergen Avenue to the north and Marshall Street is to the south. In addition, 2 of the Kearny Facility parcels were located between Passaic Avenue and the Passaic River. The 2005 Annotated Tax Map identifies when the parcels were sold by various Congoleum entities, and the name of the purchasers.



(PAP-00220445)

Diamond Alkali OU2 Allocation
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In 1972, the facility (Kearny Manufacturing Facilities) employed 297 employees: 5 days a week; 1 shift per day producing linoleum and 2 shifts per day producing tile (PAS-00104990).

1. **Business Type:** Over the years, Congoleum entities manufactured straight line (plain, printed and inlaid) linoleum flooring, vinyl asbestos tile ("VT"), asphalt tile ("AT"), linoleum/vinyl wall coverings, vinyl desk tops, vinyl operating room flooring, pastes, waxes, adhesives and other materials and specific products for military use (tent cloth, aerial torpedo parts and grenades, mildew proof sandbags, linoleum, camouflage netting and synthetic leather, all manufactured for the military during World War II) at the Kearny Manufacturing Facilities Property (PAP-00233590; PAP-00403143).

2. **Time Period of Ownership/Operations**

Operator: Approximately 1886 – to 1974
Owner: Approximately 1886 – to 1979 (PAP-00220445)

Kearny Manufacturing Facilities

- Block 15, Lots 22.01, 22.02, 7.01, 7.02 and 7.03: Purchased by Congoleum entities in approximately 1886. (PAP-00220445).

- Block 15, Lots 2.01 and 2.02: Purchased by Congoleum entities in approximately 1886. This property was sold on March 8, 1966 to John and Ann Tully (PAP-00220431).

- Block 15, Lots 8.01, 8.02, and 8.04: Purchased by Congoleum entities in approximately 1886. This property was sold on July 27, 1979 to Pantlin and Chananie Development Corp., a New York Corporation, (PAP-00231009-012; PAP-00220428).

- Block 1, Lots 13, 14, and 15: Purchased over time by Congoleum entities beginning in 1886, with additional portions acquired in 1899, 1923 and 1924 (PAP-00448245-6; PAP-00448238; PAP-00448248; PAP-00448243). This property was sold by Congoleum entities to Kearnyland, Inc., prior to November 5, 1959 (PAP-00220437-40; PAP-00220445).

- Block 1, Lots 12 and 12.01: Purchased over time by Congoleum entities beginning in 1940, with an additional portion acquired in 1946 (PAP-00448252-56; PAP-0048259-60).). This property was sold on February 16, 1976 to Franklin Burlington Plastics. (PAP-00220445; PAP-00724242, 44, 50; PAP-00724224).

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

Kearny Administrative Facilities

- Block 15, Lots 8A, 9, 19, 20, 21 and 23A: Purchased by Congoleum entities in approximately 1886. This property was sold on March 16, 1987 to Belgrove Arms (PAP-00220445).

1886: Nairn Linoleum Company purchased a portion of the property making up the former Kearny Facility to manufacture plain imprinted linoleum (PAP-00233581).

1903: United Roofing & Manufacturing (United Roofing) organized as a wholly owned subsidiary of Barrett Co., Inc., and began manufacturing floor covering products in 1903 (PAP-00233581).

1911/1912: United Roofing began doing business as Congoleum Co., a division of Barrett Co., Inc. (PAP-00233581).

1916: Congoleum Corporation of PA was formed as a wholly owned subsidiary of Barrett Co., Inc., and all assets and liabilities of United Roofing were transferred to The Congoleum Corporation of PA (PAP-00233581).

1919: Congoleum Co., Inc. was formed, and all of the flooring business of Barrett Co., Inc., including The Congoleum Company of PA, was transferred to and operated as Congoleum Co., Inc. (PAP-00233581).

1920: Congoleum Co., Inc. purchased the stock of Farr & Bailey Manufacturing Co. (Farr & Bailey) (PAP-00233581).

1921: Congoleum Co., Inc. purchased Baltimore Roofing & Asbestos Co. (PAP-00233581-82).

1924: Nairn Linoleum Company merged with Farr & Bailey, and the company was renamed Nairn Linoleum Manufacturing Corporation. Nairn Linoleum Manufacturing Corporation was then acquired by and merged into Congoleum Co., Inc. The resulting company was named Congoleum-Nairn, Inc. (PAP-00233582). By deed dated October 31, 1924, Nairn Linoleum Company conveyed to Congoleum-Nairn, Inc. 19 parcels (PAP-00230958-68). Note: The deed does not provide the block or lot numbers only metes and bounds.

1940s: According to a Civilian Production Administration Report dated July 30, 1946, Congoleum-Nairn, Inc., was authorized to produce incendiary bombs, M-6 and M-7 grenades, fuses, torpedo air flasks and heads, and ammunition boxes between July 1940 and August 1945 (PAP-00232300).

1951: Congoleum-Nairn, Inc. purchased the following companies and/or assets between 1951 and 1968: Delaware Floor Products, Inc. (1951); assets of Sloan Blaban Corporation (1953); Patchogue Plymouth Mills Corp. and Loomweave Corp. (1955); Mersman Brothers, Inc. (1963); Lewis Carpet Mills (1967); Kinder Manufacturing Co. (1968) (PAP-00233582).

1956: There was a substantial reduction in the manufacture of straight line linoleum flooring at the Kearny Facility (PAP-00233590).

The production of straight line linoleum in Building 31 and Building 114 terminated in 1956 or 1957 (PAP-00724252; PAP-00403143).

1959: On November 5, 1959, Kearnyland, Inc. conveyed 2 parcels containing 8.7288 acres and 6.3165 acres, respectively to Vornado, Inc. a Kansas corporation (PAP-00220437-40). The 2005 Annotated Tax Map outlines this property in **BLUE** as Block 1, Lots 13, 14, and 15) (PAP-220445).

1960: On June 15, 1960, Congoleum-Nairn conveyed to Standard Toch Industries, Inc., a Delaware Corporation, Parcel 1 containing 2.2224 acres; Parcel 2 containing 3.1937 acres; Parcel 3 containing 5.1949 acres; and Parcel 4 containing 5.8599 acres (PAP-00220432-46). The property is outlined in **ORANGE** on the 2005 Annotated Tax Map as Block 15, Lots 22.01, 22.02, 7.01, 7.02 and 7.03 (PAP-00220445). This property was used by Bath-Congoleum entities in connection with the manufacture of linoleum (Building 31 and Building 114) (PAP-00724240; PAP-00724224; PAP-00724395; PAP-00403143). Following the sale of this property, the Kearny Manufacturing Facilities Property was reduced to approximately 23 acres (PAP-00724224).

1966: On March 8, 1966, Congoleum-Nairn conveyed a parcel of land to John and Ann Tully (PAP-00220431). The lot numbers are not available in the deed. The property is outlined in **PINK** on the 2015 Annotated Tax Map as Block 15, Lots 2.01 and 2.02 (PAP-00220445). This property was primarily operated by Bath-Congoleum entities as a recreational field (PAP-00724224; PAP-00724395). The Tullys and/or their successors ultimately developed this property as a “Shoprite” shopping center (PAP-00724224; PAP-00724395).

1968: Congoleum-Nairn, Inc., merged with Bath Industries, Inc., the merged entity changed its name to Congoleum Corporation (“1968 Congoleum”), and continued to own and operate the Kearny Manufacturing Facilities and Kearny Administrative Facilities (defined above) as they existed at the time of the 1968 merger (PAP-00219931-952).

On September 30, 1968, Congoleum-Nairn conveyed to Congoleum Industries two parcels of land (PAP-00230993-98). Note: The deed did not provide the block or lot numbers only metes and bounds, however, it can be concluded based on information provided that this conveyance was for the Kearny Facility.

1971: Linoleum manufacturing operations ceased in the early 1970s (PAP-0233590).

Tile manufacturing operations ceased in 1973 or 1974 (PAP-0233590). In a January 3, 1983 letter, Congoleum Corporation, Resilient Flooring Division stated that tile production had closed in the early 1970’s (PAP-00232303).

1975: On December 13, 1975, a Certificate of Ownership and Merger merging Congoleum Industries, Inc., a Delaware Corporation into Congoleum Corporation, a Delaware Corporation, was filed with the State of Delaware and the Resilient Flooring Operations were operated as a division of Congoleum Corporation (PAP-00231005-08; PAP-00233583).

1976: On February 16, 1976, Congoleum Corporation conveyed to Franklin Plastics, Block 1, Lot 12 (PAP-00220430). This property included Building 115, which was used by Bath-Congoleum entities in connection with the manufacture of AT and VT (PAP-00724242, 44, 50; PAP-00724224; PAP-00724395). Franklin Plastics and its successors used this property to operate a plastic manufacturing business that included, among other things, mixing various colorants, stabilizers and plasticizers with vinyl resin in a batch mixer to create an extruded plastic material (PAP-00055953).

1979: On July 27, 1979, Congoleum Corporation conveyed to Pantlin and Chananie Development Corp., a New York Corporation, Block 15 Lot 8 (PAP-00231009-012; PAP-00220428). This property is highlighted in **GREEN** on the 2005 Annotated Tax Map, and is identified as Block 15, Lots 8.01, 8.02, and 8.04 (PAP-00220445). This property was used by Bath-Congoleum entities in connection with the manufacture of linoleum (Building 2), linoleum cement (Building 8), and other products. (PAP-00724240-41; PAP-00724224; PAP-00724395; PAP-00403143). Pantlin and Chananie Development Corp., and/or its successors, ultimately developed this property as a strip mall and parking lot (PAP-00219971).

Following the sale of property to Pantlin and Chananie Development Corp., all "Kearny Manufacturing Facilities" property had been sold. The only Kearny Facility property that remained was the "Kearny Administrative Facilities" property (outlined in **MAGENTA** on the 2005 Annotated Tax Map (PAP-00220445).

1980-84: Between 1980 and 1984, 1968 Congoleum engaged in a series of corporate transactions that re-structured its businesses into different subsidiaries and divisions. As a result of this re-structuring, the assets and liabilities related to the Resilient Flooring Operations, including the liabilities associated with the Kearny Manufacturing Facilities, were transferred to a newly formed entity that was also subsequently named Congoleum Corporation ("1984 Congoleum"). 1968 Congoleum changed its name to Congoleum Industries, Inc. ("Congoleum Industries") and remained as the parent corporation of 1984 Congoleum (as well as other subsidiary businesses as part of the corporate restructuring) (PAP-00402979).

1986: Congoleum Industries determined to sell the certain, defined assets of several of its wholly owned subsidiaries to third parties, including certain defined assets of 1984 Congoleum. The sale of the certain defined assets of 1984 Congoleum's resilient flooring business was accomplished as follows:

1. 1984 Congoleum formed a new corporation on March 31, 1986 named Resilco, Inc. (PAP-00233561-3).

2. 1984 Congoleum then transferred to Resilco, Inc., the "Transferred Assets," defined as "all of the rights, properties, assets, and contracts . . . belonging to [1984] Congoleum and which are utilized in the business conducted by its Resilient Flooring Division on the date hereof . . . . ." (PAP-00402979; PAP-00219958-61).

3. Resilco assumed only those liabilities "directly related to the Transferred Assets existing as of the date hereof and the business conducted by [1984] Congoleum's Resilient Flooring Division on the date hereof." (PAP-00402979; PAP-00219958-61).

4. 1984 Congoleum transferred to Congoleum Industries all of the capital stock of Resilco and all of the rights, assets and businesses of 1984 Congoleum that were not transferred and assigned to Resilco, and Congoleum Industries expressly assumed "all other liabilities and obligations of [1984] Congoleum" that were not assumed by Resilco (PAP-00402979; PAP-00219953-7).

5. After completion of the transfer of those certain assets utilized in the resilient flooring business as of April 18, 1986, Resilco changed its name to Congoleum Corporation ("1986 Congoleum", aka Current Congoleum) (PAP-00402980; PAP-00233564-5).

6. Third party purchasers (Hillside Capital Incorporated) formed a new company named Resilient Acquisition Incorporated (PAP-00402980; PAP-00233553-7).

7. Resilient Acquisition Incorporated then "purchased" the Transferred Assets and assumed the liabilities "directly related to the Transferred Assets existing as of [April 18, 1986]" via a merger into 1986 Congoleum, aka Current Congoleum (PAP-00402980; PAP-0233382-489).

8. 1984 Congoleum merged into Congoleum Industries (the selling parent company), Congoleum Industries changed its name to BIW Industries, Inc. and then BIW Industries merged into Bath Iron Works Corporation ("BIW"). (PAP-00402980; PAP-00233558-60).

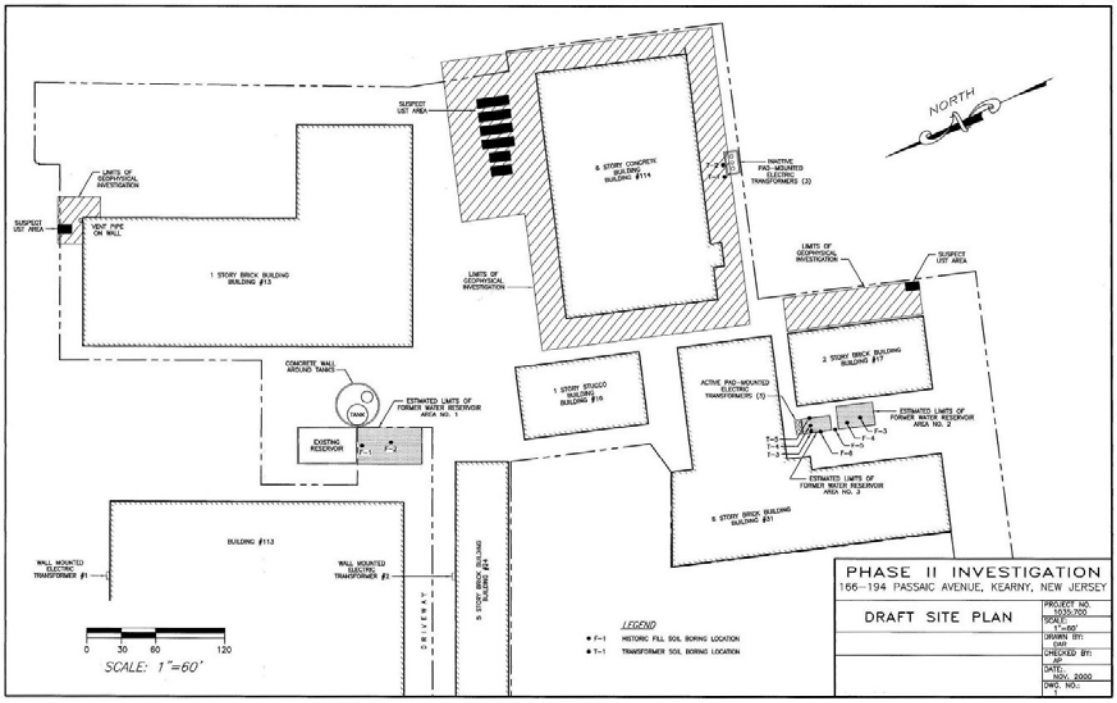
1987: On March 16, 1987, Current Congoleum conveyed to Belgrove Arms, a New Jersey General Partnership, lots 8A, 9, 19, 20, 21, and 23A in Block 15, outlined in MAGENTA on the 2005 Annotated Tax Map (PAP-00219963; PAP-00220445).

2003: Current Congoleum Corporation filed a petition for relief under Chapter 11 of the Bankruptcy Code on December 31, 2003 (PAP-00448162).

DVL Property Tenant History

As noted above, on June 15, 1960, the DVL Property was purchased from Congoleum-Nairn (PAP-00220432-46; PAP-00233641). These parcels are outlined in **ORANGE** on the 2005 Annotated Tax Map (PAP-00220445), and include Block 15, Lots 22.01, 22.02, 7.01, 7.02 and 7.03.

According to a 2000 Phase I ESA (PAP-00219965-427) and a 2002 RI Workplan Report (PAP-00220527-635) drafted by Peak Environmental, Inc., ("Peak") a DVL consultant, a portion of the DVL Property is an irregularly shaped parcel, 7.981 acres in size, located in a mixed commercial, industrial, and residential area of the Town of Kearny, Hudson County, New Jersey. At the time these reports were drafted, Peak noted that the property included eight buildings used for commercial, office, and storage space by DVL (PAP-00219969; PAP-00220533). The Peak reports also noted that seven structures were located on the site containing eight separate buildings identified as Building Nos. 12, 113,13, 24, 16, 114, 31, and 17 (PAP-00219972). Prior to the 1960 purchase of the DVL Property, these buildings were associated with straight line linoleum manufacturing operations of Congoleum-Bath entities (PAP-00219969; PAP-00220533). Since 1960, the buildings on the DVL property have been leased to various tenants, with associated driveways, loading/unloading areas, and parking lots (PAP-00219971). See the Site Plan below, which displays some, but not all of the DVL Property.



(PAP-00231560)

According to Peak, structures associated with the Congoleum facility north of the DVL Property (the property sold to Pantlin and Chananie Development Corp., highlighted in **GREEN** on the 2005 Annotated Tax Map (PAP-00220445) were demolished in the 1970's, and a strip mall and parking lot were constructed (PAP-00219971).

Information regarding entities that owned and/or leased space on the DVL property is summarized below:

- Talon Adhesives Co. leased portions of Building 114 and Building 31 from DVL from at least 1963 through at least the mid-1970s (PAP-00219985-986; PAP-00232838). Talon, which manufactured adhesives and stored them on site, purchased at least 120 pounds of Aroclor 1254 in 1966 and at least 1,800 pounds of Aroclor 1254 in 1968 (PAS-00104771; PAP-00207161-62, 87, 94). In 1963, Talon arranged to install four 10,000-gallon solvents tanks and two 6,000-gallon solvents tanks at Building 114 (PAP-00219985-986). Talon was also engaged in sloppy business practices resulting in documented releases, including from 55-gallon drums of waste chemicals stored on the DVL property (PAP-00219986).

- In a June 4, 1963 letter to the Kearny Fire Department, Double Bond Products Corporation (Double Bond) stated that they planned to occupy Building No. 114 of the DVL Property. Double Bond stated that “Red label” solvents will be consumed including hexane, toluol and methyl ethyl ketone. It was planned that a tank farm for 36,000 gallons would be installed (PAP-00232598).

- Nortech Adhesive Corporation (“Nortech”) leased property from DVL. (PAP-00233295; PAP-00232588). Nortech manufactured non-flammable no-red adhesive and red adhesive, both of which were likely to contain PCBs (PAP-00233295). In a June 7, 1978 letter to the Kearny Fire Department, Nortech stated that it would occupy half of Building No. 114 with the greater percent of manufacturing operation using non-red label adhesive (PAP-00232588). Handwritten correspondence dated August 18, 19 and 20, 1981 states that numerous chemical containers, drums, bottles and cans containing hazardous materials and “adhesive paper labels,” apparently abandoned by Nortech or Talon, remained within different areas of Buildings 31 and 114 in 1981 (PAP-00220352-5).

- According to a Certificate of Occupancy signed on June 12, 1992, Ameritraf Transformer Distributors was leasing Building No. 31. Ameritraf Transformer Distributors used Building No. 31 as a warehouse for new Power Transformers (PAP-00232306). In 1993 an inspection by Kearny Fire Department Bureau of Combustibles was attempted at Building No. 31 but the building was locked and it was noted that the company was out of business (PAP-00232305).

- According to the 2000 Peak ESA, Royal Arts is listed as a tenant of Building No. 13 in 1983 (PAP-00219986). Royal Arts is listed as the owner on a UST permit for a 550-gallon No. 2 fuel oil UST originally installed in 1973 (PAP-00219986). This UST corresponds with the presence of a vent pipe at the northeast comer of Building No. 13 as referenced in the report (PAP-00219986).

- According to a Preliminary Assessment Report for Munire Furniture, Block 15, Lot 7A prepared by Peak Environmental Inc., dated January 2008, (2008 Peak PAR) Munire Furniture occupied Building No. 113 from October 1995 until April 2007 (PAP-00231759). Operations at the facility included the cutting of wood to specified sizes, the staining and finishing of wood, and the assembly of furniture products. Finished products are transported, off-site to independent furniture retailers (PAP-00231773).

- Franklin Plastics leased 20,000 square feet of space on the DVL property (PAP-00724225, 30).

- Toch Brothers, located in Kearny, New Jersey, is believed to be a predecessor of DVL. Toch Brothers purchased 4,000 Pounds of Aroclor 1254 in 1962. (PAP-0040331).

3. Operational History/COC Use and Presence at the Facility

Congoleum-Bath manufactured straight line (plain, printed and inlaid) linoleum flooring, VT, AT, battleship linoleum, linoleum/vinyl wall coverings, vinyl desktops, vinyl operating room flooring, pastes, waxes, adhesives and other materials and specific and specific products for military use (tent cloth, aerial torpedo parts and grenades, mildew proof sandbags, camouflage netting and synthetic leather all manufactured for the military during World War II) at the Kearny Manufacturing Facilities property. Raw materials included vinyl resins, plasticizers, stabilizers, limestone, pigments, oils and fillers (PAP-00233590).

Between 1886/1888 and into, possibly, the early 1970s, the Kearny Facility manufactured six-foot rolled/straight line linoleum flooring (battleship linoleum, linoleum/vinyl wall covers, vinyl desktops and vinyl operating room flooring) (PAP-00233590).

Linoleum production at the Kearny Facility, took place in Building 2, Building 31, Building 114, and other areas of the Facility. (PAP-00724240; 50). Linoleum production at the Kearny Facility started in Building 2, and Building 31 was most likely built in the 1920's, when Congoleum-Nairn bought its straight line linoleum processing equipment, because Building 31 housed that equipment (PAP-00724250).

Linoleum products followed the same basic formula throughout the years, which generally included only natural ingredients, a "cement" - linseed oil- as a binder, fillers including wood flour, kauri gum, resins, cork and calcium carbonate (limestone), and color pigments. When linseed oil was used to produce linoleum, it was already gelled or partially oxidized, and was not a liquid (PAP-00724251). Lead may have been used in pigments as part of the production of linoleum (PAP-00233588).

Manufacturing that was done in Building 31 was straight line, meaning that the manufacturing equipment was arranged in a single straight line. The product went directly from the manufacturing equipment into an oven. Building 114 was a "stove" or "oven" building. The ovens had high walls in which the linoleum was hung, or

"festooned" on rollers to cure. No liquids dripped off of linoleum during its production, including the hanging in the stoves. The linoleum was like a soft dough but was not wet to the touch. The linoleum did not touch the floor or walls, which would have ruined the appearance of the flooring (PAP-00724251).

Between 1956 and 1957, the Kearny facility substantially reduced production of rolled/straight line linoleum as a result of declining consumer demand for linoleum. (PAP-00233590; PAP-00724252) Accordingly, it is very unlikely that any new linoleum product was introduced at the Kearny Facility at any time after 1950 (PAP-00724252).

Adhesives produced at the Kearny facility were standard floor adhesives that used lignin as anti-fungicide filler and small amounts of mercury as an antibacterial agent (PAP-00233591). In the 1950s, adhesives were manufactured in Buildings 8, 10, and 11. Waxes were carnauba-based waxes. Manufacturing of adhesives ceased in the mid to late 1960s (PAP-00233591).

From the late 1950s through until approximately 1973 and 1974, the Kearny Facility produced VT (PAP-00233590). VT was manufactured in Building 115 at the Kearny Facility. VT was never manufactured at any other area of the Kearny Plant (PAP-00724242).

The ingredients of VT before and after 1955 at the Kearny Facility generally included limestone, asbestos, non-fibrous talc, vinyl copolymer resin (Poly Vinyl Chloride and Poly Vinyl Acetate), a stabilizer (Liquid Nuodex 863-a barium/zinc compound), a plasticizer (Santicizer 160/butyl benzyl phthalate, epoxidized soybean oil and, possibly, benzaflex 988) and pigments (PAP-00724242, 53; PAP-00233590). Plasticizer was used in vinyl products to soften resins and to allow them to be processed more easily. Plasticizers were used in very small amounts in vinyl manufacturing at the Kearny Facility. Plasticizers were not used in linoleum manufacturing at all (PAP-00724252).

The VT manufacturing process before and after 1955 at the Kearny Facility involved weighing appropriate amounts of vinyl resin, plasticizer, stabilizer, and epoxidized soybean oil and placing them in a pre-blending mixer. These materials emerged from the pre-blending mixer in a slightly damp, sand like consistency. Limestone, asbestos and pigments were then added to the pre-blended material on a conveyor. The conveyor transported these ingredients to a Banbury mixer. In or about 1957, limestone and asbestos were added to the pre-blending process (PAP-00724242).

The VT product left the Banbury mixer in big chunks as a hard dough, which were then sent through a two-roll mixing mill that turned the chunks into a slab. The slab was then forced through two calendars that thinned the product to the final required gauge or thickness (PAP-00724242).

A 1972 Waste Effluent Survey stated that average production in 1971 was 4 million square yards of tile and linoleum and 800,000 gallons of paste and wax (PAP-00056085).

Pigments, including those containing heavy metals, would have been stored in bags, drums or other containers in which the pigments were supplied. There would not have been separate pigment waste. Because raw materials were used almost in their entirety in making finished product, very little, if any, raw materials would have been included in any waste streams (PAP-00233574, 88, 92).

The Kearny facility had a 60,000-gallon aboveground fuel oil tank that was diked, and Building No. 115 had five aboveground storage tanks that ranged in size from 10,000 to 80,000 gallons (PAP-00233597, 607).

Former Congoleum entity employee, Daniel Ross' affidavit claims that as a Crew Leader and Pipefitter, he recalled a container of very strong acid located at the northern end of Building No. 8 that had a fill pipe leading into and another pipe in the bottom of the container. Spent acid discharged into "some type of drain". According to Mr. Ross, machines such as calendars, Banbury mixers and sheeters were cleaned with kerosene, Varsol and other solvents. He also claimed firsthand knowledge that runoff from machine cleaning ran into floor drains located in each of the processing buildings (PAS-00058525). In Congoleum's January 15, 1998 response to EPA's Request for Information, Congoleum notes that a schematic indicates that Building No. 115 (Asphalt Tile Plant) had aboveground drains and an open pit or trench that ran through the building. The schematic also indicated that goods were spray cooled and the spray cooling drainage ran into the open trench and discharged into the Passaic River (PAP-00233595).

The Congoleum's January 15, 1998 Response to EPA's request for information also states that there was an 8-inch drainpipe to the River from a sump. Among other things, the sump collected water from a 6-inch drain that ran along the building and consequently was discharged to the River (PAS-00104963).

Former employee Daniel Ross also noted that large amounts of asbestos, pigments and cement were used in AT production carried out in Building No. 115, and runoff from cleaning operations (including machine cleaning operations) at Building No. 115 flowed into floor drains in the building (PAS-00058525). Mr. Ross did not state the time period that any of these allegation occurred. Mr. Ross' statements are refuted in affidavits executed by long-time Kearny facility employee Anthony N. Piacente (PAP-00724239-393).

Anthony N. Piacente was employed by Congoleum entities from 1955 to 1996. Mr. Piacente explained in two affidavits, one dated July 18, 2016, and another dated October 4, 2018, that he was initially employed by Congoleum-Nairn, Inc., at the Kearny facility as a Development Chemist from 1955 to 1958, then as a Works Chemist from 1958 to 1960, and Plant Superintendent from 1960 to 1965. (PAP-00724239, 42). In 1965, Mr. Piacente was promoted to the position of Manager of Process Development, which included responsibilities both within and outside of the Kearny facility. From 1965 to 1996, although his title changed over time, Mr. Piacente continued to perform similar duties and hold similar responsibilities relating to research, product development and manufacturing process development for flooring products, with increasing managerial responsibility and roles in company leadership (PAP-00724239).

Mr. Piacente noted that Linoleum manufacturing generally ran one shift each day and that cleaning of work areas was typically performed daily after each run. As the manufacture of linoleum did not generally involve liquids, Mr. Piacente explained that any spills during the manufacturing of linoleum would be either of dry compound or a mixed, dough-like material. As a result, Mr. Piacente stated that Kearny Facility personnel would use brooms and shovels to clean their work areas and remove any excess linoleum components. Refuse from the cleaning process was placed in containers and the containers were brought to a common area where they were placed in a larger receptacle for transport to an off-site dump (PAP-00724240).

In order to protect the integrity and quality of the final product, Mr. Piacente noted that no foreign material or water could come into contact with linoleum during the manufacturing and seasoning process. For this reason, the areas of linoleum manufacture were kept free of foreign materials and chemicals, and water hoses and other cleaning devices that might impact or otherwise contaminate the product were not used on the linoleum manufacturing equipment. Mr. Piacente did not recall ever seeing a water hose used in or near the linoleum manufacturing work areas or equipment at the Kearny Facility (PAP-00724240).

The only water involved with the manufacture of linoleum at the Kearny Facility was "non-contact" cooling water used to cool the manufacturing equipment. This non-contact cooling water was run through a closed system of sealed pipes connected to the manufacturing equipment. Mr. Piacente stated that the water in this system never made contact with the linoleum product or equipment (PAP-00724240-41).

Linoleum manufacturing equipment at the Kearny Plant, such as Banbury mixers, jerman mixers, mill rollers, scratchers, and calendars were cleaned with a "clean out" batch that was run after a change in product color was required. The "clean out" batch was typically the first batch of product in the next required color (PAP-00724241).

If the linoleum manufacturing machinery required further cleaning, it was wiped off. Contrary to Mr. Ross' statement, Mr. Piacente stated that machinery would never be "rinsed down" with any solvent, such as kerosene, Varsol or any other solvents. If additional cleaning was required, Kearny Facility personnel would sometimes hand wipe the machine equipment with a rag dampened with a small amount of solvent. The rag would then be placed in containers with refuse and disposed as described by Mr. Piacente above. Building 8 at the Kearny Plant was one of the areas where linseed oil and soybean oil were processed to make "linoleum cement." Linoleum cement was the main "binder" ingredient used to manufacture linoleum. Linoleum cement, which had a stiff, dough-like consistency, was stored on metal trays prior to use in the manufacturing process. After use, any linoleum cement that remained on the metal trays or other equipment was cleaned off by Kearny Facility personnel with rags containing an alkali solution of sodium hydroxide (PAP-00724241).

Mr. Piacente stated that while an alkali solution was stored in a tank in the area of Building 8, Building 8 was not used to store acid at any time--and he was unaware of any Kearny Facility personnel directing or otherwise releasing acid to a drain in or near Building 8 (PAP-00724241).

Water was supplied to the VT cooling tank by two artesian wells. Kearny Facility personnel cleaned the cooling tank approximately once a week, which involved draining water from the tank to a drain system. As the material that went through the cooling tank was uncut, finished product, the only material that could have been transferred to the tank might be very small pieces of finished and non-soluble VT (PAP-00724242-43).

Similar to the production of linoleum, non-contact cooling water was used to cool certain machines involved in the manufacture of VT in Building 115. The water was run through a closed system of sealed pipes connected to the manufacturing equipment and never made contact with the VT product or equipment (PAP-00724243).

In 1957, the VT production line in Building 115 was updated, but the general ingredients of VT remained the same. The primary 1957 equipment updates included a scratcher, consolidator, and an additional calendar. In addition, the VT cooling water tank was replaced with a water spray nozzle system. The water for the misting system was also sourced from two artesian wells (PAP-00724243).

During the updated VT manufacturing process, when the uncut, finished product emerged from the newly added third calendar, the material was cooled with a fine mist of water from numerous spray nozzles, which system used less water and also cooled the VT product at a faster rate. While the majority of misting cooling water evaporated, some water dripping occurred. Dripping water was collected under the VT production conveyor into a small reservoir that connected to a drain in the floor of Building 115. Water was supplied to the VT misting system by the same artesian wells that provided water to the older tank cooling system. Like the previous cooling system, the misting water contacted only uncut, finished product. Thus, as explained by Mr. Piacente, the only material that could have been transferred to the reservoir catching dripping water might be very small pieces of finished VT. After leaving the spray cooling area, styrene butylene type wax or a carnauba based wax was added to the surface of the product before it was cut with a press, inspected, packed and sent to the warehouse (PAP-00724243-44).

General cleaning of work areas and cleaning of VT manufacturing machinery was performed when a color change was required. Cleaning of VT production line work areas and equipment was generally performed with brooms, shovels and compressed air. Mr. Piacente specifically stated that VT machinery would never be “rinsed down” with kerosene, Varsol or any other solvents. If additional cleaning was required, which would be highly unusual, it was performed when the manufacturing process was non-operational by Kearny Facility maintenance personnel who would wipe the machinery with a rag dampened with a small amount of solvent and the rags were then disposed of as set forth above (PAP-00724244).

AT was also manufactured in Building 115 at the Kearny Facility in the same manufacturing line and using the same machines and equipment as VT, but some of the ingredients were different-- for example, petroleum resin and polystyrene based products, both in powder form, were used as the binder for AT production. AT was never manufactured at any other area of the Kearny Facility. The maintenance and cleaning procedures used to clean and maintain the AT manufacturing equipment were

the same used to clean and maintain the VT manufacturing equipment and work areas (PAP-00724244).

Mr. Piacente stated that linoleum, linoleum paste, VT, AT and other manufacturing operations at the Kearny Plant were run in a clean, efficient, orderly and professional manner. Cleanliness and attention to detail were emphasized as a matter of course, including for the purpose of keeping the products clean, undamaged and otherwise suitable for sale to the public (PAP-00724245).

Congoleum employees heard stories over the years, but had no personal knowledge that coal ash from the power plant may have been dumped and spread along the bank of the Passaic River, and scrap vinyl may have been buried in some areas of the facility (PAP-00233593).

A 1956 handwritten note and letter from the Kearny Fire Department documented poor housekeeping conditions at the south end Building No. 115, oil was being dumped in the weeds next to the building on the river side, and duct system above mixing machine disconnected at time of inspection; unspecified poor housekeeping on the north side in Building No. 23 (Sealer Mixing Building); and combustible materials that needed clearing in Building No. 31 (PAS-00058543-45).

According to a 1972 Waste Effluent Survey completed by Congoleum Industries, Inc. for the plant located at 160 Passaic Avenue, there was no discharge of lead, mercury, copper, or any other OU2 COCs (PAS-00058548, 51).

According to the Current Congoleum's January 15, 1998, response to the EPA's Request for Information, an Erie Railroad siding ran through the tile plant property (PAP-00233595).

According to an undated table; Lower Passaic re Kearny, NJ Sales Summary Analysis, in 1968 Congoleum purchased 110 pounds of Aroclor 1242 (PAP-00207161). The author of this table is unknown as well as where the information came from. Anthony N. Piacente who was employed at the Kearny Facility as a Development Chemist, Works Chemist, Plant Superintendent, Manager of Process Development and other positions, stated in his affidavit dated July 18, 2016, and October 4, 2018, that he was employed between the years 1965 to 1996, with responsibilities relating to research, product development and manufacturing process development for flooring products (PAP-00724239). Mr. Piacente reviewed the document "Lower Passaic re Kearny, NJ Sales Summary Analysis" and stated that he had no knowledge of the purchase of 110 pounds of Aroclor 1242 for manufacturing purposes, but it may have been used for research. Mr. Picante also stated that in 1957 or 1958, one trial batch of VT containing PCBs was run in Building 115 as a test trial to determine if a fire retardant flooring tile could be manufactured. The trial run was not successful, no further trials were performed, and no product with PCBs was ever manufactured at the Kearny Plant (PAP-00724245).

A November 8, 1943, study prepared by the United States Navy establishes that fire retardant linoleum manufactured by Congoleum entities during WWII, "Congoleum Nairn Fire Retardant Linoleum", did not contain PCBs (PAP-0220451).

Talon Adhesives, Inc., a tenant of Building 114 and Building 31 on the DVL property from at least 1963 through at least the mid-1970s (PAP-00219985-6; PAP-00232838) and Toch Brothers, a predecessor of DVL, purchased the following PCBs years after Congoleum-Bath sold the DVL Property:

Talon Adhesives (Kearny New Jersey):

- 120 pounds of Aroclor 1254 in 1966 (PAP-00403302);
- 1,800 pounds of Aroclor 1254 in 1968 (PAP-00207161-62, 87, 94);
- 500 pounds of Aroclor "Dist. 5460-HI SOL" in 1968 (PAP-00403303).

Toch Brothers (Kearny, New Jersey):

- 4,000 Pounds of Aroclor 1254 in 1962 (PAP-00403301).

Asphalt Tile Manufacturing Operations

According to the Congoleum-Nairn, Inc. AT Plant Suggested Improved Production Line with Notes and Comments report prepared by Congoleum's Engineering Department dated May 9, 1950 (1950 Asphalt Tile Plant Suggestions), the AT Plant (Building 115) had two production lines; one for manufacturing asphalt tile and one for manufacturing decorative stock. Manufacturing the asphalt tiles required: (1) processing binder; (2) mixing; (3) sheeting and calendaring; (4) die cutting; (5) cooling, inspecting, and packaging; and (6) crushing and grading process scrap for return to the Branbury mixer.

- Binder: Three 5,000 bound gas-fired batch fluxing kettles were used for fluxing and increasing the softening point of the binders. Large kettles heated by oil or other sources and with close clearance or scraping agitators may have been used. Two of the kettles were emptied by pumping, the third drains from the bottom. The hot binder was pumped to two 2,000-gallon hot binder storage tanks. The binder could also be fed directly to a Banbury mixer.

- Mixing: A skip hoist was utilized to charge all weighed materials to No. 11 Banbury mixer. Two skip loads are required per Banbury batch. The Banbury mixer discharged onto a steel apron conveyor. Sometimes the discharge batch fell in a large mass which was difficult to meter to the sheeter.

- Sheeting and Calendaring: Hot Banbury Mixed Base Stock after forming into full blanket around cold roll of a 28-inch diameter 48-inch face sheeter is decorated by applying about 5% crushed and screened stock. This stock is contained in storage hoppers above sheeter is spread evenly across the roll with a vibrating feeder. One full revolution of sheeter roll is made while applying the decorative stock.

- Die Cutting: A combination slitter and cross-cutter was used to cut tile to about 9.5 inches by 9.5 inches following which these rough-cut pieces were cut to size with 4 single die hopper feed presses.

- Cooling, Inspecting, and Packaging: To obtain required effective cooling, plain water was sprayed onto the top surface of the cut tile and this water evaporated by the forced air-cooling system. Stacked tiles were inspected on edges and any crumbs thereon were removed by a hand scraper. Cartons of packed tile were sealed with an automatic carton sealing and compression machine. Finished stock of tile was palletized for warehousing or shipment directly.

- Process Asphalt Tile Return System: Process scraps from cutting presses, inspection lines and other points were crushed by hand, and weighed out for return to the Banbury mixers (PAP-00725645-50).

All of the jacketed pumps, piping, fittings and meter, as well as hot binder tank coils were heated or cooled with saturated steam. According to the 1950 Asphalt Tile Plant Suggestions Report, if the recommendations were accepted, other production facilities required would include "adequate dust collection system; die maintenance equipment; materials handling equipment (PAP-00725644, 46, 51).

Raw Material Storage

According to Congoleum's January 15, 1998 response to EPA's request for information, raw materials used included vinyl resins, plasticizers, stabilizers, lime stone, pigments, oils, and fillers. Pigments, including those containing heavy metals, were stored in bags, drums, or other containers in which they were originally supplied. Oils, both raw material oils and fuel oils, were stored in above ground storage tanks (PAS-00104958, 60). According to the 1950 Asphalt Tile Plant Suggestions, binder materials were delivered by tank car to Building 115, where they were transferred to three 20,000-gallon heated and insulated tanks. All bagged raw materials at Building 115 were palletized on 4,000 capacity 48" x 48" double-faced pallets (PAP-00725645). The raw materials stored in the Asphalt Tile Building (Building 115) included, as of April 22, 1950, 203,000 pounds of asbestos and 1,100,000 pounds of limestone. Resins were stored in drums in the yard behind the Asphalt Tile Building as well as in heated tanks in the yard. Additional asbestos was stored in Building 3 and Gilsonite (a hydrocarbon resin) was stored in Building 19 (PAP-00725655).

Building 115 Storage Areas

According to the 1950 Asphalt Tile Plant Suggestions, Building 115 was divided into the following areas: Raw Materials in Building with Aisle Space (13,500 square feet (sq. ft.)); Packing Material (3-month supply) (3,500 sq. ft.); Finished Goods, with Loading Area and Aisle Space (9,500 sq. ft.); Binder Fluxing Room (2,500 sq. ft.); Production Equipment including Weighing Section and Operating Aisles (15, 500 sq. ft.); Materials in Process Decorative Stock and Scrap (2,500 sq. ft.); Repair Shop for Equipment and Dies, Spare Equipment Storage, Air Compressor and Deep Well Pump (3,400 sq. ft.); Wash Rooms and Locker Rooms (1,000 sq. ft.); Laboratory (1,000 sq. ft.); and Offices (600 sq. ft.) (PAP-00725654).

According to a figure stamped with the date July 14, 1975, the interior of Building 115 was divided into the main production area, a binder room, machine shop, offices, lab, and wash rooms/locker rooms. Directly to the southwest of Building 115, the figure shows five 10,000-gallon steel tanks used for asphalt and process oil storage. The figure also includes a drawing of two transformers behind a fence on the south side of the building separated from the Passaic River by a retaining wall. Notes on the figure state "Stge. Scrap Tile & Plasticizer in Drums" (in the area of the south side of Building 115) and "Stge. Scrap Tile 3' High" (in the area behind building 115) (PAP-00725633). A second, undated figure includes a drawing of Building 115 and a note stating "Scrap Tile in Drums Up to 9' High" and "Stge. Scrap Tile" (in the area behind Building 115) (PAP-00725634).

Transformers

Transformers were located on the 113 Passaic Avenue (Building 115) property during the time that Congoleum entities owned and operated on the property (PAP-00725660-61). A figure stamped with the date July 14, 175 includes a diagram of the Building 115 property and a drawing of "two 1,5000 k,v,a" transformers on the south side of the building separated from the Passaic River by a retaining wall (PAP-00725633). A December 2, 1968 letter directed to Frank B. Hall & Co., Inc., references a "Transformer Burnout, October 15, 1968 – 3 A.M., Kearny Plant" and notes that there will be no claim submitted as losses were less than $10,000. (PAP-00725631). The General Electric letter does not state that oil leaked or that oil was otherwise released from any transformers. (PAP-00725628-30). Additionally, a Congoleum-Nairn, Inc., purchase order dated October 28,1968 provides for the removal and return of a transformer to General Electric and installation of a "transformer from W.S. of Bldg. 115 in position where transformer is being removed." (PAP-00725627). An August 12, 1965 Congoleum-Nairn, Inc., purchase order and an August 5, 1965 "Maintenance Appropriation" form describe work involving replacement of 10C oil in two transformers located at Building 115 during a plant shutdown. (PAP-00725660).

4. Identified COCs

- PCBs (used, and detected)
- PAHs (used, detected)
- Copper (detected)
- Lead (potentially used, and detected)
- Mercury (used and detected)

PCBs

Anthony N. Piacente, who was employed by Congoleum entities at the Kearny Facility as a Development Chemist from 1955 to 1958, as a Works Chemist from 1958 to 1960, Plant Superintendent from 1960 to 1965, and then Manager of Process Development and other titles which included responsibilities both within and outside of the Kearny Facility until operations at the Facility ceased, stated in his July 18, 2016 and October 4, 2018 affidavits that he had no knowledge of PCBs ever being used to manufacture any product at the Kearny Facility (PAP-00724239-40, 44-45, 53). Based on his years of experience and knowledge of raw materials, formulations, and processes used to manufacture flooring products generally, and those used to manufacture flooring products at the Kearny Facility specifically, Mr. Piacente stated that to his knowledge,

PCBs were never used to manufacture linoleum, linoleum paste, VT, AT, adhesive, or any other product manufactured by any Congoleum entity at the Kearny Facility (PAP-00724239-40, 45).

Current Congoleum's January 15, 1998, response to the EPAs EPA's request for information noted that Congoleum entities did not receive, utilize, manufacture, discharge, release, store or dispose of PCBs at the Kearny Facility, aside from use in the transformers at the facility which may have contained PCBs (PAP-00233588). However, an undated table by an unknown author stated that Congoleum purchased Aroclor 1242 in 1968 at the Kearny Facility (PAP-00207161). Mr. Piacente stated that transformers at the Kearny Facility were routinely maintained and kept in good working order (PAP-00724253).

A 2000 Phase I ESA (PAP-00219965- PAP-00220427) performed by Peak Environmental, Inc., a consultant retained by DVL, identified a total of eight electrical transformers on the DVL Property (PAP-00219969-70). Two of the transformers were located on the outside walls of Building Nos. 12, and 24, respectively (PAP-00219969-70). The remaining six transformers consist of two separate groups of three pad mounted units, located south of Building No. 114 and west of Building No. 17 (PAP-00219969-70). These transformers were installed after Congoleum entities sold the property to DVL in 1960 (PAP-00724490; PAP-00724489).

A 2001 Phase II ESA performed by Peak Environmental, Inc., discussed sampling of the two electrical transformer pads located west of Building No. 17 and south of Building No. 114 (PAP-00231551). Two samples (T-1 and T-2) were collected from the north side of the transformer pad at Building No. 114, and three samples (T-3, T-4, and T-5) were collected adjacent to the south side of the transformer pad west of Building No. 17. Sample results showed Aroclor-1254 was detected at T-2 (1,950 mg/kg), T-3 (1,380 mg/kg), and T-4 (2,810 mg/kg). The samples were taken at the depth of 0-6" bgs (PAP-00231551, 8).

According to the 2008 RIR/RI/RAW performed by Peak, during the June 2001 excavation of Reservoir No. 2 (AOC-3), 11 pits, each approximately 2' by 2', were identified within the reservoir. It was discovered that five pits completely breached the 6-inch concrete flooring. Soil samples were taken from the five breaches and found that one sample breach (Pit 5-A at 1-1.5' bgs) showed Aroclor-1254 at 2.16 mg/kg (PAP-00232651). It is not known when the concrete floor in the reservoir was breached.

According to the 2008 Peak RIR/RI/RAW, based on the sample results discussed above, further Remedial Investigations were conducted at AOC-7 the Former Pad Mounted Transformer site. On October 27, 2003, four surface samples (TF-5 through TF-8 at a depth of 0.0 to .5") were collected from the eastern, northern, and western sides of the pad associated with the transformers located adjacent to Building No. 114. The results showed presence of PCBs above the applicable soil cleanup criteria within samples TF-6 (3,920 parts per billion (ppb)), TF-7 (927 ppb), and TF-8 (689 ppb) (PAP-00232624, 57).

The Self-Implementing Cleanup and Disposal of Polychlorinated Biphenyl (PCB) Remediation Waste Plan prepared by Peak Environmental, Inc., dated May 2015 (2015 Peak PCB Cleanup), noted that on March 25, 2015, sidewall and floor slab samples were collected from the nine bays within the first floor of Building No. 114. The results showed that Aroclor 1254 was detected in all 19 samples collected. Concentrations ranged from 0.0443 mg/kg (C-68) to 419 mg/kg (C-55) (PAP-00220930). Note: The concrete slab sample results are included in this report due to Peak's allegation that AOC-7 Former Pad Mounted Transformer was being impacted by the contamination inside Building No. 114. Further discussion can be found at the end of this section.

According to the 2015 Peak PCB Cleanup Amendment, AOC 23 - Dry Well and Swale sampling results of the concrete ranged from 1,938 mg/kg total PCBs in sample C-91 (Aroclor 1254 at 1,310 mg/kg and Aroclor 1260 at 628 mg/kg), located on the northeastern corner of the swale to Aroclor 1254 at 0.888 mg/kg (C-95) located on the southeastern corner of the swale (PAP-00223729, 66). The dry well and swale are located north of Building No. 114, which is one of the buildings leased and used by Talon Adhesives (PAP-00219985-986; PAP-00232838).

In addition, Peak reported that on June 26, 2015, adhesive samples were collected from an old, but undated foundation encountered below Building No. 31 foundation, another building where Talon Adhesives leased space (PAP-00219985-986; PAP-00232838). The results of the adhesive sampling showed significant PCBs concentrations of Aroclor 1254, ranging from 44,200 mg/kg to 1,240 mg/kg (PAP-00223729, 40). Aroclor 1232 was detected at a range of 1.51 mg/kg to 25.7 mg/kg on adhesive samples taken from the third floor of Building No. 31 (PAP-00223739).

In May 2015, soil samples collected to the north of Building No. 114 as part of the swale investigation detected Aroclor 1254 in the following samples:

- Test pits depth of 0.5-1' – 51.6 mg/kg and 5.68 mg/kg
- Storm Sewer-1 depth of 3.5-4' – 443 mg/kg
- Dry well near sump depth of 3-3.5" – 292 mg/kg (PAP-00223731, 56, 65)

Further investigation was conducted at AOC-7 Former Pad Mounted Transformer and Peak concluded that the observed PCB impacts in AOC 7 are associated with the historical activities conducted inside Building No. 114. Peak arrived at this conclusion because PCBs were not detected in the samples from the concrete pad and from the enclosure of the transformers and Aroclor 1254 was detected in the concrete samples from the walls inside Building No. 114 (PAP-00223731). Peak did not detail what "historical activities" conducted inside Building No. 114 are associated with the PCB impacts in AOC 7 (PAP-00223731).

Building 31 and Building 114 were used by Bath-Congoleum entities to manufacture straight line linoleum. PCBs were not used to manufacture linoleum, linoleum paste, or any other product at the Kearny Facility. (PAP-00724244-45).

PAHs

According to Congoleum's January 15, 1998 response to EPAs Request for Information, the Kearny Facility had a 60,000-gallon aboveground fuel oil tank that was diked, and Building No. 115 had five aboveground storage tanks that ranged in size from 10,000 to 80,000 gallons (PAP-00233597, 607).

In 1947, PVSC notified facilities of stream contamination. An oil sample collected near Bergen Avenue in September 1947 contained good fresh fuel oil that was traced to a Congoleum-Nairn Inc. engine room. The inspector found an open valve and considerable amounts of fuel oil that drained into the sanitary sewer. Closing the valve stopped the release into the sanitary sewer. The inspector noted that only small amounts of fuel oil had intermittently reached the Passaic River through the storm sewer as a result of intermittent overflow, and the Kearny sewer department was asked to clean out the sanitary sewer to prevent overflows (PAS-00058534).

Congoleum's January 15, 1998 response to EPA's Request for Information noted that current Congoleum employees believed but had no personal knowledge of a spill of No. 6 fuel oil in the winter of either 1973 or 1974 resulting from vandals opening a valve on a fuel oil tank at night (PAP-00233575). According to the response, the spill was discovered and cleaned up (PAP-00233575).

According to Congoleum's 1998 response to EPA's request for information, oils, both raw material oils and fuel oils, were stored in above ground storage tanks (PAS-00104958, 60). Note: Year and location of the above ground storage tanks was not provided in this document.

In June 1990, one waste composite sample (NJEP-S2) was collected from two of the drums. Mercury, copper, PAHs, and lead were detected in the sample. Mercury, copper, PAHs, and lead were also detected in the soil samples collected in the proximity of the two drums (NJEP-S1 and NJEP-S3) and near the solidified sludge (NJEP-S4) (PAP-00337325).

The 2001 Peak Phase II ESA identified one 550 gallon No. 2 fuel oil UST at Building No. 13 and six solvent USTs associated with Building No. 114. It was recommended that these be closed by following proper UST closure procedures (PAP-00231553-54). Peak noted that Royal Arts was listed as the owner of the 550 gallon No. 2 fuel oil UST which was originally installed in 173. Peak also noted that in 1963, Talon arranged to install the six solvent USTs at Building 114 – four 10,000 gallon solvents tanks and two 6,000 gallon solvents tanks (PAP-00219985-86).

According to the 2002 Peak RIR/RAW, UST-7 (550 Gallon Fuel Oil UST) was decontaminated, removed and inspected. Approximately five cubic yards (CY) of impacted material were excavated and stockpiled for disposal. Following site investigation activities, the UST excavation was backfilled with clean fill (PAP-00220536-37).

Copper

In response to the EPA's Request for Information, Current Congoleum stated that it did not know whether copper was used at the Kearny Facility (PAP-00233588).

During the 2001 Peak Phase II ESA, samples (F-3 and F-4 at depths of 5.5" to 6' bgs) were taken at Water Reservoir Area No. 2 on the DVL property, which was located along the west wall of Building No. 17, east of Building No. 31. Sample F-4 showed copper at 557 mg/kg (PAP-00231550, 56).

In addition, samples (F-5, F-6, and F-6a at depths of 5.5" to 6' bgs) were taken at Water Reservoir Area No. 3 on the DVL property, located directly adjacent to the north side of Water Reservoir No.2 along the west wall of Building No. 17. Sample F-6a showed copper at 482 mg/kg (PAP-00231551, 56).

Lead

Congoleum's January 15, 1998 response to EPAs Request for Information, states that lead may have been used in connection with manufacturing products at the Kearny Manufacturing Facilities (PAP-00233588). Lead may have been used in pigments as part of the production of linoleum, VT and AT (PAP-00233592).

Mercury

Current Congoleum's January 15, 1998, response to the EPA's Request for Information, states that adhesives would have included standard floor adhesives using lignin as an antifungicide filler and small amounts of mercury as an anti-bacteria agent (PAP-00233591).

Historic Fill

The Allocation Team has determined that the Kearny Facility site is partially located on regional Historic Fill as designated by the NJDEP.[1]

Two parcels of the Kearny Facility bordered the Passaic River: Block 1, Lots 12 and 12.01 (purchased by Franklin Plastics Corporation in 1976, outlined in **YELLOW** on the 2005 Annotated Tax map) and Block 1, Lots 13 through 15 (purchased by Kearnyland Inc. in 1959, outlined in **BLUE** on the 2005 Annotated Tax map, are located on the regional Historic Fill; the remaining properties owned and sold over time by Congoleum entities (east of Passaic Avenue) are not located on regional Historic Fill. Based on a review of the documents for this report, it appears that Current Congoleum did not conduct an investigation of the historical fill because Congoleum entities have not owned the property since 1959 and 1976, respectively. Since a Congoleum-Bath entity may have owned the land during a portion of the time period of the historical fill, information

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

provided by Franklin-Burlington Plastics investigation of the historic fill on Block 1, Lots 12 (Building No. 115, (outlined in YELLOW on the 2005 Annotated Tax map) is included in this report.

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00056222-24).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	879 mg/kg
Copper	168 mg/kg
Mercury	8.8 mg/kg
Benzo(a)anthracene	9.1 mg/kg
Benzo(a)pyrene	5.3 mg/kg
Benzo(b)fluoranthene	6.2 mg/kg
Benzo(k)fluoranthene	2.8 mg/kg
Dibenzo(a,h)anthracene	1.0 mg/kg
Indeno(1,2,3-cd)pyrene	4.2 mg/kg

According to a Franklin Burlington Preliminary Assessment Report (PAR) summary on non-Indigenous fill materials, the property purchased by Franklin Plastics on February 16, 1976, Block 1, Lot 12 (Building No. 115), outlined in YELLOW on the Annotated 2005 Tax Map) contained nonindigenous fill material for raising the elevation. The material allegedly covered approximately 85% of Block 1, Lot 12 and ranged in depth from between 5 and 7 feet deposited upon tidal marsh sediments (PAP-00054694). The western portion of the Block 1, Lot 12 along the Passaic River contained the most fill. A 1929 map establishes that bulkheading and fill operations on the property began prior to 1929, when the property was owned by "Watts Kearny." (PAP-00724491). The PAR

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characteriz7ation of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Report states that aerial photographs show that the first stage of fill occurred between 1933 and 1946 (PAP-00054694; PAS-00063679). Bath-Congoleum purchased a portion of this property in 1940 and another in 1946 (PAP-00448252-56; PAP-0048259-60) . According to the PAR Report the second stage occurred between 1953 and 1966. The fill was comprised of silty sand, course sand, cinders, gravel, brick fragments, rod, wood pieces, glass, ceramics and scrap metal. Even with the fill events, the site is still subject to periodic flooding from the Passaic River (PAP-00054694).

5. COC Pathways

Sanitary and Storm Sewer

Congoleum-Nairn, Inc. sent a letter to PVSC in March 1926 acknowledging discharge of sewerage to the Passaic River and noting that it was working on a plan to resolve the issue. The letter does not state the amount or content of the sewage discharged (PAP-00056076; PAS-00058529).

A 1928 PVSC list of polluting town sanitary sewers noted that Congoleum-Nairn Company sanitary sewage pollution was a result of Kearny town sewers being blocked by sand. The facility was on the list because sewage was coming from an outlet at their interception chamber. PVSC acknowledged that Congoleum-Nairn installed the chamber at considerable expense and trouble and noted that there was no trouble until the chamber became blocked by sand. The letter does not state the amount or content of the "pollution" associated with Congoleum-Nairn sanitary sewage (PAS-00058532). In 1947, PVSC notified facilities of stream contamination. An oil sample collected near Bergen Avenue in September 1947 contained good fresh fuel oil that was traced to a Congoleum-Nairn Inc. engine room. The inspector found an open valve and considerable amounts of fuel oil that drained into the sanitary sewer. Closing the valve stopped the release into the sanitary sewer. The inspector noted that only small amounts of fuel oil had intermittently reached the Passaic River through the storm sewer as a result of intermittent overflow, and the Kearny sewer department was asked to clean out the sanitary sewer to prevent overflows (PAS-00058534).

In November 1949, PVSC noted sanitary sewer system overflows into the Passaic River that would continue until the waste from the facility's 24" line could enter a line large enough to prevent overflow. At the time the connecting chamber was only 9" (PAS-00058536-37).

Bath-Congoleum responded, in part, as follows to a May 31, 1972, Waste Effluent Survey prepared for the Passaic Valley Sewage Commissioners:

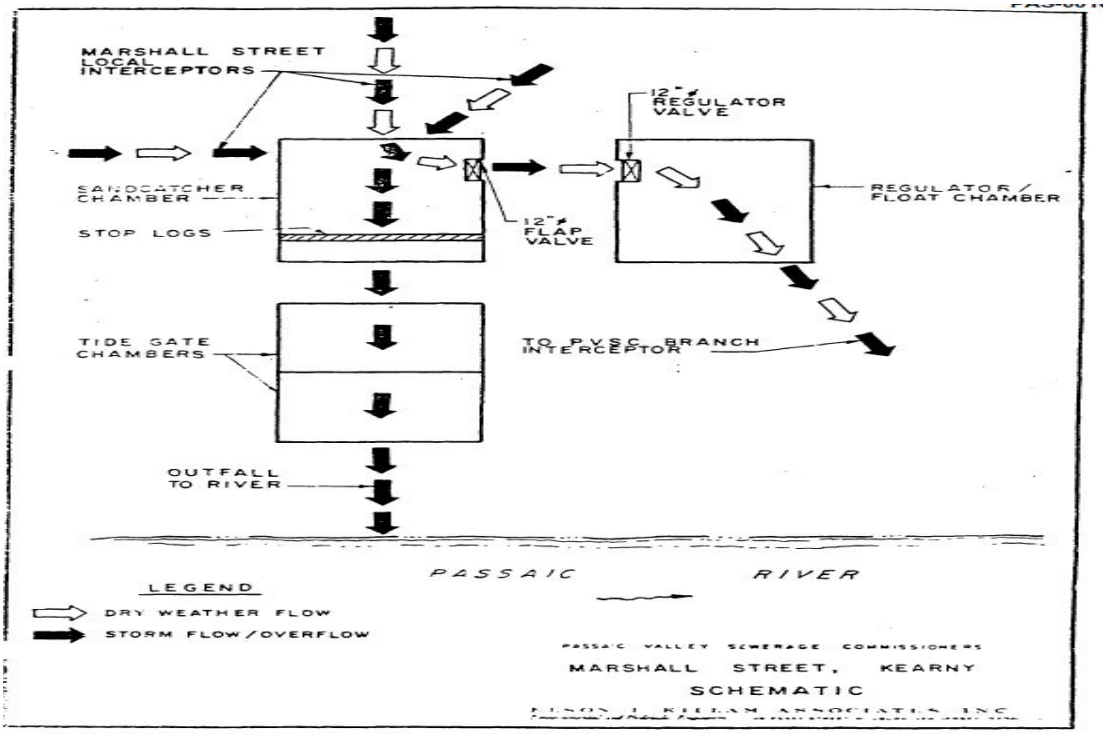
"Water Use in 1971:

- Water to Sanitary Sewer: 39,158,000;
- Water to Storm Sewer, River or Ditch: 30,000,000;
- Name of River, Stream, or Tributary, and location of storm sewer or ditch outlet to river, stream, or tributary: Passaic River." (PAP-00056086, 8).

Congoleum Corp.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

A 1976 PVSC Overflow Analysis for Marshall Street, Berger and Nairn CSOs stated that the Marshall Street Overflow Chamber served a heavily industrialized/commercial area. During periods of rainfall, a portion of the combined flow entered the PVSC interceptor with the balance overflowing the stop logs and discharging through the outfall into the Passaic River (PAS-00105009-10). The average daily flow during wet weather was an estimated 0.12 million gallons per day. It was estimated a combined flow of 2.5 million gallons per day would produce an overflow. During dry weather, PVSC estimated the average daily flow was 0.09 million gallons per day (PAS-00105014). Between February and April 1975 there were 13 rainfall events and six observed overflows and three recorded overflows (PAS-00105016). The range of rainfall duration was between 0.75 and 25.75 hours with average rainfall intensity between 0.015 and 0.175 inches/hour (PAS-00105027). A PVSC Overflow Analysis for Marshall Street is below.



(PAS-00105207)

According to an Overflow Data Extract, the Bergen Avenue and Nairn Avenue Overflow Chambers served primarily residential districts with some industrial flows. The cause of overflow in primarily residential chambers during rainfall was similarly described, i.e., overtopping the interceptor, flowing over the stop logs and into the Passaic River; however, average daily flow for Bergen during wet weather was an estimated 0.06 million gallons per day. PVSC estimated a combined flow of 0.090 million gallons per day would produce an overflow. The average daily flow during dry weather was estimated at 0.05 million gallons per day (PAS-00105020, 23). Average daily flow during wet weather for the Nairn Avenue Overflow Chamber was 0.69 million gallons per day, and an estimated combined flow of 3.2 million gallons per day would produce an overflow. The estimated daily flow for dry weather was 0.54 million gallons per day (PAS-00105051).

Current Congoleum noted in its January 15, 1998, response to EPA's Request for Information "there were no waste treatment systems or facilities at the Kearny Facility." (PAP-00233571). Contact and non-contact cooling waters were discharged to the Kearny sanitary sewer system. However, in an October 21, 2004, letter from Spartech Polycom stated: "Spartech Polycom's facility located at 113 Passaic Avenue has recently implemented wastewater re-use and conservation measures that have eliminated the facilities contact and non-contact cooling water discharge to the Passaic River. A closed loop chiller was installed to replace the existing cooling tower thereby eliminating the facilities non-contact cooling water discharge." (PAP-00057271). According to the January 15, 1998, response, prior to the early 1970s, when all manufacturing activities at the Kearny Facility ceased, contact cooling water, which was used to cool finished tile products in Building No. 115, was not used in the manufacturing process and, therefore, should not have contained anything other than trace amounts of plasticizer, dirt and washing contaminants as a result of being washed over finished product (PAP-00233571-2). Contact cooling water may have been intermittently discharged to the Passaic River during times of sanitary sewer overflow (PAP-00233572). The response also states that contact cooling water from spraying of finished products may have been collected in open trenches in the floor of some buildings and discharged to the sewer system and/or the Passaic River. Non-contact cooling water would have been discharged to the Passaic River (PAS-00104941). Congoleum employees believed that there were outfalls discharging cooling water and storm run-off into the Passaic River (PAS-00104942).

The only water involved with the manufacture of linoleum at the Kearny Facility was "non-contact" cooling water used to cool the manufacturing equipment. This non-contact cooling water was run through a closed system of sealed pipes connected to the manufacturing equipment. The water in this system never made contact with the linoleum product or equipment (PAP-00724240-41).

Finished VT was cooled by running through a cooling water tank. Water was supplied to a VT cooling tank by two artesian wells. Kearny Facility personnel cleaned the cooling tank approximately once a week, which involved draining water from the tank to a drain system. As the material that went through the cooling tank was uncut, finished product, the only material that could have been transferred to the tank might be very small pieces of finished and non-soluble VT (PAP-00724242-43).

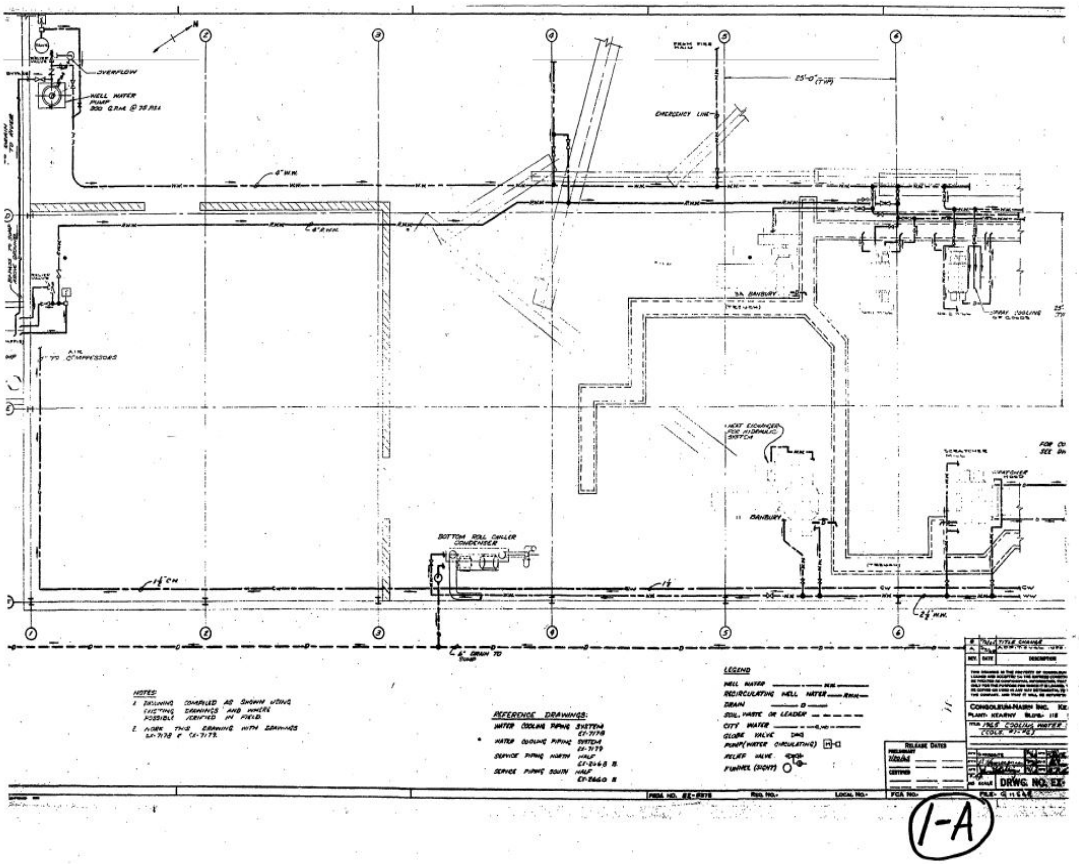
Similar to the production of linoleum, non-contact cooling water was used to cool certain machines involved in the manufacture of VT in Building 115. The water was run through a closed system of sealed pipes connected to the manufacturing equipment and never made contact with the VT product or equipment (PAP-00724243).

In 1957, the VT production line in Building 115 was updated, but the general ingredients of VT remained the same. The primary 1957 equipment updates included a scratcher, consolidator, and an additional calendar. In addition, the VT cooling water tank was replaced with a water spray nozzle system. The water for the misting system was also sourced from two artesian wells (PAP-00724243).

During the updated VT manufacturing process, when the uncut, finished product emerged from the newly added third calendar, the material was cooled with a fine mist of water from numerous spray nozzles, which system used less water and also cooled the VT product at a faster rate. While the majority of misting cooling water evaporated, some water dripping occurred. Dripping water was collected under the VT production conveyor into a small reservoir that connected to a drain in the floor of Building 115 (PAP-00724243).

Water was supplied to the VT misting system by the same artesian wells that provided water to the older tank cooling system. Like the previous cooling system, the misting water contacted only uncut, finished product. The only material that could have been transferred to the reservoir catching dripping water might be very small pieces of finished VT (PAP-00724243).

See the following schematic of the Cooling Water System in Building No. 115, where VT and AT were manufactured, as it existed in 1965.



(PAP-00233598)

Current Congoleum's January 15, 1998, response to the EPA's request for information notes the possibility that floor drains and open trenches may have connected to the sanitary sewer system during the years of manufacturing operations at the Kearny Facility (PAP-00233573). Current Congoleum's employees at the time of the January

15, 1998 response to the EPA request for information believed that retention ponds for firefighting purposes may have existed at the Kearny Facility, but that there were no lagoons at the site (PAS-00104941). Current Congoleum employees at the time of the January 15, 1998 response also believed that outfalls at the Kearny Facility discharged cooling and storm water runoff into the Passaic River (PAP-00233574).

According to a Phase I ESA prepared by Peak for the DVL Property (166-194 Passaic Avenue Kearny, New Jersey 07032 Block 15, Lot 7a - outlined in **ORANGE** on the Annotated 2005 Tax Map (PAP-00220445)), a large concrete water reservoir was present in the center of the DVL Property, and was reported to have been used for the collection of storm water for fire prevention purposes, with a capacity of 116,000 gallons (PAP-00219972).

Direct Release

Former employee, Daniel Ross, stated that floor drains in Building No. 115 were routed through a large pipe that discharged directly to the Passaic River (PAS-00058526). Former employee Anthony Piacente stated that the pipe from Building 115 to the Passaic River discharged contact cooling water used to cool uncut, finished tile product and that the only material that could have been transferred to the water might be very small pieces of finished tile (PAP-00724242-43).

Flooding

At the time of Current Congoleum's response to EPA's Request for Information, Current Congoleum employee's believed that from time to time the river banks flooded, but there was no information regarding dates, duration or extent of such flooding (PAP-00233576). In addition, Current Congoleum's 1998 response to the EPA's request for information references a schematic/drawing reflecting boring results in the area of Building No. 115 that also describes a bulkhead located along the Passaic River near Building No. 115 with a high-water mark that came well-over the bulkhead (PAP-00233595, PAP-00233601).

Spills

A 1998 Current Congoleum's response to EPA's Request for Information noted that Current Congoleum employees believed but had no personal knowledge of a spill of No. 6 fuel oil in the winter of either 1973 or 1974 resulting from vandals opening a valve on a fuel oil tank at night. According to the response, the spill was discovered and cleaned up (PAP-00233575).

The Sampling Analysis Plan (SAP) for 113 Passaic Avenue (Building 115) submitted as an appendix to the Franklin Plastics 1986 Initial Notice SES, focused on possible areas of spillage of the following:

- Phenols associated with asphalt storage in the tank farm at the south side of the facility during Congoleum Corporation ownership/operation of the facility,

- Phthalates associated with unloading, storage, and processing of plasticizer compounds at transfer lines, around the dust collector system blower, and around the two storage tanks used for plasticizer storages,

- Heavy metal bearing pigments on and around process equipment within the Production Plant and the dust collector system blower,

- Transformer fluids associated with the transformer substation on the south side of the property,

- Petroleum hydrocarbons associated with oil lubricated compressor discharges throughout the facility, and Gasoline from the underground storage tank or related plumbing system (PAP-00057055).

Incidents

On or about August 19, 1943, during World War II, there was an explosion at the Kearny Facility. At the time of Current Congoleum's January 15, 1998, response to EPA's Request for Information, Current Congoleum employees believed, but had no personal knowledge, that the explosion was caused and/or arose from the processing used for camouflage netting with nitrocellulate, an explosive (PAP-00233575).

According to an October 18, 1943, memo to the Kearny Fire Department the explosion occurred at Building No. 12 in the Number 6 stove, as a result of an explosion of vapors of Sovosol No. 5 used as a solvent for the paint used in the treating of camouflage nets (PAP-00232310). In an August 19, 1943, Kearny NJ Police Department report, Sovasol was stored in two small tanks containing 1,000 gallons each and one large tank containing 2,500 gallons. The three tanks of Sovasol located in the yard on the north side of the Building No. 12-D Section. The two small tanks were on small cars and the large tank was stationary about 50 feet away from the building (PAP-00232576).

6. Regulatory History/Enforcement Actions

Inspections

The Town of Kearny, Department of Fire conducted a detailed inspection of the Congoleum-Nairn facility between April 1 and April 25 of one year in the 1950s. The inspection identified multiple conditions which constituted a fire hazard including:

- Building 115 – Tile Manufacturing: Housekeeping conditions were very poor on the south end. Oil was being dumped in the weeds next to Building 115 on the river side. The damper control for the fixed CO-2 system inside the duct system above the mixing machine was found to be disconnected.

- Building 23 – Sealer Mixing: Housekeeping very poor on north side.

- Building 32 – Flannel saturated with Kerosene Oil is stored on the outside of the building (PAP-00056081).

According to the September 17, 1990 Site Inspection Report, prepared by NUS Corporation for the Environmental Protection Agency (1990 EPA SI), an EPA contractor's on-site reconnaissance at 113 Passaic Avenue (the location of Congoleum Building 115) in April 1990 discovered three areas of abandoned drums along the Passaic River. The drums were in poor condition and some drums were partially buried. The contents of the drums appeared to be crumbled pieces of tile. Solidified sludge from a vinyl tile manufacturing process was also observed on the property (PAP-00337307; PAP-00054201-02). When discussing the drums and the sludge pile, the 1990 EPA SI specifically states that "the former operator of the property, Congoleum Corporation/Floor Covering Division, manufactured asphalt and/or vinyl tile on site from approximately 1946 to 1974" (PAP-00337307). Congoleum's January 15, 1998, response to EPAs Request for Information that current Congoleum employees had heard stories over the years had stated "scrap vinyl may have been buried on some portions of the Kearny Facility" (PAS-00104956; PAS-00104961).
In June 1990, one waste composite sample (NJEP-S2) was collected from two of the drums. Mercury, copper, PAHs, and lead were detected in the sample. Mercury, copper, PAHs, and lead were also detected in the soil samples collected in the proximity of the two drums (NJEP-S1 and NJEP-S3) and near the solidified sludge (NJEP-S4) (PAP-00337325).

Violations

On May 7, 1979, almost 20 years after the DVL Property (outlined in **ORANGE** on the 2005 Annotated Tax Map, PAP-00220445) had been sold by Congoleum entities, a notice of violation from the Kearny Fire Department, Bureau of Combustibles was sent to Toch Park management for the removal of numerous 55-gallon drums of waste chemical due to the condition of the drums (PAP-00233320). According to the 2000 Peak Phase I ESA, the drums were located at Building No. 114 (PAP-00219986). Note: The violation did not state what chemicals were in the drums.

According to research conducted for the 2000 Peak Phase I ESA, the following information regarding Building No. 114 was located all of which is dated after Congoleum entities had sold the DVL Property:

- A handwritten note indicating that D&J Oil Service of Paterson, NJ is to start removing drums from the site on August 21 and 22, 1979. The drums were placed on the property by a tenant of DVL, not a Congoleum entity

- Handwritten correspondence dated August 18, 19, and 20, 1981, stated that numerous chemical containers, 55-gallon drums, bottles, and cans of hazardous materials abandoned by former DVL tenant Talon Adhesives remained within different areas of Building No. 114. Note: The types of chemicals were not identified in report (PAP-00219986).

- The Kearny Fire Department noted reduced access to Talon's exit path, due to hardening of adhesives on the floor resulting from ruptured drum spillage and in-complete cleanup of residue, worsened the problem (PAP-0023321).

- A Kearny Fire Department letter dated April 24, 1968 stated that Talon's "entire operation has now become extremely hazardous," and that "the housekeeping and general appearance is very poor" (PAP-00232841).

- The Kearny Fire Department demanded that Talon "Repair leak in solvent piping" and "Refrain from storing solvents in open containers" (PAP-00232841).

Permits

Current Congoleum stated in its January 15, 1998, response to EPA's Request for Information, that it was not aware of RCRA permits being issued to any Congoleum entity with regard to the former Kearny Facility, however, as a result of a Freedom of Information Request (No. 02-RIN-01147-97), Current Congoleum's attorneys were informed that an RCRA permit was issued to Belgrove Arms with regard to a facility known as "Congoleum Building – Geller Associates" in or about September 1989 with an EPA ID. No. of NJD040736704 (PAP-00233569). The entity Belgrove Arms and the facility "Congoleum Building – Geller Associates" are not affiliates or otherwise related with or to Current Congoleum or any other Congoleum entities, but the referenced property appears to be the "Kearny Administrative Facilities" parcel property purchased on March 16, 1987, by Belgrove Arms, outlined in **MAGENTA** on the 2005 Annotated Tax Map (PAP-00219963; PAP-00220445; PAP-00233569).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facilitythat occurred on the DVL Property after being sold by Congoleum entities in 1960; outlined in **ORANGE** on the 2005 Annotated Tax Map (PAP-00220445):

- Phase I Environmental Site Assessment for the site located at 166-194 Passaic Avenue Kearny, New Jersey, Block 15, Lot 7a, dated October 2000 (PAP-00219965).
- Phase II Environmental Site Assessment report for 166-194 Passaic Avenue, Kearny, New Jersey, dated November 2001 (PAP-00231543).
- Remedial Investigation Report/Remedial Investigation Workplan for the site located at 166-194 Passaic Avenue Kearny, New Jersey, Volume I of III, dated January 2002 (PAP-00220527).
- Remedial Investigation Report/Remedial Investigation Workplan/Remedial Action Workplan, Toch Park 166-194 Passaic Avenue, Volume I of II dated December 2008 (PAP-00232602)Self-Implementing Cleanup and Disposal of Polychlorinated Biphenyl (PCB) Remediation Waste Plan dated May 2015 (PAP-00220923).
- Amendment to the Initial Notification and Self-Implementing Cleanup and Disposal of Polychlorinated Biphenyl (PCB) Remediation Waste Plan dated August 2015 (PAP-00223723).

Congoleum Corp.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

The Franklin-Burlington Plastics, Inc., Facility Data Report includes information concerning response actions relating to the property conveyed to Franklin Plastics on February 16, 1976 (PAP-00220430) (highlighted in YELLOW and identified as Block 1, Lots 12 and 12.01 on the 2005 Annotated Tax Map).

According to the September 1984 Hart Preliminary Site Assessment conducted at 113 Passaic Avenue (the location of Congoleum Building 115), four soil samples were collected for chemical analysis and subsurface soil samples were collected for physical inspection and OVA analysis. One surface sample consisted of a composite of several samples in a spill and vegetative stress area near the air pollution control units and the other three were collected inside the tank containment area (PAP-00057068).

Composite Sample: The surface soils of the locations chosen for the composite chemical sample were described as black, compact, and largely composed of fine sandy silt with large amounts of debris such as plastics, broken bottles, metal scraps, bricks, etc. At one of the composite sample locations, C1-A, the soils were covered with a silvery material (PAP-00057070).

Tank Containment Area: This area consisted of a square concrete walled structure within which were five columnar tanks formally used by Congoleum Corporation for asphalt storage. Around the base of the tanks, and formerly covering a majority of the containment area, were solidified asphalt flows. Surface samples and test pit locations were selected to provide fairly even distribution as well as possible worst-case conditions (PAP-00057070).

The 2000 Peak Phase I ESA was conducted at the DVL Property for the purpose of observing the presence or likely presence of hazardous substances or petroleum products that may show an existing release, a past release or a threat of a release (PAP-00219969). As a result of the 2000 Phase I ESA, Peak, DVL's consultant, claimed to have observed the following recognized environmental conditions (RECs) at the site:

- Storage Tanks: Two aboveground bulk storage tanks, and records relating to ten underground storage tanks were identified by Peak during the assessment. No records regarding removal or disposal of the storage tanks were discovered by Peak, nor were records discovered by Peak that related to an evaluation of the condition of soil and/or groundwater in the vicinity of these areas.

- Fill Material: Three filled water reservoirs were located by Peak on the subject property. Peak did not locate records identifying the quality or source of the fill material with which they had been filled.

- Storage Areas: Peak claimed to have discovered current and historical drum storage areas during the investigation. A site plan from 1941 showed that 125 drums of resin had been staged outside the north wall of Building No. 13. In addition, site inspection records from 1981 identified numerous drums of chemicals and hazardous materials within Building No. 114. Hazardous materials were also noted to be stored within Building Nos. 114 and 16.

- Potential PCB-Containing Equipment: A total of eight electrical transformers were identified on the subject property which, according to Peak, due to their aged appearance and staining was considered RECs. The transformers were installed after Congoleum entities sold the property to DVL in 1960 (PAP-00724490; PAP-00724489). Two of the transformers were located on the outside walls of Building Nos. 12, and 24 respectively. The remaining six transformers consist of two separate groups of three pad mounted units, located south of Building No. 114 and west of Building No. 17. A County Health Department investigation report and an NJDEP Communications Center Notification Report state that a potential release occurred in 1994, during the time that DVL owned the property, from transformers behind Building No. 18, which was formerly located directly south of Building No. 114 (PAP-00219969-70; PAP-00219984).

The purpose of the 2001 Peak Phase II ESA was to further investigate certain potential areas of environmental concern identified during the Phase I ESA process. These were limited to investigations related to the presence or absence of suspected USTs; an evaluation of the environmental quality of fill material within three former water reservoirs; and an evaluation of soils adjacent to six electrical transformers for the presence of PCBs (PAP-00231547).

The 2001 Peak Phase II ESA identified one 550 gallon No. 2 fuel oil UST at Building No. 13 and six solvent USTs associated with Building No. 114. It was recommended that these be closed by following proper UST closure procedures. The fill material in the reservoirs included brick, wood, plastic, and concrete fragments at each reservoir location, in addition to an oily material exhibiting soil staining and petroleum odors at the base of Reservoir Nos; 2 and 3. The results of the pad mounted transformer investigation showed the presence of the PCB Aroclor-1254 in each soil sample collected adjacent to the pads (PAP-00231553-54).

According to the Peak Remedial Investigation Report/Remedial Investigation Workplan (RIR/RAW) for the DVL Property January 2002 (2002 Peak RIR/RAW), remedial investigations were conducted for two areas: 550 Gallon Fuel Oil underground storage tank (UST-7) and Solvent UST Area consisting of UST-1-6. UST closure activities were initiated on May 23, 2001. During closure, corrosion holes were noted within five of the USTs (PAP-00220532).

Following removal of the USTs from their respective excavations, potentially impacted soils were excavated, and stockpiled on site for evaluation. Results of soil sampling at each excavation did not show any target contaminants above applicable cleanup criteria (PAP-00220532).

According to the 2008 Peak RIR/RI/RAW, the following remedial investigations occurred:

- AOC-3 Reservoir No. 2 – In the fall of 2003, soil delineation was conducted around Reservoir No. 2. The results of the investigation showed a black, thick (similar to No. 4 oil), oil/product within 11 of the 20 boring locations. The soil sample results showed that the contamination is limited to Total Petroleum

Hydrocarbons (TPHs) and that the highest TPH concentrations were noted near the piping run associated with the aboveground fuel oil tanks (PAP-00232620).

- AOC-6 Former Pad Mounted Transformer – Additional sampling was conducted on October 27, 2003 following the decommissioning of the transformers. Four surface samples (TF-1 through TF-4) were collected from the sides of the pad associated with the transformers for PCB analysis. The results of the analysis did not show the presence of PCBs above applicable soil cleanup criteria. On November 3, 2003 two additional soil samples (TF-9 and TF-10) were collected on the west side of samples T3 and T-4 to complete horizontal delineation. The results of the analysis did not show the presence of PCBs. Based upon these results, Peak determined that it appeared as if the source of the PCBs within T-3 and T-4 was associated with fill used in Reservoir No. 4 and not the transformers (PAP-00232623-24).

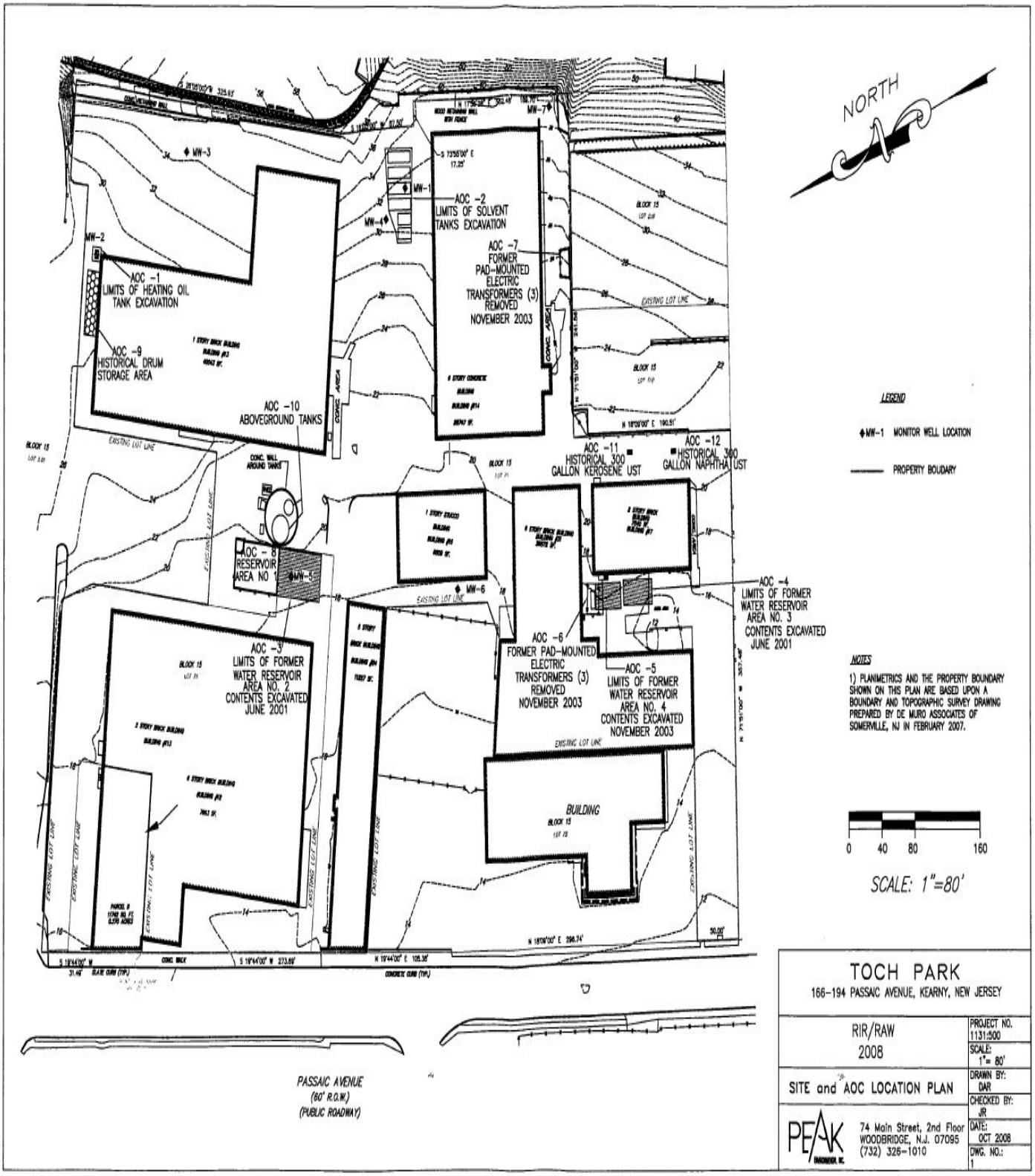
- AOC-7 Former Pad Mounted Transformer – Further sampling was conducted on October 27, 2003. Four surface samples (TF-5 through TF-8) were collected from the eastern, northern and western sides of the pad associated with the transformers located adjacent to Building 114 for PCB analysis (PAP-00232625).

- AOC-9 Historical Drum Storage Area – Historic records showed a drum storage area along the northern wall of Building No. 13. On August 5, 2008, four soil borings (DS-1 through DS-4) were advanced and tested. The results did not show the presence of any target compounds detected above the SCC (PAP-00232625).

See the following site map for locations of the above discussed AOCs.

Congoleum Corp.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report



(PAP-00232636)

According to the 2015 Peak PCB Cleanup Amendment, an amendment was needed to address PCB impacts detected in concrete and brick in the swale and soils in the sumps and manholes of the swale, around and beneath Building No. 114, and adhesives from Building No. 114 and Building No. 31 (PAP-00223726). The swale is comprised of concrete walls and a brick top that connects to grates, the pipe appears to be constructed of clay. Four sumps and two manholes were found. Based on the initial investigation, the swale appears to end at a sump, no additional manholes were encountered (PAP-00223729).

The 2015 Peak PCB Cleanup Amendment stated that soil delineation will be conducted in the area outside of the Building No. 114 in order to define the vertical and horizontal extent of the observed concentrations of PCBs. In addition, three soil samples beneath the foundation of each bay of Building No. 114 will be collected to evaluate subsurface conditions (PAP-00223731). Note: No further information on the soil delineation after 2015 was located in the materials provided for review.

Remedial Activities

According to the 2002 Peak RIR/RAW, the following UST Closure Activities occurred:

- UST-7 (550 Gallon Fuel Oil UST) was decontaminated, removed and inspected. Approximately five cubic yards (CY) of impacted material were excavated and stockpiled for disposal. Following site investigation activities, the UST excavation was backfilled with clean fill (PAP-00220536-37).

- UST-1 through 6 (Solvent UST Area), removal of overburden soils above the six tanks occurred. Following gauging of the soils, the tank contents were pumped out and staged on site within bulk storage tanks pending disposal. The USTs were decontaminated, removed, and 80 CY of impacted soils was removed (PAP-00220537-38). Following site investigation activities, the UST excavation areas was backfilled with clean overburden fill and clean fill (PAP-00220539).

According to the 2008 Peak RIR/RI/RAW, the following remedial activities occurred:

- AOC- 5 Reservoir No. 4 – During November 2003, the contents of Reservoir No. 4 were excavated and stockpiled on site pending disposal. Approximately 100 tons of suspect petroleum impacted soil was excavated from this reservoir and transported off site on Sept. 15, 2004 (PAP-00232623).

- AOC-6 and AOC-7 Former Pad Mounted Transformers – Following removal of the transformers, on November 6, 2003, approximately 10 tons of PCB impacted soil was excavated from the area adjacent to the pad mounted transformers located to the south of Building 114 (PAP-00232625).

According to the 2008 Peak RIR/RI/RAW, the proposed RAW is to remediate known soil contamination associated with the adjacently located AOC-3, (Reservoir No. 2), AOC 8 (Active Water Reservoir No. 1), and AOC 10 (Aboveground Storage Tanks). This would consist of soil excavation in the vicinity of the three AOCs. The removal action proposed

was a single phase remediation, where the remedial action will be conducted concurrently with sampling to delineate the contamination and to confirm contaminant removal (PAP-00232631).

8. Summary of Asserted Defenses

Congoleum Corporation asserts that "the corporation currently known as Congoleum Corporation ("current Congoleum") is a different corporation (formed in 1986) with different owners than the corporations which previously manufactured products in Kearny, NJ under the brand name "Congoleum," which previously owned and/or operated the "Kearny Manufacturing Facilities" outlined in **RED** on the 2005 Annotated Tax Map (PAP-00220445) and which previously did business under the names Congoleum-Nairn, Inc., Congoleum Industries, Inc., Congoleum Corporation and/or Congoleum as a division or subsidiary of these other Congoleum entities, Bath Industries, Inc. and/or Bath Iron Works Corporation ("BIW") (jointly, "Bath-Congoleum"). Current Congoleum never owned or operated the Kearny Manufacturing Facilities, is not the successor to Bath-Congoleum or any owners/operators of the former Kearny Manufacturing Facilities with regard to the liabilities, including but not limited to the environmental liabilities and liabilities alleged by EPA as part of Operable Unit No. 2 of the Lower Passaic River Study Area at the Diamond Alkali Superfund Site arising from the ownership and/or operation of the Kearny Manufacturing Facilities.

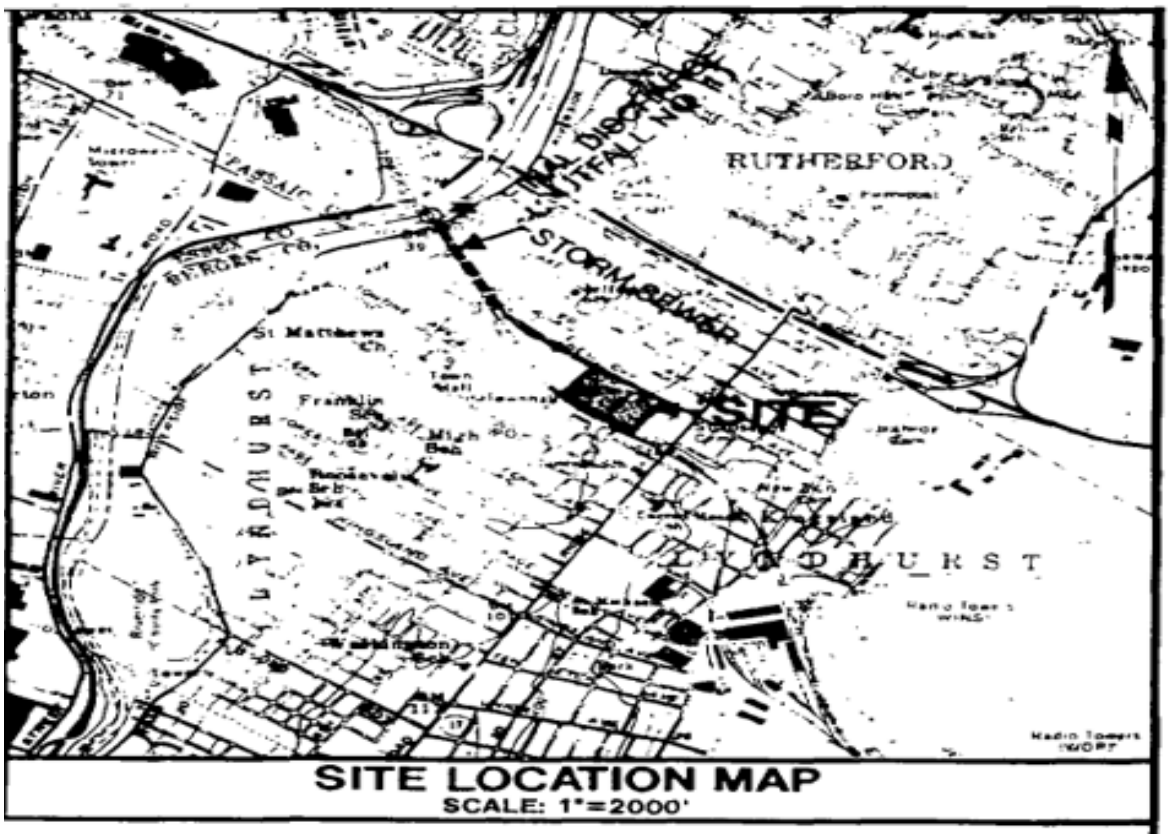
Conopco, Inc.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

CONOPCO, Inc.
(as successor to Corn Productions Corporation (CPC) / Bestfoods, former parent of the Penick Corporation)

Facility Name, Address and Size: Conopco d/b/a Unilever (as successor to CPC/ Bestfoods, former parent of Penick Corporation), 540 New York Avenue, Lyndhurst, New Jersey. The site is located on 14 different Lot numbers that fall within Block Numbers: 2A, 3, 73, 79 and 83 (PAS-00112914); 17-acre site (PAP-00048761). The site is also referred to as 550 New York Avenue, Lyndhurst (PAS-00112742; PAS-00112829).

Over time the property grew and in the 1960's included the 550 New York Avenue portion of the parcel. The 1968, 1970 and 1973 New Jersey State Industrial Directories noted that S.B. Penick located at 550 New York Avenue employed 540 people (PAS-00112829, 32, 35). The 1984 MacRae's Industrial Directory for New Jersey listed the Penick Corp., affiliate of CPC North America, as employing 400 (PAS-00112838). Note: pre-1960 operations on the 550 New York Avenue portion of the property are not attributable to Conopco.



(PAS-00113059)

1. **Business Type:** Between 1941 and 1986, Penick manufactured chemicals at the facility, including botanical extracts, pharmaceutical-fine chemicals, acetaminophen, resmethrin, rodenticide, insecticides/pesticides, specialty chemicals and stearates (PAS-00113112, 2741, 3149; PAP-00048761).

2. Time Period of Ownership/Operations

Operator: 1941-1986 (PAS-00113143; PAS-00112922)
Owner: 1938/1941-February 10, 1986 (PAS-00112822, 2922; 3143).

1914: According to the Penick Corporation website, S.B. Penick, Sr. founded the company in Marion, North Carolina in 1914 where he made drugs of vegetable origin (PAS-00112759).

1938: According to a book, *American Chemical Industry*, dated 1949, edited by Williams Haynes and D. Van Nostrand Company Inc., in 1938, S. B. Penick & Company bought a 15-acre manufacturing plant with extensive research and control laboratories at Lyndhurst, New Jersey (PAS-00112822). Peter Trippett, Penick Corporation, sent an Initial ECRA Notice of Requirements letter to NJDEP on April 30, 1984 (PAS-00113138) that said prior to Penick's ownership, United Cork Works Company owned and operated Blocks 73, Lots 1 and 3 and Blocks 79, Lots 1 and 2 until approximately 1941 (PAS-00113141, 43). The Initial ECRA Notice described the site location on New York Avenue between Ridge Road and Delafield Avenue to the east and west respectively and bordered by the Erie Lackawanna Railroad to the south. There were two parking lots, an open storage field and 43 buildings (4 of which were warehouses, i.e., 11, 28, 38 and 39), three administrative/ technical buildings (4A, C, 30 and 44) one lunch room/cafeteria, and a maintenance area (PAS-00113149). The 1984 ECRA Notice said that a third parcel was purchased in 1959 from Lehmen Brothers, Inc., an engineering firm (PAS-00113143).

1941: According to a 1984 *Initial ECRA Notice of Requirements*, Penick operations began in approximately 1941 (PAS-00113143). According to the 1985 *Environmental Assessment (EA)*, since 1941, the Lyndhurst plant has been engaged in the production of numerous chemical products, including pharmaceutical formulations, specialty organic and botanical preparations, and pesticides. The original part of the plant, comprised of Buildings 1 through 15, engaged in manufacturing various organic chemicals and botanical preparations. Newer areas of the plant included warehouses (Buildings 11, 11A, 38, and 39) and pharmaceutical/pesticide manufacturing (Buildings 41A, 41B, 42 and 43) (PAS-00113112).

1949: According to the book, *American Chemical Industry*, S.B. Penick & Company produced pyrethrum for control of malaria in World War II and red squill to control diseased rats. They also produced emetine, atropine and homatropine, hyoscine, hyoscyamine, pilocarpine, serine, strophanthin, ouabain, arecoline and totaquine from cinchona bark (PAS-00112823).

1960s: The S.B. Penick Company was acquired in the mid 1960's (PAS-00112759) and operated at the facility until February 10, 1986, when the assets were sold (PAS-00113408). The Penick Corporation website noted that when a large multinational conglomerate corporation acquired the S. B. Penick Company, the company was broken up into many pieces with each being sold over a period of

about 20 years. The last remaining piece, Penick Pharmaceuticals, was sold to a private investor in 1988 (PAS-00112759).

1985: According to the response to the Administrative Order, on November 5, 1985, Penick informed NJDEP it had reached an agreement for sale of the facility to Standard Chlorine and Chemical Company and other affiliated companies owned by Louis P. Weiner and requested a permit for the sale to move forward. The response to the Administrative Order noted that in paragraph 4 of a Scheduling Agreement, it showed that all permits would be transferred to Standard Chlorine and Chemical Company, and they would be responsible for obtaining any other permits. The Standard Chlorine and Chemical Company ultimately formed Penco of Lyndhurst, Inc. (PAS-00113405). This sale included the acetaminophen and botanicals part of the business (PAS-00112771).

Roussel UCAF (a French-based company) purchased the Lyndhurst pesticide business from CPC in 1985 and called the new company Penick-Bio UCLAF (PAS-00112715).

1986: A Memorandum from Peter Trippett to Frank Sanchez, dated May 16, 1990, documented the sale of Penick Corporation to Penco of Lyndhurst on February 10, 1986 (PAS-00112922). A *Bureau of Environmental Evaluation and Cleanup Responsibility Assessment Industrial Site Recovery Act (ISRA), Report of Inspection of 540 New York Avenue, Lyndhurst, ISRA Case E93651*, dated August 6, 1997, confirmed Penco of Lyndhurst, Inc. owned and operated the facility in 1986, when they purchased the business and property from Penick Corporation. Penco of Lyndhurst, Inc. manufactured acetaminophen, resmethrin (a pesticide) and botanical extracts.

According to the Administrative Order response, a Purchase and Sale Agreement, dated February 10, 1986, documented Penick's agreement to sell all assets, including its interim status to Penco, and Penco agreed to purchase all buildings "as is" and indemnify Penick of any liabilities attributable to operation after closing (PAS-00113405).

1987: According to a Memorandum to Peter Trippett from Frank Sanchez, dated May 16, 1990, in 1987 CPC International removed all hazardous materials and wastes at the facility via appropriate manifests (PAS-00112922).

According to a publication, "The Record, Northern New Jersey," dated June 10, 1987, Roussel UCLAF, consolidated its Lyndhurst pesticide operations and 20 executives at 400 Sylvan Avenue, Englewood Cliffs in May 1987. CPC continued to own Penick Corporation (PAS-00112786).

1988: According to the Administrative Order response, CPC International sold all stock in Penick to Mayfair Pharmaceuticals, Inc. pursuant to an Agreement of Purchase and Sale of Stock, dated February 1, 1988. As part of the transaction, CPC agreed to assume Penick's ECRA obligations arising out of the asset sale to Penco. The arrangement was formalized in an amendment to the ACO, dated March 31, 1988 (PAS-00113406).

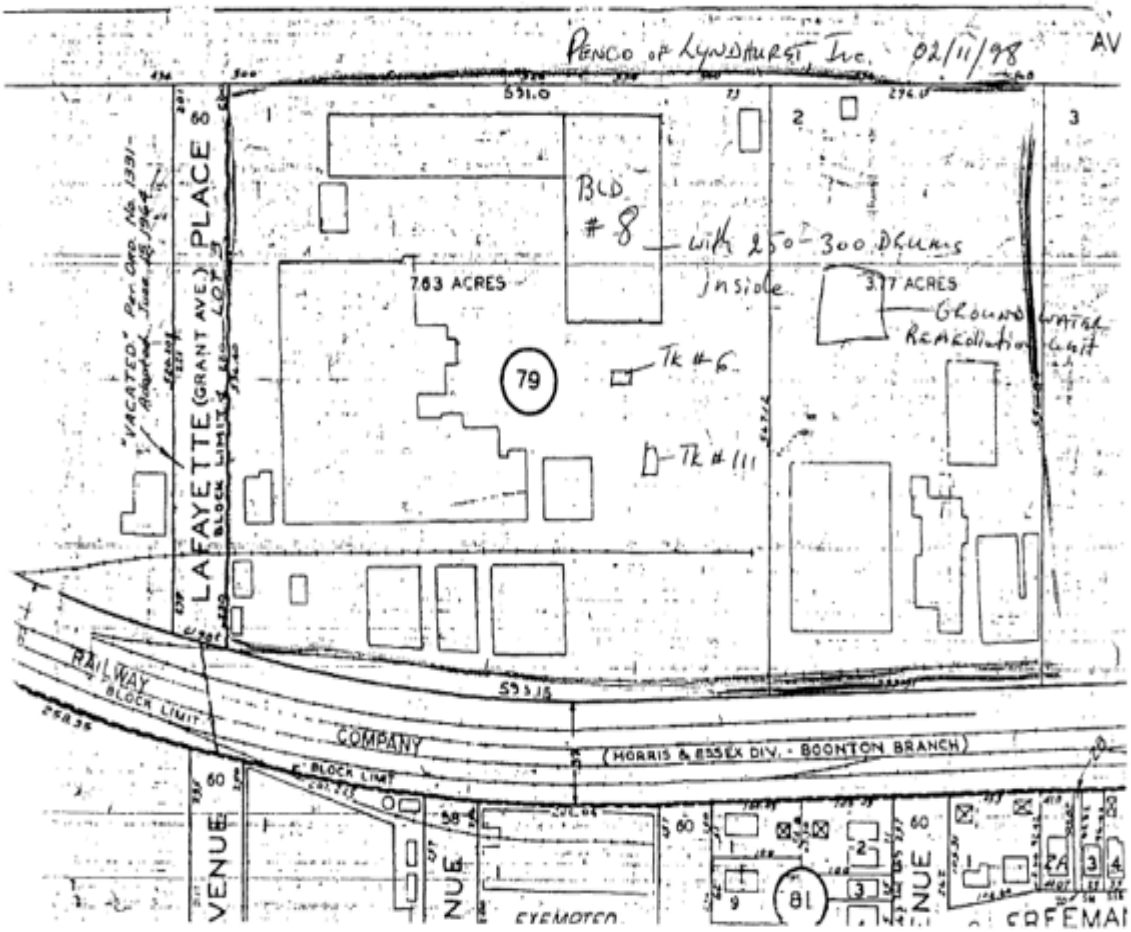
1991: Penco of Lyndhurst, Inc. filed for bankruptcy in 1991 (PAS-00112774).

1994: According to Penick Corporation website, Penick declared Chapter 11 Bankruptcy in 1994. In 1997 the Bankruptcy Court appointed a Trustee to run the company, whose job was to find a buyer (PAS-00112759). The publication, "The Record, Northern New Jersey," dated November 27, 1997, described the Penco chemical plant on New York Avenue, Lyndhurst, as a 17-acre abandoned, state-registered toxic waste site proposed to house a 60,000 square foot ShopRite (PAS-00112773).

1998: A Memo to File through Jeffrey Sterling from Boleslaw Czachor, dated February 13, 1998, documented a Site Remediation Progress Report for NJD 981 184-401 for 250 New York Avenue owned by Penco of Lyndhurst, Inc., described between 250 and 300 mostly 55-gallon drums in storage; some were observed to be in bad condition. The report described a noticeable organic odor at the entrance of the facility and that nothing had been done on two RCRA USTs, tanks 66 and 111, 50,000-gallon and 10,000-gallon, respectively. Mr. Czachor contacted Bennett Barnes, ISRA Case Manager, who informed Mr. Czachor that UST 66 had been surrendered to ISRA for closure, but the company had not submitted a closure plan. At the writing of the report, North Atlantic Properties, Ltd. owned the site (PAS-00112965-68). The facility layout at this time is shown on the map on the next page.

2000: According to the Penick Corporation website, in February 2000, Penick Holding, Inc., a group of individual investors with specific intentions to acquire Penick, received approval from the Court for a Reorganization Plan. Penick Holding, Inc. acquired the Penick Corporation and proceeded with plans to re-establish Penick's medicinal narcotics manufacturing businesses (PAS-00112759).

2005: According to a Dun and Bradstreet Comprehensive Report, Unilever is a division of Conopco, Inc. (PAS-00112750).



(PAS-00112969)

3. Operational History/COC Use and Presence at the Facility

The 1984 Initial ECRA Notice of Requirements contained an operational history which proceeded through three departments, Pesticides, Botanicals and Acetaminophen. Acetaminophen production occurred in Building 41 using acetic acid, anhydrous ammonia, sulfuric acid 66 Be', and p-nitrophenol. Hydrogen was used to reduce p-nitrophenol to form p-aminopheno which was acetylated with acetic anhydride to form 4-hydroxyacetaninilide or acetaminophen. The compound was heated, crystalized, redissolved and crystallized again for a purer product. Wash water was processed through the plant pretreatment station (PAS-00113149).

Pesticides production occurred in Building 43 and formulations were prepared in Building 7. In 1984 the only bulk pesticide was resmethrin (tradename SBP-1382) otherwise known as (5-benzyl-3-furyl) methyl-1, 2, 2-dimethyl-3-(2-methyl propenyl) cyclopropane carboxylate. Raw materials required for production included benzyl cyanide, ethylene glycol, N-hepatane, methylene chloride, sulfuric acid 66 Be', sulfuric acid 66 Be' electrolyte, toluol 1 nitration, p-toluene sulfonic acid, isopropyl alcohol, methanol ACS, kerosene deodorized Baylor 90 and dimethyl succinate. Drums containing bulk material were stored in Building 28 (PAS-00113150).

The only pesticide produced in bulk was resmethrin, which took five stages to create. Carbinol was the precursor immediately preceding the resmethin final product. Intermediate steps produced Valerate and Furoate in that order which were isolated and not handled in an open system. Manufacturing produced two waste streams that were isolated for off-site disposal or treatment. 1) Spent toluene solvent obtained from an acid layer separation during the manufacture of Furoate was stored in vessel 66 while awaiting hazardous waste disposal through an approved private disposal firm. 2) The second waste stream was a solid at room temperature and was a "polymerized process tar" that was disposed as a hazardous waste through a private disposal firm (PAS-00113150-51).

According to the 1984 *Initial ECRA Notice of Requirements*, staff in Building 7 produced various grades and concentrations of active ingredients, i.e., a natural occurring pesticide isolated from the root of a south American Plant, Rotenone; Dursban; chlorpyrifos and a naturally occurring insecticide of plant origin, pyrethrum. Their formulations required deodorized kerosene and occasionally water (PAS-00113151).

Botanicals provided naturally occurring active ingredients for pharmaceuticals, cosmetics, flavors, fragrances industrial photographic emulsions and pesticides. The active ingredients may have been isolated by extraction, direct milling and/or a combination of both. The final products were packaged or further processed via spray drying, formulation, or air- drying. Extraction from the botanicals could either be aqueous or organic e.g., ethyl alcohol. Botanicals consisted of several diverse product lines (PAS-00113151).

According to the 1984 *Initial ECRA Notice of Requirements*, operations proceeded as follows:

- Building 2 – extraction and milling botanic products such as cascara and guarana
- Building 3 – milling, sifting and blending
- Building 9 – Tagetes[1] blending
- Building 13 – quillaia[2] and henna[3] production
- Buildings 12, 13 and 14 – piperidine ester manufacture; quassia purification; henna leaf extraction
- Building 16 – soap bark processing
- Building 19 – solvent recovery
- Building 22 – Rotenone extraction (PAS-00113152).

Raw materials considered as hazardous substances in the botanical operation included: ethyl alcohol, toluene, methanol acetone, heptane, isopropyl alcohol, hydrochloric acid, sulfuric acid, caustic, formaldehyde and calcium oxide. According to the 1984 *Initial ECRA Notice Requirements*, the only hazardous waste generated in these processes were waste solvents incorporated into below ground vessel No. 66 (PAS-00113152).

According to the February 1985 EA, since 1941, the Lyndhurst plant has been engaged in the production of numerous chemical products including pharmaceutical formulations, specialty organic and botanical preparations and pesticides. The original part of the plant

[1] Chicken feed
[2] Foaming agent
[3] Natural shampoo

comprised of Buildings 1 through 15 had engaged in the manufacture of various organic chemicals and botanical preparations since the plant's inception Newer areas of the plant include warehouses (Buildings 11, 11A, 28, 38, and 39) and the pharmaceutical / pesticide manufacturing complex (Buildings 41A, 41B, 42, and 43). Many of the chemicals were stored in above- and below-ground tanks and in 55-gallon drums in various locations. Prior to construction Buildings 38 and 39, the area occupied by Building 39 was used for storage of solvents in drums. Infrequently, materials were spilled or drums ruptured. The plant generated process wastewater that was discharged to sewer lines connected to an on-site industrial waste treatment plant. The wastewater was skimmed for oil and grease, neutralized with lime and discharged through the sewer line to the local publicly owned treatment works in Newark, New Jersey. As the wastewater left the plant at the northwest corner, the sewer routed it under the center of New York Avenue toward the Passaic River (PAS-00113112). Solid and liquid hazardous waste were stored in drums in the hazardous waste storage area to await pick up by an outside contractor. The plant generated hazardous waste under Permit NJ0081894842 (PAS-00113113).

A NJ Bureau of Environmental Evaluation and Cleanup Responsibility Assessment was triggered due to cessation of Penco of Lyndhurst, Inc.'s operations in 1993 and an agreement to sell the property to North Atlantic Properties, LLC, a New Jersey Limited Liability Company consistent with a Remediation Agreement dated January 31, 1997. The resultant Inspection Report stated that Penick Corporation (i.e., CPC International, Inc.) was conducting remediation at the site under ISRA case E84090. Upon arrival, the inspector noted the site was surrounded by fencing and was in a commercial and residential area. There were at least 20 structures, and one burnt to the ground and another partially burnt in June 1996. Walls were collapsing and nearly every building had been vandalized (PAS-00112971). Numerous drums and containers were seen located in numerous buildings that included, but were not limited to, 5, 6, 10, 27, 38, 39 and 43. Labeled contents were "speedydry" at "50 ppm and 150 ppm." These drums, along with a partially covered soil pile were attributed to ISRA Case E84090 (PAS-00112972).

According to the August 6, 1997, Inspection Report, globules and bubbling were observed in the wastewater at the pretreatment facility. Floor drains, trenches and sumps were present in storage and manufacturing buildings that involved hazardous substances include Buildings 4, 7, 15 and 16. The report documented significant staining on the floor of building 27 (a boiler room) and in the concrete near 30,000-gallon USTs 112 and 113 that contained 6 heating oil. UST 111 was empty, and UST 27 (2,000-gallon capacity) contained 2 fuel oil. Transformers were noted on second story walls in some buildings with at least one label indicating it contained PCBs. Pint size jars of reportedly radioactive material were noted in a closet in unsecured Building 18, a quality control building (PAS-00112972). Penco of Lyndhurst, Inc. was notified that sampling conducted under ISRA Case E84090 did not acceptably address areas of concern that had since been identified. Therefore, Penco of Lyndhurst, Inc. was to identify and address areas identified since ISRA Case E84090 (PAS-00112972-73).

The August 6, 1997, Inspection Report stated that USTs 112 and 113 were excavated in 1991 but had been re-contaminated with No. 6 fuel oil between April 26 and May 3, 1994 (PAS-00112973). Penco of Lyndhurst, Inc. was directed to address all issues identified in the Inspection Report and determine the extent of groundwater contamination (PAS-00112974).

According to an unnamed publication, dated November 26, 1997, as much as 10,000-gallons of toluene spilled from an underground tank in May 1981. The extent of the spill was unknown but was evidenced by tree defoliation in 1982 (PAS-00112776).

DDT, DDE

According to the 1984 Initial ECRA Notice of Requirements, Buildings 6, 7 and 43 were the locations of pesticide formulation, and inspection of Buildings 6 and 7 found DDT and a minute amount of DDE contamination (PAS-00113150, 156).

PAHs and Metals

There were underground storage tanks on-site that were used to store No. 2 and No. 6 fuel oil. There was also one tank used to store waste oil. No. 6 fuel oil was stored in Tanks 112 and 113 (both 30,000 gallons) (PAS-00112939). Both were reported to be in good condition with no significant corrosion or holes when removed in 1999 (PAS-00112939). Tanks 27, 114, and 119 held No. 2 fuel oil (size unknown) (PAS-00112989-90). The waste oil was stored in Tank 111 that had a capacity of 10,000 gallons (PAS-00112939). Fuel oil and waste oil typically contain PAHs and metals.

PCBs

According to an undated Regulatory Compliance Status (circa mid-1980's), nine transformers on-site were owned by the public utility. They were fenced in but accessible to Penick personnel. The utility informed Penick that the transformers contained PCBs at 50-500 ppm. Penick owned three transformers on-site; one of which contained PCBs at less than 50 ppm (PAP-00328085). According to a 1999 letter from NJDEP to a law firm, regarding a remediation agreement, prior to demolition of buildings on-site, PSE&G removed their last transformer. There was reportedly no evidence of stains or contamination beneath the transformers (PAS-00112940).

4. Identified COCs

- PCBs (used and detected)
- PAHs (detected)
- DDx (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

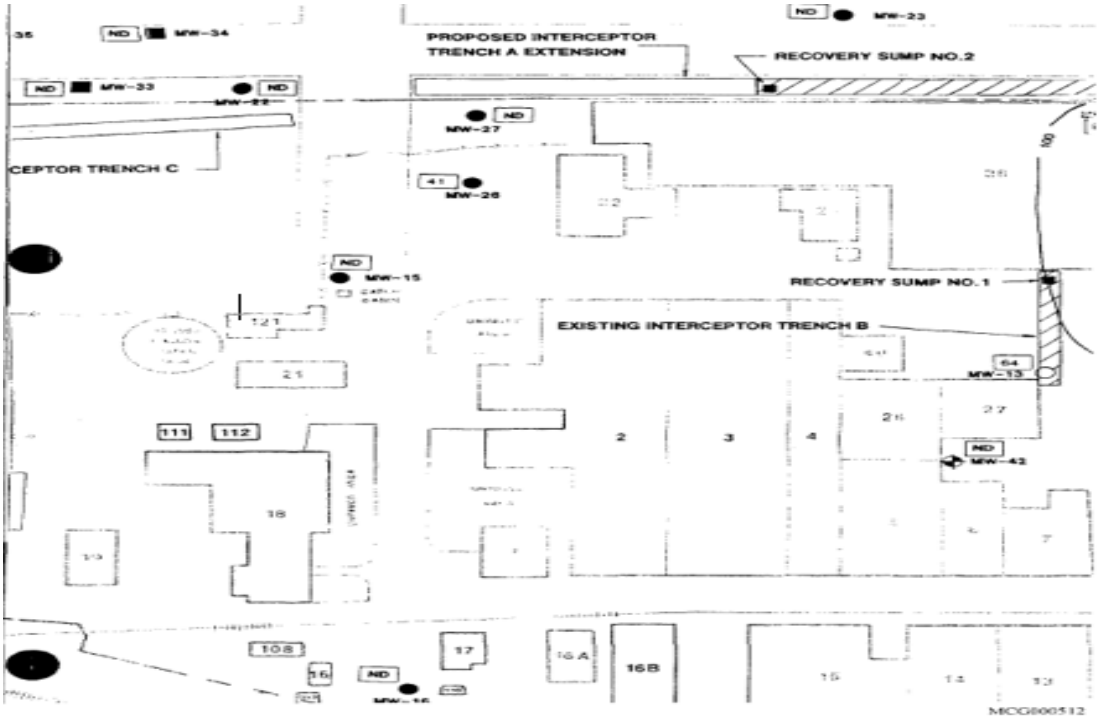
According to an NJDEP Letter, dated November 9, 1990, to Howard B. Epstein, Penick Corporation, 148 ppm PCBs were detected in sample OPA-30 collected from the South Drainage Ditch (PAS-00112953).

Results of the *1991 Supplemental Soil Characterization Program* noted that there were 620 ppb PCBs near sample OPA-43 along the southeastern border in 1987, but were not detected in five soil samples collected near the same location in 1991 (PAS-00113284).

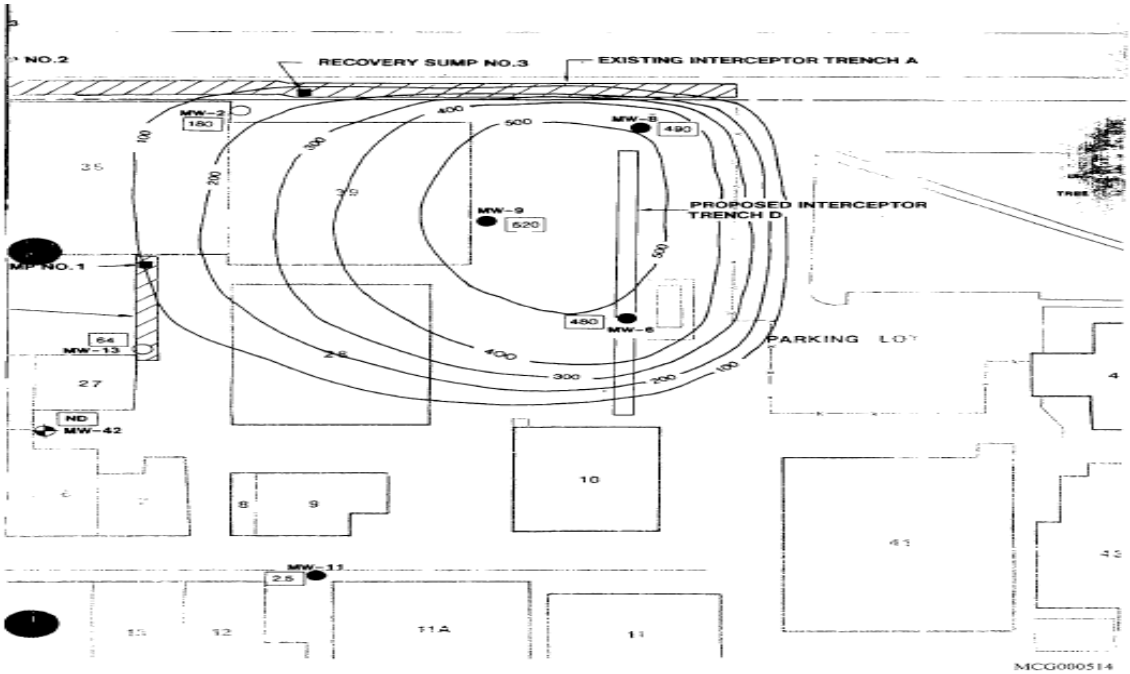
Conopco, Inc.

Diamond Alkali OU2 Allocation
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Facility Data Report

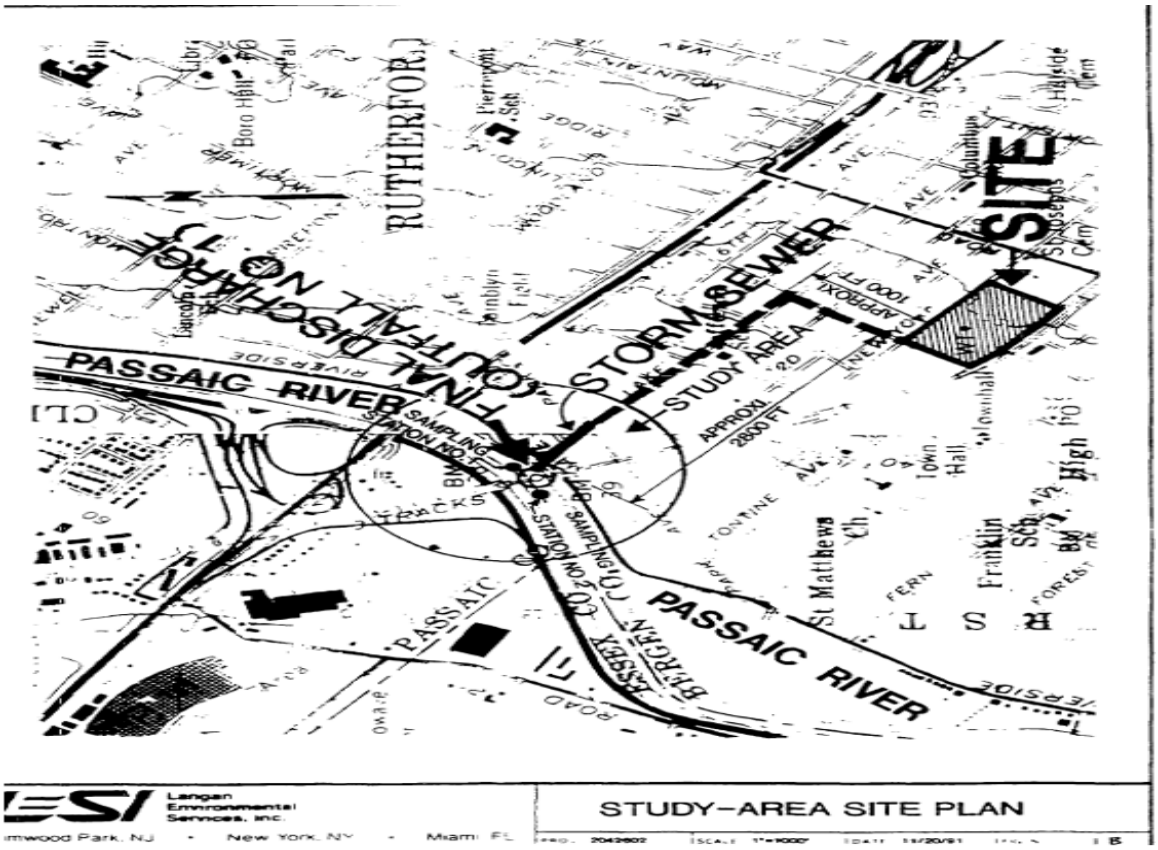
According to the 1995 RAR South Drainage Ditch, samples collected by Langan on April 19, 1995, identified 21 ppm PCBs in soil sample No. D-1 collected at 2 feet bgs (PAS-00113246).



(PAS-00113063)



(PAS-00113065)



(PAS-00113020)

According to a February 1985 letter from Penick to NJDEP, in July 1982, the one transformer that contained PCB oil was retrofitted with non-PCB oil. The transformers were noted to be on paved portions of the site (PAP-00328039-40).

According to the June 8, 2018, Deed Notice Restricted Area Data Table, a maximum concentration of 0.62 mg/kg PCBs has been detected at the facility from 0-2 ft. bgs (PAP-00328266; PAP-00328282).

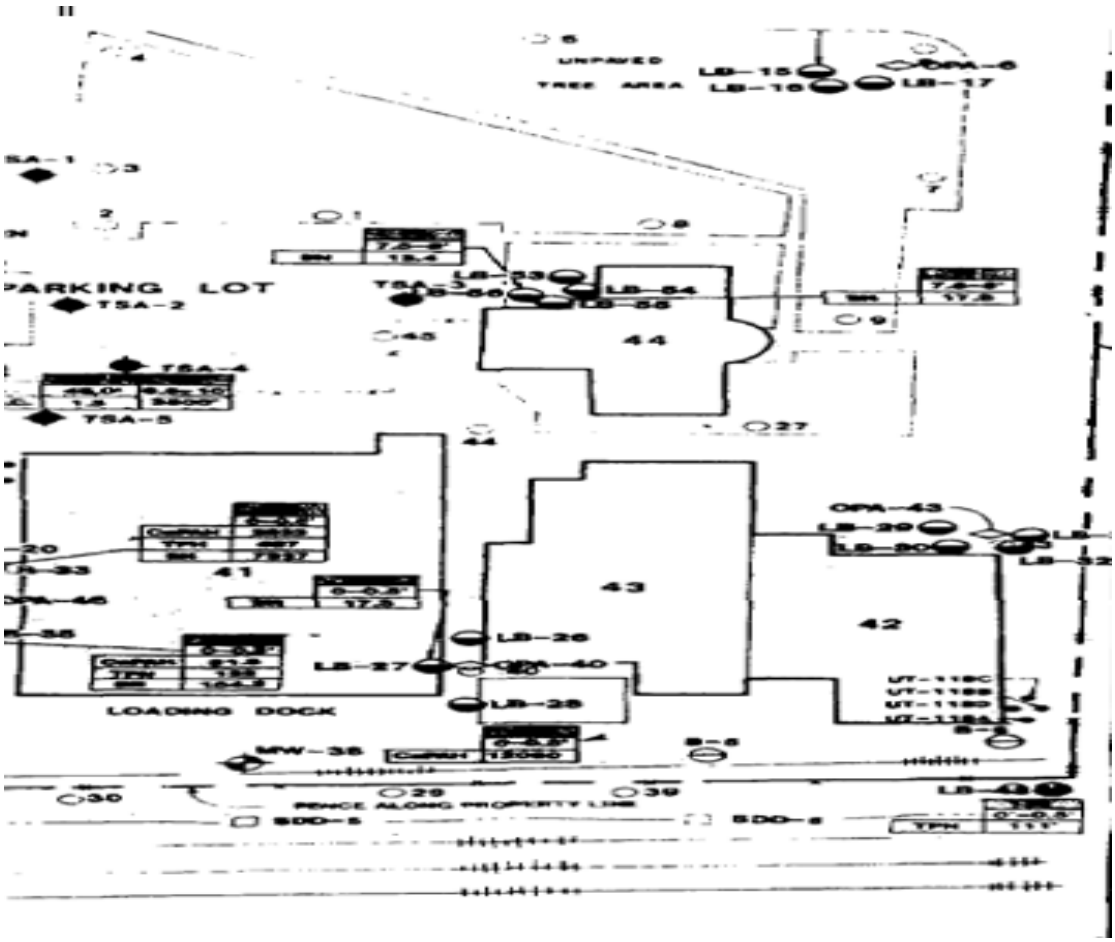
PAHs

Preparation of the 1985 EA by Versar, Inc. for the Penick Corporation involved collecting samples in July 1984 that detected ubiquitous PAHs at the site (PAS-00113117). The source of PAHs was believed to be asphalt particles; therefore, PAH sampling was dropped (PAS-00113121).

The *Results of the Supplemental Soil Characterization Program, Former Penick Corporation* developed by Langan Environmental Services (Langan) on May 14, 1991 (PAS-00113276) noted 67 ppm carcinogenic PAHs in sample “Other Plant Areas” (PAS-00113279) (OPA-6) collected in 1987 (PAS-00113283). Resampling of OPA-46 on January 10, 1991, identified 1,200,000 ppb fluoranthene and phenanthrene in soil

surface sample LB-33 located on the west central border. Soil sample LB-33 also contained 840,000 ppb benzo(a)anthrene; 940,000 ppb pyrene; and 2,833,000 ppb total targeted carcinogenic PAHs (CaPAHS). There were numerous other PAHs in surface soil sample LB-35, collected from the southeast corner of the facility which contained 22,000 ppb of chrysene and phenanthrene that are above the NJDEP action level of 10,000 ppb for base neutrals (PAS-00113306). PAHs exceeded NJDEP action levels in samples collected near OPA-53. Soil confirmation sample LB-38 collected on January 14, 1991, from the southwest corner of the facility, contained 180,000 ppb pyrene; 150,000 ppb chrysene and 130,000 ppb benzo(a)fluoranthene (PAS-00113307).

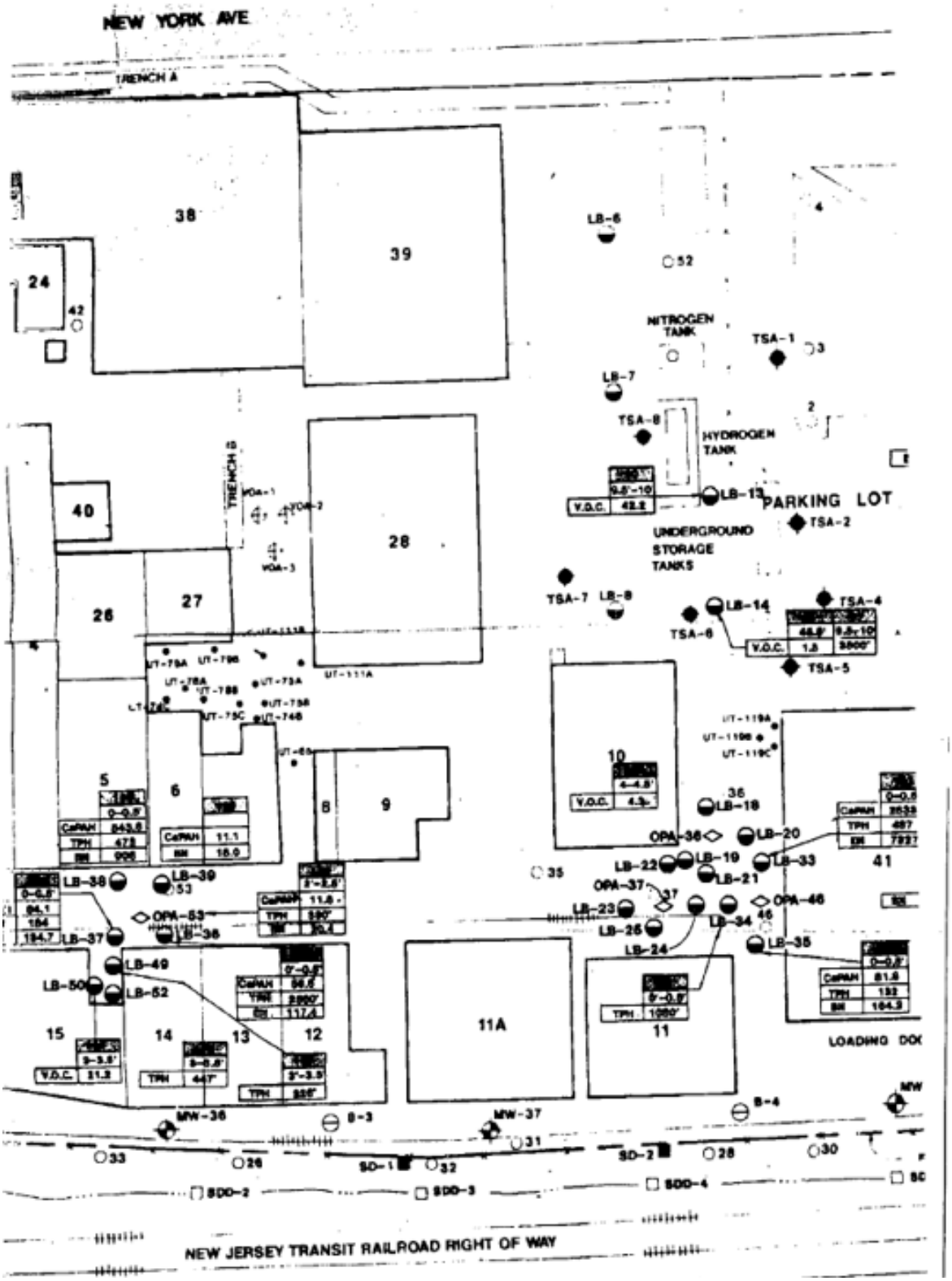
Analysis of the Septic and Leach Tank in Building 1 detected 13,000 ppb C12H15 PAH between 7.5 and 8 feet bgs in soil sample LB-59 near the center of the site (PAS-00113312). Background samples contained up to 5,300 ppb fluoranthene; 7,900 ppb pyrene in surface soil sample LB-41; 9,500 ppb benzo(b)fluoranthene and 7,600 ppb fluoranthene in surface soil sample LB-42; 347 ppm copper in surface soil sample LB-67 (PAS-00113316).



(PAS-00113321)

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(PAS-00113323)

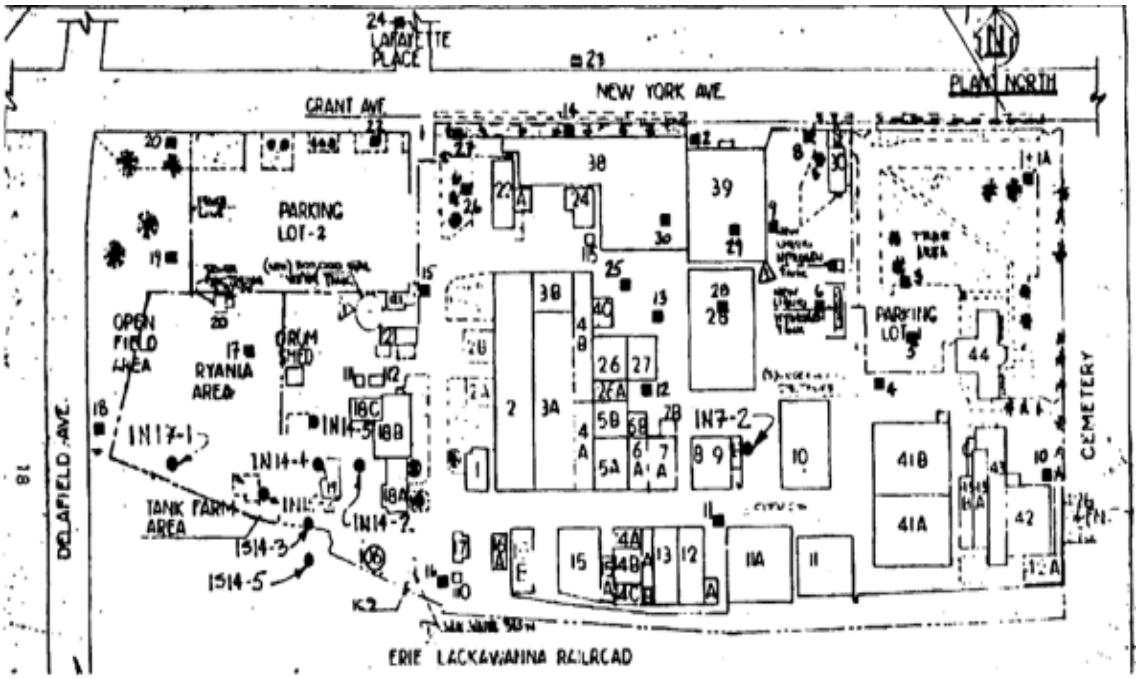
According to a *Remedial Action Report (RAR), South Drainage Ditch, Former Penick Corporation Site*, prepared for CPC International, Inc. by Langan dated December 8, 1995, sampling on April 19, 1995, identified PAHs that included 4.0 ppm benzo(a)anthracene; 3.8 ppm 3,4-benzofluoranthene and 2.5 ppm benzo(a)pyrene in soil sample D-1 collected at 2 feet bgs (PAS-00113246). South Drainage Ditch is located not far off-site (PAS-00113260). This ditch also receives runoff from other properties south of the Penick Facility, including south of the Penick facility, including a parking lot for some condominiums (formerly a paint factory) and a shopping mall (PAP-00327509).

DDx

Versar collected samples for the 1985 Penick EA in July 1984 and found between 660 mg/kg 4,4'-DDD in surface soil sample INI4-4 and 2 mg/kg in soil sample INI4-4 collected at 3 feet below ground surface (bgs) and between 370 mg/kg 4,4'-DDT in surface soil sample INI4-4 and 1 mg/kg in soil sample INI4-2 collected at 3 feet bgs near the southwestern corner of the site (PAS-00113127).

A July 2, 1990, *Cleanup Plan, Former Penick Corporation Facility*, prepared for CPC International by Langan, stated that four surface soil samples FB-1 through FB-4 were collected from the Foam Basin, approximately ten feet northwest of the on-site wastewater treatment plant on April 15, 1987, and September 2, 1987. The Foam Basin was a concrete floored, masonry walled basin used to trap foam originating from the sewer lines and neutralization tanks on the property. Soil sample FB-2 was collected from inside the Foam Basin, and the remainder were collected from outside the Foam Basin (PAS-00113339). Soil sample FB-2 contained concentrations of DDT, DDE and DDD at 600, 14 and 210 ppm, respectively. FB-3 contained 283 ppm DDD and FB-4 contained 28.8 ppm DDT (PAS-00113340). 4,4-DDT and 4,4-DDD were identified in soil sample UT-65 near UST No. 65 at concentrations of 9,700 and 10,200 ppm, respectively (PAS-00113349).

The report *Sampling Plan Results, Penick Corporation*, dated November 13, 1997, by Dames and Moore (PAS-00113205) showed 120,000 µg/kg 4,4-DDT, 2,900 µg/kg 4,4-DDE and 21,000 µg/kg 4,4-DDD in soil sample UT-116B associated with UST No. 116 (PAS-00113221-22).



(PAS-00113124)

According to a Regulatory Compliance Status document, in 1984 Penick completed cleanup of chlordane, DDT, DDE and DDD from Buildings 6 and 7 (PAS-00112928).
A Deed Notice dated June 8, 2018, restricting use of the property states that DDD, DDT and DDE contamination remains at the facility and that the maximum concentration of each is 5.1 mg/kg, 13 mg/kg, and 3.6 mg/kg, respectively (PAP-00328266; PAP-00328282).

Copper

The July 2, 1990, *Cleanup Plan* prepared by Langan noted that 202 ppm copper was identified in surface soil sample TSA-5 collected on April 15, 1987 (PAS-00113344, PAS-00113339). Copper concentrations ranging between 189 and 3,930 ppm were identified in soil locations OPA-10, 13, 26, 28, 29 and 33 (PAS-00113345).
Samples collected on April 1, 1995, for the *1995 RAR*, South Drainage Ditch, contained 587 ppm copper in soil sample D-1 collected at 2 feet bgs (PAS-00113246-47).

Lead

Soil samples collected on April 15, 1987, for the July 2, 1990, *Cleanup Plan* identified 1,090 ppm of lead in OPA-29 (PAS-00113345).

Samples collected on April 19, 1995, for the *1995 RAR, South Drainage Ditch*, contained 363 ppm lead in soil sample D-1 collected at 2 feet bgs (PAS-00113246-47)
A composite sample of sludge from the 1990s was sampled and the only Passaic COC detected in the sludge was lead, at 7.30 mg/kg (PAS-00112942).

Mercury

The report *Sampling Plan Results, Penick Corporation*, dated November 13, 1987, by Dames and Moore found 25,000 µg/kg mercury in soil sample UT-116B and 31,000 µg/kg mercury in soil sample UT-116C. Samples were associated with UST No. 116 (PAS-00113221).

The first round of sampling for the July 2, 1990, Cleanup Plan occurred between April 20 and 27, 1987; however, holding times were exceeded in some samples and a second round of sampling occurred between August 26 and September 2, 1987 (PAS-00113344). Sample analysis identified mercury concentrations that ranged between 1.0 and 7.6 ppm at sampling locations OPA-16, 17, 21, 24, 26, 37, 47 and 52 (PAS-00113345). The *Results of the Supplemental Soil Characterization Program, Former Penick Corporation Facility, ECRA Case No. 84090*, prepared for CPC International, Inc. by Langan dated May 14, 1991 (PAS-00113276), noted that 20 ppm mercury was found in 1987 sample OPA-37, but mercury was not found in five soil samples collected in 1991 in the vicinity of OPA-37 (PAS-00113284). In 1987, 16 ppm mercury was detected in OPA-43; however, no mercury was detected in 1991 in this area (PAS-00113284). A 1991 soil characterization effort collected eight soil samples from background areas adjacent to the facility, including from a New Jersey Transit right-of-way adjacent to the facility and a paint facility nearby (PAS-00113288-89). Mercury and copper were both detected at levels exceeding action levels at the former paint processing plant and the right-of-way. The same report concluded that, based on the "higher off-site levels of mercury," the "surficial mercury contamination found intermittently throughout the [Facility] is from a regional source and not from former site operations" (PAS-00113289-90).

According to a March 3, 1992, letter from Langan to NJDEP, Bureau of Industrial Discharge Permits, June 1987 water quality analysis identified 0.37 ppb mercury in MW-13 in the central portion of the site (PAS-00113045, 48). Samples collected on April 1, 1995, for the RAR, South Drainage Ditch, which is located not far off-site, contained 1 ppm mercury in soil sample D-1 collected at 2 feet bgs (PAS-00113244, 246-47,260).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[4]

Deed Notices dated June 8, 2018, states that historic fill at the facility contained PAHs, pesticides, PCBs and metals (PAP-00328266, 282; PAP-00328297, 312).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and

[4]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).

mercury.[5] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[6] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[7]

The levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00328282).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,090 mg/kg
Copper	3,930 mg/kg
Mercury	31 mg/kg
Benzo(a)anthracene	120 mg/kg
Benzo(a)pyrene	100 mg/kg
Benzo(b)fluoranthene	130 mg/kg
Benzo(k)fluoranthene	19 mg/kg
Indeno(1,2,3-cd)pyrene	38 mg/kg
PCBs	148 mg/kg

No information is available regarding when fill materials were placed on the facility site.

There is no indication from a review of provided documents that facility operations disturbed contamination located in historic fill.

5. COC Pathways

Storm Sewer

Possibly as early as 1947 chemical waste found its way from S.B. Penick & Company on Grant Avenue through an open channel into a storm ditch and into the Passaic River, according to PVSC (PAS-00112813). Between 1947 and 1984, a handful of spills were reported to reach the sewer system from the property, including an acetaminophen spill and a toluene spill reported in the 1984 *Potential Hazardous Waste Preliminary Assessment for the Penick Corp, 540 New York Avenue* (PAS-00112984-985).

[5] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[6] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[7] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a memorandum, regarding an Interim Inspection dated July 1994, all storm water from this site, including the off-site south drainage ditch, flowed to a sewer monitoring station. At this station, a pumping system rerouted the water via an above-ground pipe to a sanitary sewer catch basin near the facility's waste water system to which it was connected. The wastewater was then discharged to the sanitary POTW line. During periods when the capacity of the pump at the monitoring station was exceeded, the excess flow discharged directly to the storm sewer system. According to Mr. Sanchez, of Penco of Lyndhurst, the reason for the pumping of storm water from the site to the sanitary system was “just in case any sanitary lines may still be connected to storm sewer lines.” Prior to the 1970’s sanitary sewer lines were interconnected with storm sewer lines. To his knowledge, however, all sanitary sewer lines had been disconnected from the storm sewers in the 1970s (PAP-00327204).

A September 19, 1990, *Tentative Cleanup Plan for South Drainage Ditch* developed by various regulatory agencies described the drainage trench located along the railroad tracks on the south end of Penco property. The trench was on railroad property, but Penco discharged storm water into the trench. The effluent from the trench then flowed through plant storm sewers to a transfer pit at the northwest section of the plant. The transfer pit would divert via a transfer pump up to 15 gallons/minute of the storm flow into the PVSC industrial sewer line. The flow was neither treated nor sampled for contaminants. The remaining flow was then sent into the Passaic River via the town storm sewers. The effluent entering into the transfer pit averaged between 2 and 3 gallons/minute. Heavy rains exceeded that rate (PAS-00113375). A historical description noted that the drainage ditch had been in existence at least half a century, with the current (i.e., circa 1990) storm water discharges from the plant site discharging into it. In the 1970s, the plant obtained an NJDEPS permit for discharge of storm water into the trench, which was later terminated favoring discharge into the PVSC system (PAS-00113376).

An October 23, 1990, *Progress Report on Cleanup of South Drainage Trench* found three storm drains discharged into the drainage trench. One storm drain was a roof drain on Building 16 that was plugged. The other two storm drains located near Buildings 43 and 11 were set up to reroute the plant industrial sewer (PAS-00113370). At the time, the untreated storm flow including the trench outflow discharged into the town storm sewers. On September 28, 1990, a two-inch PVC pipe connected the storm sewer transfer pit bypass pump into the plant pretreatment station. Oil was skimmed and pH was adjusted. During large rainstorms the storm sewer bypass pump was inadequate to keep untreated storm water from passing directly into the town sewer system (PAS-00113371).

According to the 1985 EA, process wastewater from all buildings discharged to sewer lines connected to the industrial waste treatment plant where all of it was skimmed for oil and grease and neutralized with lime. The treated water was then discharged to the sewer line and then to the local publicly owned treatment works in Newark. Treated water left the plant property near the northwest corner, and the sewer was routed under the center of New York Avenue toward the Passaic (PAS-00113112).

The 1990 Progress Report also noted a steam condensate line from Building 41 that connected into the storm sewer (corrected on October 14, 1990); a floor drain in Building 43, that was not being used at the time, also connected into the storm sewer; and the west end cooling tower overflow connected at another point into the plant storm sewer system. The last two items were to be plugged off and redirected into the industrial sewer during the week of October 22, 1990 (PAS-00113372).

Sanitary Sewers

A letter NJDEP wrote to Howard Epstein, dated November 9, 1990, referred to a 1970 map that showed that the plant sanitary system consisted of a network of underground clay tile piping. NJDEP strongly recommended that the Penick Corporation identify points of exfiltration and fix them (PAS-00112956).

Sanitary sewers and the waste water pre-treatment system discharged to the sanitary sewer system of the Passaic Valley Sewage Commission (PAS-00112926, 72).

According to a July 31, 1995, Compliance Evaluation Inspection, contaminated groundwater was discharged to PVSC at 100 gpm while the CPC discharge permit for the Penco Lyndhurst facility was being negotiated and modified (PAS-00113078).

According to an August and September 1976 PVSC Monthly Report, on February 19, 1976, the S.B. Penick plant at 540 New York Avenue, Lyndhurst, connects to the New York Avenue storm sewer, thence to the Lake Avenue storm sewer to the Passaic River (PAS-00112806).

6. Regulatory History/Enforcement Actions

Permits

According to the April 30, 1984, *Initial ECRA Notice of Requirements*, S.B. Penick and Co. applied for a NPDES Permit on April 12, 1974, and the NPDES Permit No. NJ00D3531 was obtained on June 28, 1974. The permit covered discharge of storm water runoff to the Passaic River. Available references did not include the permit and associated flow and monitoring requirements. On April 4, 1977, EPA exempted S. B. Penick's Lyndhurst facility and canceled the permit (PAS-00113146; PAP-00048997).

According to PVSC Monthly Reports from August and September 1976, S.B. Penick & Company held NPDES Permit NJ0003531 (PAS-00112805-06).

According to the July 1991 response to an Administrative Order, the Penick Corporation applied for a RCRA Part A permit on November 14, 1980, to allow the plant to continue to operate as an interim status treatment, storage and disposal facility under RCRA (PAS-00113404).

The preponderance of hazardous wastes were placed in drums and temporarily stored in compliance with RCRA Part 262 generator standards prior to pick up by an outside contractor for off-site disposal. In November 1980, Penick Corporation completed a Part A permit application for RCRA interim status for continued operation as a treatment, storage and disposal (TSD) site. Four facilities were listed: the drum storage area, storage tank, an incinerator and a wastewater treatment tank system. The incinerator and treatment system were removed, as they did not qualify for RCRA regulation. The drum storage area operated under the storage permit standards for accumulation of wastes for up to 90 days, and a storage permit was not necessary; however, the underground flammable solvent storage operated under RCRA Part 265 rules (PAS-00112928-29).

According to the undated Regulatory Compliance Status, Penick Corporation obtained a permit, in compliance with Lyndhurst Ordinance No. 1744, on January 8, 1980, to manufacture, process, handle, use or storage significant quantities of hazardous chemical substances. The permit required an inventory of all hazardous chemicals and quantities in each plant area and compliance with leak-testing of underground storage tanks (PAS-00112929). None of the chemicals listed were OU2 COCs (PAS-00113154).

Penick had Sewer Connection Permit 18402412 to discharge process wastewater to the PVSC water pollution control plant in Newark for treatment. It expired January 26, 1986, (PAP-00328090; PAS-00112720).

According to a NJDEP letter, dated November 9, 1990, CPC International was notified that PVSC would not accept additional recovered water generated by a proposed trench expansion, and that it may require Treatment Works Approval (TWA) for a proposed groundwater treatment unit. If the discharge of treated, recovered groundwater will be to surface waters, the State required a NJPDES Discharge to Surface Water Permit. In addition, a NJPDES Discharge to Ground Water Permit would be required if treated groundwater would be discharged to the ground (PAS-00112957-58).

CPC held an Industrial/Commercial Surface Water Permit No. NJ0081248, effective February 1, 1995, through January 31, 2000, which permitted discharge of treated commercial/industrial water to the Passaic River via storm sewer at a rate of 30 gallons per minute through outfall Discharge Serial Number 001 (PAS-00113081, 83). NJDEP issued a Memorandum, dated December 15, 1999, that documented the facility associated with Permit No. NJ0081248 was demolished, the property sold, and the site redeveloped into a Shop Rite Supermarket. The permit for discharging to surface water was to be administratively expired upon CPC International, Inc. request (PAS-00113101).

The 540 New York Avenue address received NJPDES Permit NJ70013BO effective January 16, 1997, with an expiration date of January 15, 2002. This permit was issued to CPC International as permittee and Penco of Lyndhurst as co-permittee and property owner (PAP-00048752). The permit authorized the discharge of treated groundwater from an approved ground water remediation program back to the ground waters of the State via a Class V Underground Injection Control (UIC) well (PAP-00048757). Toluene was the only substance requiring monitoring (PAP-00048760).

NJPDES Permit No. NJ0081248, was effective from February 1, 1995, through January 31, 2000. The permit covered industrial and commercial surface water discharge from the 540 New York Avenue, Lyndhurst facility to the Passaic River via a storm sewer; however, the NJDPES permit was terminated as of December 17, 1999. A new Permit NJ7001380 was issued to modify discharge of treated water to groundwater (PAS-00113073-74).

Enforcement and Violations

A PVSC report, dated March 1947, attributed dark brown chemical waste from drug manufacture seeping from an open channel into a storm ditch that flowed into the Passaic River. The storm sewer was about a mile away from the plant. S.B. Penick & Company, Inc. planned to put in a permanent pipeline to avoid leakage through the open channel. The PVSC inspector had the leak stopped temporarily (PAS-00112810-11). A May 19, 1947, letter from PVSC again referred to S.B. Penick & Co., Inc. Drug Manufacturers on Grant Avenue, Lyndhurst that had industrial waste and sanitary sewage overflowing from a collection sump and an open storm ditch that discharged into the Passaic River. The river inspector found the pump in the sewage and waste collection sump in operational, and the plant engineer fixed the sump (PAS-00112813).

According to a PVSC Stream Contamination report for May and June 1948, on May 28, 1948, a PVSC inspector documented amber fluid (soap bark used in the manufacture of fire foam) from the S.B, Penick facility on Grant Avenue, Lyndhurst, discharging into a storm sewer that was attributed to a careless employee (PAS-00112815).

According to the PVSC Weekly Summary of Inspections by Inspector, on May 3, 1956, inspection of the Lyndhurst storm sewer showed a jet black discharge into the Passaic River that had killed a number of small fish. The inspector traced this flow to a sewer where the cover was lifted and saw it coming from the S.B Penick Co., 540 New York Ave facility. On May 4, the inspector revisited S.B. Penick and upon inspection of the sewer it was found to be clean and the violation had ceased, the source of the black discharge was unknown (PAS-00112818).

On May 17, the inspector observed a black discharge coming from the Lyndhurst Storm Sewer that was traced to the S.B. Penick Company where a blocked sewer was found to be the cause of the violation. Later that afternoon the storm sewer was inspected and found to be satisfactory (PAS-00112744).

According to a 1971 PVSC Annual Report, intermittently between November 1970 and September 1971, PVSC noted a discharge that went from S.B. Penick & Company, 540 New York Avenue through the Lake Avenue storm sewer to the Passaic River. On November 2, 1970, Mr. Lubetkin wrote to S.B. Penick & Company directing them to cease pollution, and they replied on November 5 that they were attempting to find the source. The problem appeared to be a carry-over from their barometric condensers on an intermittent basis. On March 17, S.B. Penick & Company experienced an industrial waste overflow into the Passaic River via the Lake Avenue storm sewer. Penick wrote to PVSC the next day explaining the situation had been corrected. PVSC again wrote to S.B. Penick & Company in April to let them know they were still polluting. After a plant inspection on May 25, S.B. Penick was told to find the source of small filamentous

particulate matter entering the storm sewer and find another path for the clean water overflowing into the railroad track ditch and then into storm sewers. S.B. Penick received another letter from PVSC on August 13 – all the while responding with letters letting PVSC know what they have been doing to track down the source. On September 2, S.B. Penick & Company was warned if the pollution was not terminated, the Commissioners would take legal actions. On October 1, S.B. Penick reported they had reconnected improperly connected lines, and the violation was considered eliminated (PAS-00034516; PAS-00034628-29).

According the 1974 PVSC Annual Report, between January and May 1974 PVSC reported solvent spills and boiler blowdown from the Penick facility that discharged into the Lake Avenue storm sewer and into the Passaic River (PAS-00112731-32;). CPC personnel informed PVSC that the spills were caused by a faulty vent and pump (PAS-00112722). According to the 1974 PVSC Annual Report, Reed Plumbing Company installed a continuous boiler blowdown system by May 24, 1974, that connected to the sanitary sewer (PAS-00112732).

According to a 1976 PVSC Annual Report, between February 19 and September 8, 1976, S.B. Penick was discharging a yellowish substance into the Lake Avenue storm sewer and into the Passaic River. A televised survey of the facility's storm sewer identified two leaks emanating from Building 41 that were sealed. Other leaks were found and grouted by the end of July. S.B. Penick, under control of CPC, addressed the issues and reduced the flow to the storm sewers to about 2,500 gallons per day. PVSC Inspector Laughlin felt that the balance of the flow was coming from the area adjacent to the Erie Lackawanna property. The Inspector considered the violation eliminated (PAS-00035289-90).

According to a PVSC Bi-Monthly Report, September and October 1977, S.B. Penick Company, 540 New York Avenue, had a Violation and Elimination for the period between February 2 and September 29, 1977. Facility discharge into the New York Avenue storm sewer was sampled on February 2 and February 8 and found to contain pollution that appeared to be acetaminophen. The source was a ditch along the Erie-Lackawanna Railroad right-of-way. The plan was to install a small pit to collect the material before pumping it into the sanitary sewer. In May, suppression of a fire on para-nitrophenol (PNP) pallets washed PNP into the storm sewer (PAS-00112802). After installation of the intercepting pit, there was still a slight flow of discharge into the storm sewer. After adjustments to the float collar on the pump start switch and the design of the intercepting pit, sampling in September confirmed the discharge was mitigated (PAS-00112803).

A PVSC Weekly Report for the week of February 3 through 10, 1978, noted on February 10th there was intermittent industrial pollution discharging into New York Avenue storm sewer from S.B. Penick Co., 540 New York Avenue (PAS-00112799).

According to a PVSC record, between July 7 and 13, 1978, a PVSC inspector found polluted wastewater discharging into the New York Avenue storm sewer from S.B. Penick Co., 540 New York Avenue. The plant manager informed the inspector that wastewater from floor washing was intended for the sanitary sewer, but went into the storm sewer due to a sump pump failure (PAS-00112793).

An October 23, 1990, *Progress Report on Cleanup of South Drainage Trench* referred to notices of violations Penco of Lyndhurst received concerning unpermitted discharges to the storm sewer and from the drainage ditch. The Progress Report also noted an incident where cleanup water from a reactor overflowed onto the roof of Building 41 and subsequently discharged into the facility's storm sewer (PAS-00113370, 372-73).

The property was deeded to the Penick Corporation by deed dated January 1, 1978, from CPC International, Inc., appearing on Book 6370 page 420 in the Deed of Books of Bergen County, New Jersey (PAS-00113366).

NJDEP issued a Declaration of Environmental Restriction in 1995 to Penco of Lyndhurst as a result of 4'4'-DDT, chlordane, heptachlor and other substances (PAS-00112717).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Preliminary Assessment, dated 1984 (PAS-00112981)
- Environmental Assessment of Contamination Associated with Penick Corporation, dated February 7,1985 (PAS-00113106)
- Supplemental Soil Characterization, dated May 14,1991 (PAS-00113276)
- Remedial Action Report – South Drainage Ditch, dated December 8,1995 (PAS-00113235)

Soil

In the 1991 *Results of Supplemental Soil Characterization* Langan collected 92 soil samples in an attempt to comprehensively define the lateral and vertical extent of contamination and scope of cleanup at the site (PAS-00113279-80). The characterization incorporated several septic tanks, leach pits, underground storage tanks and dry wells (PAS-00113280). Eleven background samples were collected – eight along transportation corridors to assess train and automobile exhaust influence on surficial soils and three from a former paint processing plant (PAS-00113288-89). Analytical results confirmed background carcinogenic PAHs were 19.2, 26.7 and 1 ppm in sample location LB-41, LB-42 and LB-43, respectively. Carcinogenic PAHs were 7.6 ppm alongside New York Avenue at sampling location LB-44 (PAS-00113289). Soil samples LB-67, LB-68 and LB 69, collected for background at an existing nearby shopping center that was the former paint processing plant. The highest concentrations of copper and mercury were found behind the former paint processing plant. Concentrations ranged between 188 and 525 ppm copper and between 0.35 and 136 ppm mercury. Action levels for copper and mercury are 170 ppm and 1 ppm, respectively. DDD, DDE and DDT were tentatively identified at 9.2 ppm, 2,3 ppm and 6.2 ppm, respectively in background concentration sample LB-41 (PAS-00113289).

Remedial Activities

The 1984 Preliminary Assessment (PA) for Lot 1, Block 79 of 540 New York Avenue for NJD 081 894 842 addressed fuel oil wastes, along with numerous other constituents (PAS-00112981; PAS-00112982; PAS-00112983). The PA addressed issues that included an acetaminophen spill, fugitive emission effects on the employee population, a toluene spill and the potable water supply (PAS-00112982-84).

Penick Corporation submitted remedial cleanup plans to NJDEP in 1984 (PAS-00112717).

The 1985 Environmental Assessment (EA) was produced for 540 New York Avenue facility as it became the subject of an agreement of sale and was created to establish viable remedial alternatives for cleanup. The tentative plans involved possible shutdown of some sections of the plant, but did not substantially alter the primary production of pharmaceuticals and pesticide chemicals (PAS-00113114). Many of the substances used on the property were botanicals for which there were few or no analytical techniques for soil or water; therefore, Versar used indicator parameters rather than those specific compounds. The indicator parameters were the 129 priority pollutants that EPA set for ambient water quality criteria in the Clean Water Act with the addition of 30 more organic compounds. Sampling was conducted in July 1984. Sampling results showed ubiquitous PAHs and pesticides throughout the site (PAS-00113116-17).

The 1987 Annual Hazardous Waste Generator Report, filed March 16, 1988, documented in 1987 CPC International removed all hazardous materials and wastes at the Lyndhurst facility via appropriate manifests. Removal of wastes were consistent with RCRA closure operations in December 1985 documented in a June 15, 1984, RCRA Plan that was not filed with the state (PAS-00112922).

The 1987 Analysis of sampling performed on or about August 28 through September 3 showed PCBs, pesticides, metals and base/neutral extractable organics at concentrations that significantly exceeded NJDEP action levels (PAS-00113208). Note: sampling results Tables 7-18 with concentrations were missing from the report. According to the1990 Penick DEF, the Penick Corporation was granted approval to proceed with remedial activities in 1990 following submission of remedial cleanup plans to NJDEP in 1984. The site was given Industrial Site Recovery Act (ISRA) E93651. 31 underground storage tanks were removed with ISRA oversight, and NJDEP provided oversight of contaminated pesticide cleanup in Buildings 6 and 7 (PAS-00112717).

The 1990 Cleanup Plan outlined a program of remediation for the property formerly owned by Penick Corporation and included removal of contaminated soil, characterization of extent and degree of contamination, and removal of USTs (PAS-00113329). Langan proposed no further action in “several” areas with hazardous substances in excess of cleanup levels because remediation would destabilize nearby site structures. No further action was also proposed near USTs 74, 75, 78, 79 and 116 because soil contamination had not impacted groundwater, and the areas were covered by an asphalt pavement (PAS-00113330).

The Cleanup Plan described the drainage trench located along the railroad tracks on the south end of Penco property. The trench is on railroad property, but Penco discharged storm water into this trench (PAS-00113375). The Cleanup Plan involved: 1) removal of oil-like substance from surface water, 2) elimination of Penco's discharge into the trench, 3) elimination of untreated storm drain trench flow into the industrial sewer, 4) cleanup of the trench, and 5) rerouting trench effluent after cleanup (PAS-00113376-78).

A NJDEP letter, dated November 9, 1990, to Howard B. Epstein, Lord Day & Lord, Barrett Smith, Penick Corporation, approved CPC International, Inc.'s Cleanup Plan for 540 New York Avenue, Blocks 73 and 79; Lots 1,3 and 1,2. The letter noted that cleanup levels were 5 ppm PCBs; 1,000 ppm lead; 1 ppm mercury; 10 ppm total of DDT, DDD and DDE; and 10 ppm carcinogenic PAHs (PAS-00112950-51). No further action was approved for thirty underground storage tanks (PAS-00112952). CPC International was to delineate all contamination above NJDEP action levels and was mandated to cleanup all contamination in excess of cleanup levels. CPC International was to submit PCB samples (PAS-00112952-53). The letter noted that a total of 40 underground storage tanks existed at the facility (PAS-00112954). The letter referred to a letter dated April 28, 1970, that identified a septic system that served Building 44, a septic tank and leach tank for Building 1, a leaching tank south of Building 19 that connected to Building 18; and a drywell in the southwest corner of Building 16. NJDEP required sampling of all abandoned septic systems (PAS-00112956).

Based on analytical results, excavation was proposed at OPA-46, OPA-53 (PAS-00113291) the Leach Tank in Building No. 19 (PAS-00113293).

The 1991 Ground Water Monitoring Report, conducted groundwater sampling of 23 monitoring wells (PAS-00113253). Langan concluded that soil contamination had little impact on groundwater quality. Because much of the contaminated soil had been removed or was to soon be removed, contaminant concentrations in groundwater were expected to decrease (PAS-00113262).

The 1995 RAR documented the removal of carcinogenic PAHs from the South Drainage Ditch for off-site disposal and the installation of a storm water conveyance system. The drainage ditch was located immediately south of the former Penick Corporation on property owned by the State of New Jersey and is operated by New Jersey Transit (PAS-00113236). The South Drainage Ditch was sampled during production of the Dames and Moore 1987 Report Sampling Results. Sediment in the ditch was black stained; there was stressed vegetation; and sheens on the surface water in the ditch (PAS-00113237-38). Remedial actions between June and August 1991 involved excavating 1,000 cubic yards of contaminated soil from the southern-most railroad siding for off-site disposal, along with removal of 480 linear feet of pipe that serviced the site's sanitary system. Between April 1993 and June 1993, a Remedial Investigation of the South Drainage Ditch concluded that groundwater near the ditch had not migrated to other off-site areas (PAS-00113239). Between June and July 1993, 900 cubic yards of soil contaminated with carcinogenic PAHs were removed. The 1995 RAR described 90 percent of the site was covered with impervious surfaces, and 40 percent of that was buildings (PAS-00113240). At the date of this document, approximately 3,500 cubic yards of contaminated soil was excavated and removed from the site. Between April

and May 1995 the South Drainage Ditch remediation was complete with installation of a subsurface stormwater conveyance pipe (PAS-00113243, 245).

On April 12, 1995, CPC International, Inc., sought approval for a Declaration of Environmental Restrictions (DER) for ISRA Case No. 84090, Former Penick Corporation. The letter noted that Penco of Lyndhurst filed a motion in U.S. Bankruptcy Court (Case N. 91-21339 WFT), returnable May 1, 1995, compelling Penco to execute a DER (PAS-00113359-60). The DER applied to Block 79 Lots 1 and 2 and Block 73, Lots 1 and 3 on the Township of Lyndhurst tax map. The proposed DER stipulated an impermeable surface cover would be placed and maintained in the area subject to engineering controls (PAS-00113360-61).

The July 2, 1999, memorandum documented the excavation of 31 underground storage tanks, including USTs No. 66 and No. 111, and that the RCRA Closure Plan had been carried out (PAS-00112948).

According to the Regulatory Compliance Status, parameters of the wastewater discharge permit were occasionally exceeded; however, Penick Corporation corrected them in a timely manner (PAS-00112926). The plant operated an on-site pretreatment wastewater plant for process wastewater. Per the Compliance Status, on April 30, 1984, Penick Corporation sent an "initial notice" to NJDEP announcing its intention to sell the Lyndhurst plant and telling them they had fulfilled their ECRA requirements (PAS-00112927). Penick subsequently submitted its environmental evaluation, with monitoring by Versar Inc. that found with the exception of the toluene spill there were a few locations where soil was contaminated by pesticides, primarily DDT and chlordane at levels of potential concern. Penick requested that NJDEP approve a negative declaration. Consistent with RCRA Part 262 generator standards, the preponderance of hazardous wastes generated at the plant drummed and temporarily stored while awaiting outside contractor off-site disposal. In 1984, Penick completed cleanup of chlordane, DDT, DDE and DDD from Buildings 6 and 7 (PAS-00112928).

8. Summary of Asserted Defenses

Conopco asserts the following defenses:

- Permitted releases are exempt from the definition of "release" under CERCLA. 42 U.S.C. §9601(10)(H).
- With respect to PAHs, Conopco asserts the petroleum exclusion. 42 U.S.C. §9601(14).
- Conopco may not be responsible for the entire period of 1941 to 1986 due to corporate successor and related issues. Conopco, Inc. is the successor in interest to CPC which purchased the stock and assets of S.B. Penick & Co. ("S.B. Penick") in 1967, including the Lyndhurst Facility. CPC continued as the surviving corporation with S.B. Penick operating the Facility as a division of CPC. On December 7, 1977, Penick Corporation ("Penick") was established as a separate, wholly owned Delaware Corporation. Penick then operated the Lyndhurst Facility until 1986 when all assets were sold to a third-party (Penco of Lyndhurst, Inc., which is not related to or affiliated with either Penick or CPC). CPC later sold Penick to a third party in 1988. Conopco, Inc. ("Conopco") is the successor in interest to CPC.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

COOPER INDUSTRIES, LLC

Facility Name, Address and Size: Cooper Industries, LLC (Cooper), 7, 13 and 26 Bank Street, Newark, NJ. Records reflect that a business of 10 -12 Library Court was in use as of about 1873 and by at least 1877, the business address included 14 and 18 Library Court (PAP-00480574; PAP-00480579; PAP-00728760).

According to the May 22, 2020 Expert Report the property at 7 Bank Street (1848 – 1854) was quite small it was calculated to be no more than 750 square feet (< 0.02 acres) by scaling an 1868 Newark Atlas Map (PAP-00480542; PAP-00480559; PAP-00728750).

The property at 13 Banks Street (1854 – 1869) was also quite small and calculated to be no more than 3,850 square feet (0.09 acres) by scaling the 1868 Newark Atlas Map (PAP-00480542). The property reportedly had a three-story building fronting Bank Street (in which the Wiss family lived upstairs), with a two-story building in the rear with a 950 square ft footprint (PAP-00728756).

The 26 Bank Street (store and residence) and Library Court (factory) (1869 – 1887) occupied 7,900 square feet (0.18 acres), based on scaling an 1874 fire insurance map (PAP-00480547; PAP-00728759). There is no evidence of any production activities at 26 Bank Street (PAP-00728765). The plant behind 26 Bank St. consists of three brick buildings, one three stories high, with a basement, covering an area of 40x60 feet; one 25, 50 feet, also three stories high and a two-story building, 25x25 feet (PAP-00480559).

By the 1870's there were reportedly nine employees (PAP-00480640). The employee count reportedly increased over the course of the operations at 26 Bank Street and Library Court, with there being a reported 50 employees working at the location by 1887 (PAP-00480628; PAP-0072764-65).



(PAP-00480547; PAP-00728761 as modified by Expert Report)

Note: The dark vertical line in the larger of the Library Court buildings indicates the location of the boiler (PAP-00728761).

1. **Business Type:** Specifics unknown. Certain records contain references to the "cutlery manufacturing trade" (PAS-00027499).

2. **Time Period of Ownership/Operations**

Operator: 1848 – 1887 (PAS-00027500-02)

Cooper acquired certain assets of an entity known as J. Wiss & Sons Co. in 1976, which entity was not formed until 1900 (after operations at the Bank Street locations had ceased) (PAP-00049987; PAP-00331507).

Ownership and operation of other persons / entities during the relevant time period and during the period immediately following the end of the relevant time period is set forth below.

Jacob Wiss occupied these properties sequentially, with no apparent overlap (PAP-00480559; PAP-00728748).

According to an April 12, 1864 Indenture (deed), Jacob Wiss, as an individual, owned property at 26 Bank Street, and his business earlier occupied first 7 Bank Street and then 13 Bank Street (PAP-00332545; PAS-00027500). The entity J. Wiss & Sons Co. never owned property at 7, 13, or 26 Bank Street as it was not incorporated until May 1900. In 1888, he bequeathed property to his children (PAP-00332550-54), who, conveyed the 26 Bank Street property to Prudential Insurance Company of America by deed dated February 1, 1889 (PAS-00034509, 11; PAP-00480537-39).

1848: According to the book, "*A Story of Shears and Scissors*, J. Wiss & Sons Co., 1848-1948" Jacob Wiss started his business in 1848 at 7 Bank Street in Newark (PAS-00027500; PAP-00480559).

1854: According to the book, "*A Story of Shears and Scissors* J. Wiss & Sons Co., 1848-1948", Jacob Wiss moved to 13 Bank Street in 1854 (PAS-00027500; PAP-00480559).

1860s: According to an article "*WISS, The Edge of Excellence Since 1848*", by the time of the Civil War, the Wiss retail shop had been moved twice to larger quarters on Bank Street. The military looked to Wiss for scissors to cut surgical dressings and tailor's shears to cut uniforms (PAS-00027521-22).

1869: Business moves to 26 Bank St (PAP-00480559).

1872: The Boyd's New Jersey State Directory from 1872 listed J. Wiss at 26 Bank Street as a cutlery manufacturer (PAS-00027496).

1877: Factory address changed to 14, 18 Library Court (PAP-00480559).

1880: According to the book "*A Story of Shears and Scissors*", when Jacob Wiss died in 1880, his son Frederick Wiss took over the family business (PAS-00027500).

1881: Name in the Newark Directory is J. Wiss's Sons (PAP-00480581).

1882: Business name is now J. Wiss & Sons Co., all grinding and repairing done on the premises was dropped from Newark Directory ad (PAP-00480581).

1887: According to the book "*A Story of Shears and Scissors*" the sons of Jacob Wiss acquired a large tract of land facing Littleton Avenue "on the hill" in Newark, and built their factory to meet the production needs of business with a 150 men workforce (PAS-00027502; PAP-00480560). Any manufacturing operations by the Wiss family at the Library Court location behind Bank Street would have ended (PAP-00480560; PAP-00728762). The retail store remained at 26 Bank St (PAP-00480560).

1888: The real property at 26 Bank Street was conveyed to Jacob Wiss' heirs, Louis Wiss and Charlotte Wiss, in 1888 (PAP-00332548).

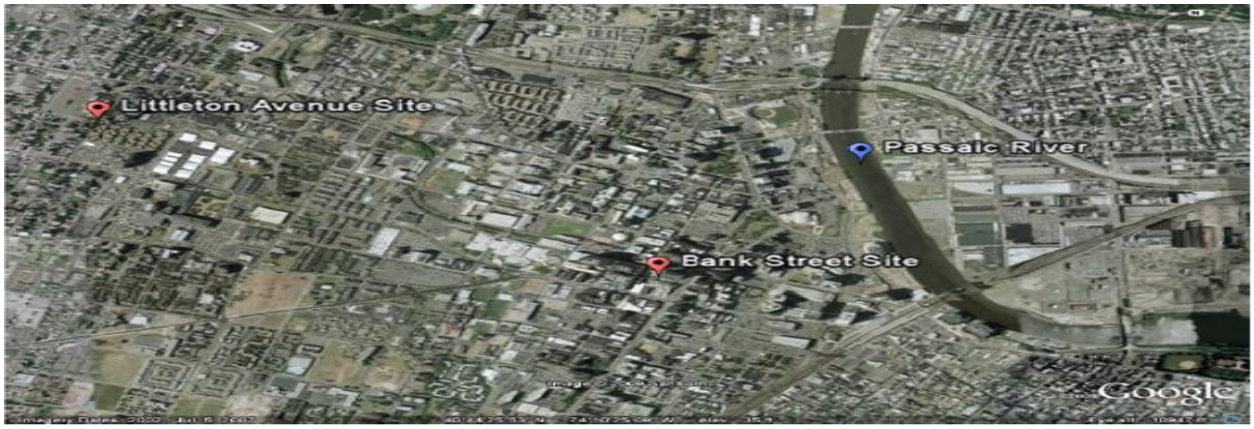
1889: Jacob Wiss' children conveyed the 26 Bank Street property to the Prudential Insurance Company of America by deed dated February 1, 1889 (PAP-00034511; PAP-00480537-39).

1900: J. Wiss & Sons Co. was incorporated (PAP-00331502).

1976: According to the Federal Trade Commission, Special Report of J. Wiss & Sons Co., J. Wiss & Sons Co., Cooper Industries, Inc. purchased "all the assets (except for certain assets relating to federal, state and local income taxes) presently comprising the business of, and presently owned by (unless otherwise noted) J. Wiss & Sons Co.". The Bank Street Property was not included (PAP-00331567-68).

Note: The Banks Street locations relevant time period (1848 to 1887) ended 13 years before J. Wiss & Sons Co. was incorporated.

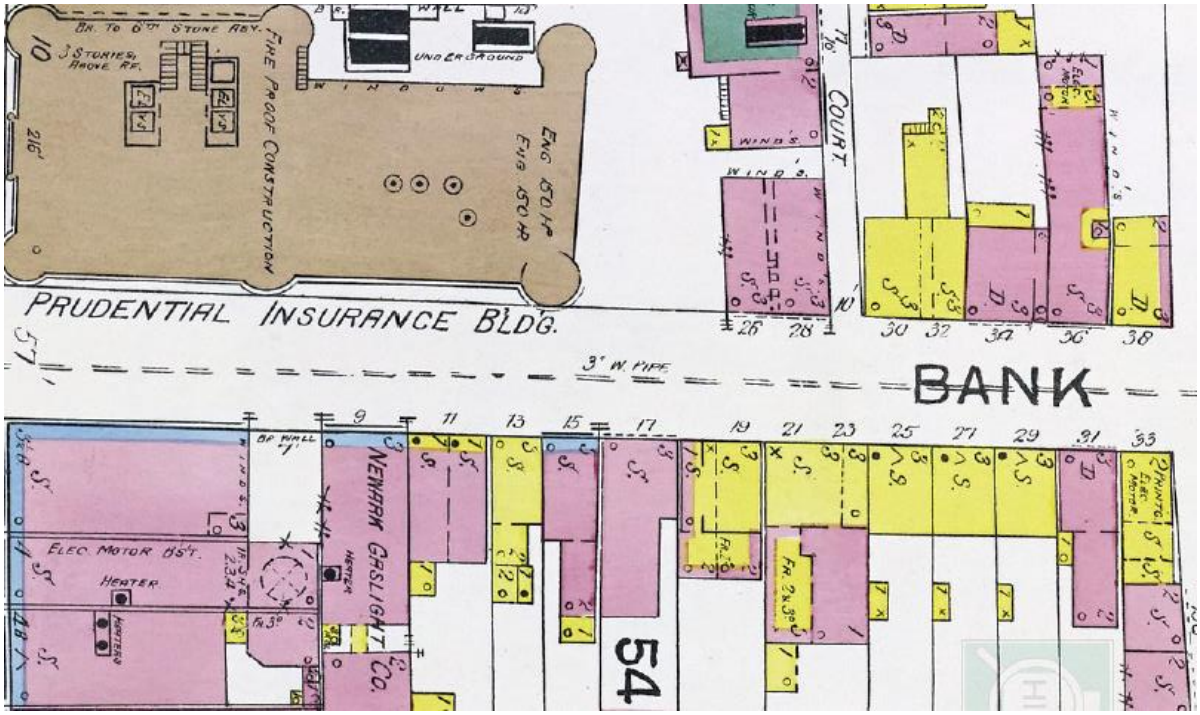
The following image from the 2009 DEF shows the location of the Bank Street site in relation to the Passaic River (PAS-00027478).



The following Sanborn maps from 1874 and 1892 show the location the Bank Street addresses:



(PAP-00332539)



1892 Sanborn Map of 7, 13, and 26 Bank Street (PAP-00332555)

3. Operational History/COC Use and Presence at the Facility

Specifics regarding the operations are limited, but the book "*A Story of Shears and Scissors"* states Jacob Wiss engaged in the cutlery manufacturing trade (PAS-00027499). Jacob Wiss manufactured shears and scissors using hand-operated drop hammers to weld cutlery steel blades and a dog-powered treadmill to power his grinding and polishing wheels until the late 1800's when dog-power switched to steam (PAS-00027499-500).

7 Bank Street (1848 – 1854)

Directory listings and advertisements from this period describe Mr. Wiss as a "cutler" and as of 1852 as a manufacturer of shears, scissors, razors etc. (PAP-00480563-4). Manufacturing at the 7 Bank Street property would have been done by hand, using hand-operated drop hammers to shape and weld steel blades to iron shear frames including four steps: forging / molding, tempering (heat treating), grinding and polishing (PAP-00480622; PAS-00027502; PAP-PAP-00728751).

The general methods of forging steel and iron in the cutlery business at the time were similar to those used in blacksmith shops and likely used a small coal forge of approximately one square foot. These forging operations would have included repeated heating, shaping, hammering and quenching bar stock iron or steel into the desired shape. After forging was completed the steel would be hardened through a process known as tempering, which includes a series of heating and cooling in a cold-water bath until the desired hardness of the steel was achieved (PAS-00027502; PAP-00728751-52).

After the metal was forged and tempered, grinding was performed using cylindrical stone grinding wheels and polishing using wooden wheels built up with a coating of beeswax, tallow, and emery on the polishing surface. At the start of operations in 1848, Wiss reportedly used dog-operated treadmills (one dog during the first year, with a second dog added during the second year) to power his grinding and polishing wheels. The first reference to mechanically powered operations by Jacob Wiss was a boiler used to steam power the grinding and polishing wheels (PAP-00480623; PAP-00480542; PAP-00728752).

Production volumes would have been very low. No information was found regarding the quantity of shears or scissors that could be produced in one day in these operations. The tempering, grinding, peening (a cold process of carefully forming steel with a hammer, usually a ball peen hammer) and polishing would have required the most time. Given the processes involved and that two different grades of steel likely had to be welded together (one used for the handle and the other used for the shear), it is estimated that one, or maybe two, pairs of shears or scissors could be produced by a person in one day and the pace of production would be dependent upon the size and the complexity of the design (PAP-00728752).

13 Bank Street (1854 – 1869)

Operations at 13 Bank Street would have been similar to those described above at 7 Bank Street, with manufacturing done by hand, using hand – operated drop hammers to shape and weld steel blades to iron shear frames, no plating process, and a “in the dry”. No information was found regarding the quantity of shears or scissors that could have been produced, although production volumes would have been low due to the process described above (PAS-00027502; PAP-00480559; PAP-00728758).

26 Bank Street and Library Court (1869 – 1887)

According to the Expert Report, there is no evidence of any production activities at 26 Bank Street. Production took place at the Library Court locations in the rear at least as of early 1870s and until 1887, when the Littleton Avenue factory opened, and manufacturing operations were moved to and consolidated at that location (PAP-00728762).

At Library Court, some of the steps in the production process would have involved mechanically powered equipment, but at a relatively small scale. The first reference to mechanically powered operations by Jacob Wiss was circa 1870, involving a use of a boiler to power a 30 horsepower steam engine used to turn the grinding and polishing wheels (PAP-00480611; PAP-00480641; PAP-00728766).

The only raw materials used at the Library Court operations would have been steel and iron, and the small boiler was likely coal-fired. The production would have been a “dry” operation and therefore there would not be any wastewater discharges associated with the operations (PAP-00728768).

The 2009 DEF reported that there was no documentation available on the process of manufacturing plated products by J. Wiss & Sons, Co. prior to the 1950s; however, as early as the mid-1800s manufacturers produced commercial nickel-plated scissors (PAS-00027481, PAS-00027548, 550, 698). In addition, the 2009 DEF noted that nickel plating and steel pickling operations may have been conducted at the Bank Street site as early as 1850, based on general cutlery industrial practices at the time (PAS-00027483, 677, 709, 718). Note: There are no citations or available underlying documents to support these statements.

According to the 2009 DEF, between 1848 and 1985, J. Wiss & Sons forged, fabricated and finished steel at several locations in Newark, NJ, including the Bank Street locations in the mid-1800s (PAS-00027476, 478; 500, 502). According to *“A Story of Shears*”, tailors’ shears were still manufactured of malleable iron with welded crucible steel blades until as late as 1912 (PAS-00027504).

According to “*The Story of Wiss Quality”* the major steps in manufacturing scissors, shears and snips are die, and tool making, forging, grinding, heat treating, polishing and finishing (PAS-00027525, 479, 504).

According to an EPA publication, "*Profile of the Iron and Steel Industry*", dated September 1995, steelmaking in itself required a basic oxygen furnace into which molten iron, metal scrap, and high purity oxygen were heated. Fluxes and alloys were added, and may include fluorspar, dolomite, and alloying agents such as aluminum, manganese, and others. Outputs from the basic oxygen furnace include dust, sludge and metals-bearing waste (PAS-00027664). Note: The use of an oxygen furnace at the facility is unknown.

4. Identified COCs

Available references did not provide information regarding specific COCs used or discharged at the Bank Street locations during the time Jacob Wiss' and his family conducted operations there.

According to the Expert Report, the only COCs that are likely to have been stored and used at the Bank Street properties would have been trace levels of lead and copper in the purchased streel (assuming it would have been similar to later produced steel) and iron that would have been used to produce scissors and sheers (PAP-00728748, 58).

Historic Fill

The Allocation Team has determined that the Bank Street locations are not located on regional Historic Fill as designated by the NJDEP.[1]

5. COC Pathways

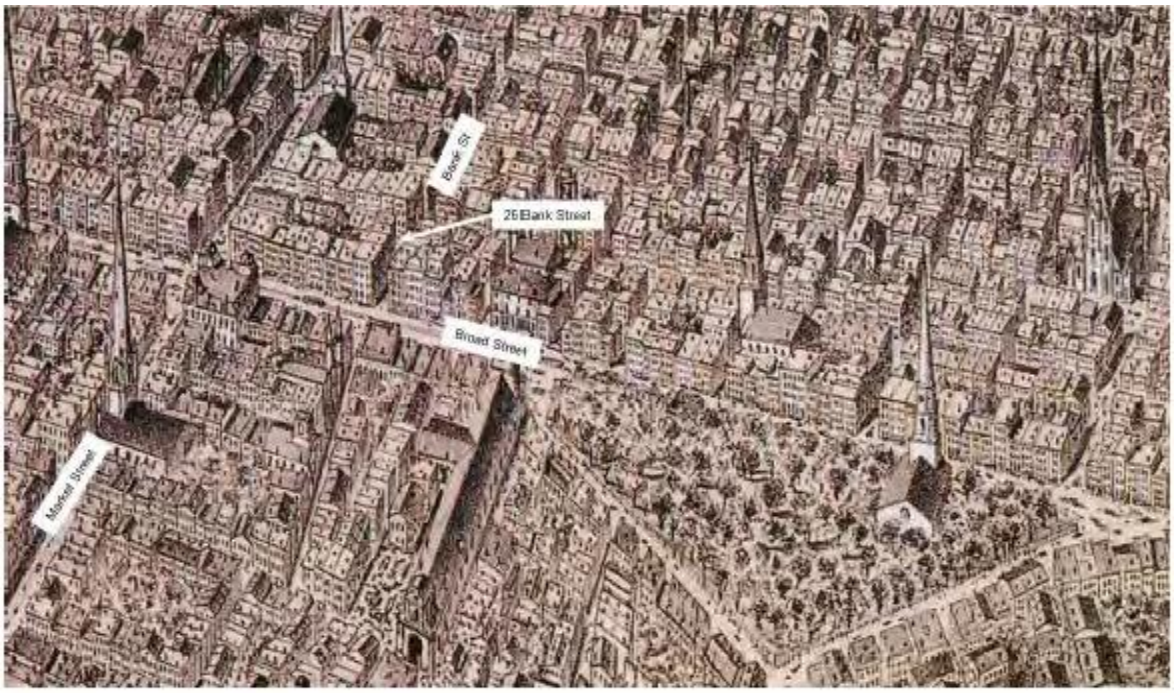
Limited information on pathways through which contaminants could be discharged to the Passaic River was available for the Bank Street locations.

Direct Discharge

According to the Expert Report, the Passaic River is located one-half mile from the Bank Street locations (PAP-00728748).

According to the Expert Report, during the relevant period, the Bank Street locations were located in an area near the center of Newark that contained residential, retail, commercial and small-scale manufacturing operations as shown in the 1874 "Birdseye" map of Newark (PAP-00728749). A portion showing Bank Street is below.

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 (NJDEP map identifying locations of recognized historic fill).



(PAP-00480545; PAP-00728749)

According to the Expert Report, there is no indication in maps from the era of any adjacent creek or other surface water body to any of the Bank Street locations (PAP-00728755).

Sewer

According to the 2009 DEF, prior to establishing the Passaic Valley Sewerage Commissioners (PVSC) system in 1924, sewers in Newark discharged untreated waste into the Passaic River. For its entire 40-year operating history, the Bank Street facility would have discharged process, sanitary, and storm water directly to the Passaic River via the Newark sewer system (PAS-00027483).

A sewer was not constructed in Bank Street until 1872, three years after Wiss moved to 26 Bank Street and Library Court (PAP-00480556; PAP-00728768). No records regarding the date on which 26 Bank Street property would have connected to that sewer have been identified (PAP-00728768). The sewer in Library Court was not installed until 1902, 15 years after Wiss' factory operations moved from the Bank Street area (PAP-00480558; PAP-00728768-69).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Available references did not provide information on response actions.

8. Summary of Asserted Defenses

Cooper asserts the following defenses:

- Cooper never owned or conducted any operations at any of the Bank Street locations. J. Wiss & Sons, Co. never operated at the Bank Street locations and was not formed until over ten years after the Bank Street real property was sold to Prudential Insurance Company (PAP-00332550; PAP-00331502).

- In the 1976 transaction wherein Cooper acquired certain assets of J. Wiss & Sons Co., Cooper did not assume any CERCLA liabilities of J. Wiss & Sons Co. or of any alleged predecessors to J. Wiss & Sons Co., including any such liabilities with respect to the Bank Street locations.

COOPER INDUSTRIES, LLC

Facility Name, Address and Size: Cooper Industries, LLC (Cooper); 75 Belmont Avenue, Belleville, New Jersey. The site consisted of approximately 15 acres combined (PAP-00334840; PAP-00335506).

Primary Battery Facility

The operations conducted at 75 Belmont Avenue have been referred to using a number of different names:

- A Site Survey, dated March 5, 1925, identified the facility as Thomas A. Edison, Inc., Edison Storage Battery CO, & Thomas A. Edison Silver Lake Plant in Bloomfield & Belleville NJ (PAP-00332567).

- In 1974 and 1977, a facility located on Belmont Avenue was identified by the New Jersey Industrial Registry as the Edison Battery Division of McGraw-Edison Co. (PAS-00027974, 76).

- In 1982 and 1989, a facility on Belmont Avenue was identified by the New Jersey Industrial Registry as the Power Systems Division of McGraw-Edison Co. (PAS-00027978, 80).

- According to a response to a Request for Information related to the Caldwell Trucking Superfund Site with respect to the Primary Battery Facility, the operations at the Primary Battery Facility have also been referred to as the Battery Products Plant of the Power Systems Group of McGraw-Edison (PAP-00334369).

- According to a response to a Request for Information with respect to the Primary Battery Facility related to the Caldwell Trucking Superfund Site, the operations at the Primary Battery Facility have also been referred to as the Edison Battery Products of Cooper Industries (PAP-00334369).

The Primary Battery Facility location is partially in the township of Bloomfield, New Jersey and partially in the township of Belleville, New Jersey (PAP-00333167). The location was also sometimes referred to as “Silver Lake” (PAP-00332567). The real property associated with the Primary Battery Facility consisted of approximately 5.6 acres (PAP-00335506).

Storage Battery Business

The operations conducted at the property adjacent to the Primary Battery Facility has been referred to using a number of different names:

- A memorandum notes the raw materials requirements of the Edison Chemical Works Division (PAP-00333465).

- A Map of Sewers and Water Lines labels the Storage Battery Business as the "Active Materials Department" (PAP-00333512).

The real property associated with the Storage Battery Business (defined below in Section 2) consisted of approximately 10 acres (PAP-00334840). The size of the Storage Battery Business' operations varied over time (see Section 3 below).

1. **Business Type:** The Primary Battery Facility manufactured wet and dry, primary batteries and charging equipment, such as chargers, converters, inverters, and voltage regulators, while the Storage Battery Business manufactured the active materials for storage batteries (PAP-00049802; PAP-00049213; PAP-00332578).

2. **Time Period of Ownership/Operations**

Primary Battery Facility

Owner: 1889-1992

Owner	From	To
Thomas A. Edison	1889	1910
Thomas A. Edison, Inc.	1910	1957
McGraw-Edison Company	1957	1985
Battery Products, Inc.	1985	1992

1926: Thomas Edison acquired the real property for the Primary Battery Facility through multiple conveyances, ultimately conveying the property to Thomas A. Edison, Inc. circa 1926 (PAP-00335517-30).

1957: Thomas A. Edison, Inc. was merged into McGraw-Edison Company (PAP-00194620). McGraw Electric Company is described as in 1957, having acquired the business, described as "owning and operating a manufacturing industry, producing and marketing a range of products, including…batteries", together with its related assets, for stock of McGraw Electric Company (PAP-00194620). According to the agreement between Thomas A. Edison, Inc. and McGraw Electric Company, McGraw Electric Company: (i) was assigned "all [Thomas A. Edison, Inc.'s] assets and properties"; (ii) assumed and discharged all "debts, liabilities and obligations" of Thomas A. Edison, Inc. as shown on the balance sheet or arising in the "ordinary course of its business prior to the date of closing"; and (iii) changed its name to "McGraw-Edison Company" (PAP-00194620-25).

1960: According to the McGraw Edison *1960 Report to Stockholders* and the Electric Storage Battery Company *72nd Annual Report, 1960*, the Electric Storage Battery Company acquired the storage battery facility from McGraw-Edison Company in 1960, while the primary battery facility remained with McGraw-Edison (PAP-00194648-49; PAP-00194661-63).

1985: In February 1985, Battery Products, Inc. Acquired the Primary Battery Facility from McGraw-Edison Company (PAP-00335534).

In March 1985, CI Acquisition Company was merged with and into McGraw Edison Company and McGraw-Edison Company became a subsidiary of Cooper Industries, Inc. (PAP-00194671).

1992: According to a letter from Christopher Marraro, Howrey LLP, dated June 30, 2010, Battery Products, Inc. sold the Belmont Avenue property to Dominick Tozzo by deed dated December 14, 1992 (PAS-00034505).

1995: Battery Products, Inc. was voluntarily dissolved on January 18, 1995 (PAP-00332556). According to the letter from EPA to Mr. Christopher Marraro, Esq., the McGraw-Edison Company merged with Cooper Industries, LLC in 2004. In the letter, EPA notified Cooper that the liabilities of the selling corporation became the liabilities of the surviving corporation, Cooper (PAS-00034499).

Operator: 1889-1987

Operator	From	To
Thomas A. Edison	1889	1910
Thomas A. Edison, Inc.	1910	1957
McGraw-Edison Company	1957	1985
Battery Products, Inc.	1985	1987

Based on the available references, the facility at 75 Belmont Avenue in Belleville, New Jersey originally operated as Edison Manufacturing Company, a battery manufacturer in the early 1900s (PAS-00027943, 48, 89; PAP-00194594, 97; PAP-00194750). There are conflicting references in available documentation as to when operations at the Primary Battery Facility actually began. A summary of those references is included below.

1889: Some sources reference operations of the Primary Battery facility as early as 1889 (PAP-00332563; PAP-00332593).

1909: According to the New Jersey (NJ) Industrial Registry, Edison Mfg. Co. manufactured primary batteries in Silver Lake in 1909. Note the Registry did not have similar listings for the years 1912, 1915, 1918, 1921, 1931, 1940-41 or 1943-44 (PAS-00027916-980).

1911: The Company was merged with Thomas A. Edison, Inc. (PAS-00027989). A site survey map from 1925 identified Thomas A. Edison, Inc. as operating the Primary Battery Division and Salvage Division, while Edison Storage Battery Co. operated the Chemical Works Division at the Silver Lake plant on Belmont Avenue (PAP-00332567).

According to the *Preliminary Assessment Report*, dated May 24, 2012, for the Pathmark Supermarket site, Thomas A. Edison Inc. took ownership of the Chemical Works facility in the mid-1920's (PAP-00334774, 87). By 1938, the entire site was identified as owned by Thomas A. Edison, Inc. (PAS-00027984; PAP-00334787).

According to the survey map of the Silver Lake Plant prepared by the Plan Department of the Associated Mutual Insurance Cos., the Primary Battery Division Buildings were built in about 1911-12 (PAP-00332567).

1914: According to Edition Primary Batteries – An Old Timer's Recollection, the Primary Battery manufacturing operations of Thomas A. Edison, Inc. were not moved to the Silver Lake until 1914 (PAP-00334576).

1930: According to a Selected Substance Report prepared by McGraw Edison Co. in 1981, the facility began operations in approximately 1930 (PAP-00334489).

1987: The facility ceased operations in 1987, when Cooper Industries moved the operations to South Carolina (PAP-00050209-10).

Size and Operations over Time

Based on the available references, the size and operations of the Primary Battery Facility varied over time. A summary of those references is included below.

1920: According to a May 1920 edition of "The Flash", a newsletter "issued for the employees of the Primary Battery Division of Thomas A. Edison, Inc., Bloomfield, New Jersey," production was down because it was difficult to get materials into the plant and to get workers to "do their part" in light of the ongoing railroad strike (PAP-00334659).

1925: A site survey, dated March 5, 1925, identified the Primary Battery Division of Thomas A. Edison, Inc. located at the Silver Lake plant as producing batteries (PAP-00332567).

1927: According to the Industrial Registry, 202 employees were employed at the Primary Battery Facility in 1927 (PAS-00027931).

1930s: According to "Edison Primary Batteries – An Old Timer's Recollection," by the mid-1930s, "factory working conditions were deplorable" at the Primary Battery Facility, and "it had become obvious that the business could not be continued without undertaking a major rebuilding" (PAP-00334605).

1936: According to corporate meeting minutes, the Primary Battery Facility was producing around 114,000 – 115,000 units per month in the fall of 1936 (PAP-0033288).

1938: According to the Industrial Registry, 343 employees worked at the Primary Battery Facility and the Storage Batter Business combined (PAS-00027952).

1940-1941: According to the Industrial Registry, 398 persons worked at the Primary Battery Facility and the Storage Battery Business combined (PAS-00027955).

1943-1944: According to the Industrial Registry, 398 persons worked at the Primary Battery and the Storage Battery Business combined (PAS-00027955).

1944: According to corporate meeting minutes, the Primary Battery Facility was having "an unusually difficult time getting materials" circa 1944 (PAP-00334721).

1947: A facility located on Belmont Avenue was identified by the New Jersey Industrial Registry as the Edison Battery Division of McGraw-Edison Co. (PAS-00027974, 76).

1956- 1959: According to the Industrial Registry, 163 persons worked at the Primary Battery (PAS-00027968, 70).

1963: According to handwritten notes by William R. Rawson, water consumption for the Primary Battery Facility was 1,178,500 cu ft. in 1963 (PAP-00333524).

1964: According to handwritten notes by William R. Rawson, water consumption for the Primary Battery Facility was 1,078,000 cu ft. in 1964 (PAP-00333524).

1965: According to handwritten notes by William R. Rawson, water consumption for the Primary Battery Facility was 1,227,500 cu ft. in 1965 (PAP-00333524).

1966: According to a letter from the Bloomfield Town Engineer, water consumption for the Primary Battery Facility was approximately 1,039,500 cu ft. in 1966 (PAP-0033509).

1967: According to the industrial Registry, 135 employees worked at the Primary Battery Facility (PAS-00027972).

1970's: The *Final Preliminary Assessment Final Remedial Investigation Report*, dated May 6, 2017 (Final RI Report), stated that the buildings associated with the Thomas A. Edison, Inc. Chemical Plant were demolished in the early 1970's, and the property remained vacant until it was redeveloped as a retail grocery store and laundromat with associated parking lots in 1980 (PAP-00334737, 840).

1974: According to the Industrial Registry, 250 persons worked at the Primary Battery Facility (PAS-00027974).

1976: According to a response to a CERCLA §104(e) request for information for another Superfund Site (CERCLA §104(e) Response), the Primary Battery Facility's production of the zinc, copper oxide primary batteries ended in 1976 (PAP-00334371).

1977: According to the Industrial Registry, 250 employees worked at the Primary Battery Facility (PAS-00027976).

1978: According to handwritten notes regarding operations of the Primary Battery Facility, 292,000 battery units were produced in 1978 (PAP-00334686).

1979: According to a PVSC Sewer Connection Application, the Primary Battery Facility employed 175 employees full-time, each working 5 days per week (PAP-00402959).

1981: According to a "Division Survey" conducted in 1981, the average employment for the Primary Battery Facility at that time was 175 (PAP-00334517).

1982: A facility on Belmont Avenue was identified by the New Jersey Industrial Registry as the Power Systems Division of McGraw-Edison Co. (PAS-00027978, 80). According to a response to a Request for Information related to the Caldwell Trucking Superfund Site with respect to the Primary Battery Facility, the operations at the Primary Battery Facility have also been referred to as the Battery Products Plant of the Power Systems Group of McGraw-Edison or as the Edison Battery Products of Cooper Industries (PAP-00334369).

1984: According to an NJDEP Investigative Report in 1984, approximately 100 people were employed by the Primary Battery Facility (PAP-00332930).

1985: In an application for a sewer connection permit submitted to PVSC, the Primary Battery Facility was reported to have 116 full-time employees, working 240 days per year with 3 shifts per day (PAP-00333483).

1986: According to a 1986 press release regarding the upcoming closure of the Primary Battery Facility, the General Manager said that the Primary Battery Facility had "been operating at about half its capacity and that antiquated facilities have made it uneconomical to operate in today's competitive marketplace" (PAP-00335444).

Storage Battery Business

Owner: Unknown – 1960 (PAP-00334750).

Owner	From	To
Thomas A. Edison	Unknown	1925
Thomas A. Edison, Inc.	1925	1957
McGraw-Edison Company	1957	1960
The Electric Storage Battery Company	1960	1967
S.W.M Realty Corporation	1967	1967
Seymour Heller and Nathan Pflasky	1967	1969
Alexander Caplan and Nathan Plafsky	1969	1969
Supermarkets General Corporation (SGC)	1969	1971
SGC / Public Service Electric and Gas Company	1971	1971
Jersey Stuart, Inc. / Public Service Electric and Gas Company	1971	2014
BOIV Belleville MCB, LLC	2014	Present

1957: As noted above for the Primary Battery Facility, in 1957 McGraw Electric Company acquired certain assets of Thomas A. Edison, Inc., including the assets and property associated with the Storage Battery Business.

1960: In 1960, the Electric Storage Battery Company acquired the Storage Battery Business from McGraw-Edison Company (PAP-00194648; PAP-00194661; PAP-00194663).

Operator: 1900 – 1960 (PAP-00334750)

Operator	From	To
Thomas A. Edison	1900	1925
Thomas A. Edison, Inc.	1925	1957
McGraw-Edison Company	1957	1960
The Electric Storage battery Company	1960	1969
None / Vacant	1969	1980
Pathmark Supermarket	1980	2015
None / Vacant	2015	2016
Super Fresh Food World	2016	Present

Size and Operations over Time

Based on the available references, the size and operations of the Storage Battery Business varied over time. A summary of those references is included below:

1900 – 1905**:** According to the survey map of the "Silver Lake Plant" prepared by the Plan Dep't of the Associated Mutual Insurance Cos., the "Chemical Works Div. Bldgs Nos 7 to 28 inclusive [were] built in 1900-05" (PAP-00332567).

1901: A letter from Edison in 1901 instructs an employee to begin the placing and arranging of the Silver Lake Storage Battery Business (PAP-00334344).

1904 – 1909: The Storage Battery Business was closed down in December 1904 and production as suspended until 1909 for technical improvements (PAP-00335388; PAP-00194750).

1916: According to a June 5, 1916 Insurance Service Department Memo regarding the Settlement of Loss by Fire Edison Chemical Works, Silver Lake, a fire occurred in May of 1916, with losses to the building, equipment and stock of the Storage Battery Business valued at over $52,000 (PAP-00334421).

According to the survey map of the Silver Lake Plant prepared by the Plan Department of the Associated Mutual Insurance Co., the Chemical Works Division Buildings 111 – 129 were built in 1916 – 1917 (PAP-00332567).

1917: According to a memorandum for the Storage Battery Business, the Storage Battery Business employed 205 men in October 1917 (PAP-00332944).

1921: According to a handwritten note dated April 1921, the Storage Battery Business was not in operation at that time (PAP-00334422).

1925: According to a Questionnaire submitted to PVSC in 1925, the Storage Battery Business employed 91 persons (PAP-00333531).

1927: The first time the New Jersey Industrial Registry listed the Storage Battery Business as manufacturing storage battery material in Belleville, Bloomfield or Silver Lake was in 1927, but the Registry did not contain similar listings for storage battery manufacturing in Belleville, Bloomfield or Silver Lake for 1931 or 1956 – 1957 (PAS-00027916 – 80). The Industrial Registry reported 92 employees for Edison Storage Battery Co. in 1927 and listed it as manufacturing storage battery material (PAP-00027929).

1934: According to the Industrial Registry, 322 employees worked at Thomas A. Edison, Inc. batteries (PAS-00027940).

1936: According to the corporate meeting minutes of Thomas A. Edison Industries from September 1936, the Storage Battery Division started a program that eventually would bring most or all of their Silver Lake Operations to Orange (PAP-00332886).

1938: According to the Industrial Registry, 343 Employees worked at the Thomas A. Edison, Inc. (Primary Battery Facility and the Storage Battery Business combined) (PAS-00027943).

1940-1941: According to the Industrial Registry, 398 persons worked at the Primary Battery Facility and the Storage Battery Business combined (PAS-00027955).

1943-1944: According to the Industrial Registry, 398 persons worked at the Primary Battery and the Storage Battery Business combined (PAS-00027955).

1970: According to the 2017 Final RI Report, the buildings associated with the Storage Battery Business were demolished in the early 1970s and the property remained vacant until it was redeveloped as a retail grocery store and laundromat with associated parking lots in 1980 (PAP-00334840).

3. Operational History/COC Use and Presence at the Facility

Primary Battery Facility

Operations began at the Primary Battery facility as early as 1889, according to New Jersey Environmental Clean-up Responsibility Act (ECRA) and remedial reports (PAP-00332563; PAP-00332593). Based on Industrial Directories of New Jersey, the facility had been manufacturing batteries at the Belmont Avenue facility since at least 1909. The earliest entry in the available Industrial Directories was an Edison Manufacturing Company located in Silver Lake (now Belleville) that made primary batteries in 1909 (PAS-00027916-17). According to a Selected Substance Report prepared by McGraw

Edison Co. in 1981, the facility began operations in approximately 1930 (PAP-00334489).

A site survey, dated March 5, 1925, identified the Primary Battery Division of Thomas A. Edison, Inc. located at the Silver Lake plant as producing primary batteries, while the Chemical Works Division of Edison Storage Battery Co. produced nickel hydrate, nickel sulfate, medical iron, iron sulfate and oxide, and wax records. The Primary Battery Division buildings were listed as built in 1911 to 1912, and the oldest Chemical Works Division buildings were listed as constructed in 1900 to 1905 (PAP-00332567).

A December 23, 1981, Division Survey for the Power Systems Group located at 75 Belmont Avenue, stated manufacturing operations consisted of sheet metal fabrication of electronic hardware; machining battery parts and electronic hardware; painting electronic housings; assembling, packaging and shipping batteries and electronics; various mixing, baking casting and foundry operations (PAP-00049802).

According to Edison Primary Batteries – *An Old Timer's Recollection*, the Primary Battery Facility did not have any laboratory facilities or technical personnel. Instead, the Primary Battery Facility had to use laboratory space and equipment from the Storage Battery Business if such facilities were required (PAP-00334584).

According to a response to a Request for Information pertaining to the Primary Battery Facility, the Primary Battery Facility manufactured several different types of primary batteries: 1) a zinc, copper oxide primary battery (until 1976); 2) a zinc, carbon primary battery (from 1978 through 1986); 3) a nickel-cadmium, sintered plate battery (from 1975 through 1978); and 4) the Mercury Free Primary Battery (beginning in 1986) (PAP-00334371).

According to a December 11, 1990 Response to Information Request for Caldwell Trucking Superfund Site, the Battery Products plant up until 1976 manufactured zinc, copper oxide primary battery. The production process involved the recycling of returned batteries, which required the washing of copper oxide plates and then grinding them into powder; an amalgamation operation of zinc plates with mercury was also necessary. In the course of performing these operations, come heavy metals were introduced into the plant liquid effluent and settled out to be periodically pumped into the sludge holding area, and eventually disposed of off-site. The production of this type of batter was discontinued at the end of 1975 (PAP-00334371).

The *General Information Submission and Site Evaluation Submission (ECRA SES) for Battery Products, Inc.*, which was submitted to ECRA July 10, 1986, stated anodes, cathodes, and electrolytes were produced at the facility, as well as a lime refining operation. Mercury was used to produce a final anode mixture containing 0.25% mercury, and asphalt was used to seal the carbon black in the battery (PAP-00049213-14). According to handwritten notes regarding operations of the Primary Battery Facility in 1978, 292,000 battery units with four anodes each were produced in 1978, and each anode contained 3.965 grams of mercury(PAP-00334686).

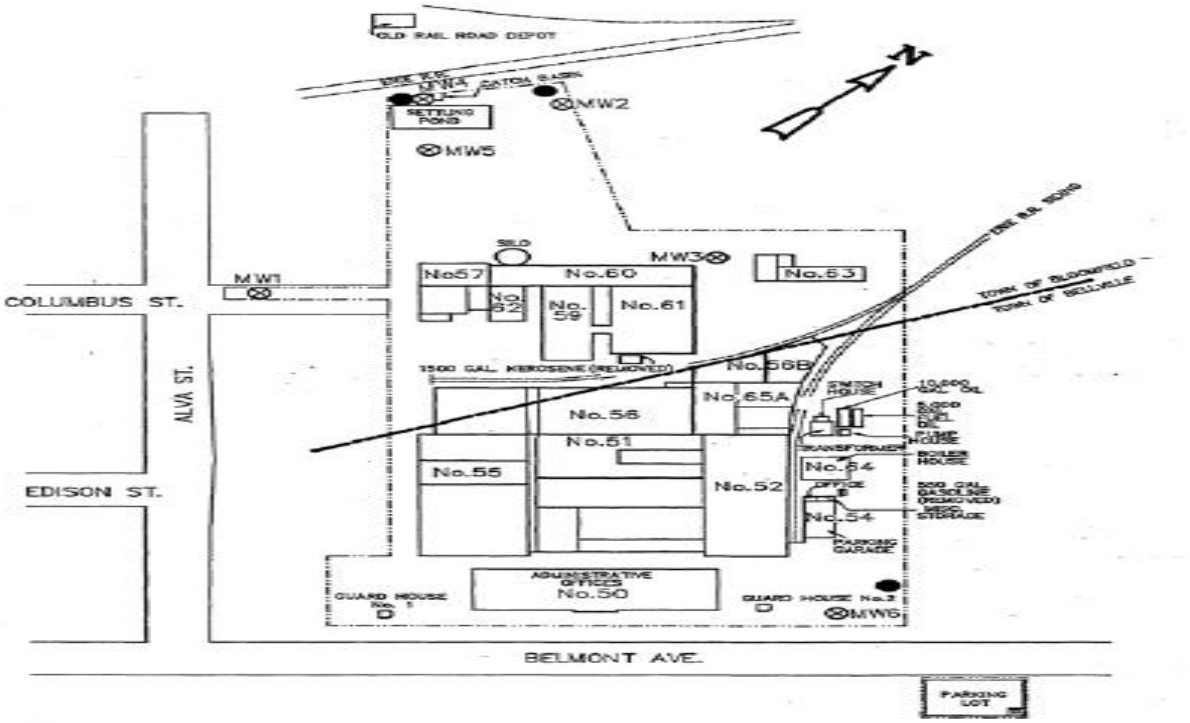
From 1975 through 1978, Battery Products operated a nickel-cadmium, sintered plate aircraft starting battery. Thereafter, from 1978 through 1986, Battery Products manufactured a zinc, carbon primary battery which required that the zinc anodes be amalgamated with mercury (PAP-00334371).

According to a response to a Request for Information pertaining to the Primary Battery Facility, the manufacturing of the nickel-cadmium, sintered plate battery involved nickel and cadmium process. From 1978 through 1986, Battery Products manufacture a zinc, carbon primary battery, which required that the zinc anodes be amalgamated with mercury. In September 1986, Battery Products changed over to the Mercury Free Primary Battery (PAP-00334371).

The 1986 ECRA SES identified storage facilities at the Primary Battery Facility, including a 1,500 gallon kerosene steel tank; 50 and 5,000 gallon potassium hydroxide steel drums/tanks; a 50-year old, 185,000 gallon, abandoned settling pit that contained sludge and rain water; a 50 pound steel drum containing bichloride of mercury; a (removed) 550 gallon steel tank containing gasoline; a 55 gallon steel drum containing methylene chloride; a 55 gallon steel drum containing phenolic mod polyester resin varnish; a 55 gallon steel drum containing denatured alcohol – ethanol; and a 15 gallon carboy containing hydrochloric acid (PAP-00049221).

According to the response to Question 12 of the 1986 ECRA SES (Inventory of Substances Contained Throughout Plant), mercuric chloride and mercury zinc were stored in the foundry (PAP-00334403, 08). No other COCs were listed in the inventory.

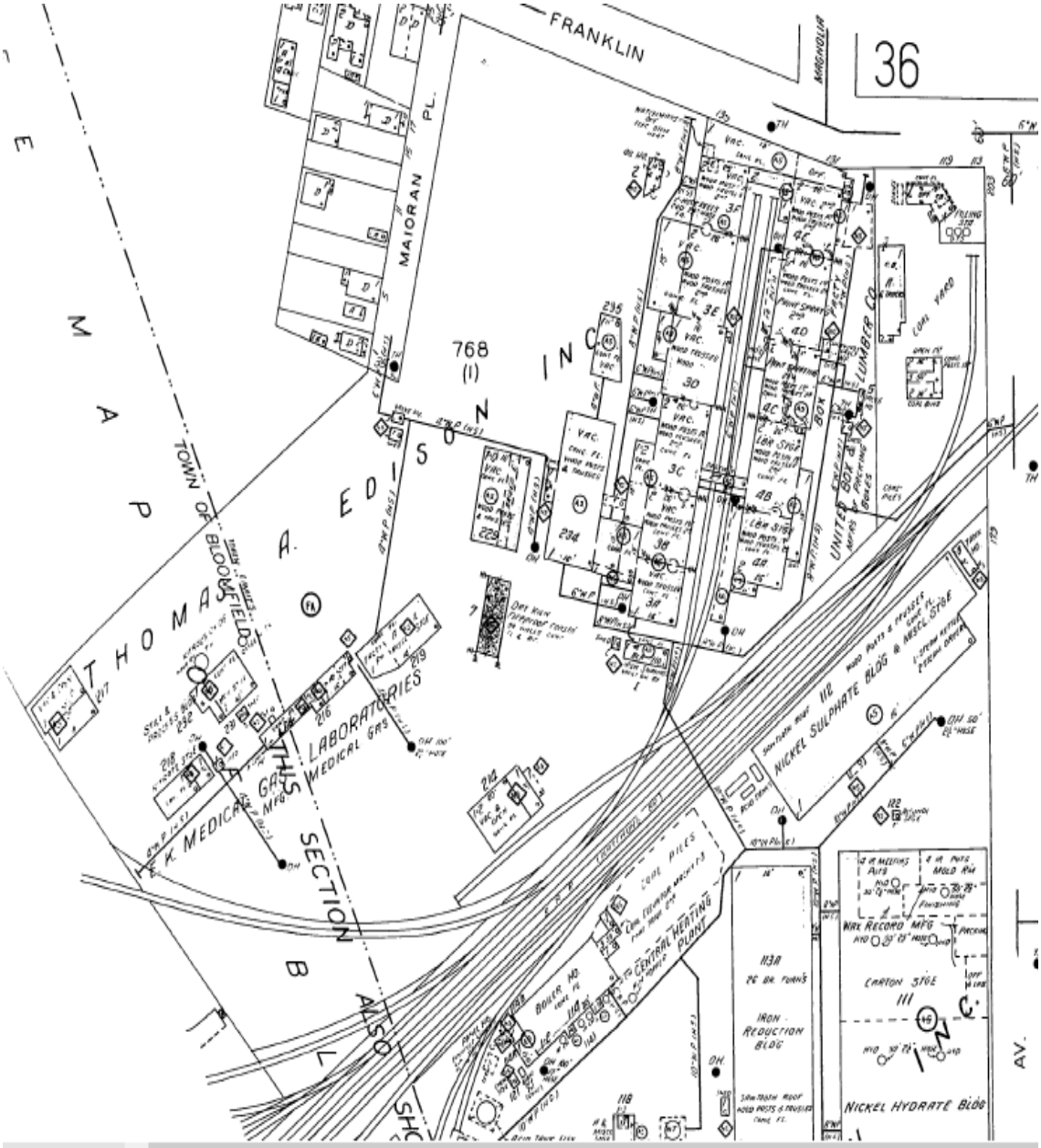
The figure below shows the site layout submitted in the ECRA SES.



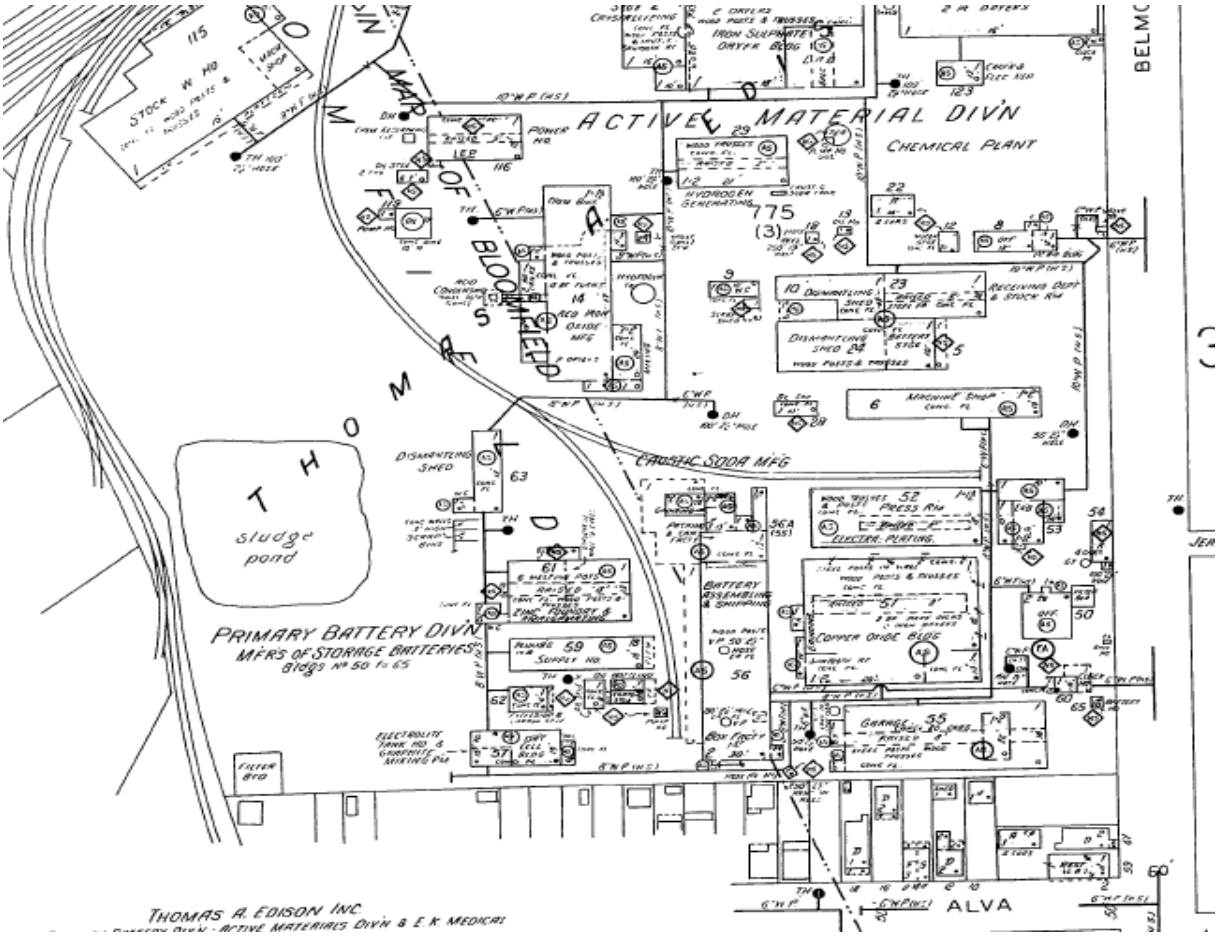
(PAP-00049210)

The Sanborn map from 1938 below showed that the plant was much larger than the plant in the figure from 1986 above. Three divisions were identified at the Thomas A. Edison, Inc. site in Belleville: the E.K. Medical Gas Laboratories north of the railroad tracks manufactured medical gas, the Active Materials Division had a chemical plant, and the Primary Battery Division manufactured storage batteries at the southern end of the site. The Primary Battery Division included a copper oxide building and battery assembly building. The sludge pond was noted to be larger and to the northeast of where it was located in the figure from 1986 above (PAS-00027984).

Sanborn map from 1938, northern half of site: (PAS-00027984)



Sanborn map from 1938: southern half of site: (PAS-00027984)



A site survey map from 1925 shows the same buildings; however, the Active Materials Division was identified as the Chemical Works Division of Edison Storage Battery Co., and the division north of the railroad tracks was identified as the Salvage Division of Thomas A. Edison, Inc. (PAP-000332567).

According to a New Jersey Department of Environmental Protection (NJDEP) Inspection Report, dated August 4, 1987, the plant ceased operation on July 31, 1987, and on the date of inspection no manufacturing activities were taking place. The site was in the process of shuttering, and the process equipment was being dismantled. New raw material was in the warehouse; however, the inspector noted it would be used at the facility in South Carolina (PAP-00050209-10).

Waste Disposal

According to a map dated 1916, the Primary Battery Facility utilized a “filter bed” located on the property of the Storage Battery Business (PAP-00333473). A later map, drawn in 1926, shows the same filter bed (described as “settling beds – Chemical Works”) in addition to “settling tanks – Primary” on the property of the Primary Battery Facility (PAP-

00333479). In 1966, the Primary Battery Facility connected to the sanitary sewer in Bloomfield, and then to the Passaic Valley Sewerage Commission (PVSC) treatment plant. (PAP-00049812; PAP-00333450).

Heavy metals introduced into the plant liquid effluent were settled out to be periodically pumped into the sludge holding area, and eventuall disposed of off-site (PAP-00334371). A letter from McGraw Edison dated May 9, 1973 described the settling basin sludge that was removed from the site every 4 to 6 months. Available information regarding the sludge that was removed from the lagoon/settling pits and disposed off-site is summarized below:

1973: According to the representative evaluation and analysis of the sludge provided by the Primary Battery Facility to Caldwell Trucking Company, Inc., the sludge had the following properties:

- The materials settled in the tanks were a “3.3% slurry (mixture of solid and liquid)”;
- Mercury – 32 mg. per liter of slurry;
- Lead – none;
- Copper – 48 mg. per liter of slurry;
- Inorganic processing waste: “mostly calcium hydroxide Slurry washed from processing tanks daily. Calcium equals 10,470 mg. per liter in the Slurry, accounting for most of the solids.”
- “Additional material is contributed by the plating wash, foundry amalgamation wash, copper oxide stack scrubber and process cooling water.”
- Total solids – 33,500 mg./liter of slurry
- Settleable solids – 30,855 mg./liter of slurry
- Suspended solids – 48 mg./liter of slurry
- Dissolved solids – 2,597 mg./liter of slurry (PAP-00332945-6).

1978: According to a Selected Substance Report for McGraw-Edison Co. based on 1978 figures, 200 lbs. of zinc dross containing mercury was disposed of off-site (PAP-00334492).

1979: According to a Waste Product Survey submitted by McGraw-Edison Company to SCA Chemical Services, the Primary Battery Facility expected to have 200 cubic yards of lime sludge per year for disposal, containing 5-20% suspended solids and over 20% “dissolved solids by weight”. The survey noted that the lime sludge contained 400 ppm copper, 0.4 ppm lead and 1.6 ppm mercury. (PAP-00402950).

1981: According to letters from Peabody Clean Industry Inc., McGraw Edison had the following amounts of “lime sludge, contaminated with heavy metals” for removal and disposal:

- April 1981: 48,000 gallons (PAP-00333237)
- August 1981: 230 cubic yards (PAP-00333242)
- October 1981: 250 cubic yards (PAP-00333257).

The lime sludge and hazardous waste produced by the facility was disposed offsite in the late 1970's and 1980's. The sludge, zinc dross, and other hazardous wastes were noted to contain polychlorinated biphenyls (PCBs), copper, mercury, and lead (PAP-00402947; PAP-00334492; PAP-00334551-52, 57; PAS-00028154-60).

1982: According to NJDEP Division of Hazardous Waste Management waste manifest printouts from 01/01/80 to 12/31/1994 for the Primary Battery Facility, the Primary Battery Facility disposed of 76,000 gallons of waste containing mercury and 5,200 gallons containing lead off-site in 1982 (PAS-00028157-158).

The NJDEP Bureau of Hazardous Waste Generator's Annual Report for the year of 1982 for the Primary Battery Facility reported 115,700 gallons of "hazardous Waste Liquid N.O.S. Lagoon Sludge" transported off-site (PAP-00402947-48).

1983: According to NJDEP Division of Hazardous Waste Management waste manifest printouts from 01/01/80 to 12/31/1994 for the Primary Battery Facility, Edison Battery Products disposed of 10,700 gallons, 56 cubic yards and 18 lbs. of waste containing mercury off-site in 1983 (PAS-00028157-59).

The NJDEP Bureau of Hazardous Waste Generator's Annual Report for the year of 1983 for the Primary Battery Facility reported 10,700 gallons and 74 cubic yards of "hazardous Waste Liquid N.O.S. Lagoon Sludge" transported off-site (PAP-00402974). Sampling results from March 1983 taken from "water from [the] pit arena" reported lead as 0.119 mg/l and mercury as 0.136 mg/l (PAP-00402949).

1984: According to NJDEP Division of Hazardous Waste Management waste manifest printouts from 01/01/80 to 12/31/1994 for the Primary Battery Facility, Edison Battery Products disposed of 31,000 gallons of waste containing mercury off-site in 1984 (PAS-00028157).

1985: According to the NJDEP Hazardous Waste Generator Annual Report for the Primary Battery Facility for 1985, 9 lbs. of waste containing PCBs and 23,400 lbs. of solid waste containing mercury was disposed of off-site in 1985 (PAP-00334551-52).

1986: According to the 1985 NJDEP Hazardous Waste Generator Annual Report for the Edison Battery Products – Cooper Industries, 37,702 lbs. of solid waste containing mercury was disposed of off-site (PAP-00334557).

1987: According to NJDEP Division of Hazardous Waste Management waste manifest printouts from 01/01/80 to 12/31/1994 for the Primary Battery Facility, Edison Battery Products disposed of 36,702 lbs. of waste containing mercury and 259 cubic yards of waste containing PCBs off-site in 1987 (PAS-00028160-161).

Storage Battery Business

According to Edison Storage Battery Company Records, the Storage Battery Business manufactured the chemicals for Edison's "alkaline storage battery" (PAP-00194750). According to *The Submarine Boat Type of Edison Storage Battery* by Miller Reese Hutchison, E.E., Ph.D., Chief Engineer to and Personal Representative of Thomas A. Edison, the active chemicals used in the storage battery were iron oxide and nickel hydrate mixtures of special manufacture by secret process at the Edison Chemical Works, Silver Lake, New Jersey. The iron oxide was powdered, and mixed with a small quantity of mercury (PAP-00334532). The nickel hydrate flakes were produced by filling copper cylinders with very thin alternating layers of nickel and copper by passing the copper cylinders through copper and nickel baths, respectively. The nickel-copper composite sheet is them "stripped from each cylinder" and taken to another department and "placed in crocks containing a solution which dissolves the copper from between the nickel layers", resulting in pure nickel in the "form required for loading the positive tube" of the storage battery (PAP-00334534-35).

Waste Disposal

According to correspondence between representatives of the Storage Battery Business in 1913, the Storage Battery Business utilized "filtering beds" prior to discharge to the brook behind the property (PAP-00334544-545). According to correspondence between the PVSC and the Storage Battery Business in 1926, the Storage Battery Business was discharging wastewater containing iron to the brook lying south of the property of the Storage Battery Business (PAP-00050257; PAS-00028089-90). A memorandum of a conference in 1916 noted that the "use of the open settling tanks or sumps has been abandoned and the material which formerly emptied into the same is emptied alternatively into a pair of closed settling boxes and the overflow from the latter turned into the Belleville sewer" (PAP-00334547).

According to a letter from PVSC to the Storage Battery Business, the settling pits were periodically cleaned out of sludge (PAP-00334678). Sampling from effluent pretreated in the filtering beds / settling pits was collected in 1921 and reported lead and copper as "nil" (PAP-00717650).

A ten-year chemical and inspection record of the Storage Battery Business for the years 1938 – 1948 compiled by PVSC noted that certain events such as "heavy rains" causing flooding at the Storage Battery Business and broken sewer pipes resulted in brief pollution of iron sludge to the storm sewers that led to the Second River (PAS-00028123–30).

According to a Statement forwarded to Ordnance Department regarding the construction of the facilities at the Storage Battery Business, all of the concrete pits in the buildings were waterproof, and "to make these pits absolutely waterproof, the Storage Battery Business installed a drainage system all over the yards" (PAP-00335464). According to a letter between representatives of the Storage Battery Business, a continuous closed circuit apparatus was installed in April 1925 in order to further eliminate iron discharge to the brook, and in September 1925 the Storage Battery Business completed putting in a common drain to collect all waste material at one common source as requested by

PVSC (PAP-00333476). According to another letter between Storage Battery Business representatives, in 1926 an additional pump was installed to address overflow of copper carbonate from the separating solution sumps and a filter press was added such that all of the solution from the Parts Plating Department would have to pass through the filter press before getting to the brook, resulting in all of the nickel carbonate being filtered out (PAP-00333477).

4. Identified COCs

- PCBs (used, detected)
- PAHs (detected)
- Copper (stored, used, detected
- Lead (detected)
- Mercury (stored, used, detected)

Primary Battery Facility

PCBs

The 1985 *Final Draft Site Inspection* noted that the soil had been contaminated with PCBs. The highest concentrations were noted to be in the drainage basins (PAP-00050135-36). Concentrations of the PCBs were not provided in the available references.

A 1987 NJDEP Inspection Report contained a 1985 *Hazardous Waste Generator Report* that noted hazardous waste shipped from the 75 Belmont Avenue property consisted of 9 lbs. of PCBs (PAP-00050226). Waste manifest records from October and November 1987 state 259 cubic yards of PCBs were removed from the Primary Battery Facility (PAS-00028160-61).

According to a letter from Cooper Industries to the NJDEP, dated August 3, 1992, PCBs were detected in Toxicity Characteristic Leaching Procedure (TCLP) composite samples at 2.4 parts per million (ppm) and 3.36 ppm. The letter stated that McGraw-Edison Company did not “utilize transformers, machinery or materials which contained PCBs,” and the PCBs were attributed to railroad activities and the soil was disposed off-site (PAP-00332584).

PAHs

According to the 1986 ECRA SES, substances stored on-site included between 1,001 and 10,000 gallons of kerosene (PAP-00049269, 72). According to a 1989 ECRA SES, the facility had been heated with oil and gas for 98 years. Fuel oil storage tanks were located aboveground (PAP-00049812).

According to the August 20, 1986 ECRA SES, in April 1986, a 1,500-gallon underground kerosene storage tank and a 500-gallon underground gasoline storage tank were discovered leaking. Both tanks were removed on April 28, 1986 (PAP-00049278-79).

Copper

According to a December 11, 1990 Response to Information Request for Caldwell Trucking Superfund Site, the Battery Products plant up until 1976 manufactured zinc, copper oxide primary battery. The production process involved the recycling of returned batteries, which required the washing of copper oxide plates and then grinding them into powder. In the course of performing these operations, come heavy metals were introduced into the plant liquid effluent and settled out to be periodically pumped into the sludge holding area, and eventually disposed of off-site. The production of this type of batter was discontinued at the end of 1975 (PAP-00334371).

The Edison Primary Battery Division Annual Reports ad Weekly Averages reported the following amounts of copper (PAP-00333463).

- 5/30/1910 – 2/28/1911: 373,585 lbs. copper scale
- 3/1/1911 – 2/29/1912: 706,741 lbs. copper scale
- 3/1/1912 – 2/28/1913: 986,044 lbs. copper scale
- 3/1/1913 – 2/28/1914: 1,014,255 lbs. copper scale
- 3/1/1914 – 2/28/1915: 1,224,066 lbs. copper scale
- 3/1/1915 – 2/29/1916: 907,690 lbs. copper scale

According to memoranda from the General Manager's Office of the Primary Battery Division, the Primary Battery Facility "had not been able to keep a sufficient amount of copper scale on hand" in 1917 and the actual amount of stock on hand averaged about one day's supply only (PAP-00333469; PAP-00333470).

According to corporate meeting minutes from 1918, the Primary Battery Facility cancelled the second car of copper turnings ordered from "Poole Engineering & Machine Company of Baltimore, Md." (PAP-00333214).

According to Corporate Meeting Minutes from 1920, the Primary Battery Facility was authorized to purchase 50,000 lbs. and 60,000 lbs. of copper in 1920 and 100,000 lbs in March and April 1924 (PAP-00333216; PAP-00333217; PAP-00333454). According to Meeting Minutes from 124, Primary Batter was authorized to enter into an agreement for the provision of cooper scale from March 1, 1925 – February 28, 1926 at an estimated 500,000 lbs. (PAP-00333458-9).

According to the 1986 ECRA SES, the Quality Control Laboratory stored 0.5 kg of cupric oxide (PAP-00049264).

Lead

According to the 1985 SIR, the drainage basins on-site contained high levels of lead. Concentrations of lead in samples from the two drainage basin were 210 and 950 mg/kg (PAP-00050136, 70).

Results from an effluent sample collected October 25, 1985 had less than 0.025 mg/L lead (PAP-00333499).

According to waste manifests from the 1980s and 1990, the following amounts of lead waste was removed and disposed of off- site (PAS-00028154-60).

Waste Mercury Disposed	
Date	**Amount**
10/13/1982	5,200 gallons
10/11/1988	3,493 gallons
10/03/1989	10 cubic yards
09/13-10/01/1991	936 cubic yards
12/16/1992	1,100 pounds

The Soil Sampling Report submitted with the 1986 ECRA SES reported results for soil samples collected in 1984 throughout the site. The maximum detected concentration of lead in surface soil was 2,300 ppm, from a sample located at the eastern corner of the main building along the railroad tracks (see Area 6 in figure above). Only two surface samples (SS-9 and SS-20) contained lead concentrations above 1,000 ppm. The maximum subsurface soil concentration for lead was 570 ppm (PAP-00049318-19, 28-29). Soil samples collected from the edges and within the lagoon detected concentrations of lead up to 920 mg/kg (PAP-00050153, 65; PAP-0004553, 64).

Mercury

As described above, mercury was used at the Primary Battery Facility for the manufacture of zinc-air and copper-oxide batteries (PAP-00334371).

According to a description of operations provided by NJDEP by the Primary Battery Facility in connection with application for Certificates to Operate, mercuric chloride dip was applied with dip tanks that had a “hood ducts, suction fans and roof stacks (PAP-00402937).

According to a July 1987 Evaluation of Mercury and Zinc in Soils, prior to the fall of 1985, the amalgam was produced using a hand casting machine. Because management wished to ensure maximum industrial hygiene, the amalgamation occurred in a Lepel generator (an electric furnace). It appears through mass balance calculation that the procedure of amalgamation using the Lepel generator results in mercury loss, at the same time environmental investigations revealed some visible mercury deposition on the roof of the building where the amalgam was being produced. It would appear that Buildings 55, 56, and 61 are the only locations where mercury was amalgamated. In response to these concerns, Battery Products, Inc. ceased using the Lepel generator, cleaned the roof in accordance with hazardous waste management regulations and obtained an outside supplier who could supply amalgam which met appropriate specifications. (PAP-00332565).

According to a July 1987 Evaluation of Mercury and Zinc in Soils Near the Battery Products, Inc. Facility, Bloomfield, New Jersey, prepared by ENVIRON Corporation, mercury was found to be emitted to the air from the amalgamation process and had been deposited on the soil in the backyards of certain houses fronting on Alva Street and abutting the western boundary of the facility (PAP-00332558). Results for the mercury in

off-site soil were not available. Prior to the fall of 1985, the amalgam was produced in Building 61, and later in Building 56, using a hand casting machine which was located in the electrics lab area, the process was moved a short distance to Building 55 and the amalgamation occurred in the Lepel generator (an electric furnace). It was hypothesized that airborne emissions of mercury may have resulted from the amalgamation process and in response to these concerns, Battery Products, Inc. ceased using the Lepel generator and obtained an outside supplier (PAP-00332565).

The Edison Primary Battery Division Annual Reports ad Weekly Averages reported the following amounts of mercury (PAP-00333463).

- 5/30/1910 – 2/28/1911: 8,700 lbs. mercury
- 3/1/1911 – 2/29/1912: 12,900 lbs. mercury
- 3/1/1912 – 2/28/1913: 18,325 lbs. (and 1,770 lbs. of “mercuric bichl.”)
- 3/1/1913 – 2/28/1914: 18,146 lbs. (and 2,454 lbs. of “mercuric bichl.”)
- 3/1/1914 – 2/28/1915: 17,550 lbs. (and 3,075 lbs. of “mercuric bichl.”)
- 3/1/1915 – 2/29/1916: 12,458 lbs. (and 4,700 lbs. of “mercuric bichl.”)

According to corporate meeting minutes, the Primary Battery Facility was authorized to purchase 6,000 lbs. of mercury in 1918 (PAP-00333206-207). However, The Primary Battery Facility’s “Schedule of Material Requirements” for the year ending December 31, 1918 did not list mercury as an anticipated major material required for the year in any quantity (PAP-00334658).

According to a June 1981 Selected Substance Report, McGraw-Edison Company reported the following based on 1978 usage (PAP-00334492).

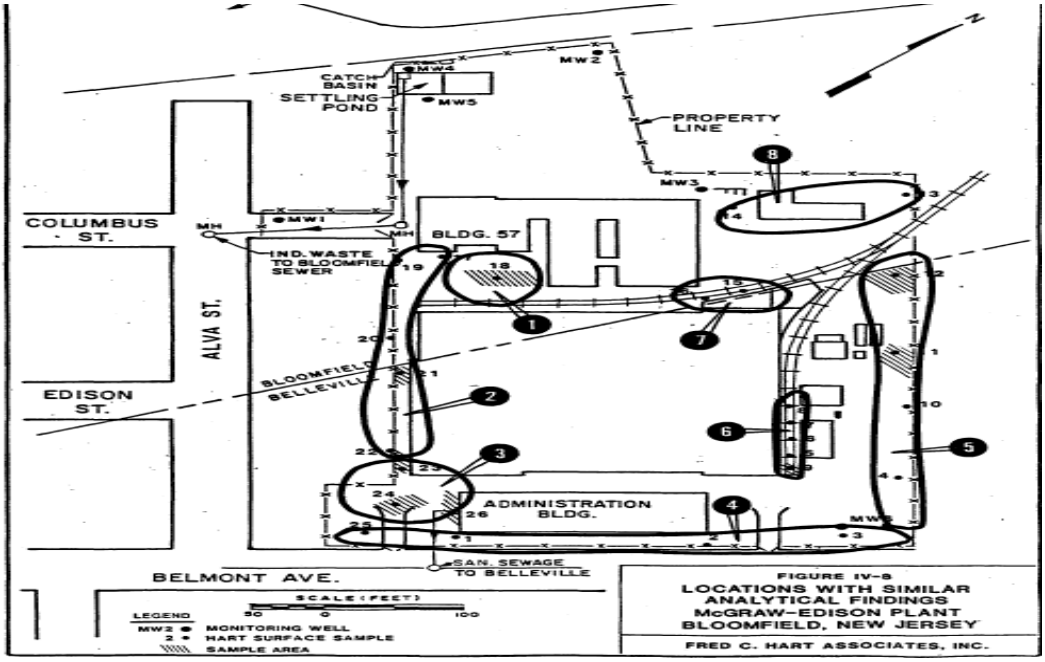
	COMPLETE THE FOLLOWING INFORMATION FOR THE PLANT BASED ON 1978 USAGE	ENTER THE ACTUAL OR ESTIMATED AMOUNTS	USE THE REQUESTED UNITS	ACTUAL	ESTIMATE
THROUGHPUT QUANTITIES	4. QUANTITY PRODUCED ON SITE	NONE	lbs/yr.		
	5. QUANTITY BROUGHT ONTO SITE	13755	lbs/yr.	X	
	6. QUANTITY CONSUMED ON SITE	13555	lbs/yr.		X
	7. QUANTITY SHIPPED OFF SITE AS (OR IN) PRODUCT	13255	lbs/yr.	X	
	8. MAXIMUM INVENTORY	850	lbs		X
AIR EMISSIONS	9. TOTAL STACK EMISSIONS OF SELECTED SUBSTANCE	.202	lbs/yr.	X	
		.000846	max lbs/day	X	
	10. TOTAL FUGITIVE EMISSIONS OF SELECTED SUBSTANCE	NA	lbs/yr.		
		NA	max lbs/day		
WASTEWATER DISCHARGE	11. TOTAL DISCHARGE OF SELECTED SUBSTANCE INTO SURFACE WATER	NONE	lbs/yr.		
		NONE	max lbs/day		
	12. TOTAL DISCHARGE OF SELECTED SUBSTANCE INTO PUBLICLY OWNED TREATMENT WORKS	.208	lbs/yr.	X	
		.0086	max lbs/day	X	

According to a December 1981 Division Survey for Power Systems Group, the facility reported an annual use of 5,000 lbs. of mercury that they received in flasks and stored in the foundry room (PAP-00049804).

According to a December 1981 Division Survey for Power Systems Group, the facility reported an annual use of 5,000 lbs. of mercury that they received in flasks and stored in the foundry room (PAP-00049804). According to handwritten notes regarding mercury-zinc usage, 2,888 lbs., 3,648 lbs., and 4,180 lbs. of mercury were used in 1982, 1983, and 1984, respectively (PAP-00334688).
According to a memorandum for the Power Systems Group of McGraw-Edison Company from September 6, 1984, about 30 pounds (lbs.) of amalgam were produced each day (PAP-00332576).

The *Final Draft Site Inspection Report*, dated June 14, 1985 (1985 SIR), identified 55-gallon drums with 50% mercury amalgam by weight as a hazardous substance present at the facility. It was noted that mercury turnings were generated on-site and stored in 55-gallon drums. In addition, the 1,922 square feet lagoon was identified as containing mercury sludge (PAP-00050134, 60, 77).

Soil samples were collected from locations across the site in 1984. According to the Soil Sampling Report submitted with the 1986 ECRA SES, the highest concentration of mercury in surface soil was 2,005 ppm, detected between the main building and Building No. 57 (see 18 in Area 1 on-site figure below). The maximum detection of mercury in subsurface soil (0.5-2.5 ft bgs) was 38 ppm (PAP-00049318, 28-29). Soil samples collected from the settling lagoon on August 21, 1984 detected concentrations of mercury ranging from 59 to 2,462 mg/kg. A sample from a drainage ditch located on the northern side of the site detected 4,406 mg/kg mercury (PAP-00050153, 65, 70).



(PAP-00049325)

Based on the figure above, the area of primary concern was Area 1, with the highest levels of mercury and copper contamination between Building No. 57 and the main manufacturing building. It was noted that this area had a concrete surface (PAP-00049324-26). The *Environmental Assessment* by IT Corporation, submitted in the 1985 ECRA SES, stated metals contamination extended to 7.5-9.0 ft bgs beneath the settling pit. In addition, sludge was found in the boring for MW2 (northwest corner of the site), indicating an abandoned, buried settling pit had contamination to 7.5 ft bgs. An oily sheen and petroleum odor were noted at MW3 (PAP-00049569, 76).

The August 4, 1987 NJDEP Inspection Report indicated that the use of mercury ceased in December 1985. At that time, the company began buying the zinc in the size and shape they needed instead of melting it on-site. The mercury was previously required to reduce the grain size of the zinc, making it more desirable for use in the batteries (PAP-00050209-10).

The 1986 ECRA SES contained inventories of substances stored at the plant. The Quality Control Laboratory stored 0.75 kg of mercuric chloride. The foundry contained between 10,001 and 50,000 pounds of mercury zinc. In addition, mercuric chloride was stored in tanks (between 1,000 and 101,000 gallons) and in drums (1,000 and 101,000 lbs.) at the foundry for the zinc anode process (PAP-00049261, 64, 68-72).
A letter from the Edison Battery Products to NJDEP in August 1986 requested that NJDEP cancel 4 Air Certificates because the Primary Battery no longer had those operations as part of their production process, referencing the following processes: zinc hand casting – surface combustion melting furnace amalgam mix; zinc casting table; and zinc anode surface treatment (PAP-00402929).

Records of waste manifests from the 1980s and 1990s document off-site disposal of mercury from the McGraw-Edison plant in the following amounts:

Waste Mercury Disposed	
Date	**Amount**
12/03-04/1991	24 cubic yards
08/24/1990	350 gallons
08/23/1990	1,476 gallons
02/26/1986	20 tons
02/27-28/1986	36 cubic yards
03/04-06/1986	56 cubic yards
04/14/1986	20 cubic yards
09/16/1987	36,702 lbs.
07/18-20/1984	10,500 gallons
02/10/1984	10,000 gallons
07/03/1984	10,500 gallons
04/07/1983	5,200 gallons
10/01-14/1982	76,000 gallons
01/17/1983	5,500 gallons; 38 cubic yards
01/18/1983	18 cubic yards; 18 lbs.

(PAS-00028154-60)

According to a September 26, 1988, letter from SESI to Cooper Industries, SESI noted free-phase mercury in soil samples from boring 9 to a depth of approximately 15.5 ft bgs. The mercury appeared to stop in a stratum that consisted of silt with a trace of fine sand and clay. SESI reported that the mercury contamination near boring 9 was a localized issue; however, a figure with the boring location was not provided. Concentrations of mercury in this boring ranged from 3.8 to 10,500 ppm (PAP-00049846, 70).

According to the 2017 Final RI Report, the maximum concentration of mercury detected in soil at the former chemical plant was collected on July 7, 2011 at 874 mg/kg from a depth of 6-6.5 ft bgs (PAP-00334914).

Storage Battery Business

PAHs

The 2017 Final RI Report detailed detections of PAHs in soil at the former chemical plant. The highest concentrations of (benzo(a)pyrene at 0.39 milligrams/kilogram (mg/kg) and benzo(b)fluoranthene at 0.69 mg/kg) were detected at a sample depth of 1.8 - 2.8 feet below ground surface (ft bgs) (PAP-00334938). The 2017 Final RI Report attributed the PAHs (except 2-methylnaphthalene) concentrations in soil to historic fill (PAP-00334877). The elevated concentrations of 2-methylnaphthalene (35 mg/kg) were attributed to an unidentified release of diesel or No. 2 fuel oil (PAP-00334868, 78)

Copper

Copper was used in the manufacturing of nickel hydrous flake as filler between the nickel flakes that could be dissolved away in solution as described in the *Submarine Boat Type of Edison Storage Battery* by Miller Reese Hutchison, E.E., Ph.D. (PAP-00334535).

According to an undated memorandum titled “Instructions for Keeping Various Solutions Under Control for The Production of Nickel Flake”, the solution used to produce the nickel flake required no more than 0.32 grams of copper per one liter of solution (PAP-00335448). An internal Edison Storage Battery Company memorandum noted an annual production of 225,000 lbs. of nickel flake in 1919 (PAP-00335470).

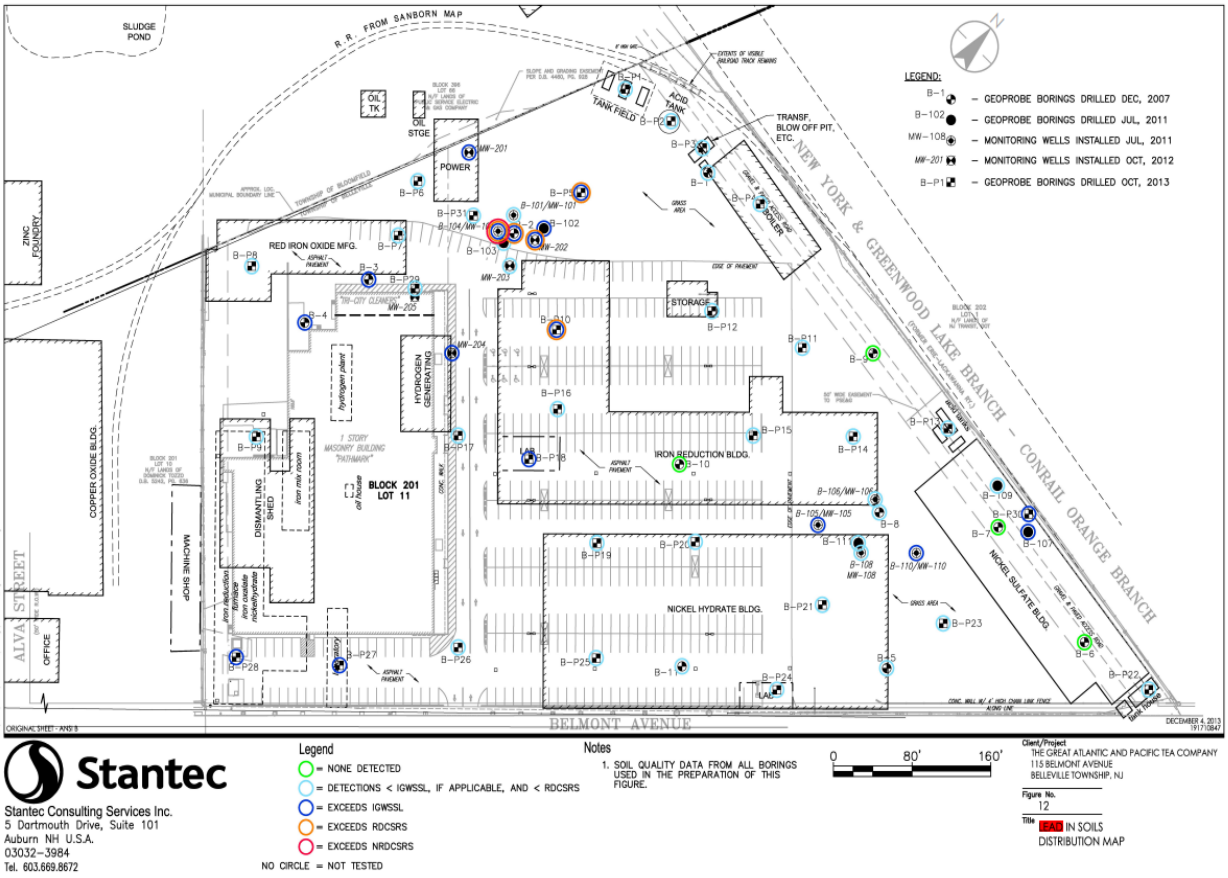
According to the 2017 Final RI Report for Pathmark Grocery Store, the max concentration of copper (1,200 mg/kg) came from sample B-107 collected on July 20, 2011 from a sample depth of 6 – 6.ft (PAP-00335204).

Lead

According to the 2017 Final RI Report for Pathmark Grocery Store, a 2007 Phase II ESA Investigation reported soil samples with lead at concentration above the NJDEPS’s most stringent Direct Contact Soil Cleanup Criteria, but below the NJDEP’s Non-Residential Direct Contact Soil Cleanup Criteria (PAP-00334848).

The maximum concentration of lead detected in soil at the former chemical plant was 1,710 mg/kg at a depth of 6-6.5 ft bgs (PAP-00334913). Laboratory results from soil samples collected in 2011 and 2012 also showed elevated levels of lead at two sample locations, with concentrations of 764 mg/kg and 633 mg/kg, respectively (PAP-00334865).

The figure below depict the locations of lead detected in soil at the Storage Battery Business property (PAP-00335218):



Mercury

According to *The Submarine Boat Type of Edison Storage Battery*, dated October 1915, by Miller Reese Hutchison, E.E., Ph.D., Chief Engineer to and Personal Representative of Thomas A. Edison, mercury was used with the iron plate for better contact, to promote chemical action, and to reduce internal resistance. It was also stated that the iron oxide manufactured at the Edison Chemical Works Silver Lake plant was “mixed with a small quantity of mercury” (PAP-00334531-32).

In a document titled, “Edison Chemical Works Division, Raw Materials Requirements” and dated August 1, 1918, the amount of mercury required for one month was 2,558 lbs. (PAP-00333465).

According to the 2017 Final RI Report for Pathmark Grocery Store, the max concentration of mercury (874 mg/kg) came from sample B-107 collected on July 20, 2011 from a sample depth of 6 – 6.ft (PAP-00335204).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

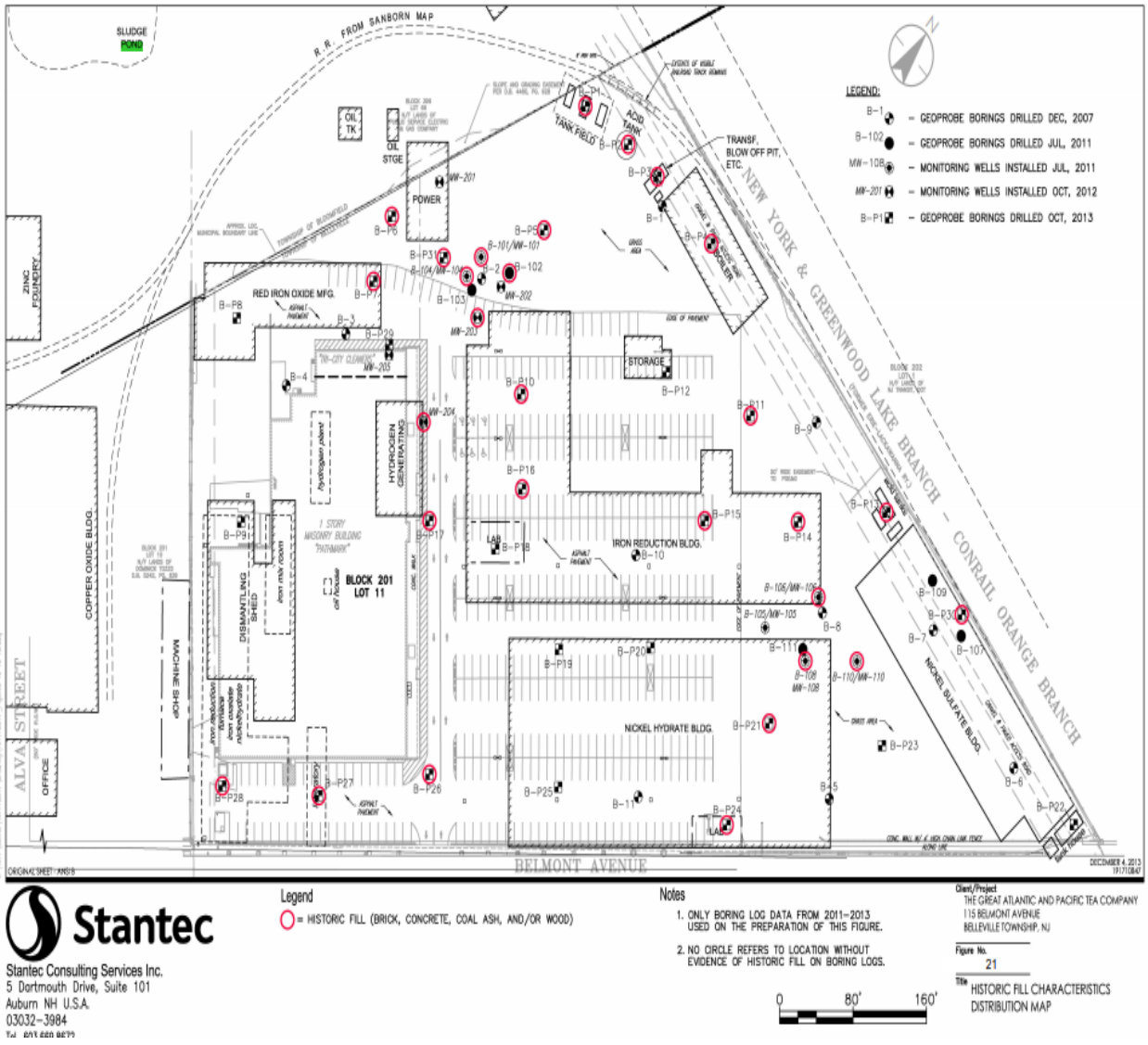
The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00049328-29, PAP-00050170; PAP-00334938).

COCs Found in Onsite Soils		
COC	**Primary Battery Max Detected Concentration**	**Storage Battery Max Detected Concentration**
Lead	2,300 mg/kg	1,710 mg/kg
Copper	80,000 mg/kg	1,200 mg/kg
Mercury	4,406 mg/kg	874 mg/kg
Benzo(a)anthracene	No Data	0.43 mg/kg
Benzo(a)pyrene	No Data	0.39 mg/kg
Benzo(b)fluoranthene	No Data	0.69 mg/kg
Benzo(k)fluoranthene	No Data	0.25 mg/kg
Dibenzo(a,h)anthracene	No Data	0.037 mg/kg
Indeno(1,2,3-cd)pyrene	No Data	0.10 mg/kg

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #41 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] NJDEP, *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Storage Battery Business

According to a 2017, Final RI Report for Pathmark Grocery Store (Battery Storage Business) historic fill impacted the concentrations of metals and PAHs across the site (PAP-00334844). Based on the presence of fill material (i.e., brick, concrete, coal ash, wood, etc.) observed in borings across the site and the lack of a correlation between the elevated concentrations and individual areas of concern, the 2017 Final RI Report attributed the metals and PAHs (except 2-methylnaphthalene) concentrations in soil to historic fill (PAP-00334877). Boring log data from samples taken between 2011 and 2013 show characteristics of historic fill as identified in the "Historic Fill Characteristics Distribution Map below (PAP-00335227).



The 2017 Final RI Report for Pathmark Grocery Store (Battery Storage Business) also noted that Historic Fill was located throughout, or across, the entire Site and impacted with levels of metals and polycyclic aromatic hydrocarbons (PAHs) above Standards (PAP-00334844). The 2017 Final RI Report concluded that the historical operations areas do not show evidence of spills or releases, and, therefore, are not considered as individual or specific AOCs; however, Historic Fill is an AOC. The concentrations of the various metals are also consistent across the Site (PAP-00334877).

5. COC Pathways

Sanitary Sewer

Primary Battery Facility

Records regarding when the Primary Battery Facility connected to a sanitary sewer are not clear, but negotiations with Belleville, Bloomfield and East Orange for the construction of a storm water sewer to replace Meadow Brook were concluded in 1929 (PAP-00717646). According to an August 1926 Statement from Thomas A. Edison Incorporated, 25% the total volume of industrial waste is discharged into the brook. The other 75% discharged into a man-hole in the private drain located within the town of Bloomfield, west of the property line (PAP-00717640).

The 1989 ECRA SES Part 2 noted that industrial waste was discharged from the primary battery facility to the PVSC from 1966 to 1987. After 1987, only sanitary waste was discharged to the PVSC. The industrial waste was listed as containing heavy metals from 1966 to 1979. Prior to 1966, it was noted that a septic system and settling ponds were used for the sanitary and industrial waste (PAP-00049812).

A letter dated November 12, 1965 from Thomas A. Edison Industries to the Town of Bloomfield stated a new sewer line would be attached from the settling ponds to a new manhole (PAP-00333478). According to correspondence between the Town of Bloomfield and a McGraw-Edison Plant Engineer, industrial discharge into the Bloomfield sanitary sewer was approximately 32 gallons per minute in 1966, for 236 working days in the year (PAP-00333510).

The 1985 SIR noted that the facility was permitted to discharge into the Bloomfield/Belleville sewer system. The permit to the PVSC was for “runoff from roof, non-contact cooling water, AC, drainage, etc.” (PAP-00050136-37).

A Selected Substance Report estimated an average volume of 75,000 gallons of wastewater discharged to PVSC per day based on 1978 usage (PAP-00334489). The Selected Substance Report reported a total annual discharge of mercury into publicly owned treatment works in the amount of .208 lbs. (.0086 max lbs./day) based on 1978 usage, and the estimated average volume of wastewater discharged to PVSC per day. No surface water was reported (PAP-00334489-92).

A PVSC Heavy Metals Source Determination Study, Phase II, dated April 1980, stated the facility discharged into the PVSC system at a rate of 0.1090 million gallons per day. The report included the following results for effluent from the McGraw-Edison-site:

Effluent in 1980		
Metals	**mg/L**	**lbs/day**
Copper	0.144	0.131
Lead	0.300	0.273
Mercury	0.025	0.0227

(PAS-00028222)

A letter from the Primary Battery Facility Plant Manager to PVSC in February 1981 stated that the annual flow at Outlet Number 002 to Belleville was confirmed to be 630,000 gallons, which divided, by 240 working days averages 2,625 gallons per day. There are no process wastes or non-contact cooling water involved in this outlet. The letter noted the intent to later provide a flow meter in the discharge line at Outlet Number 001 to the Bloomfield System (PAP-00402951). Note: The PVSC Sewer Connection Application identifies the daily flow at outlet 001 to be 50,865,409 gallons and at outlet 002 to be 630,000 (PAP-00402962). This letter clarifies that these values are the *annual* flow, as opposed to the daily flow, consistent with the annual usage amounts reported at PAP-00402960.

According to an October 1980 Chemical Neutralizing Pit Letter, the Primary Battery Facility noted that most of the water going to the pit is clear cooling water. The remaining water was process effluent which contains suspended lime particles. The pit was used to settle out the particles of lime and the discharge goes into the Bloomfield Sewer System. The letter noted that PVSC was advised of the laboratory analysis results of mercury at 42.150 ppm and that PVSC concluded the pits and discharge posed no immediate hazard because the materials were below PVS limits for waste water (PAP-00402953-55).

According to a PVSC Sewer Connection Application, dated February 4, 1980, 51,495,409 gallons of industrial and domestic water were discharged to the sanitary sewer in 1979. The majority of this volume was industrial waste (50,865,409 gallons) that was discharged through Outlet 001 to the Bloomfield sewer, while the rest (630,000 gallons) was sanitary waste that was discharged through Outlet 002 to the Belleville sewer. Concentrations detected in samples collected in 1980 from Outlet 001 were 0.748 mg/L copper and 0.15 mg/L mercury (PAP-00402951; PAP-00402957; PAP-00402960, 62, 66). Based on a process diagram from 1980, a pretreatment plant was used for the waste (i.e., non-contact cooling water, roof leaders, and process waste) sent to Bloomfield, and both Belleville and Bloomfield sewers went to the PVSC (PAP-PAP-00725624).

A Division Survey for the Power Systems Group, dated December 23, 1981, listed 260,000 gallons of process water and 15,000,000 gallons of cooling water discharged to the PVSC sanitary sewer each year. The pretreatment was identified as settling weirs. It was stated that waste was not discharged to the storm sewers (PAP-00049806). A

PVSC permit noted no process water was discharged to the sewer in 1984 (PAP-00333484).

According to a PVSC Application, the Primary Battery Facility has two outlets. An industrial waste filled chamber composite Outlet 01402141 with a daily flow of 50,856,409 gallons and a sanitary sewer Outlet 01402142 with a daily flow of 630,000 gallons (PAP-00333486; PAP-00402962).

According to a 1980 PVSC Sewer Connection Application, the Primary Battery Facility discharged 51,495,409 gallons of industrial and domestic water to the sanitary sewer in 1979 (PAP-00402960).

The maximum results from plant effluent samples reported on June 30, 1984 were 0.026 mg/L copper and 0.059 mg/L mercury. Lead was not detected (less than 0.025 mg/L) (PAP-00334524).

According to a letter from the Primary Battery Facility to PVSC, the Primary Battery Facility discharged 35,87,301 gallons during the period from the Fourth Quarter of 1984, thru the Third Quarter of 1985. The Primary Battery Facility representative explained that the discrepancy between the PVSC's reading of 110,000,000 gallons of effluent and the Primary Battery Facility's reported amount was likely due to the fact that the Primary Battery Facility had a "Sigmamotor LMS-500 Flowmeter, which charts flow through the Weir and Bubbler principle. Due to this, any abnormal amount of water over the top of the Weir will result in a greatly accelerated total volume flow". The letter further noted that the flowmeter reading at the end of October, 1985 was 385,281 gallons. (PAP-00402971).

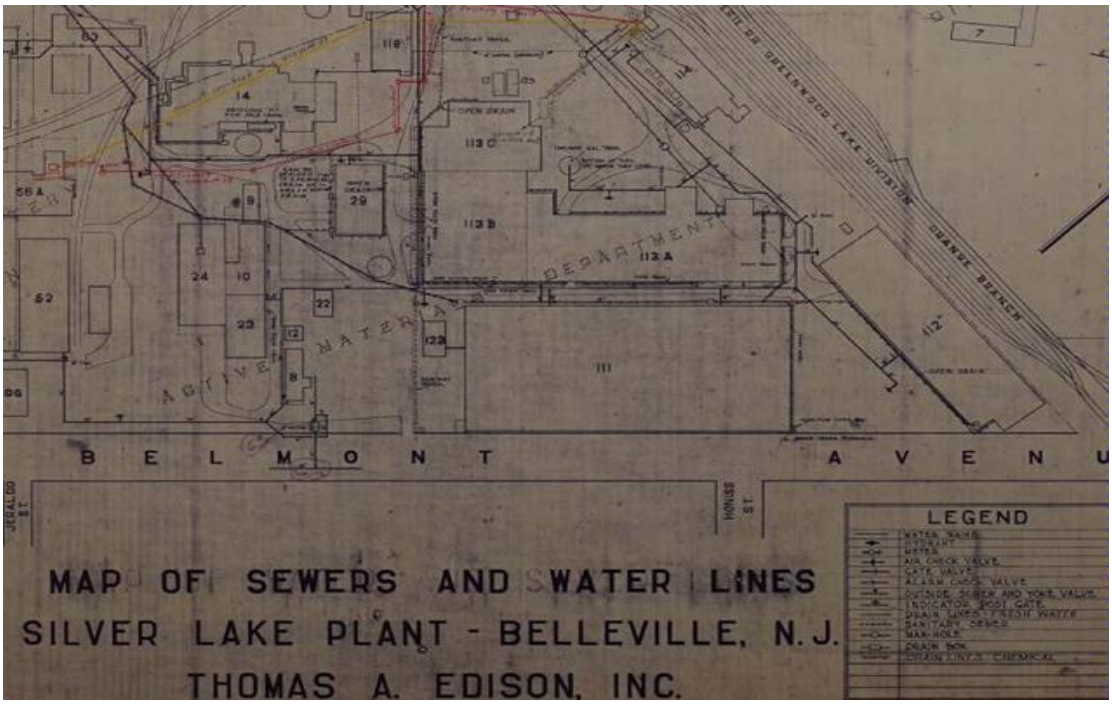
Results from an effluent sample collected October 25, 1985 reported 0.052 mg/L copper and less than 0.025 mg/l lead (PAP-00333499).

A letter from the Primary Battery Facility to PVSC in June 1986 referred to a "violation of high pH in the effluent stream, which empties into the Bloomfield Sanitary Sewer on Alva Street" and proposed the following solutions: 1) "a more often clean out of certain manholes and catch basins" – on a "monthly basis"; and 2) the "addition of Muriatic Acid into the sewer line most affected by high pH" to help "maintain the allowable pH range" (PAP-00402967).

According to a letter from the Edison Battery Products to PVSC, the Primary Battery Facility's well water system had not been functioning since mid-November, due to a pump problem and as a result, there was a plus 3,255,559 gallon difference in their discharge (PAP-0040286). The volumes discharged through Outlet 02404620-41009-0201 reported in a user charge self-monitoring report for the period January 1 through March 31, 1986 were 6,449,000 gallons based on the flow meter and 3,693,441 gallons based on city water measurements. This discrepancy in measured volumes was attributed to a broken pump. The sanitary waste was 194,418 gallons through Outlet 01404620-41009-0201 (PAP-00402968-70).

A letter from the Primary Battery Facility to PVSC noted that the Primary Battery Facility's flowmeter reading on March 7, 1986 was 396,743 gallons (PAP-00402971).

Based on a PVSC Sewer System Evaluation Survey, dated July 1979, the site was located within the Second River Union Outlet Overflow District (PAS-00028203).



Battery Storage Business

According to correspondences between Passaic Valley Sewerage Commissioners (PVSC) and the facility in 1926, the Edison Chemical Works Division of Silver Lake was polluting a brook to the south of the plant with wastewater from their settling ponds (PAP-00050257; PAS-00028089-90). By 1938, this wastewater was discharged to a storm sewer that led to the Second River. In 1942, the site was connected to an industrial sewer that carried its waste to the Belleville sanitary sewer, according to an entry in the record of ten years of inspections performed by the PVSC on the Edison Company, Storage Battery Division, in Silver Lake, Belleville, dated June 15, 1948 (PAP-00050260-63).

A document titled Chemical Plant Discharge, dated July 24, 1926, listed 59,847 gallons discharged per day containing 1.959 lbs. of copper (PAP-00334684).

According to Storage Battery water sample results reported by F.S. Schimerka on November 17, 1926, copper and lead was absent from water samples taken from the Laboratory Outlet, Works Outlet 8" Universal Pipe, Works Outlet 8" Steel Pipe and Gate 45 (PAP-00334685). The sample results did not mention mercury results.

A March 23, 1942, entry in the record of ten years of inspections performed by the PVSC on the Edison Company, Storage Battery Division, in Silver Lake, Belleville, dated June 15, 1948, noted that the facility was connected to an industrial sewer that carried its waste to the Belleville sanitary sewer (PAP-00050262-63). According to the undated "Map of Sewers and Water Lines, Silver Lake Plant - Belleville, NJ," this facility identified as the Active Materials Department was connected to the sanitary sewer via a connection on Belmont Avenue (PAP-00333512).

Combined Sewer Overflow

Primary Battery Facility

The Primary Battery Facility was located within the Second River Union Outlet Overflow District. According to the *Report upon Overflow Analysis to Passaic Valley Sewerage Commissioners* for the Second River Union Outlet, prepared by Elson T. Killam Associates, Inc. in 1976, "under normal dry weather flow conditions, the flow is diverted to the PVSC interceptor via the regulator. During periods of rainfall, none of the sanitary flow enters the interceptor. The entire flow is discharged through the outfall line into the Passaic River" (PAS-00028167). The report noted that the District covered 10,227 acres (PAS-00028170).

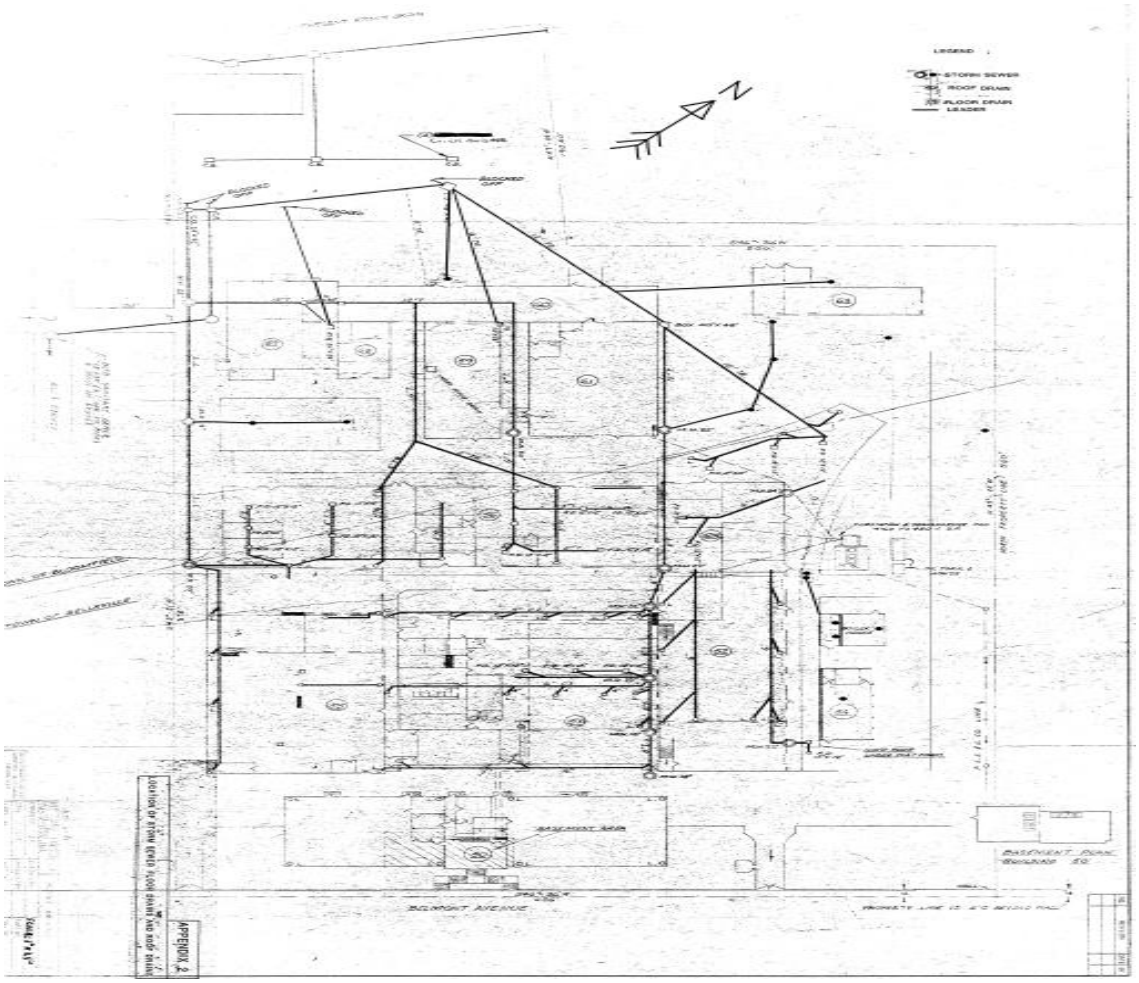


(PAS-00028203)

Storm Sewer

Primary Battery Facility

The June 1985 Final Draft Site Inspection noted the site was gently sloped (0-3%) with a slight grade (5-8%) on the Belmont Avenue border (PAP-00050160). According to the 1986 ECRA SES, the Bloomfield area received approximately 47 inches of precipitation per year. Due to buildings and paved surfaces at the site, most water drained into the sewage systems of the Cities of Bloomfield and Belleville that were controlled by PVSC (PAP-00049309).
Storm sewer and floor drain Locations are provided below.



(PAP-00049218)

Storage Battery Business

A record of ten years of inspections performed by the PVSC on the Edison Company, Storage Battery Division, in Silver Lake, Belleville, dated June 15, 1948, documented the investigation of contamination entering the Second River. In 1938, it was suspected that iron hydroxide from the Edison facility was being discharged from the Meadow Brook

storm sewer into the Second River. On June 30, 1938, sludge from an overflowing a settlement pit at the Edison Facility was traced from the Second River through the storm sewer. The overflowing sludge was diverted to an alternate settlement pit, but the storm sewer was still contaminated with iron. In 1939, it was determined that underground seepage of dissolved iron from the seepage lagoon was entering the storm sewer. In April 1939, the Edison Company removed the iron mud from the Meadow Brook storm sewer, treated waste in settlement pits to eliminate use of the seepage lagoon, and replaced a cooling water line that had been leaking and bringing iron from the ground to the storm sewer. Sampling data for the composition of the sludge and wastewater was not available (PAP-00050260-61).



Source: Bloomfield Sewer Map 1894 (annotated)

(PAS-00027741)

Several short term releases of iron waste to Belmont Avenue storm sewer and the Meadow Brook storm sewer occurred from 1940 to 1947 due to breaks in the sewer lines or heavy rains causing flooding. In 1946, contamination of the Second River from the Meadow Brook storm sewer was noted and found to be caused by a blocked sanitary sewer near the Edison plant that was subsequently removed (PAP-00050268).

On May 12, 1948, “exceptionally strong iron wastes were found flowing into the Second River from the Meadow Brook storm sewer of such intensity that Second River looked like a river of blood all the way down to its confluence with the Passaic River.” The discharge emanated from Edison Storage Battery Division, Belmont Avenue, Belleville facility. The cause was a waterline break that resulted in releasing 100,000 gallons of water that flooded all north side buildings, undermined the buildings and producing a 30-foot hole in the yard and resulting in subsequent collapse of all three industrial sewers. Chemicals, sand, and finished chemical materials were washed into the sewer and caused a blockage. The broken water line was repaired with a sleeve and the pipes

broke again. The large hole filled with an acid and iron solution. A pump line from the hole drained the mixture into the clear water line directly to the storm sewer and into Second River. The waste could not be put into the sanitary sewer until new sewer pipes had been installed. The acid corroded the pumps and caused them to fail, and by June 2, 1948, the sewer line was repaired (PAP-00050268-69).

Direct Release

The 1985 SIR identified the Branch Brook and Passaic River as potentially impacted by site contamination. The Branch Brook was 0.5 miles and the Passaic River was 1.5 miles from the site (PAP-00050138).

Storage Battery Business

According to correspondence between representatives of the Edison Chemical Works in 1913, drainage from filter beds at the Silver Lake facility was discharged to the brook behind the property (PAP-00334544-45). Blueprints of the property in 1916 and 1919 showed piping from filter beds, settling tanks, and settling beds from the Chemical Division, which led to the brook in 1916 and a 36" concrete pipe that emptied into the brook in 1919 (PAP-00333473, 74). In addition, a PVSC questionnaire submitted by the Storage Battery Business in 1925, listed the daily volume of industrial waste as 160,000 gallons, which was "discharged in brook" (PAP-00333531).

According to the 1986 GIS SES, the mercury zinc amalgamation process periodically resulted in atmospheric escape and disposition of elemental mercury onto plant property and the process was terminated in 1985. The Battery Products Division of Cooper Industries, Inc. removed the external roof materials and performed internal surface cleaning to address the mercury emission (PAP-00049278).

A PVSC report dated February 6, 1926 identified Edison Chemical Works of Silver Lake as a known polluter discharging "iron liquors, sometimes acid" to a river (PAS-00028089). According to a letter from Edison Storage Battery Co. to the PVSC, dated August 6, 1926, the Edison Chemical Works Division of Silver Lake was identified as polluting a brook to the south of the plant. The brook was noted to flow into the Passaic River. The letter stated that the plant was discharging 10,000 gallons of solution per hour, and the acid content was a maximum of 0.07 percent sulfuric acid. The facility planned to connect pipes that drained acidic water to the pipe that discharged straight to the brook instead of passing all of their wastewater through pits, leading to the high iron content (PAP-00050257; PAS-00028089-90).

Lagoon

Primary Battery Facility

According to the 1986 ECRA SES, the sedimentation impoundment overflowed on May 30, 1984, due to a blockage of the discharge line during extremely heavy rains. The overflow accumulated in a neighboring homeowner's excavation for an in-ground pool. Use of the settling pond was discontinued, and the discharge from the swimming pool was pumped into the local sewer system (PAP-00049278). According to an August 3,

1989, ECRA SES, NJDEP issued a Directive Letter to McGraw Edison on June 6, 1984, to cease operation of the unlined pretreatment lagoons (PAP-00049811). The 1985 SIR stated that the lagoon had been pumped out and would be filled and paved over, and drums hauled away. The lagoon was noted to be lined with clay (PAP-00050135, 37). The lagoon soil has been contaminated with PCBs, volatile organics, and metals including mercury and lead. Drainage basins contained highest levels of PCBs and lead (PAP-00050135-6). Concentrations detected in the sludge were reported in a July 16, 1984 NJDEP memorandum as 6,240.0 ppb mercury and 110,000.0 ppb lead (PAP-CONF-00725620).

In 1966, the Primary Battery Facility connected to the sanitary sewer in Bloomfield, and then to the Passaic Valley Sewerage Commission (PVSC) treatment plant. (PAP-00049812; PAP-00333450).

Battery Storage Business

The ten-year record of PVSC inspections described a seepage lagoon that was installed by the Edison Company in approximately 1936. The lagoon could dispose of 35,000 gallons of waste in a few hours. After it was noted that contaminated water from the seepage lagoon was entering the Meadow Brook storm sewer, the facility negotiated with the City of Belleville for use of their sanitary sewers and returned to using settlement ponds for the waste water (PAP-00050261-62).

Samples of the settling pit were collected January 18, 1983 and reported up to 75.53 mg/kg mercury and 10.03 mg/kg lead (note units of measure were not clearly identified). Copper was not reported (PAP-00725623).

6. Regulatory History/Enforcement Actions

Inspections & Violations

Primary Battery Facility

An August 4, 1987, NJDEP Inspection Report stated that the facility did not have a hazardous waste management program consistent with hazardous waste regulations. The inspector noted that the Bureau of Industrial Site Evaluation was aware of the situation and was ensuring that NJDEP accomplished the intent of ECRA (PAP-00050211). The inspector noted that the company would have been issued a Notice of Violation, but they had ceased operations and were not undergoing an NJDEP supervised cleanup pursuant to ECRA law. The inspector noted that, “In a word, the facility slipped through the system” (PAP-00050213).

According to a 1989 ECRA SES Part 2, NJDEP issued a Directive Letter to McGraw Edison on June 6, 1984, to cease operation of the unlined pretreatment lagoons (PAP-00049811). Use of the settling pond was discontinued, and the overflow discharge that had entered the swimming pool was pumped into the local sewer system (PAP-00049278).

On November 9, 1984, NJDEP issued an order directing McGraw-Edison Company to conduct an investigation to define the extent of soil and groundwater contamination at the Bloomfield facility (PAP-00049543).

Storage Battery Business

According to the PVSC ten-year inspection record, PVSC issued a notice to desist pollution to Edison Chemical Company at Belleville on May 1, 1939 (PAS-00028126).

In a letter from H.T. Leeming to Mr. Saltzman, dated August 20, 1913, it noted that the health officer of Bloomfield, NJ called complaining about polluted waters through the creek at the rear of the Silver Lake plant. The health officer claimed that the facility's filters should retain the matter which exuded an obnoxious odor and affected animals drinking water from the creek. Mr. Saltzman was asked to examine the condition and submit a report (PAP-00049892).

As noted above, PVSC compiled a record of ten years of inspections performed on the Storage Battery Business dated between 1938 and 1948 (PAS-00028123-133). According to the PVSC ten-year inspection record, PVSC issued a notice to desist regarding pollution to Edison Chemical Company in Belleville on May 1, 1939 (PAS-00028126).

Permits

Primary Battery Facility

An August 3, 1989 ECRA SES Part 2 identified the following NJDEP Air Permits for the facility:

ATTACHMENT 1

Permit No.	Date of Approval	Expiration Date
065776	-------	08-01-88
046573	11-26-80	11-26-90
046494	08-13-80	10-20-89
046572	11-26-80	11-04-89
046356	08-13-80	10-20-89
045925	07-08-80	09-16-89
045897	07-07-80	07-07-90
045345	05-12-80	Cancelled 08-05-86
045344	05-12-80	Cancelled 08-05-86
043482	07-23-79	07-21-89
033861	10-28-77	04-19-88
022937	06-01-76	09-05-90
022773	09-09-76	09-09-91
037862	03-30-78	03-29-88
036426	12-29-77	09-15-88
036427	12-29-77	09-15-88
034172	08-15-77	03-30-88
022774	09-09-76	09-09-91
036431	09-15-78	09-15-88
036433	12-29-77	09-15-88
065775	---	08-19-88
036425	12-29-77	09-15-88
036428	12-29-77	09-15-88
036242	12-29-77	09-15-88
036240	12-29-77	Cancelled 08-05-86
046507	12-12-80	12-12-90
036430	12-29-77	09-15-88
036241	12-29-77	09-15-88
036239	01-03-78	09-15-88
030493	01-20-77	07-01-87
036238	12-29-77	09-15-88
036980	12-29-77	Cancelled 08-05-88

(PAP-00049818)

PVSC sewer connection permit number 01402142 was effective March 16, 1981, and expired March 16, 1986. This permit was an industrial sewer connection permit, and was superseded by another permit number 01404620, effective March 17, 1987, and expired on March 17, 1991 (PAP-00333481-82). According to the *ECRA Initial Notice General Information Submission*, dated February 18, 1985, the PVSC permit number 01404620-41009-0201 was for Belleville, and PVSC permit number 02404620-41009-0201 was for Bloomfield (PAP-00333200).

According to the June 14, 1985 Final Draft Site Inspection and Hazardous Ranking System Model, the Primary Battery Facility had a local permit (unknown number) for runoff from roofs, non-contact cooling water, air conditioners, drainage, etc. that would drain to PVSC (PAP-00050137).

The 1989 ECRA SES Part 2 identified the EPA Identification number for the site as NJD060779949. A PVSC Permit No. 01404620 was approved on March 17, 1986, with an expiration date of March 17, 1991 (PAP-00049810).

The 2007 PRP DEF clarified that Generator ID NJD060779949 was a Resource Conservation and Recovery Act (RCRA) Generator ID that pertained to disposal of a variety of RCRA wastes documented at the Belleville site manifesting era and included mercury containing wastes (D009), PCBs and lead (D008) (PAS-00027747).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Soil and Groundwater Contamination Investigation Report, dated July 1985 (PAP-00333550)
- Environmental Assessment of the McGraw-Edison Plant, dated November 1985 (PAP-00332948; PAP-00333080)
- Site Evaluation Submission dated August 20, 1986 (PAP-00049203)
- ECRA Sampling Report, dated December 1987 (PAP-00333695)
- Remedial Action Plan, dated March 1989 (PAP-00333795).
- Final Draft, Site Inspection Report and Hazardous Ranking System Model, McGraw Edison, Battery Plant, Bloomfield, New Jersey; prepared for Environmental Services Division, U.S. EPA by NUS Corporation, Superfund Division (PAP-00050130)
- Mobility and Potential Impact of Dissolved Metals in Groundwater, dated March 1992 (PAP-00332589)
- Cleanup Plan Final Progress Report dated March 23, 1992 (PAP-00334161)
- NJDEP Memorandum re ECRA Case # 85260, dated April 1992 (PAP-00334705)
- NJDEP Cleanup Completion letter dated August 13, 1992 (PAP-00334153)
- Final Remedial Investigation Report for the Former Pathmark Grocery Store, dated May 2017 (PAP-00334730).

The Primary Battery Facility was subject to two ECRA actions: (1) ECRA Case # 85260 – Sale of Property, Sale of Business, Transfer of Stock; and (2) ECRA Case # 86528 – Cessation of Operations (PAP-00334149). A third ECRA Case, ECRA Case # 89651, governing the sale of the Primary Battery Facility in 1991, was withdrawn as no contract of sale had been executed and the DEP granted Cleanup Plan approval on June 28, 1991 for the facility based upon other transactions such as cessation of operations (PAP-00334525).

Soil

Primary Battery Facility

Soil investigations in the 1980s found elevated concentrations of mercury, lead, and copper. The highest concentrations of mercury were found in a drainage ditch on the northern edge of the site (4,406 mg/kg mercury) (PAP-00050153, 65, 70). The maximum detected concentration of lead in surface soil was 2,300 ppm, from a sample located at the eastern corner of the main building along the railroad tracks (PAP-00049318-19, 28-29). The highest concentration of copper was found in subsurface soil (1-3 ft bgs) at 80,000 ppm. Elevated concentrations of copper were also noted in the lagoon (up to 43,330 mg/kg) (PAP-00049316-17, 28-29).

As reported in the *Soil Sampling Report* submitted with the 1986 ECRA SES, soil sampling in 1984 detected concentrations of copper greater than 10,000 ppm along the southwestern and northern edge of the main manufacturing building. The highest copper concentration detected in surface soil was 65,000 ppm, from a sample located between the main building and Building No. 57 (see 18 in Area 1 on figure above). The highest concentration of copper in subsurface soil (1-3 ft bgs) was 80,000 ppm (PAP-00049316-17, 28-29). Soil samples collected from the edges of the settling lagoon on August 21, 1984 detected concentrations of copper ranging from 400 to 43,330 mg/kg (PAP-00050153, 65). Soil samples collected from within the pit of the excavated lagoon detected a maximum concentration of 30,000 ppm. Contaminated soil and sludge had been removed from the pit in 1984 (PAP-00049558, 64).

Sewer

There is no information regarding sewer sampling in the available file material.

Remedial Activities

Primary Battery Facility

According to the 1985 Soil and Ground Water Contamination Investigation, Bloomfield Plant, prepared for McGraw-Edison Company by IT Corporation, IT Corporation drilled four soil borings, installed five monitoring wells and nine bore holes (PAP-00049547). Soil sampling results from the composite soil sample B01 showed elevated concentrations of copper, lead and mercury. The soil appeared free of contamination between 6 and 9 ft bgs (PAP-00049569). Contaminated soil and sludge were removed from the pit in 1984, and the eastern half was backfilled with clean fill brought in from off-site (PAP-00049558). The report concluded that the vertical and horizontal extent of soil

contamination beneath the settling pit was unknown; however, the data suggested the vertical extent extended to a depth between 7.5 and 9 ft bgs, and the presence of an oil sheet and petroleum odor in the soils of monitoring well MW3 suggest a spill may have occurred (PAP-00049576).

According to the June 14, 1985 Final Draft Site Inspection and Hazardous Ranking System Model, the Final Draft Site Inspection referenced a clay lined lagoon that had been pumped out and excavated. The lagoon was in the process of being filled and was eventually to become a parking lot (PAP-00050137). NUS Corporation FIT II collected six soil samples on August 21, 1984 from the 1,922-square foot lagoon (PAP-00050160).

According to the November 1985 Final Report, Environmental Assessment of the McGraw-Edison Plan, Fred C. Hart Associates, Inc. installed 21 soil borings (PAP-00049608, PAP-00049616).

The August 1986, Investigation of Former Underground Storage Tank Locations, addressed observations made at the excavation of a former 1,500-gallon kerosene and 500-gallon gasoline underground storage tanks. Soil borings were proposed at both sides and both ends of excavations, as well as a network of shallow wells at the former tank locations. The number of samples and monitoring wells were not identified (PAP-00049227-31).

The 1989 ECRA Site Evaluation Submission stated that all hazardous substance and waste containers had been removed and that all hazardous waste/substance inventory had been removed (PAP-00049813). The evaluation noted a remedial action plan had been designed to stabilize and isolate contaminated areas to prevent off-site migration. The plan recommended limited soil excavation, construction of a slurry wall and surface capping. Limited soil excavation was to include mercury contamination removal from the central portion of the site and slurry wall installation to control groundwater flow off-site. The entire site was to be capped to prevent surface infiltration (PAP-00049821-22).

According to an undated Environmental Assessment of the McGraw-Edison Plant, field activities for the Environmental Assessment ran between April 12 and 24, 1986 to define the spatial distribution of metals at the McGraw-Edison Plant (PAP-00049292) and were conducted by Hardin-Huber Soil Testing Company of Crofton, Maryland who drilled ten soil borings (PAP-00049296). All borings, except T-6, were drilled at ground surface or immediately below the asphalt surface to a depth of approximately 8 feet (PAP-00049296, 98). Sampling results identified several areas of primary concern: 1) the work area between Building No. 57 and the main manufacturing building, 2) the alley along the southwest border of the plant, 3) the southern corner of the plant, 4) the truck and old railroad loading docks and 5) the area north of the main manufacturing building (PAP-00049330).

According to the March 23, 1992, Cleanup Plan Final Progress Report; prepared by SESI, soil excavations were performed in September and October 1991 (PAP-00334181).

An August 13, 1992, letter from NJDEP to Cooper Industries stated cleanup was to be completed in accordance with the Cleanup Plan (PAP-00334153).

Storage Battery Business

Cooper did not remediate the Storage Batter Business property. A Remedial Investigation was completed on behalf of MCB Acquisition Company in 2017 (PAP-00334725).

8. Summary of Asserted Defenses

Cooper asserts the following defenses:

Cooper never owned, operated, occupied or used the Primary Battery Facility. Cooper is the predecessor-by-merger to McGraw-Edison (formerly known as McGraw-Electric Company and referred to herein and in the Preliminary Questionnaire as “McGraw-Edison”), which owned and occupied the Primary Battery Facility between approximately January 2, 1957 and February 7, 1985. Cooper disputes that it has any liability associated with the Primary Battery Facility operations prior to that period, when those operations were owned and operated by Thomas A. Edison, Inc. (“TAE”) or after McGraw- Edison’s ownership/operations of the Primary Battery Facility ended in 1985 (i.e., Battery Products, Inc. operations).

Cooper’s liability, if any, for purposes of the Allocation does not extend to operations associated with the Storage Battery Business. When Cooper merged with McGraw-Edison in 1985, any liabilities that McGraw-Edison may have had with respect to the Storage Battery Business had already been transferred to and assumed by Electric Storage Battery Company (later referred to as Exide Technologies). Any operations in and after 1960 would be the responsibility of Exide, and Cooper has no connection to or liabilities for any such operations.

In addition, regarding the liabilities transferred to Exide, Cooper contends that those liabilities would not include any liabilities related to the operations prior to the 1957 TAE transaction.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

COOPER INDUSTRIES, LLC

Facility Name, Address and Size: Cooper Industries, LLC (Cooper Industries), 33 Littleton Avenue aka 400 West Market Street, Newark, New Jersey (PAP-00049893, 98-99; PAP-00049918). The facility encompassed approximately six acres (PAP-00049933). A *Passaic Valley Sewerage Commissioners* (PVSC) *Industrial Wastewater Questionnaire,* dated July 10, 1978, noted the facility had 500 employees working eight hours a day, five days a week (PAS-00000742; PAS-00027682). According to a *PVSC Sewer Connection Application* dated February 6, 1980, 165 employees worked two shifts a day, five days a week (PAP-00332121). By October 1983, the facility employed 77 employees (PAP-00331986).

1. **Business Type:** According to a *New Jersey Department of Environmental Protection (NJDEP) Environmental Cleanup Responsibility Act (ECRA) Application for ECRA Review, Site Evaluation Submission* (the 1985 SES), dated December 19, 1985 the facility manufactured shears and scissors prior to 1980. After 1980, operations were limited to production of forgings that were shipped elsewhere for completion (PAP-00049927, 33).

2. **Time Period of Ownership/Operations**

   Operator: December 1, 1976 – 1985 (PAP-00049933; PAP-00049893; PAS-00027519)
   Owner: December 1, 1976 – April 1988 (PAP-00049893; PAP-00332017, 40-41, 72; PAS-00034511)

   According to a deed dated December 1, 1976, J. Wiss & Sons Co. conveyed the property at Littleton Avenue and Eleventh Avenue in the City of Newark to Cooper Industries, Inc. (PAP-00049893, 98-99). An *Agreement for Acquisition of the Business and Assets of J. Wiss & Sons Co. by Cooper Industries, Inc*. dated November 1976 documented that Cooper Industries would retain the use of the corporate name “J. Wiss & Sons Co.” (PAP-00049982, 87). According to the Agreement, Cooper Industries was entitled to Purchased Assets including buildings, facilities, machinery, equipment, tools, patterns patents, trademarks, copyrights, copyright registrations, etc. (PAP-00049997-98, 50006). J. Wiss & Sons agreed to indemnify, hold harmless and defend Cooper Industries from any loss, liability, cost, expense or claim arising from or incurred in connection with any misrepresentation, breach of warranty or non-fulfillment or non-performance of any agreement (PAP-00050046). The document titled *Cooper Industries, Inc. Purchase of Assets of J. Wiss & Sons Co.* included an Agreement of Assumption of Liabilities of Wiss by Cooper Industries (PAP-00331539). The Agreement dated December 8, 1976 between Cooper Industries, Inc. and J. Wiss & Sons Co. stated that Cooper Industries agreed to assume and in due course to pay and discharge the liabilities and obligations described in Section 1.2 of the Agreement; the liabilities and obligations which were not assumed included, but were not limited to: (b) liabilities, if any, not related to or which did not arise from the normal continuing operations of Seller (PAP-00331894-96).

During the Cooper Industries' operating period at the site, Cooper Industries owned a portion of the facility and leased the remainder from Sixth Street Urban Renewal Corporation (SSURC) (PAP-00049893, 98-99; PAP-00332013). The *Certificates of Occupancy* for the facility issued at the beginning of the Cooper Industries' operating period identified J. Wiss & Sons as the owner of 13-45 Littleton Avenue, which was used for forging, grinding, and assembly of sheers and scissors (PAP-331987). SSURC was identified as the owner of 29-35 11th Avenue (PAP-00331991-92), 392-414 West Market Street (PAP-00331989-90) and 472-474 Central Avenue, on which the parking areas and an office building were located (PAP-00331995-96), and of 13-15 Littleton Avenue, which was used for offices and forging and annealing of sheers and scissors (PAP-00331993-94). The parcels owned by Cooper Industries and those owned by SSURC were sold in April 1988 (PAP-00332072).

According to the May 28, 2010 letter from Christopher Marraro on behalf of Cooper Industries to the EPA, operations at the site ceased in August 1983. However, according to Cooper Industries' New Jersey National Pollutant Discharge Elimination System (NJPDES) application, Cooper Industries ceased operations at the facility in 1985 (PAS-00027519). In addition, Cooper Industries transferred the Littleton Plant property on April 12, 1988 to Newark Venture, Inc., which subsequently transferred the property to Victory Temple National Holiness Church, Inc. (PAS-00034509, 11).

3. Operational History/COC Use and Presence at the Facility

According to the 1985 SES, the facility was a complete shear and scissor manufacturing operation prior to 1980. After 1980, operations were limited to production of the forgings which were shipped elsewhere for completion (PAP-00049933). [Note: Cooper Industries acquired ownership interest in the property and operations for the Littleton Avenue site in 1976 (PAP-00049893; PAP-00049982).]

According to the 1985 SES, manufacturing began in the tool rooms on the second floor of Buildings 8, 9 and 15 where ancillary and forging tools were made and repaired. Graphite electrodes were machined into molds for shears and scissors using an electric discharge machining procedure. Dust was collected in a baghouse dust collector on the roof of Building 8 (PAP-00049927, 33).

The 1985 SES stated that forging tools were set in large drop hammers in Building 4. Each drop hammer had an oil-fired slot furnace that heated a steel bar stock raw material to a forging temperature of 2,200 degrees Fahrenheit. Steel bar raw stock was received in Building 14 and cut to lengths for forging in Building 11. No. 2 fuel oil heated the slot furnaces and the buildings in the winter. Four underground storage tanks existed at this facility in which No. 2 fuel oil was stored (PAP-00049933-34, 36).

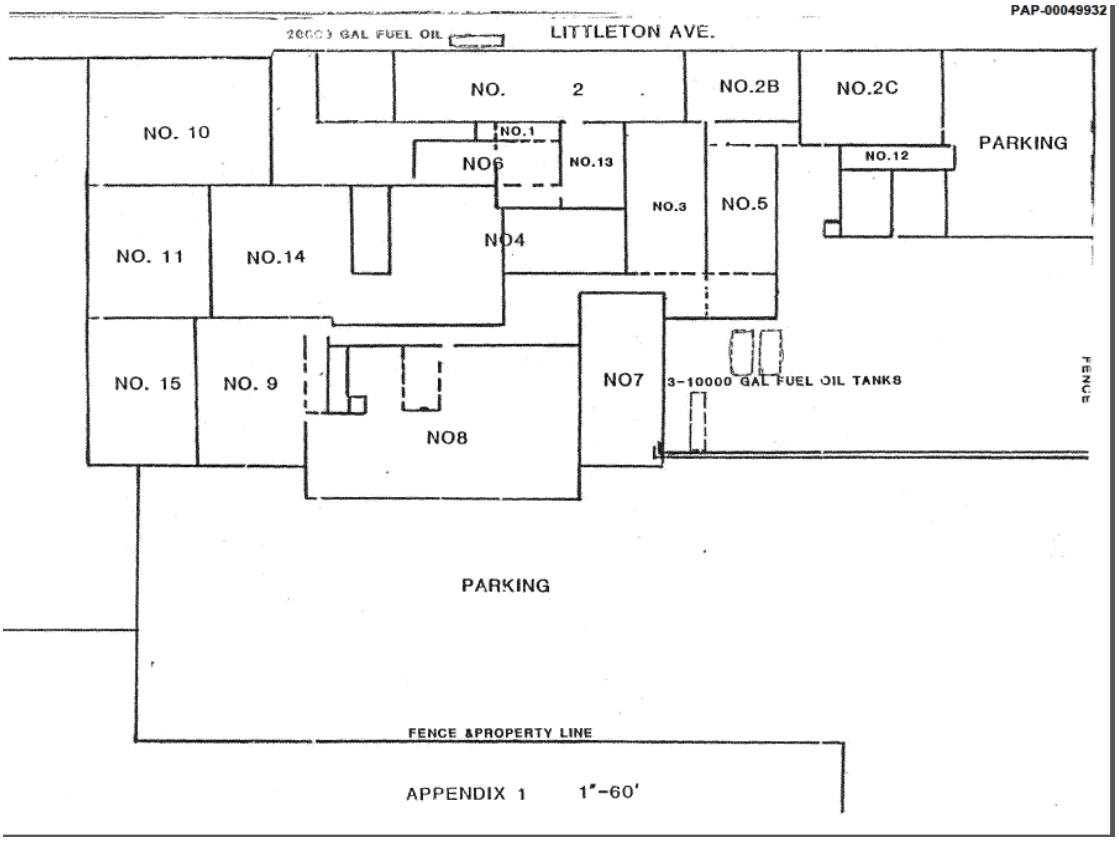
Forgings produced in Building 4 were annealed in a furnace in Building 10. Water passed through the plant one time to cool the furnaces and air compressors. Influent and effluent water samples were collected bimonthly beginning in 1981 (PAP-00049934). Eldib Engineering and Research, Inc. collected discharge monitoring samples and sent quarterly Individual Discharge Monitoring Reports to the PVSC (PAP-00049937-38). [Note: The monitoring reports contained within the 1985 SES were not

copied completely, resulting in missing parameter names (PAP-00049939-81).] Scale was removed from forgings by a Wheelabrator machine in Building 11, and dust generated by this machine and all grinding processes at the plant was periodically picked up by a scrap contractor. The descaled forgings passed on to press rooms in Building 9 and 15 where Trim, Punch and Coin operations occurred. In the coining area, large knucklepress machines were kept well lubricated. Oil would run into a containment area composed of approximately 18 inches of thick impervious concrete and was then pumped into 55-gallon drums that were removed by a contractor (PAP-00049934).

The list of assets purchased by Cooper in the 176 Acquisition Agreement did not include any pickling equipment (PAP-00331785-93).

The PVSC *Industrial Wastewater Questionnaire* for the facility, which was contained within Appendix A, Industrial Waste Surveys, to the *Heavy Metals Source Determination Study, Phase I,* prepared by Elson T. Killam Associates, Inc., dated August 15, 1978, stated the principle raw materials used at the facility were nickel and steel (PAS-00000742).

The following figure from the *NJDEP ECRA Initial Notice General Information Submission*, dated December 19, 1985 provides a site map for the facility showing building locations and the locations of the fuel oil tanks:



(PAP-00049932)

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

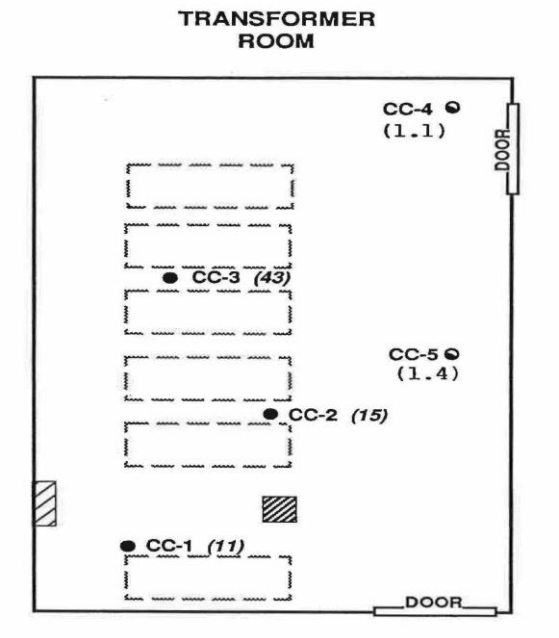
PCBs

According to an undated *Electrical Transformer Decommissioning Report, Former Cooper-Wiss Facility* (Decommissioning Report), there were six 200 kilovolt electrical transformers in a small room in the facility. The report stated that in June 1991, the oil from the transformers was sampled and it was determined that the transformers were non-PCB class since the oil contained under 50 parts per million (ppm) of PCBs. The report stated that this was consistent with Wiss having the transformers retro-filled at least twice before 1985. The report stated that two wipe samples collected from stained areas on the concrete floor near the transformers inside the building contained PCB levels of 58 and 119 ppm. The report stated that "it is presumed that the elevated PCB levels resulted from historical spills from the transformers prior to retrofilling" (PAS-00027729).

As described in the Decommissioning Report, in October 1991, Cooper Industries contracted Direct Environmental, Inc. to drain and decommission the transformers and remediate the oil stained areas. After the transformers were removed and disposed off-site, the oil stained areas in the concrete floor were cleaned and scarified to a depth of 1/16 of an inch, and it was reported that no holes or deep cracks were noted in the concrete. Three concrete chip samples were collected to confirm removal of PCBs. Analytical results stated that slightly elevated levels of PCBs, namely Aroclor-1254, were still present in the concrete. PCB concentrations ranged from 11 ppm to 43 ppm. On November 15, 1991, Direct Environmental returned to the site and scarified an additional one-eighth of an inch from the concrete floor (PAS-00027729-30; PAP-00332169-70). Scarification solids were drummed and second round of confirmatory samples were collected (PAP-00332170; PAS-00027565, 729-30). The November 15, 1991 samples reported concentrations of Aroclor-1254 ranging from 0.082 to 1.4 ppm, which are below NJDEPE's preliminary draft cleanup standards of 2 ppm (PAP-00332172, 89, 93-94).

According to the Final Remedial Investigation Report, 20,000-Gallon No. 6 Heating Oil Underground Storage Tank Area of Concern, dated March 31, 2014, for the facility, no cracks in the concrete beneath the transformers or other conduits to the subsurface were identified. In 1992, a closure report was issued by Cooper Industries and no further action was recommended (PAP-00332283).

The following figure from the January 15, 1992 *Cooper-Wiss Facility Quarterly Progress Report*, shows the PCB sampling locations with detected concentrations in parentheses:



(PAP-00332171)

PAHs

The PAHs naphthalene and 2-methylnaphthalene were detected in subsurface soil samples associated with a former 20,000-gallon fuel oil UST and a former 5,000-gallon fuel oil UST, respectively (PAP-00332283-84). Data for additional PAH analytes were not available in the references.

Metals - Copper, Lead and Mercury

According to the *Heavy Metals Source Determination Study, Phase II*, dated April 1980, J. Wiss & Sons, Inc., 400 West Market St., was listed as having a process wastewater flow rate of 0.1320 million gallons per day (mgd) from its forging and fabricating operations, resulting in contributions of copper at 0.260 pounds (lbs) per day (0.236 milligrams/Liter [mg/L]); lead at 2.818 lbs per day (2.560 mg/L); and mercury at 0.0003 lbs per day (0.000 mg/L) (PAS-00027508, 681).

According to the Industrial Wastewater Questionnaire provided in the *Heavy Metals Source Determination Study, Phase I*, dated August 15, 1978, there were three metal contributing discharge points to the municipal sewer (PAS-00000744). Previous measurements were reported for Sampling Point A only, including a daily flow of 132,000 gallons per day (gal/day) with a lead concentration of 3.75 mg/L, and no results for copper or mercury (PAS-00000753). Sampling Point A appears to be a manhole where samples were collected to represent discharge to the municipal sewer (PAS-00000746-7).

According to a February 6, 1980 PVSC Sewer Connection Application, the facility's water usage in 17 was 44,256,916 gallons (PAP-00332122). Effluent samples collected from three outlets collected on January 16-17, 1980 reported concentrations of 0.236 mg/L for copper, 2.56 mg/L for lead, and 0.000 mg/L for mercury (PAP-00332125-26). The application stated that "metal forging" operations were being conducted at the time the samples were collected (PAP-00332126). The 24 Hour Sample Analysis for Outlet 1 (boiler outfall) reported lead at 0.284 mg/L, mercury at 0.045 mg/L and a pH level of 9.2 (PAP-00332127-28). The 24 Hour Sample Analysis for Outlet 2 (tumbler outfall) reported lead at 0.482 mg/L, mercury at 0.116 mg/L and a pH level of 12.7 (PAP-00332129-30). The 24 Hour Sample Analysis for Outlet 3 (parking lot manhole) reported lead at 0.457 mg/L, mercury at 0.037 mg/L and a pH level of 7.2 (PAP-00332131-2). Copper results were not reported for the 24 hour samples.

Samples were also collected and reported in a June 3, 1981 PVSC Sewer Connection Application. Outlet No. 2 was identified as the tumbler room; no OU2 COCs were sampled for. A composite sample from Outlet No. 3 (boiler room) was reported to have a concentration of lead at less than 0.42 mg/L, and less than 0.0007 mg/L mercury; no concentration was reported for copper (PAP-00402652).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] NJDEP, *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a *Final Remedial Investigation Report, 20,000-Gallon No. 6 Heating Oil Underground Storage Tank Area of Concern*, dated March 31, 2014, prepared on behalf of Cooper Industries, during the installation of five borings/temporary wells, apparent fill was observed to depths up to approximately 10 feet below ground surface (bgs). Observed fill materials included orange fine sand, brick and mortar fragments, concrete fragments, and ash. Some of this fill was removed by Public Service Electric & Gas (PSE&G) during site demolition work. The area of the site where fill was observed appeared to have first been developed with residences and offices sometime between 1900 and 1925. By the late 1960s, this area of the site was redeveloped with an addition to the main site building. It was stated that fill materials may have been utilized during one, or both, of these development periods (PAP-00332230-31). Historic fill was confirmed in 2013 at the site during PSE&G site redevelopment activities at depths of approximately 0 to 10 feet below ground surface (PAP-00332242). However, no analytical data were available for soil concentrations of copper, lead, mercury, and PAHs associated with Historic Fill at the site. [Note: Although this report is outside the ownership and operational timeframe of Cooper Industries, the initial investigation of this site began during the timeframe of ownership.]

5. COC Pathways

Combined Sewer System

Correspondence predating Cooper Industries' operation at the site (dated April 11, 1975 from J. Wiss & Sons Co. to the PVSC transmitted Waste Effluent Surveys) states there were for four discharge points to the PVSC from the Newark facility. The letter stated the information was the same as supplied to PVSC for 1972, since the effluent discharge characteristics had not significantly changed since that time, except for volume (PAP-00332144).

According to the *Report upon Overflow Analysis to Passaic Valley Sewerage Commissioners for the Clay Street CSO District*, prepared by Elson T. Killam Associates, Inc. in 1976, the site was located within the Clay Street CSO District. The outfall was located on the westerly side of the intersection of Clay Street and McCarter Highway. During wet weather events, when the volume of combined sanitary and storm water flow was too much for the sewer, both sanitary and storm water bypassed to the Passaic River. Under normal dry weather flow conditions, the flow was diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow entered the interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River through six tide gates (PAS-00027640).

According to a 1977 Semi-Annual Report prepared by PVSC, PVSC identified Wiss as one of the "major contributing industries" with 50,000 gallons per day or more to the PVSC CSO system (PAS-00027647, 50).

According to the PVSC *Industrial Wastewater Questionnaire,* dated July 10, 1978, J. Wiss & Sons, Inc. obtained 4,899,400 gallons of water per quarter from the city or public water supply and 3,627,800 gallons of water per quarter from a private well supply. Of the water used at the site, less than 5% of the water was consumed in actual process. 45.5% of water was discharged from process; 42.5% of water was discharged as non-contact cooling water; and 7% of water was discharged from sanitary conveniences (PAS-00000743).

According to a February 6, 1980 PVSC Sewer Connection Application, there were three 3-inch outlets connected to the sewer. All three were reported to contain industrial waste. Outlet 1 had a reported daily flow of 5,000 gallons; Outlet 2 had a reported daily flow of 1,300 gallons; and Outlet 3 had a reported daily flow of 177,027 gallons (PAP-00332124). It is noted that a subsequent letter from the facility to PVSC, dated April 24, 1981, stated that only two of the three outlets contain industrial waste: 1) the outlet from the Tumbling Room; and, 2) the outlet from the Boiler Room, and that the third outlet ran to the manhole in the parking lot and carried only sanitary waste from the office buildings (PAP-00402655).

According to correspondence from the facility to the PVSC, dated February 25, 1980, the facility had collected samples from the sewage outlets upon completion of phase down activities at the 33 Littleton Avenue site. It was stated that during the third quarter of 1979, the complete nickel plating operation, 25% of the parts washing facility, 20% of the tumbling facility and 40% of the wet grinding facility were removed from plant. During the fourth quarter, 75% of the parts washing facility, 50% of the tumbling facility and 60% of the wet grinding facility were removed from the plant. These removals materially affected the volume and constituents of their sewage outfall (PAP-00331985). Note: The sample results were not included, and the change in volume was not specified.

According to results of samples collected in early May and June 1981 and attached to a June 3, 1981 PVSC Sewer Connection Application: a) effluent from outlet #1 had a pH level of 10.8; b) effluent from outlet #3 (from the boiler room) had pH levels of 6.7 and 7.6 (on June 4, 1981); and c) effluent from outlet #2 (the tumbler room) had a pH level of 12.3 (PAP-00402650-4).

According to a letter from Cooper to PVSC in 1982, the facility had reduced water usage because of plant shutdowns for vacation and “lack of business in this state of economy” (PAP-00332142).

According to a letter from a facility plant engineer to PVSC in 1983, the facility had decreased water usage and effluent output because: 1) the facility “had a reduction of just over 50 percent in personnel over the past year”; and 2) the facility changed its work process to use less water (from 200 gals. of water per batch to 50 gals.) (PAP-00332143).

A letter from Wiss to the PVSC, dated August 29, 1983 stated that the tumbling operation was terminated, and starting August 31, 1983, all residuals would be eliminated from this operation's discharge point, and only potable effluent would be discharged (PAP-00480643)[5]. According to a PVSC Industrial Monitoring Work Order, on August 29, 1983 the facility ceased industrial operations that "might have required pre-treatment" and the facility only had "domestic and cooling water waste" (PAP-00331986).

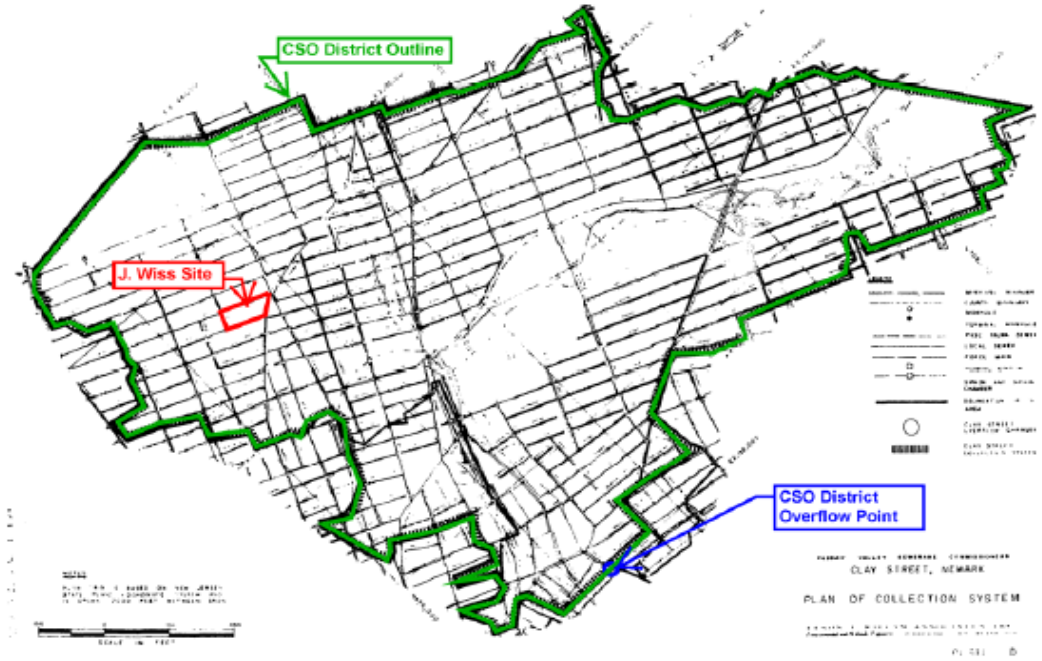
According to the *Cleanup Plan Progress Report; Reporting Period: 4/92 – 6/92, Former Cooper-Wiss Facility*, dated July 15, 1992, a product recovery system was installed in May 1991 to address groundwater contamination and ran nearly continuously during June 1992. Between June and July, a total of 24,710 gallons were treated and discharged to the sanitary sewer. This equated to a monthly average of 0.64 gallons per minute (gpm). During the latter part of June the average flow rate was 0.93 gpm (PAS-00027572-73).

According to the 1985 SES, forgings produced in Building 4 were annealed in a furnace in Building 10. A stream of water making one pass through the plant was used to cool both this furnace and the air compressors. This stream was monitored by analysis of composite influent and effluent samples performed bi-monthly since 1981 (PAP-00049934). Note: Results of the sampling were not provided. It was also not reported to where this effluent discharged. However, the 1985 SES stated that the facility conducted nickel-plating prior to 1979, and wastewater flowed directly to the sewer system (PAP-00049935).

According to a letter from Christopher Marraro on behalf of Cooper Industries to the EPA, dated May 28, 2010, the plating room had an intermittent flow while the boiler room with non-contact cooling water had a continuous flow. Outlet A received effluent from plating operations, and Outlet B received boiler room discharge. The configuration of the discharge mechanism from the plating operation was a float operated sump pump with a very small diameter influent and effluent. Operation of the pump was intermittent because the sump had to fill before the float activated the pump to discharge to the sewer (PAS-00034513).

The following figure from the 2009 Data Extraction Form shows the approximate location of the Littleton Avenue facility within the Clay Street Combined Sewer Overflow District:

[5] This Report was revised to include documents received on May 23, 2020. The additional documents did not change Cooper Industries' previous certification.



(PAS-00027487)

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

Permit Summary					
Permit #	**Issued by:**	**Use**	**Dates**	**Discharge Limits**	**Citation**
20400752	PVSC	Discharge to sewer	July 2, 1981 to July 2, 1986	Not listed	PAP-00049921, 25
620	NJDEP	Approved Physical Connection	April 1, 1985 to March 31, 1986	Not listed	PAP-00049921, 26

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- 1985 SES
- Preliminary Assessment Report, dated December 23, 1985
- Cleanup Plan Progress Report; Reporting Period: 4/92 – 6/92, Former Cooper-Wiss Facility, prepared July 15, 1992 (PAS-00027568)
- January 1992 Quarterly Progress Report, Cooper/Wiss Facility, Newark, New Jersey, ECRA Case No. 85810, dated January 15, 1992, by Ground Water Associates, Inc. (PAP-00332164).
- Remedial Investigation / Remedial Action Work Plan, dated November 25, 2003
- Site Investigation Report, dated August 8, 2004
- Receptor Evaluation, dated March 21, 2014
- Case Inventory Document, dated March 21, 2014 (PAP-00332199).
- Final Remedial Investigation Report, 20,000-Gallon No. 6 Heating Oil Underground Storage Tank Area of Concern, dated March 31, 2014, prepared by Paulus, Sokolowski & Sartor (PS&S) (PAP-00332474)
- Remedial Action Work Plan, dated February 6, 2019 (PAP-00421386)
- Remedial Action Work Plan, dated June 2019 (PAP-00421392)
- Remedial Action Report, dated October 2, 2019 (PAP-00406870).

Soil

According to a *New Jersey Pollutant Discharge Elimination System, Discharge to Ground Water Permit Application, Cooper-Wiss Site*, dated May 1990, Cooper Industries retained Geraghty & Miller, Inc. in October 1986 to define soil quality conditions near an underground fuel tank (Tank No. 1) to determine if this tank had leaked fuel oil to the subsurface environment. The tank stored No. 6 fuel oil until 1978, after which it stored No. 2 heating oil. Petroleum hydrocarbons were detected in six of seven soil borings. In August 1987, the tank and 1,200 cubic yards of soil were removed, and the excavation was backfilled. Geraghty & Miller, Inc. installed a test well in the center of the excavation to determine the thickness of floating product in the subsurface and submitted a sampling and cleanup plan in November 1987. The plan was approved, and free product removal began in 1987 (PAS-00027580). Note: Analytical results were not attached.

Correspondence dated June 23, 1994 from NJDEP to Cooper Industries stated that NJDEP had reviewed the November 15, 1993 report from Cooper Industries documenting the remedial investigation and remedial action undertaken in response to the discharge from Cooper Industries' underground storage tank system. Based on a review of the information submitted, no further action would be required at that time (PAP-00332527). Note: The November 15, 1993 report was not provided.

On June 2, 2014, PS&S reported the results of sampling conducted at the facility in April 2014. This sampling was performed to screen and assess the subsurface soils for the presence of free-product to assist in defining the limits of the petroleum impacted soil. The collected samples were analyzed for extractable petroleum hydrocarbons, naphthalene, and 2-methylnaphthalene. 2-Methylnaphthalene was reported up to 152 mg/kg, and naphthalene was reported up to 34.2 mg/kg. See below for further discussion of the results (PAP-00332474-75).

Sewer

There is no information regarding sewer sampling in the available file material.

Remedial Activities

According to an undated *Electrical Transformer Decommissioning Report, Former Cooper-Wiss Facility* (Decommissioning Report), analysis of two wipe samples collected from stained areas on the concrete floor in the facility contained 58 and 119 ppm PCBs. The detected PCBs were assumed to have resulted from historical spills (PAS-00027729). As described in the Decommissioning Report and a Quarterly Progress Report from January 1992, Direct Environmental scarified the concrete floor to remove the contaminated concrete in 1991. Scarification solids were drummed and confirmatory samples reported concentrations of Aroclor-1254 ranging from 0.082 to 1.4 ppm (PAP-00332170, 72, 89, 93-94; PAS-00027565, 729-30).

According to the *Cleanup Plan Progress Report; Reporting Period: 4/92 – 6/92, Former Cooper-Wiss Facility*, dated July 15, 1992 (1992 *Cleanup Plan Progress Report*) by Ground Water Associates, Inc. for New Jersey Department of Environmental Protection and Energy (NJDEPE), the transformer area cleanup was completed at that time and no further actions were proposed (PAS-00027572).

The 1992 *Cleanup Plan Progress Report* reported that a groundwater product recovery system ran nearly continuously during June. Between June and July, a total of 24,710 gallons were treated and discharged to the sanitary sewer. This equated to a monthly average of 0.64 gpm. During the latter part of June the average flow rate was 0.93 gpm. (PAS-00027572, 75).

On June 2, 2014, PS&S reported the results of sampling conducted at the 33 Littleton Avenue site in April 2014. This sampling was performed to screen and assess the subsurface soils for the presence of free-product to assist in defining the limits of the petroleum impacted soil. The collected samples were analyzed for extractable petroleum hydrocarbons, naphthalene, and 2-methylnaphthalene. Extractable petroleum hydrocarbons were detected in several samples. 2-Methylnaphthalene was reported in PDB-03, PDB-05, PDB-09, PDB-09B, and PDB-18 at concentrations of 34.3 milligram/kilogram (mg/kg), 12.4D mg/kg, 22.1D mg/kg, 152D mg/kg, and 16.5D mg/kg respectively, exceeding the Impact to Groundwater Soil Screening Level of 8 mg/kg. The remainder of the 2-Methylnaphthalene concentrations ranged from Not Detected (ND) to 7.65 mg/kg. Naphthalene was present in PDB-03, PDB-04, PDB-09, and PDB-09B at concentrations of 14.3D mg/kg, 10.2D mg/kg, 7.01 mg/kg, and 34.2 mg/kg

respectively, exceeding the NJDEP Residential Direct Contact Soil Remediation Standard of 6 mg/kg. PDB-09B also exceeded the Non-Residential Direct Contact Soil Remediation Standard of 17 mg/kg and the Impact to Groundwater Soil Screening Level of 25 mg/kg. The remainder of the naphthalene concentrations ranged from Not Detected (ND) to 5.98 mg/kg (PAP-00332474-75). [Note: Although this sampling occurred after the timeframe that Cooper Industries operated the 33 Littleton Avenue site, this information is included here to document the effects of petroleum released at the facility.]

The sampling locations for the 2014 sampling are shown on the diagram below:



(PAP-00332476)

8. Summary of Asserted Defenses

Cooper asserts the following defenses:

- Any potential liability Respondent may have is limited to the period from December 1, 1976 to about 1985 (the Cooper Operating Period). Cooper did not assume and does not have any liability for any discharges or releases during the time that Wiss Co. owned/operated the facility (May 1900 to December 1, 1976) or any alleged predecessors of Wiss Co. owned/operated the facility (including the Wiss family members, between 1887 and May 1900, or the National Shears Company, between 1898 and 1900). As part of the 1976 transaction with Wiss Co., Cooper assumed certain liabilities, but the scope of those liabilities was narrowly and specifically prescribed and did not include any CERCLA liabilities associated with historical discharges by the facility.

- During the Cooper Operating Period, any discharges from the facility (including any COC in that discharge which may have reached the Passaic River, whether through the Clay Street CSO or otherwise), were “federally permitted releases” and cannot be the basis for imposing CERCLA liability on Cooper.

Covanta Essex Company

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

COVANTA ESSEX COMPANY

Facility Name, Address and Size: Essex County Resource Recovery Facility (ECRRF); 183 Raymond Boulevard and 66 Blanchard Street, Newark, New Jersey; 25 acres (PAP-00065320); Information on number of employees and shifts was not available in the file material.

1. **Business Type:** Municipal solid waste processor/incinerator and electricity generator (PAP-00065232).

2. **Time Period of Ownership/Operations**

Operator: 1990 to present
Owner: Port Authority (land only) 1978 to present

1978: The site was vacant prior to 1978 when it was purchased by the City of Newark Redevelopment and Housing Authority (PAS-00049003).

1983: In 1983, the Port Authority selected Browning-Ferris Industries, Inc. to design, construct, and operate the ECRRF (PAS-00049004).

1984: In 1984, BFI Energy Systems of Essex County, Inc. (an affiliate of Browning-Ferris Industries, Inc.) and Air Products Ref-Fuel of Essex County, Inc. created American Ref-Fuel Company of Essex County (ARF), which subsequently assumed responsibility for constructing and operating the ECRRF (PAS-00049004). On October 31, 1984, the New Jersey Department of Environmental Protection (NJDEP) issued a directive requiring the Newark Redevelopment and Housing Authority to clean up the property (PAS-00049005).

1985: On January 11, 1985, the Newark Redevelopment and Housing Authority and NJDEP entered into an Administrative Consent Order for Newark Redevelopment and Housing Authority to complete the investigation and remediation of the property. For the next two years, the Newark Redevelopment and Housing Authority conducted “significant” surface removal, soil excavation, and re-grading (PAS-00049005).

1987: On September 11, 1987, the Port Authority agreed to take responsibility for the remaining investigation and remediation of pre-existing environmental impacts at the property. The Port Authority executed a Memorandum of Understanding with NJDEP that required a two-phase remediation of certain portions of the property. The City of Newark Redevelopment and Housing Authority sold the property on which the ECRRF was to be located to the Port Authority in December 1987. From 1987 until 1989, the Port Authority remediated additional areas of the property either by soil excavation or capping (PAS-00049004-05).

1988: The Port Authority leased the property to ARF effective on or about January 31, 1988. ARF, pursuant to its contract with the Port Authority, completed certain elements of the remediation in conjunction with facility construction required by the Memorandum of Understanding (PAS-00049004-05).

1989: On September 29, 1989, NJDEP determined that no further investigation or remediation was required (PAS-00049005).

1990: ARF began construction of the facility in February 1990. ECRRF operations began in November 1990 (PAS-00049004).

2005: On June 24, 2005, Covanta Holding Corporation acquired ARF and, thereafter, changed the name of the company to Covanta Essex Company (PAS-00049004).

The Port Authority currently owns the real property upon which the ECRRF is located and Covanta owns the facility (PAS-00048509).

3. Operational History/COC Use and Presence at the Facility

ARF began construction of the facility in February 1990. Operations began on November 3, 1990 (PAS-00049004). The ECRRF is a large-scale water wall incinerator that produces high temperature, high pressure steam from the incineration of solid waste (PAP-00065557). The ECRRF was created as a joint effort between the City of Newark, the County of Essex, and the Port Authority to support the Essex County Utility Authority's Solid Waste Management Plan. The ECRRF processes 2,800 tons per day of municipal solid waste and generates approximately 500 million kilowatts of electricity each year (PAS-00049002-03).

Municipal solid waste is incinerated in one of three municipal solid waste combustors, and the steam from the boilers is used to drive two 35-megawatt turbines (PAP-00065231). The facility includes an air pollution control system, which consists of a carbon injection system for the control of mercury emissions, among other chemicals (PAP-00065558).

According to a New Jersey Pollutant Discharge Elimination System (NJPDES) permit application addendum prepared by ARF, dated April 8, 1991, onsite hazardous materials storage included a phosphoric acid tank, three lime silos, a protected ash tarping station, and an ammonium hydroxide tank located within an area served by two inlets, which lead to one of two outfalls at the site (outfall DSN001). An underground fuel oil storage tank and a sulfuric acid tank were located within the drainage service area of the second outfall (DSN002). In addition, a fill port for a sodium hydroxide tank, housed inside a building, was also located in close proximity to this storage area (PAS-00049039). The letter also states that ash handling functions (i.e., collection and conveying of ash streams (including fly and bottom ash), ash treatment, ferrous recovery, ash storage, and loading of trailers) were located inside buildings or enclosures. Trailers loaded with ash and ferrous product recovered from the ash were pulled outside of the building, and truck tarping occurred within a protected area called “the ash tarping station” prior to transport (PAS00049039-40).

4. Identified COCs

It is noted that prior to 1978, the property was vacant and subject to illegal dumping (PAP-00065320; PAS-00049004). According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, pre-existing contamination was identified at the property in 1982, prior to construction of the facility (in 1988) and operation of the ECRRF, which began in 1990 (PAS-00049004). Reportedly, abandoned vehicles, hundreds of 55-gallon drums, and two tanker trailers of waste were identified on the property. The letter also reports that the property was remediated by the Port Authority (owner) via soil removal or capping. Polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury, copper, lead, dichlorodiphenyldichloroethane (4,4'-DDD) and dichlorodiphenyltrichloroethane (4,4'-DDT) were detected in site soil prior to construction of the ECRRF (PAP-00195088-89; PAP-00195120-21; PAP-00065321-24). According to the letter, on September 29, 1989, NJDEP determined that no further investigation or remediation was required at the property, provided that ARF seeded, paved, or otherwise covered certain areas of the property to preclude the generation of dust (PAS-00049005).

PCBs

No PCB data, storage or use information was identified in the available file material for the time period after operation of the ECRRF began in 1990.

Dioxins/Furans

No dioxin / furan data, storage or use information were identified in the available file material for the time period after operation of the ECRRF began in 1990.

PAHs

No PAH data, storage or use information were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified low and high molecular weight PAHs in the two samples analyzed for PAHs (PAP-00195136). It is unclear what operations or potential sources of contamination these detections may be associated with based on review of the referenced document.

DDx

No DDx data, storage or use information were identified in the available file material for the time period after operation of the ECRRF began in 1990.

Mercury

The facility includes an air pollution control system, which consists of a carbon injection system for the control of mercury emissions, among other chemicals (PAP-00065558). No mercury data since operation of the ECRRF began were identified in the available file material, nor was any information identified regarding the disposal of mercury captured by the air pollution control system.

No mercury data were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified mercury in all samples collected. The maximum concentration detected was 1.6 milligrams per kilogram (mg/kg) (PAP-00195134). It is unclear what operations or potential sources of contamination these detections may be associated with based on review of the referenced document.

Copper

No copper data were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified copper in all samples collected. The maximum concentration detected was 130 mg/kg (PAP-00195134).

The NJPDES permit (No. 0055247) was initially issued on February 1, 1986, as applicable to the construction phase of the ECRRF (PAS-00049020).

Lead

No lead data for soil were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified lead in all samples collected. The maximum concentration detected was 5,880 mg/kg (PAP-00195134). It is unclear what operations or potential sources of contamination these detections may be associated with based on review of the referenced document.

According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, lead was detected at “low levels” during six different stormwater ditch sampling events at the property prior to 1994; the concentrations were not listed in the referenced document (PAS-00049006). However, concentrations of lead in facility discharges were identified in the available file material as follows:

- According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, “low levels” of lead were detected in the site stormwater outfalls between 1988 and 1992. In addition, sampling of the stormwater ditches after 1992 identified “low levels” of lead (PAS-00049005-06). According to a table appended to a *Technical Evaluation*, prepared for legal counsel for Covanta, dated August 26, 2016, lead was detected in facility stormwater on four occasions between 1991 and 1993. Lead concentrations detected at outfall DSN001 ranged from 169 micrograms per liter (µg/L) to 260 µg/L; concentrations detected at outfall DSN002 ranged from 196 µg/L to 295 µg/L (PAS-00049054).
- According to a letter prepared by NJDEP, dated June 8, 1994, lead was detected in facility effluent at a concentration of 204 µg/L on November 31, 1993 (PAS-00106082).

According to a letter prepared by Apex Companies, LLC for legal counsel for Covanta, dated January 20, 2017, and a letter prepared by legal counsel for Covanta, dated January 20, 2017, a western ditch forms the boundary between the Covanta site and an

adjacent Norpak property (formerly Eagle Picher Lead Company). Eagle Picher Lead Company operated a lead pulverizing and processing facility immediately west of and adjacent to the Covanta site from at least 1931 until 1956 (PAS-00048577; PAS-00048510). In 1993, sampling at the Norpak facility identified lead concentrations in soil as high as 20,000 ppm, and as high as 915 ppm in the western ditch (PAS-00048525, 52). The letters state that a review of NJDEP files regarding the Covanta site and adjoining properties shows that the Norkpak site is the likely source of the six lead exceedances detected in stormwater discharged to the western ditch between July 1989 and August 1993 (PAS-00048577; PAS-00048510). Reportedly, stormwater from the Norpak property may have drained on to the Covanta property before the western ditch was constructed sometime between 1966 and 1982 (PAP-00065487; PAS-00048510). After the western ditch was constructed, Covanta reports that Norpak site runoff has drained into the western ditch on the site where Covanta's historical NJPDES sampling outfalls were located when the lead exceedances occurred (PAS-00048510). A *Site Inspection Report* for the Norpak site, dated July 2005, also states that runoff from the Norpak facility discharges to the western ditch (PAS-00048553).

The letter prepared by Apex Companies, LLC for legal counsel for Covanta, dated January 20, 2017, also notes that lead has been found on the adjacent Otillio Landfill property which is upgradient from the site (PAS-00048509). In addition, according to a letter prepared by legal counsel for Covanta, dated August 26, 2016, the stormwater ditches on the property are "known to be affected" by drainage from upgradient sources contaminated with lead, including the Ottilio landfill (PAS-00049006).

A figure depicting the location of the site relative to surrounding properties and site drainage features is provided below (PAS-00049026):



In addition, the letter prepared by legal counsel for Covanta, dated August 26, 2016, notes that lead was detected in site soils before operation of the ECRRF. It goes on to state that the western ditch receives infiltration of off-site groundwater and backflow from the Passaic River during high tide events, both of which are known to be contaminated (PAS-00049006; PAS-00048509, 54).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 contaminants of concern (COCs): PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to an *Essex Country Resource Recovery Project, Mitigating Measures Program* document, dated October 1984, and an undated *Final Report, Risk Assessment for Blanchard Street Site*, prior to development, the parcel was tidal marshland. At some time prior to the construction of the ECRRF, the site was covered with a layer of fill material, which included rubble, sand, gravel, and demolition debris, and ranged in thickness from four to 10 feet. The fill was disturbed during construction of the ECRRF (PAP-00195073).

It is noted that no soil data were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data was collected by ARF in August 1988 (prior to construction of the ECRRF).

The maximum levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00195134, 36).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	5,880 mg/kg
Copper	130 mg/kg
Mercury	1.6 mg/kg
Benzo(a)anthracene	0.64 mg/kg
Benzo(a)pyrene	0.56 mg/kg
Benzo(b)fluoranthene	1.1 mg/kg
Benzo(k)fluoranthene	*
Indeno(1,2,3-cd)pyrene	38 mg/kg

*Data for “benzo fluoranthene” only was reported in the referenced document and is listed in the table under “Benzo(b)fluoranthene.”

5. COC Pathways

The site is located adjacent to the Passaic River (PAP-00065442).

Sanitary and Storm Sewer

According to a *Technical Evaluation*, prepared for legal counsel for Covanta, dated August 26, 2016, the facility has never discharged any industrial process water to the Passaic River at any time, and it discharges only sanitary sewage to the city sewer system. It is reported that “other water” is re-used in the facility’s water recycling program installed in 1997 (PAS-00049020).

Direct Release

The site has a NJPDES permit (No. 0055247) that covers the discharge of stormwater to the Passaic River. The permit was effective beginning on February 1, 1986 (PAP-00065627, 29; PAS-00049020). According to an Application for Permit to Discharge Wastewater, dated May 22, 1990, stormwater runoff was treated via oil-water separators (PAS-00082714).

According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, two stormwater ditches are present on the property. Reportedly, both ditches discharge to and receive backflow from the Passaic River (PAS-00049005). On April 15, 1997, ARF completed construction of a stormwater management system, which included converting the two stormwater ditches to stormwater outfalls (outfalls DSN001 and DSN002). This system included a preexisting retention basin that captures stormwater from operational areas.

A figure depicting the location site drainage features and outfalls is provided below (PAP-00065442):



According to a *Technical Evaluation*, prepared for legal counsel for Covanta, dated August 26, 2016, outfall DSN001 was used during facility construction and still exists, though its configuration has changed over time, and it is presently clamped shut under the site's zero discharge configuration. Prior to 1997, DSN001 received flow from the on-site settling pond [including treated construction dewatering effluent (i.e., groundwater) and runoff from the scale house area of the facility] (PAS-00049021). It is reported that sample integrity of DSN001 had been compromised historically due to tidal backup of contaminated Passaic River water to the outfall, as well as contamination entering the drainage ditch from off-site, and contaminated groundwater from construction dewatering and natural seepage. Groundwater from construction dewatering was treated with granular activated carbon prior to discharge. It is reported that available flow data show that during historical facility operations, when the outfall was flowing DNS001 flow was measured in a range of 2.8-40 gallons per minute (PAS-00049021; PAS-00082680; PAS-00082693).

Outfall DSN002 initially was not active at the time of issuance of the NJPDES permit in February 1986 until construction dewatering ceased on March 31, 1989. Outfall DSN002 reportedly is presently clamped shut under the site's zero discharge configuration. According to a *Technical Evaluation*, prepared for legal counsel for Covanta, dated August 26, 2016, when DSN002 flowed, it received site runoff from the administration building, employee parking, and air-cooled condenser areas, as well as from off-site, including from Norpak (formerly Eagle Picher Lead Company), Fairmount Chemical, Blanchard Street, and the adjacent railroad. It is reported that available flow data show that during historical facility operations, when the outfall was flowing, DNS002 flow was measured in a range of 2.8-25 gallons per minute (PAS-00049021; PAS-00082680-81; PAS-00082693-94).

In 1997, Covanta modified the ECRRF's operation to make it a "zero discharge" facility, except during storm events. After 1997, only stormwater associated with non-operational areas (or unusual storm events) is diverted to the stormwater ditches on the property, and that as a result, “only negligible amounts of stormwater have been discharged from the Property to the stormwater ditches since 1997” (PAS-00049006). Under the zero discharge program, the NJPDES permit and outfalls still exist; however, pipes are physically clamped shut (PAS-00049022). According to the facility’s *Stormwater Related Best Management Practices (BMP) and Pollution Prevention Plan*, dated September 2013, since 1997, the stormwater management system has worked as follows:

- The northeastern part of the facility flows into a man-made detention basin that holds the water until it can be used internally. This part of the system has the capability to collect a 2-year, 24-hour storm event. Water collected in this detention basin is then directed to the wastewater storage tank for reuse within the facility’s low-quality water system.
- Stormwater run-off collected on the northwest side of the property is directed into a 10,000-gallon pump pit, which holds water until it can be utilized in the facility’s low-quality water system. After the storm event is over, water from the detention basin is transferred through underground piping to the pump pit near Outfall 002 (DSN 002A) for use in the low-quality water system (PAP-00422053).

The *Stormwater Related Best Management Practices (BMP) and Pollution Prevention Plan*, dated September 2013, goes on to state that the potential for any discharge to surface water is “drastically reduced” through the use of the above-referenced stormwater management system, and that since the 1997 upgrade, an average of one to two discharge events per year has been experienced. After removal of the silt from the stormwater retention basin in 2010, there has only been one discharge which occurred on April 30, 2014, during a storm event (PAP-00422053).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

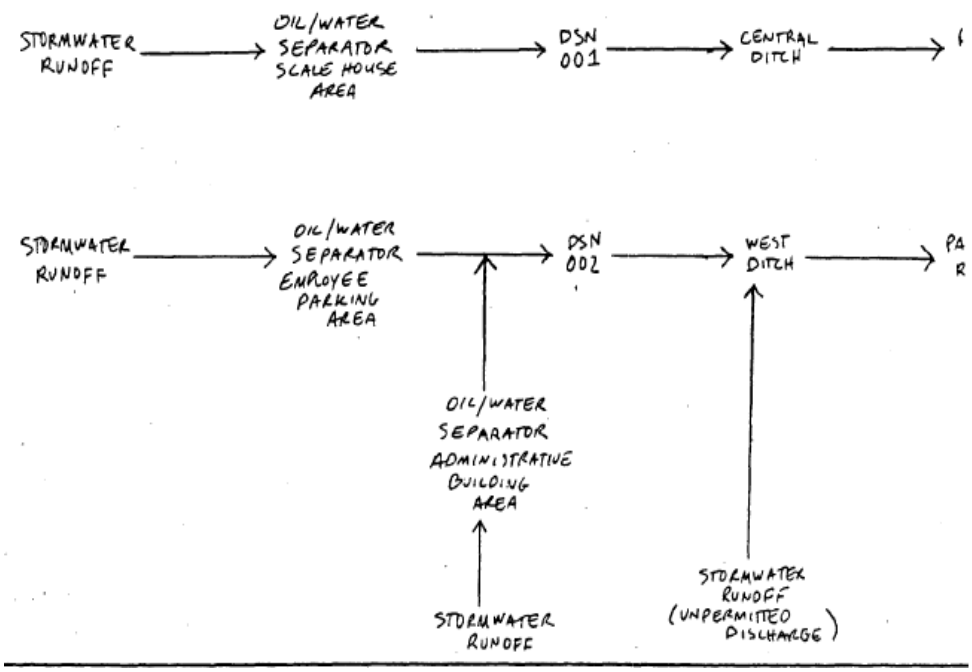
According to a letter prepared by NJDEP, dated June 22, 1988, NJDEP gave the site an "unacceptable" rating following an inspection for failing to monitor stormwater discharges and inaccurately reporting on discharge monitoring reports that there were no stormwater discharges (PAS-00082684).

An October 30, 1991 letter from ARF to NJDEP presents a summary of surveys implemented by ARF “designed to locate potential and actual problem areas” with a potential for impacting stormwater quality, and which ARF was monitoring to reduce any potential for such impact. The letter does not say these areas caused loadings to the LPR, only that the potential for impact to stormwater quality was recognized. The following facility issues were noted in review of operational practices with respect to

stormwater: (1) ash may be tracked out of the ferrous recovery area by the tires on the hauling vehicles, which may cause metals loadings; and, (2) spillage of material in the paved areas by lime slaker and ash load-out buildings may cause metals loadings (PAS-00082770-71). Ash load out was manned daily by housekeeping staff and kept clean using street sweepers and best management practices (PAS-00082822). Stormwater from the ash load out area is routed to a strip drain and sump at the toe of the ramp. Solids from the sump are periodically cleaned out, and water from the sump is recycled in the Facility's low quality water capture and reuse system**.**

According to a letter from NJDEP to ARF, dated June 10, 1992, based on a compliance inspection, the facility received an "unacceptable" rating due to several issues, including (1) lead effluent violations, among others, between October 1, 1991, and March 31, 1992; (2) operational deficiencies, including the presence of ash piles on the ground; and, (3) the facility's effluent at outfall DSN001 was black at inspection, violating the facility's permit which is for stormwater only. Lead was reported at a concentration of 196 µg/L, over the permit limit of 150 µg/L (PAS-00082812-14). An unpermitted discharge pipe 20 feet from outfall DSN002 was also noted during the inspection (PAS-00082814).

Prior to 1997, DSN001 received flow from the on-site settling pond [including treated construction dewatering effluent (i.e., groundwater) and runoff from the scale house area of the facility] (PAS-00049021). A stormwater flow diagram prepared by the NJDEP inspector at the time of inspection is presented below (PAS-00082819):



According to an April 8, 1991 letter to NJDEP, upon further investigation the potential unpermitted discharge pipe next to DSN 002 cited by Kevin Marlowe was currently not receiving drainage from the site and the origin of the water to the pipe was the West

Ditch tidal water. Once final landscaping is completed, the discharge from this pip would be a combination of on-site and off-site drainage with the majority of drainage contribution origination from off-site. ARF wanted to establish a meeting to address this particular potential discharge point, inclusive of engineered details, history, best management practice approaches available, permitting requirements, etc. (PAS-00049041).

Violations/Enforcement Actions

Violations related to inspections are discussed in the subsection above.

On or about December 1, 1992, NJDEP and ARF entered into an Administrative Consent Order in which NJDEP found that ARF had exceeded certain discharge limits in its NJPDES permit. Compounds discharged in violation of ARF's NJPDES permit included, but were not limited to, lead (PAS-00106056). Lead was the only applicable COC reportedly discharged in violation.

Permits

The site has a NJPDES permit (No. 0055247) that covers the discharge of stormwater to the Passaic River. The permit was effective beginning on February 1, 1986 (PAP-00065627, 29; PAS-00049020). The permit reportedly has been renewed several times (PAS-00049020).

7. Response Actions

Characterization Activities

There is no information regarding characterization activities in the available file material.

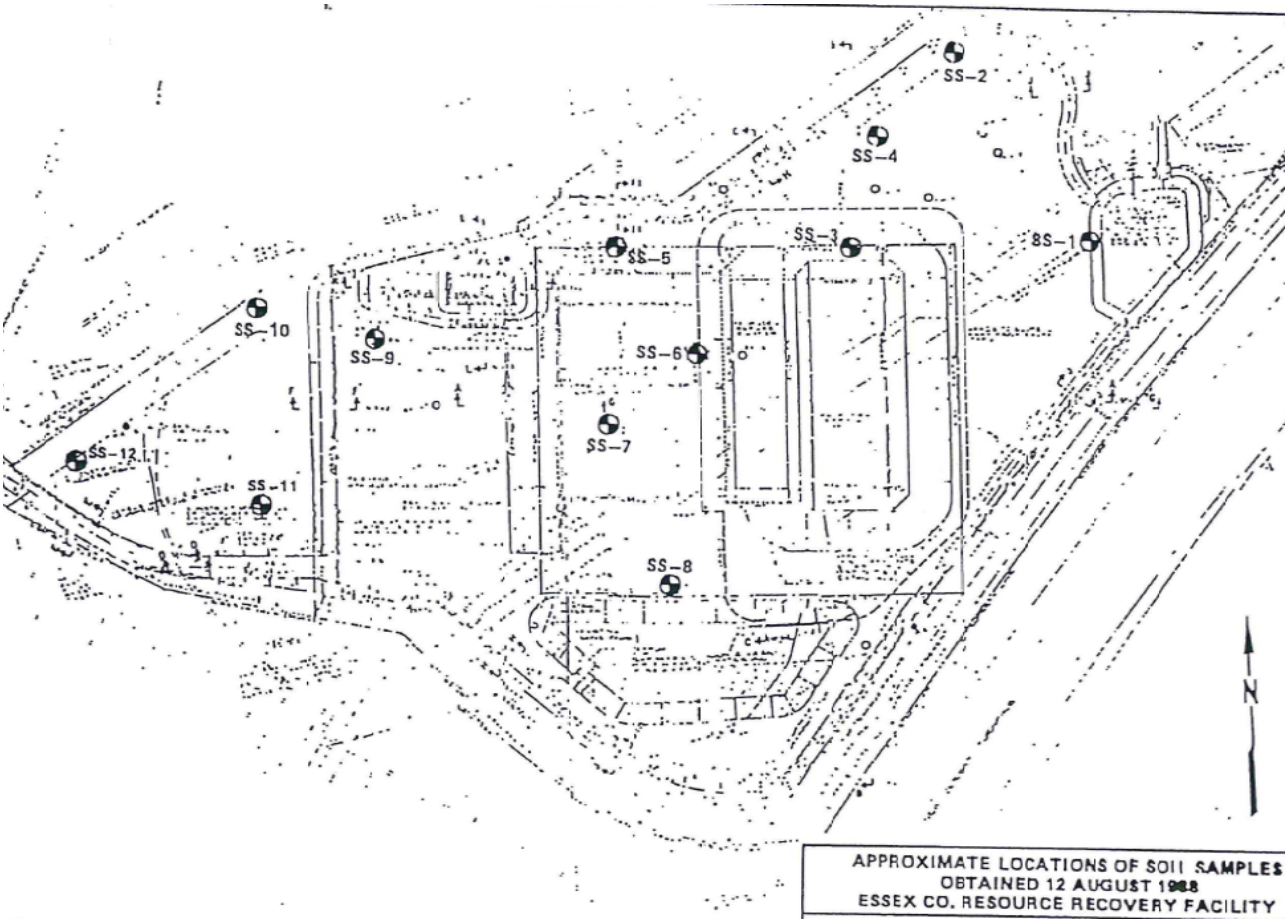
Sewer

There is no information regarding sewer sampling in the available file material.

Soil

No soil sampling data were identified in the available file material for the time period after operation of the ECRRF began in 1990. Surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified PAHs, mercury, copper, and lead in all samples collected. The maximum concentrations of mercury, copper, and lead were 1.6 mg/kg, 130 mg/kg, and 5,880 mg/kg, respectively (PAP-00195134, 36). It is unclear what operations or potential sources of contamination these detections may be associated with based on review of the referenced document.

A sample location figure is depicted below (PAP-00195132):



Remedial Activities

Prior to 1978, the property was vacant and subject to illegal dumping (PAS-00049004). According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, pre-existing contamination was identified at the property in 1982, prior to construction and operation of the ECRRF (PAS-00049004). Reportedly, abandoned vehicles, hundreds of 55-gallon drums, and two tanker trailers of waste were identified on the property. The letter also reports that the property was remediated by the Port Authority (owner) via soil removal or capping. PAHs, copper, lead, and mercury, among other chemicals, were detected in site soil prior to construction of the ECRRF (PAP-00195088-89; PAP-00195120-21). According to the letter, on September 29, 1989, NJDEP determined that no further investigation or remediation was required at the property, provided that ARF seeded, paved, or otherwise covered certain areas of the property to preclude the generation of dust (PAS-00049005). No documents confirming seeding and paving of the property were identified in the available file material.

8. Summary of Asserted Defenses

Covanta asserts that it is not and has never been the "current owner or operator" or "former owner or operator" of the LPRSA [Lower Passaic River Study Area]. Nor is there any evidence or suggestion that Covanta was a transporter of hazardous substances to the LPRSA. Accordingly, it appears that USEPA [United States Environmental Protection Agency] is contending that Covanta may be liable under CERCLA [Comprehensive Environmental Response, Compensation and Liability Act] as an "arranger." Arranger liability requires that Covanta took "intentional steps to dispose of a hazardous substance"….As the United States Supreme Court has explained, "intentional steps" means that it must be proven that Covanta actually intended to dispose of hazardous substances in the LPRSA.…Covanta operates, and since 1997 has operated, the ECRRF as a zero discharge facility, except during unusual storm events.…The only evidence allegedly connecting Covanta to the LPRSA is the stormwater exceedances in ditches at the Property. These exceedances, however, are not attributable to the ECRRF or Covanta. Instead, these exceedances all stem from pre-existing contamination on the Property – property subjected to illegal dumping, previously owned by the NRHA [Newark Redevelopment and Housing Authority], and currently owned by the Port Authority – as well as offsite, upgradient sources and surface water backflow from the Passaic River. Simply put, there is no evidence that Covanta "disposed of" anything in the LPRSA (i.e., engaged in some active conduct that caused the discharge, deposit, injection, dumping, spilling, leaking, or placing of any hazardous substances in the LPRSA)….Even if evidence of the "disposal" of hazardous substances by Covanta did exist (and it does not), there is no evidence that Covanta intended to dispose of any hazardous substances in the LPRSA. Without intent, Covanta cannot be an arranger under CERCLA – even if Covanta knew or should have known that stormwater runoff carrying pre-existing contamination at the Property or contamination from other parties could discharge to the LPRSA". "Even putting aside the lack of evidence that Covanta is an arranger, there is another problem with seeking to hold Covanta liable under CERCLA for LPRSA impacts: Covanta's hazardous substances, if any, have not caused and will not cause the incurrence of response costs. In order to be liable under CERCLA, Covanta's releases of hazardous substances must cause the incurrence of response costs…. although lead is a COC for the LPRSA, USEPA has determined…that lead is not driving any response actions. In addition, none of the other substances detected in stormwater at the Property are COCs for the LPRSA. As hazardous substances in the Property's stormwater discharges will not cause the incurrence of LPRSA response costs, Covanta cannot be liable under CERCLA. Covanta reserves the right to assert additional defenses in the future".

Curtiss-Wright Corp.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

CURTISS-WRIGHT CORPORATION

Facility Name, Address and Size: Curtiss-Wright Corp., 1 Passaic Street, Wood Ridge, New Jersey, 07075 (PAP-00114090); 160 acres (PAP-00190258). The available references did not include information on the number of site employees and typical work shifts.

1. **Business Type:** Airplane part manufacturing and testing facility (PAP-00190259).

2. **Time Period of Ownership/Operations**

   Operator: 1942/1943 to 1981/1983 (PAP-00190346; PAP-00190260)
   Owner: 09/03/1946 to 12/19/2001 (PAP-00190261)

3. **Operational History/COC Use and Presence at the Facility**

   According to the *Final Draft Preliminary Assessment* dated September 19, 1989, Curtiss-Wright operated an aircraft engine manufacturing plant at the site from 1942/1943 until November 1983 (PAP-00190346).

   Operations at this facility consisted primarily of metal working, metal polishing, painting, and metal plating (PAP-00190788). An August 24, 1984, Hazardous Substance / Waste Summary Table reported operations onsite included electroplating, a paint shop and degreasing (PAP-00191091). A June 30, 1984, Storage Vessels / Facilities table reported cutting oils were used in site processes (PAP-00191093).

   The *Preliminary Assessment Report* dated December 5, 2014, reported Curtiss-Wright ceased its operations at the site in 1983 and began leasing portions of the property for use by other companies in the 1980s (PAP-00190259). The *Remedial Action Report for the Former Curtiss-Wright Aerospace Facility* prepared by Langan dated May 2019 (PAP-00393037) notes that tenants at the site included:

   a) Rotary Power International
   b) Fabrite Laminating Corporation
   c) Dannex Manufacturing Corporation
   d) Springfield Precision Instruments
   e) Top Priority Designs
   f) Rose Art Industries, Inc.
   g) Creative Response, Inc.
   h) Carillon Mills, Inc.

4. **Identified COCs**

   - PCBs (used and detected)
   - PAHs (detected)
   - DDx (detected)
   - Copper (used, detected)
   - Lead (used, detected)
   - Mercury (used, detected)

PCBs

A letter reporting the results of an Inspection and Insulating Fluid Evaluation by Burlington Testing Company dated September 7, 1984 stated that 27 of 62 transformers showed evidence of slight leakage at various points, such as gauges, fins, valves, gaskets, tap changer, and bushing throats. Spills at two of the askarel (PCB)-filled transformers were also noted (PAP-00191030). According to the letter, the level of PCB in samples No. 2 and 10, "place them in the PCB category," i.e., concentration over 500 parts per million (ppm) or milligrams per kilogram (mg/kg). In addition, the level of PCB in thirteen samples, Nos.1, 3, 4, 5, 6, 8, 11, 12, 13, 15, 30, 60, and 61, "place them in the PCB contaminated category" (50-500 ppm) (PAP-00191031). An investigation of a stained area (Area G) adjacent to a transformer located between Buildings 25 and 26 was identified and sampling did not detect PCBs (PAP-00393062).

PAHs

According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had the following maximum concentrations: benzo(a)pyrene, 1,630 µg/kg; chrysene, 2,070 µg/kg; fluoranthene 3,370 µg/kg; phenanthrene, 2,690 µg/kg; pyrene, 2,550 µg/kg (PAP-00456923, 57). Undated subsurface soil sampling results from the oil farm area in Area A included the following maximum concentrations: acenaphthene, 812 µg/kg; anthracene, 194 µg/kg; benzo(a)anthracene, 1,170 µg/kg; benzo(a)pyrene, 2,520 µg/kg; benzo(b)fluoranthene, 4,960 µg/kg; benzo(g,h,i)perylene, 2,050 µg/kg; benzo(k)fluoranthene, 533 µg/kg; chrysene, 2,470 µg/kg; dibenzo(a,h)anthracene, 1,360 µg/kg; fluoranthene 1,390 µg/kg; indeno(1,2,3-cd)pyrene, 2,060 µg/kg; naphthalene, 11,200 µg/kg; phenanthrene, 4,550 µg/kg; pyrene, 2,660 µg/kg (PAP-00456952-3).[1]

The November 4, 2009, Case Inventory Document - Former Curtiss-Wright reported PAHs were detected at an Area of Concern (AOC) G – Transformer Spill Building 25. Based on the results, compliance was achieved with current soil criteria and a No Further Action (NFA) letter was granted by the New Jersey Department of Environmental Protection on October 8, 1993 (PAP-00191098).

According to the 2019 Remedial Action Report prepared by Langan, soil sampling collected on October 19, 1987 contained the following max concentrations in the post excavation soil sampling results from 0.0-0.5 ft bgs (PAP-00393180).

[1] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights's previous certification.

Curtiss-Wright Corp.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

Location										
CLIENT ID:	2017 Non- Residential Direct Contact Soil Remediation Standard	SS-A	SS-B	SS-C	SS-D	SS-E	SS-F	SS-G	SS-H	SS-I
COLLECTION DATE:		10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987
SAMPLE MATRIX:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
SAMPLE TYPE		Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
SAMPLE DEPTH (FT BGS)		0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
SAMPLE UNITS:		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Analyte										
Napthalene	17	0.34U	0.04	0.1	0.34U	3.5UJ	0.04	0.4U	0.24	3.5UJ
Acenapthylene	300000	0.34U	0.36U	0.34U	0.34U	3.5UJ	0.38U	0.4U	0.2	3.5UJ
Fluorene	24000	0.34U	0.04	0.44	0.068	3.5UK	0.38U	0.4U	0.14	3.5UJ
Phenanthrene	300000	0.17	1.4	9.3J	1.16	0.35J	1.3	0.16	4.7J	3.5UJ
Anthracene	30000	0.34U	0.1	1.7	0.2	3.5UJ	0.12	0.4U	0.64	9.9J
Fluoranthene	24000	0.45	4.7	35.4J	6.3	0.84J	5.03	0.32	4.7J	0.9J
Pyrene	18000	0.1	1.2	5.2	1.4	0.35J	1.3	0.077	3.5J	0.7J
Benzo(a)anthracene	17	0.14	2.3	**8.9J**	1.6	3.5UJ	1.5	0.16	**3.5J**	3.5UJ
Chrysene	1700	0.1	0.36U	9.3J	1.5	3.5UJ	1.5	0.2	3.5J	0.4J
Benzo(b)fluoranthene	17	0.2	0.36U	0.34U	0.34U	3.5UJ	0.38U	0.4U	0.4U	3.5UJ
Benzo(k)fluoranthene	170	0.34U	0.36U	12.4J	2.1	3.5UJ	2.3	0.16	3.9J	3.5UJ
Benzo(a)pyrene	2	0.1	**0.6**	**9.3J**	**1.5**	3.5UJ	**1.5**	0.12	**2.9**	3.5UJ
Indeno(1,2,3-cd)pyrene	17	0.34U	0.36U	**3.2**	0.92	3.5UJ	0.92	0.4U	1.3	3.5UJ
Dibenz(a,h)anthracene	2	0.34U	0.36U	**3**	0.34U	3.5UJ	0.38U	0.4U	**0.24**	3.5UJ
Benzo(g,h,i)perylene	30000	0.34U	0.36U	0.34U	0.34U	3.5UJ	0.38U	0.4U	0.4U	3.5UJ
Acenapthene	37000	0.34U	0.07	0.82	0.14	3.5UJ	0.08	0.4U	0.32	3.5UJ
PHC	--	**2100**	**1170**	**1090**	**1400**	**1650J**	10U	385	790	**33900**
TOC	--	--	--	--	--	--	--	--	--	--
TSS	--	--	--	--	--	--	--	--	--	--
PCB	1	--	--	--	--	--	--	--	--	--
Reactivity (Cyanide)	--	--	--	--	--	--	--	--	--	--
Reactivity (Sulfide)	--	--	--	--	--	--	--	--	--	--
Total PAH	--	--	--	--	--	--	--	--	--	--
Metals										
Arsenic	19	--	--	--	--	--	--	--	--	--
Barium	59000	--	--	--	--	--	--	--	--	--
Cadmium	78	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--	--
Lead	800	--	--	--	--	--	--	--	--	--
Mercury	65	--	--	--	--	--	--	--	--	--
Selenium	5700	--	--	--	--	--	--	--	--	--
Silver	5700	--	--	--	--	--	--	--	--	--

Notes:
U/Pink shaded = MDL exceeds 1987 NRDCSCC
Yellow shaded = Result exceeds 1987 NRDCSCC
Blue shaded = PHC result exceeded 1000 ppm
Dashed line = Result or Standard Unavailable
J = 10x dilution used to calculate results

DDx

According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had one DDT detection at a concentration of 160 mg/kg (PAP-00456923, 57).[2]

Copper

The Remedial Action Report dated May 2019 stated that copper was detected in on-site soils at the AOC referred to as Area D "Surface Stain 30 Foot Test Cells" (PAP-00393057). Sampling identified copper at a concentration of 330 mg/kg (PAP-00393057). Area D was excavated in 1988, post-excavation samples were collected, soil results were below the NJDEP Impact to Groundwater (IGW) clean up criteria, and an NFA was issued for this AOC (PAP-00393059-60).

[2] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had a maximum copper concentration of 491 mg/kg (PAP-00456923, 57).[2]

Industrial wastewater treatment plant sludge analyses dated between May 1980 and January 1984 reported monthly concentrations of copper between 32.5 and 380 mg/kg. Most observations were well under 100 (PAP-00457102-42).[3]

Lead

Lead has been detected in various areas of the Site, including Areas D, I, and J.

Area D is the location of a surface stain and sampling identified lead at an elevated concentration of 2,400 mg/kg (PAP-00191098, PAP-00393057). Area D was excavated in 1988, post-excavation samples were collected, soil results were below the NJDEP Impact to Groundwater (IGW) clean up criteria, and an NFA was issued for this AOC (PAP-00393059-60).

Lead was also detected in soil in Area I. A complaint was filed by a citizen for an area where an unknown substance was reportedly buried, later identified as Area I (PAP-00190985, PAP-00393064). An initial soil sample was tested for EPA priority pollutants with only lead identified at a concentration of 360 mg/kg (PAP-00190985, PAP-00393064). Two 8-foot-square by 2.5-feet deep excavations were completed, and post-excavation sampling showed no elevated concentrations of lead (PAP-00393064-65).

Lead was also identified in the southeast area of building 56 located in the former landfill area, Area J (PAP-00393065). Following drum removal at the landfill, samples were collected from underlying soil for lead analysis. Results showed that concentrations of lead exceeded SCC in two locations (PAP-00393066). According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had a maximum lead concentration of 61 mg/kg (PAP-00456923, 57).[3] Implementation of a 1994 Landfill Disruption and Closure Plan excavated three areas within the landfill and consolidated the removed material into a central area (Area M) for capping and closure. The excavation at Area J was sampled and backfilled with clean soil. The NJDEP approved No Further Action for Area J in 1999 (PAP-00393067-69).

Industrial wastewater treatment plant sludge analyses dated between May 1980 and January 1984 reported monthly concentrations of lead ranging from <0.1 to 190 mg/kg. Most observations were well under 100 (PAP-00457102-42).[3]

[3] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

Mercury

The Remedial Action Report dated May 2019 stated that elevated levels of mercury were detected in the AOC referred to as Area D "Surface Stain 30 Foot Test Cells" (PAP-00393057). Specifically, mercury was detected at 8.6 mg/kg, above background (PAP-00393057). Additional sampling in this AOC detected mercury at concentrations of 1.2 mg/kg in 1988 and 19.5 mg/kg and 21.7 mg/kg in 1993 (PAP-00393058-59). Area D was excavated in 1988, post-excavation samples were collected, soil results were below the NJDEP Impact to Groundwater (IGW) clean up criteria, and an NFA was issued for this AOC (PAP-00393059-60).

According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had a maximum mercury concentration of 4.8 mg/kg (PAP-00456923, 57).[4]

Historic Fill

The Allocation Team has determined that the facility site is not located on regional historic fill as designated by the NJDEP.[5] Based on review of available documents, no soil sampling data was available.

The New Jersey Department of Environmental Protection (NJDEP) has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[6] Accordingly, NJDEP technical requirements for property containing historic fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[7] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of historic fill at varying levels, not atypically at or exceeding residential soil standards.[8]

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[4] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

[5] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[6] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[7] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[8] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00393180, 279; PAP-00191098, PAP-00393057-59, PAP-0045957).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,400 mg/kg
Copper	491 mg/kg [4]
Mercury	21.7 mg/kg
Benzo(a)anthracene	40.2 mg/kg
Benzo(a)pyrene	33.7 mg/kg
Benzo(b)fluoranthene	51.1 mg/kg
Benzo(k)fluoranthene	2.3 mg/kg
Dibenzo(a,h)anthracene	3.6 mg/kg
Indeno(1,2,3-cd)pyrene	21.6 mg/kg

5. COC Pathways

Sanitary and Storm Sewer

An October 20, 1987 letter from Curtiss-Wright to NJDEP states that the surface water at the Curtiss-Wright facility drained through stormwater collection drains. Runoff was discharged from the storm sewer system to Feld Brook, which connects to the Saddle River, a tributary of the Passaic River. Specifically, the upper portion of the site is transacted by north-south oriented surface water collection trenches. The remainder of the surface water from the site is drained through stormwater collection drains located throughout the property. Roof drains discharge to the stormwater system. The stormwater and roof drain system for the site collected in a large collection basin at the western end of the site. No information was identified in available files that documented treatment of storm water prior to discharge. The letter states that the Fabrite Laminating Company and John Deere's sloppy waste drum storage areas contributed to the stormwater system. Fabrite Laminating Company's drum storage area was directly adjacent to a storm water drain and a stained area suggested that hazardous materials were discharging to the stormwater system (PAP-00190229-30, PAP-00456900-1).

Furthermore, the letter reported surface water runoff from the Curtiss-Wright facility was discharged from the storm sewer to Feld Brook, just to the west of the facility. To evaluate the possibility that contamination from the site may have been affecting Feld Brook, one surface water sample and one sediment sample were collected from Feld Brook at a point just downstream from the facility in 1987. These samples were analyzed for priority pollutant volatile organics and base/neutral organic compounds. The analytical results for the surface water samples showed the presence of several volatile organic compounds (VOCs); no OU2 COCs were detected. Fourteen base neutral organic compounds were detected in the sediment sample, "suggest[ing] that previous discharges to the Brook contained significant base/neutral contamination", and 350 ppm of total petroleum hydrocarbons was also detected (PAP-00190231). An

undated single-page document, labeled "Table 5 Summary of Analytical Results Surface Water and Sediment Samples Feld Brook" presents detections of four compounds in surface water, and 16 compounds in sediment, including (concentrations in ppb) acenaphtene (312), anthracene (1,100), benzo(a)anthracene (1,400), benzo(a)pyrene (746), benzo(b)fluoranthene (2,120), chrysene (1,760), fluoranthene (5,180), fluorene (459), indeno(1,2,3-c,d)pyrene (328), naphthalene (104) and pyrene (4,420). Total petroleum hydrocarbons were reported at 350 ppm (PAP-00456906).[9]

Industrial wastewater treatment plant sludge analyses dated between May 1980 and January 1984 reported monthly concentrations of copper between 32.5 and 380 mg/kg. Lead concentrations ranged from <0.1 to 190 mg/kg. Most observations for both were well under 100 (PAP-00457102-42).[9]

Direct Release

No information on direct releases to the Passaic River was identified in the available file material. However, according to a Passaic Valley Sewerage Commissioners (PVSC) letter report of pollutions corrected in 1969, dated March 31, 1970, there were intermittent polluting discharges in 1968 from Curtiss-Wright to Felds Brook, which the report described as a tributary to the Passaic River. Upon notification, the plant engineer explained that this occurred during filter changes and that extra care would be taken so that no oil would reach the brook again. However, oil was detected again on December 3, 1968 and traced back to Curtiss-Wright. On December 10, 1968, Curtiss-Wright was informed that they were polluting and that they needed to make corrections immediately. PVSC received a letter on December 26, 1968 from Curtiss-Wright that stated that consultants were being brought in to review the system in order to make necessary improvements. The report continued: "The situation continued much the same and finally on March 12, 1969, Mr. Lubetkin [of PVSC] again wrote to the Curtiss-Wright Corp." (PAS-00008279). Note at this point the first page of the letter report ends and the next page is numbered 12 and discusses another entity's pollution.

Spills

According to the Case Inventory Document for the Former Curtiss Wright, dated November 4, 2009, excavation took place at one transformer pad (AOC H – Transformer Stain Building 3) due to elevated PCB concentrations as a result of an oil spill adjacent to the pad near Building 22. An NFA was granted by NJDEP in a letter dated October 8, 1993 (PAP-00191098).

6. Regulatory History/Enforcement Actions

Inspections

An *Inspection and Insulating Fluid Evaluation for PCB Content for Sixty Two Transformers* was conducted by Burlington Testing Company in September 1984. It is

[9] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

not stated in the report what prompted the inspection. PCBs were detected in many of the transformers (PAP-00191030). The results are discussed in greater detail in the PCBs portion of Section 4, above.

Violations

Curtiss-Wright's 1984 Initial ECRA Notice Submission states, "there have been no known Departmental or other Governmental enforcement actions related to the site for violations of any applicable federal, state or local environmental laws or regulations throughout the history of ownership of the site (PAP-00191104)."

Permits

Stormwater at the facility drained through stormwater collection drains and was discharged to Felds Brook under the NJPDES Discharge Permit No. NJ0022004 (PAP-00191111). Monthly waste water sample data from October, 1979, to July, 1984, reported results for pH, suspended solids, chemical oxygen demand, oil and grease, as well as chromium, copper, lead, nickel, and zinc (PAP-0456964-101).[10]

In addition, a NJPDES/Discharge to Groundwater (NJPDES/DGW) Permit (No. NJ7001312) was issued on February 27, 1996 for the discharge of treated groundwater from the treatment system via onsite injection wells. The NJPDES permit expired and was transferred to a long-term Permit by Rule (PBR); NJDEP approval for the PBR was provided in correspondence dated November 16, 2009 A PBR Renewal Application for NJPDES/DGW Permit No. NJ7001312 was submitted to NJDEP on May 26, 2017. On February 15, 2019, Langan submitted a technical response to NJDEP's July 19, 2018 correspondence regarding the permit renewal submission on behalf of Curtiss-Wright (PAP-00393120).

7. Response Actions

Characterization Activities

Upon cessation of operations, Curtiss-Wright was required to perform investigation and remediation of the Site. In relation to Curtiss-Wright's cessation, 20 Areas of Concern ("AOC") were identified and NJDEP has issued No Further Action letters ("NFA") for 18 of 20 AOCs related to Curtiss-Wright. In addition, the sale of the Site to Wood-Ridge Industrial Property Owner, LLC triggered the Industrial Site Recovery Act ("ISRA") for eight of Curtiss-Wright's tenants (PAP-00393036).

The following characterization activities have taken place at the facility:

- *Preliminary Assessment Report for Former Fabrite Laminating Corporation Tenant Space*, by Langan Engineering and Environmental Services, dated December 2014 (PAP-00190252).

[10] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

- *Baseline Ecological Evaluation for the Curtiss-Wright Facility*, by Peak Environmental, Inc., dated January 2004 (PAP-00190991).
- *Remedial Action Report for Former Curtiss-Wright Aerospace Facility*, by Langan Engineering and Environmental Services, dated May 2019 (PAP-00393017)

Additional supporting documentation as identified in the 2019 Remedial Action Report (PAP-0039017) are identified below:

- November 30, 1989 Cleanup Plan and Addendums
- NJDEP approval of the Cleanup Plan on January 30, 1991, established the SCC as the remediation standards for the Site
- January 15, 1993 Soil Cleanup Plan and April 15, 1993 Groundwater Cleanup Plan; NJDEP approval of these workplans on October 8, 1993 established the SCC and Groundwater Quality Standards as the applicable standards
- October 31, 2006 Curtiss-Wright Response to NJDEP Comment Letter of 14 September, 2006
- December 4, 2006 Quarterly Remedial Action Report, March and June 2006 Groundwater Monitoring Events
- February 13, 2007 Pin Code Request for Application for an Air Emissions Permit During and Environmental Improvement Pilot Test for the Soil Vapor Extraction (SVE) System
- February 15, 2007 Application for an Air Emissions Permit during an Environmental Improvement Pilot Test for the SVE System
- April 2, 2007 Receptor Evaluation Application for an Air Emissions Permit during the Environmental Improvement Pilot Test for the SVE System
- June 29, 2007 Curtiss-Wright Response to NJDEP Comment Letter of 17 May 17, 2007
- August 28, 2007 Quarterly Ground Water Remedial Action Report for the December 2006 Groundwater Sampling Event
- November 26, 2007 Quarterly Remedial Action Report March for the June
- 2007 Groundwater Sampling Events
- January 21, 2008 Air Pollution Control Permit Modification issued to Curtiss-Wright by NJDEP
- January 22, 2008 Quarterly Remedial Action Report for the October 2007 Groundwater Sampling Event
- February 15, 2008 Remedial Investigation Workplan and Addendums submitted by Curtiss-Wright, which were approved by NJDEP on 7 December 7, 2009
- April 7, 2008 Quarterly Remedial Action Report for the December 2007 Groundwater Monitoring Event
- July 28, 2008 Application for an Air Emissions Permit Modification;
- September 10, 2008 Semiannual Ground Water Remedial Action
- March 11, 2009 Remedial Investigation Workplan Addendum
- June 8, 2009 Semiannual Ground Water Remedial Action Report for the December 2008 Groundwater Sampling Event
- November 12, 2009 Semiannual Ground Water Remedial Action Report for the June 2009 Groundwater Sampling Event

- February 17, 2010 Remedial Investigation Report
- June 10, 2010 Semi-Annual Remedial Action Report for the December 2009 Groundwater Monitoring Event
- July 16, 2010 Vapor Intrusion Remedial Investigation Report
- November 19, 2010 Semi-Annual Remedial Action Report for the June 2010 Groundwater Monitoring Event
- February 25, 2011 Receptor Evaluation submitted to NJDEP by Curtiss-Wright
- April 19, 2011 LSRP Notification of Retention of Robert Y. Koto, LSRP by Curtiss-Wright
- March 16, 2012 Remedial Action Report
- December 2010, May & October 2011 Groundwater Monitoring Event
- 5 December 2014 Receptor Evaluation for Former Fabrite Laminationn Corporation
- December 5, 2014 Preliminary Assessment Report for Former Fabrite Lamination Corporation Tenant Space prepared by Langan for Curtiss-Wright
- December 19, 2014 Vapor Intrusion Work Plan prepared by Langan
- May 8, 2015 Sub-Slab Soil Gas Sampling Work Plan prepared by Langan
- October 8, 2015 Sub-Slab Soil Gas, Soil, Overburden Groundwater and Indoor Air Sampling Work Plan prepared by Langan
- May 26, 2017 Discharge to Groundwater (DGW) Permit-By-Rule Authorization issued to Curtiss-Wright by NJDEP
- May 26, 2017 Final Permit-By-Rule Application New Jersey Pollutant Discharge Elimination Discharge to Groundwater (NJPDE-DGW) Permit Renewal Application prepared by Langan for Curtiss-Wright;
- June 30, 2017 Groundwater Remedial Action Progress Report prepared by Langan;
- September 15, 2017 Curtiss-Wright Response to NJDEP Case No. 17-07-11-0814-32 concerning reported PCE in Groundwater at Farmland Dairies;
- October 10, 2018 SVE and Pump and Treat System Effectiveness Evaluation Work Plan – Phase 2 Activities prepared by Langan for Curtiss-Wright;
- November 9, 2018 Revised Remedial Action Work Plan – Former Rotary Power International Facility prepared by Langan for Curtiss-Wright;
- November 26, 2018 SVE Discharge Piping Replacement and Blower Refurbishment Work Plan prepared by Langan Curtiss-Wright;
- January 14, 2019 Supplement to October 10, 2018 SVE and Pump and Treat System Effectiveness Evaluation Work Plan – Phase II Activities prepared by Langan for Curtiss-Wright;
- February 28, 2019 Work Plan For PCB Remedial Action Confirmation Sampling prepared by Langan for Curtiss-Wright;
- April 2, 2019 Building 2 Remedial Action Work Plan prepared by Langan for Curtiss-Wright;
- April 10, 2019 Rotary Power Pre-Excavation Sampling Work Plan prepared by Langan for Curtiss-Wright;

Sewer

Monthly waste water sample data from October, 1979, to July, 1984, reported results for copper and lead (PAP-0456964-101). Until early 1981, copper and lead concentrations were consistently reported as <0.2 ppm, and later results were below lower levels of detection. The one exception was a sample collected in February, 1983, in which copper was detected in duplicate samples at 0.72 ppm and 0.66 ppm (PAP-00457009). One sample from June, 1981, included a longer list of metals, including mercury, which was reported as 0.0009 ppm (PAP-00457060).[11]

Soil

Peak Environmental conducted a *Baseline Ecological Evaluation (BEE)* in January 2004. The BEE stated that the specific AOCs addressed were impacted soils associated with a former underground storage tank (UST) farm on northwest portions of the site (Area A), and a plume of impacted groundwater, the primary source of which was attributable to Area A. The contaminants were VOCs and TPH (PAP-00190995). No OU2 COCs were reportedly detected. However, available references did not include the specific sample results.

The BEE reported the cessation of site operations in 1983 triggered the Environmental Cleanup and Responsibility Act (ECRA-later known as ISRA). AOCs identified in the initial *General Information Submission (GIS)* and *Site Environmental Submission (SES)* dated July 27, 1984 and September 10, 1984, respectively, consisted of an UST farm, surface spill areas, a landfill area, oil spill areas, aboveground storage tanks, and groundwater (PAP-00190994). Subsequent AOC Remedial Investigations/Actions conducted during the late 1980's and 1990s yielded NFA determinations from the NJDEP for the majority of AOCs on site. The remaining AOCs for which active remediation was being conducted included the Oil and Fuel Tank Farms and Site Groundwater. Peak concluded that there was a pathway from the site to Feld Brook, but that there were no signs of impact to Feld Brook from the facility storm water discharges (PAP-00190991-1029).

Remedial Activities

An incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, describes sampling activities in several areas of the site in the late 1980s. Analytical results included the following:

Area A – Oil and Fuel Tank Farm: borings were advanced in the oil farm area, containing 45 USTs, sometime in the late 1980s. Subsurface soil sampling results included the following maximum concentrations: acenaphthene, 812 µg/kg; anthracene, 194 µg/kg; benzo(a)anthracene, 1,170 µg/kg; benzo(a)pyrene, 2,520 µg/kg; benzo(b)fluoranthene, 4,960 µg/kg; benzo(g,h,i)perylene, 2,050 µg/kg; benzo(k)fluoranthene, 533 µg/kg; chrysene, 2,470 µg/kg; dibenzo(a,h)anthracene, 1,360 µg/kg; fluoranthene 1,390 µg/kg;

[11] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

indeno(1,2,3-cd)pyrene, 2,060 µg/kg; naphthalene, 11,200 µg/kg; phenanthrene, 4,550 µg/kg; pyrene, 2,660 µg/kg (PAP-00456952-3).[12]

Area J – Six test pits were excavated and identified the presence of eight empty buried drums. Soil samples collected on December 10 and 11, 1987, from the base of each excavation below the location of the drums were analyzed for EPA Priority Pollutants. Maximum concentrations of the following constituents were as follows: benzo(a)pyrene, 1,630 µg/kg; chrysene, 2,070 µg/kg; fluoranthene 3,370 µg/kg; phenanthrene, 2,690 µg/kg; pyrene, 2,550 µg/kg; DDT, 160 µg/kg; copper, 491 mg/kg; lead, 61 mg/kg; mercury, 4.8 mg/kg (PAP-00456923, 57).[12]

The 2019 Remedial Action Report provides a summary of activities at the Site (PAP-00393017). AOCs with soil impacted with COCs of interest are discussed below:

Area D – Surface Stain 30 Foot Test Cells: In 1985, six soil borings were completed for this AOC. The samples were collected and analyzed for TPH and PP+40. Contaminants detected at levels in excess of NJDEP action limits included, TPH (110,000 mg/kg), cadmium (14 mg/kg), copper (330 mg/kg), lead (2,400 mg/kg), and zinc (770 mg/kg). In addition, elevated levels of mercury were also detected at 8.6 mg/kg, above background measurements of 0.02 to 0.6 mg/kg. Based on the sampling results, impacted soils were excavated to various depths and removed from the Site. Following post-excavation sampling and additional soil removal at the request of NJDEP, on December 15, 1998, an NFA was issued for this AOC (PAP-00393057-60).

Area G – Transformer Spill Building 25: in 1984, a fluid analysis was completed for 62 transformers on the Site. Twenty-seven of the 62 Site transformers showed signs of leaking. Sampling did not detect any PCBs, but did detect elevated levels of TPH. Following additional TPH sampling, the TPH impacted soils were excavated and an NFA was issued on October 8, 1993 (PAP-00393062-63).

Area H – Transformer Stain Building 3: a 25-square foot area of stained soil was identified during a site inspected. Initial sampling did not detect PCBs, but did identify elevated levels of TPH. Following excavation of the impacted soils and post-excavation sampling, additional excavation was required for TPH impacted soils. An NFA was issued by NJDEP on October 8, 1993 (PAP-00393063-34).

Area I – Citizen Complaint Area: this AOC consisted of a 150-foot by 300-foot section of a wooded area and includes Area J, discussed below. Initial sampling in the area of decaying steel drum identified elevated levels of lead. Additional sampling identified zinc in the area. An 8-foot-square section was excavated and an NFA was issued on March 26, 1990 (PAP-00393064-65).

[12] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights ’s previous certification.

Area J – Landfill: In 1989, six test pits were advanced based on a magnetometer survey. The date in this summary conflicts with the date (1987) in which sample results for these test pits was reported (PAP-00456957).[13] An area within the landfill located southeast of Building 56, was identified as the location of multiple, white piles of materials. The material was sampled and the results identified elevated levels of arsenic, lead, zinc, and PAHs. In 1993, 10 test pits were excavated in this area and sampled. The test pit sampling showed elevated levels of PAHs and arsenic, chromium, cadmium, and nickel. In 1994, a Landfill Disruption and Closure Plan was prepared. The plan consisted of excavating three areas within the landfill and consolidating the removed material into a central area for capping and closure. Following completion of the excavation and backfilling of the area, a deed notice for the area was filed on December 15, 1999 and an NFA was approved by NJDEP for this AOC on March 14, 2000 (PAP-00393065-69).

Electro-Chemical Machining (ECM) Tank and Pump Room Area: this AOC consisted of three ECM tanks, including two open top 45,000-gallon concrete settling tanks, on 6,000-gallon brine tank, and a pump room. An initial soil investigation of this AOC identified elevated concentrations of TPH and PAH compounds. A monitoring well was installed to determine if the soil was impacting the groundwater. The tanks were emptied and backfilled with inert soil from on-site. A second and third investigation of this AOC continued to show elevated levels of TPH and PAH compounds. A final round of soil borings and sampling in 1992 concluded that compliance with applicable soil cleanup standards was achieved for all VOC and base neutral constituents. In 1996, approximately 1,675 tons of soil was removed from this AOC. Following a second soil excavation in this AOC and post-excavation sampling, an NFA was issued on June 4, 1997 (PAP-00393079-81).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

[13] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

DII INDUSTRIES, LLC

Facility Name, Address and Size: Dresser Industries, Inc. / DII Industries (Dresser); 401 Worthington Avenue, Harrison, NJ 07029; approximately 23 acres (PAS-00063866; PAS-00122467). The available references did not include information on the number of site employees and typical work shifts.

1. **Business Type:** The Worthington Avenue facility was used for manufacture of specialty pumps. Although pump casings were cast on site in the past, raw castings and finished parts are now received from outside vendors (PAS-00122467).

2. **Time Period of Ownership/Operations**

   Operator: January 1985 to January 1993 (PAS-00023354)
   Owner: January 1985 to February 1997 (PAS-00023618; PAS-00122467)

   The facility operated as a specialty pump manufacturing facility from approximately 1906 until 1993 (PAS-00023030, PAS-00023265). The Worthington Service Corporation, which was incorporated in 1971, owned the Worthington Facility until 1979 (PAP-00402657-60, PAS-00023030, PAS-0006881). From 1980 to 1985, the facility real property was owned by indirect subsidiaries of McGraw-Edison, a predecessor-by-merger of Cooper Industries PAP-00402663-68). From 1985 to 1997, the facility was owned by Dresser (PAS-00063866). Dresser/DII, which is the subject of this data report, ceased commercial or manufacturing operations at the plant in October 1993 (PAS-0063866, PAS-00122467).

3. **Operational History/COC Use and Presence at the Facility**

   The facility manufactured specialty pumps from approximately 1906 until it ceased operation in 1993 (PAS-0023265). During the approximately 87 years of operation, raw castings were manufactured on site. The raw castings were forged, machined, and the pumps were assembled at the facility. Pump hydro-testing was performed within the manufacturing area and foundry operations involved the use of large quantities of oil and electricity. Many machining operations involved the use of solvents and lubricating oils during this 87-year period (PAS-0023265).

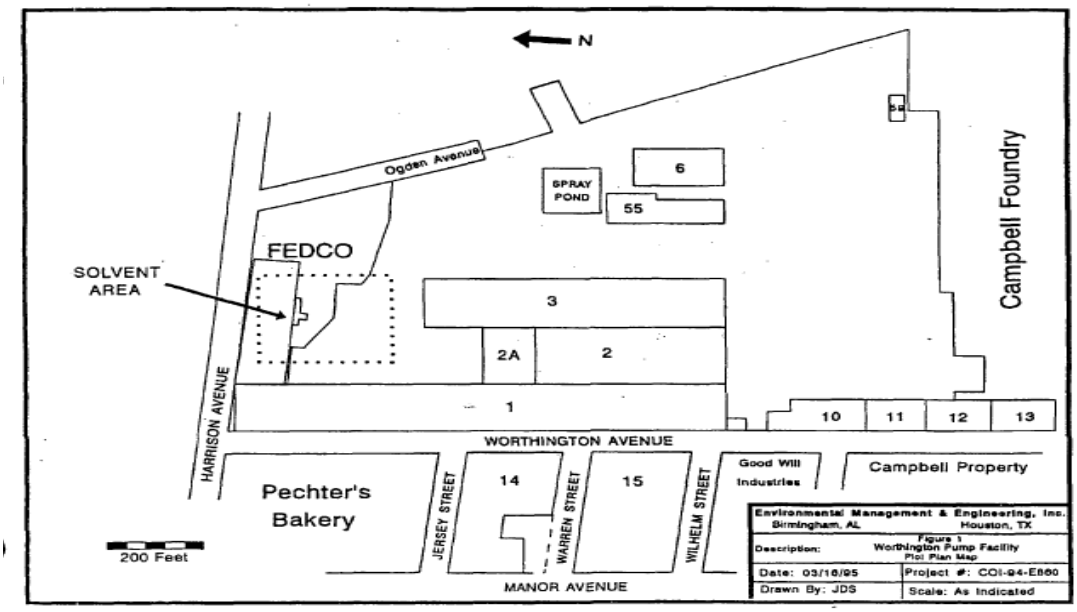
   According to a *Response to CERCLA Section 104 (e) Request Letter*, dated December 2000, Dresser's manufacturing operations at the Worthington Avenue facility from 1985 to 1993 involved the manufacture of reciprocal and centrifugal pumps, such as water pumps, boiler pumps, trident pumps, and hoovering pumps. Dresser would purchase raw solid metal casings, composed of metals such as steel, iron, copper, and titanium from various third party suppliers. The first phase of Dresser's manufacturing process involved the cutting and machining of these metal casings into the component parts, which would ultimately comprise the particular type of pump. The second and last phase of the manufacturing process would involve the assembly of the component parts with the necessary electrical wiring and components purchased from third party suppliers. After manufacturing the pumps, Dresser would hydrotest each pump's operation in

concrete test vaults filled with city water and, if the pump was fully operable, Dresser would clean, paint, and ship the pump to the relevant customer (PAS-00063869).

In the *Response to CERCLA Section 104 (e) Request Letter*, dated December 2000, Dresser states, "In Dresser's industrial operations at the Worthington Facility, Dresser did not manufacture any products in which any hazardous substances were the product. Dresser's manufacturing operations solely involved the manufacture of various type of pumps containing as part of their physical composition certain metals, such as steel, iron, copper, and titanium, depending on the particular type of pump." The only reported byproducts resulting from Dresser's industrial operations at the Worthington Avenue facility were metallic chips and shavings that resulted from Dresser's cutting and machining of the solid metal casings. (PAS-00063869-70).

The *Response to CERCLA Section 104 (e) Request Letter*, dated December 2000, also states that Dresser has not been able to determine the amount of hazardous substances generated per volume of finished product. However, Dresser estimated that approximately 80 percent by weight of the raw metal castings were ultimately used in the products and therefore 20 percent or less of the metal casting resulted in metallic chips and shavings. Dresser has not been able to determine how much of the metallic chips and shavings constituted hazardous substances (PAS-00063870).

Dresser also states in the *Response to CERCLA Section 104 (e) Request Letter,* dated December 2000; that the metallic chips and shavings were not combined with any other wastes, but rather were collected, segregated, stored, and ultimately sold to a third party scrap metal recycler. Metonis Scrap Metals of Kearney, New Jersey was a scrap metal recycler that had purchased some of the metallic chips and shavings from Dresser (PAS-00063870).



(PAS-00023583)

DII Industries, LLC

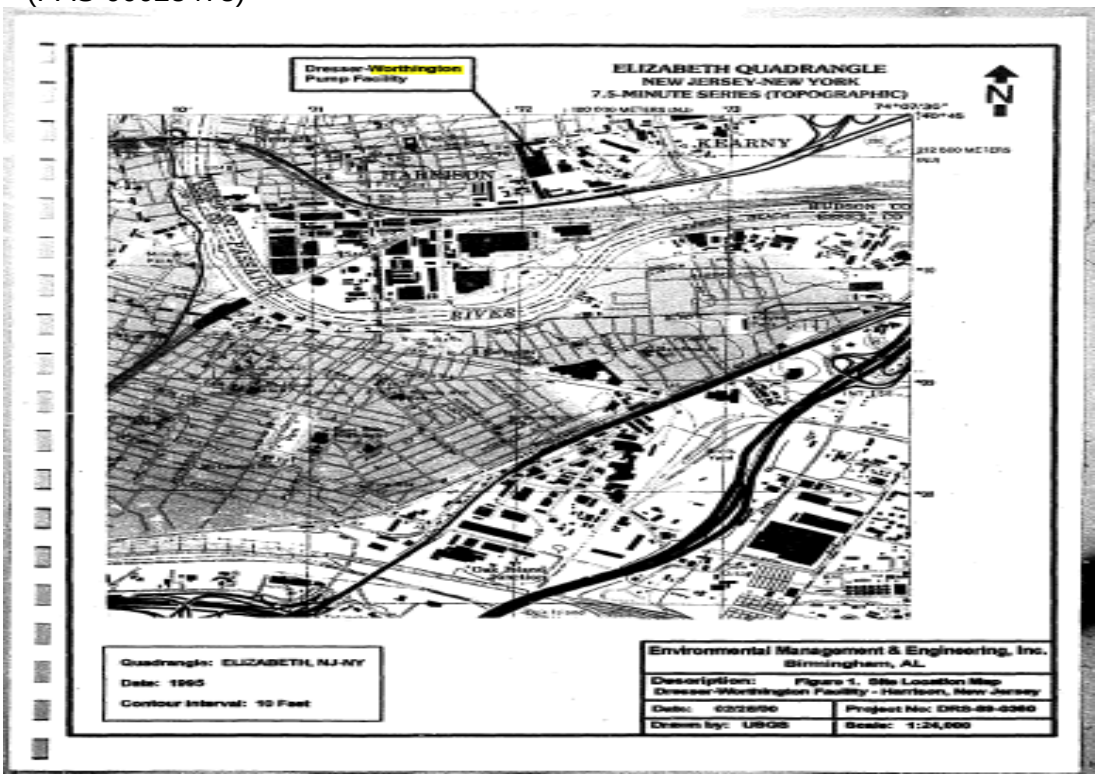
Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



(PAS-00023478)



(PAP-00033681)

The following hazardous substances were stored in one or more buildings, which had a roof and a concrete floor (PAS-00063874-75).

Stored Hazardous Substances	
Substance	**Storage Container**
Acetone	Closed glass bottle or jug
Acetylene tetrabromide	Closed glass bottle or jug
Ammonia	Closed glass bottle or jug
Hydrochloric Acid	Closed glass bottle or jug
Mercury	Closed glass bottle or jug
Nitric Acid	Closed glass bottle or jug
Phosphoric Acid	Closed glass bottle or jug
Acetylene	Sealed cylinder
Argon	Sealed cylinder
Chlorodifluoromethane	Sealed cylinder
Chloropentafluoromethane	Sealed cylinder
Chlorotrifluoromethane	Sealed cylinder
Antimony	Tote bin
Asbestos	In insulation
2 butoxy ethanol	Closed can
Chlorine	Closed fiber drum
Chromium	Tote bin
Copper	Tote bin
Dibutylphthalate	Closed can
Dichlorofluoromethane	Sealed cylinder
Lead	Tote bin
111, trichloroethane	Closed steel drum
Naptha	Closed steel drum
Nickel	Tote bin
Polychlorinated biphenyls	Sealed transformer
Sodium bisulfide	Closed steel drum
Sodium hydroxide	Closed steel drum
Sodium nitrate	Closed steel drum
Sulfur	Closed steel drum
Toluene	Closed steel drum
Xylene	Closed steel drum

4. Identified COCs

- PCBs (used)
- PAHs (detected)
- Copper (used)
- Lead (used)
- Mercury (used)

PCBs

At the time Dresser took possession of the site in 1985, there were approximately 16 transformers on the site (PAS-00023666). A McGraw-Edison report, *Sampling Plan Worthington Pump Division*, written around 1984 noted that two transformers contained 10,000 parts per million (ppm) PCB and fourteen contained 50 to 80 ppm PCB (PAS-

00023666). At least one unidentified transformer containing PCBs was noted to have been removed from the site in a Report of Inspection dated February 1987 (PAP-00216835). There have been no known spills of transformer oil (PAS-00022925). A total of seven samples, 4c-(1-7) were collected in May 1989 outside the eastern portion of the foundry building, and adjacent to the locomotive building. This area was characterized having scattered piles of waste material and heavy vegetation (PAS-00023057). The maximum detected PCB concentration was Aroclor-1254 at 31 microgram per gram (µg/g) collected from soil sample 4c-4 at a depth of 0-6 inches (PAS-00023060).

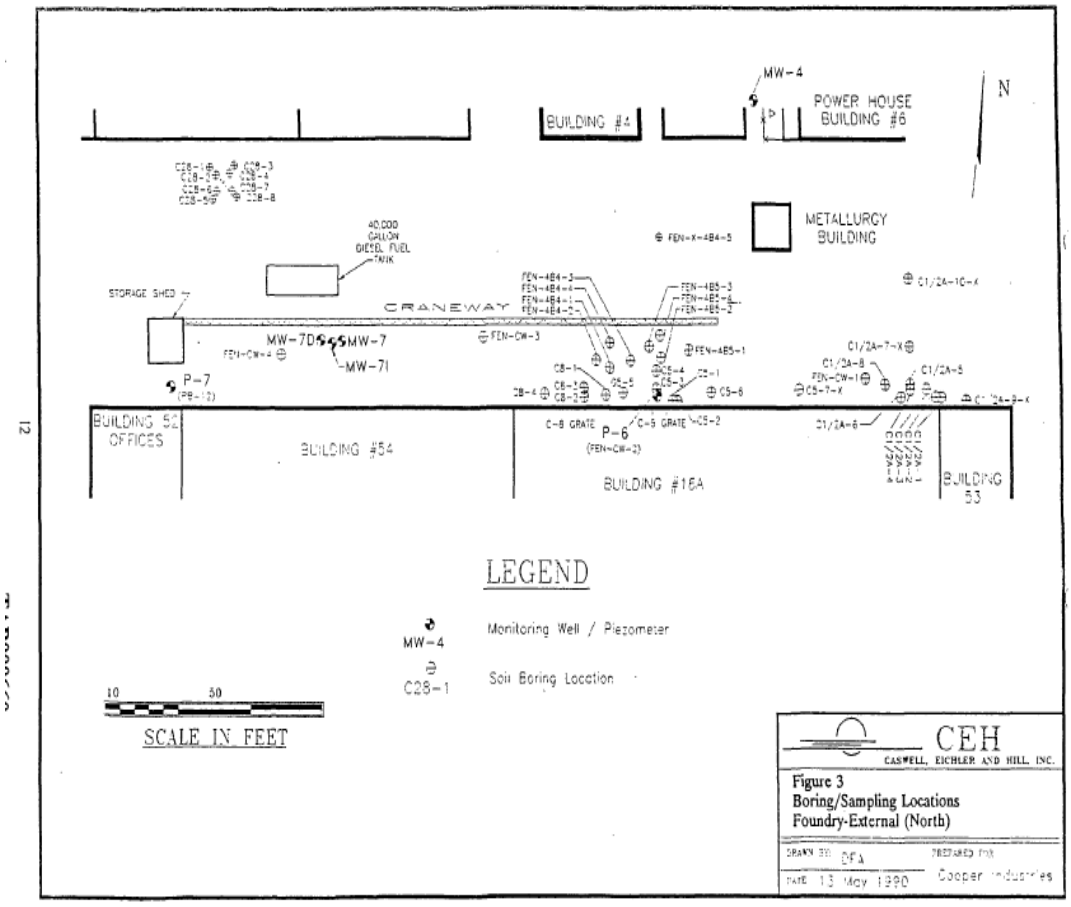
Fifty-four catch basins were located on the Dresser Facility. During the course of the field investigations conducted in May 1989, each of these catch basins was cleaned out and inspected. Sediments from the most upgradient and most downgradient catch basins were analyzed for PCBs and metals. In addition, soils adjacent to the catch basins were also collected and analyzed for metals and PCBs (PAS-00023083). The PCB, Aroclor-1254 was detected in catch basins C-33 and C-34 at concentrations of 4.4 µg/kg and 5.6 µg/kg (PAS-00023085). In addition, the PCB Aroclor-1260 was detected in soil collected adjacent to cracked basins (C-19, C-28, C-32, C-39 (duplicate), and C-48) at a maximum concentration of 19 ppm collected from catch basin (C-32) (PAS-00023089).

PAHs

Reports state that there are three 30,000 gallon underground storage tanks that contained No. 2 fuel oil (PAS-00023039) and a 200,000 gallon aboveground tank that contained No. 6 fuel oil (PAS-00023541; PAS-00122235). There may have also been an additional two 5,000 gallon underground storage tanks that contained No. 2 fuel oil. Available references do not provide specific information related to any known releases from these tanks. However, both high and low molecular weight PAHs were detected in sediment samples collected from catch basins (PAS-00023212-14).

Copper

Copper was listed as “casting” used throughout the Worthington Avenue facility on reports through 1992 (PAS-00023015). A *Monthly Status Report*, dated July 28, 1989 states that metals were detected in most soil samples at elevated concentrations with the maximum of 61,000 ppm of copper in a soil sample collected north of the foundry building in sample 4b-2 at a depth of 0-6 inches bgs in May 1989 (PAS-00023024, 61).



PAS-00023123

Copper was also detected in several sediment samples collected from selected catch basins. Copper was detected at a maximum concentration of 68,000 ppm from a sediment sample collected from a catch basin C50 on May 5, 1989 (PAS-00023086).

Lead

Lead was listed as “casting content” stored onsite (PAS-00023017). Lead may have also been present in fuel oils or gasoline stored at the Worthington Avenue facility, but testing of samples around the gasoline tanks found lead below cleanup levels with many samples listed as non-detects (PAS-00065847, 49). These tanks were located directly in front of the maintenance garage near the eastern end of the property. The tanks, pumps, and piping were excavated and cleaned according to the Tank Decommissioning Plan and consistent with the requirements of 7:26E-6.3, with sludge and remaining product drummed for disposal. Based on the post remedial soil sampling results, no further action was proposed for soil (PAS-00065843-50). As mentioned above, a *Monthly Status Report*, dated July 28, 1989 states that metals were detected in most soil samples at elevated concentrations with the maximum of 7,900 ppm of lead in a soil sample collected north of the foundry building (PAS-00023024).

Fifty-four catch basins were located on the Dresser Facility. During the course of the field investigations conducted in May 1989, each of these catch basins were cleaned out and inspected. Sediments from the most up-gradient and most down-gradient catch basins were analyzed for PCBs and metals. In addition, soils adjacent to the catch basins were also collected and analyzed for metals and PCBs (PAS-00023083). Lead was detected in sediment samples collected from catch basins (C28, C33, C34, C50, and C51) and was detected at a maximum concentration of 4900 µg/g in a sediment sample collected from catch basin C50 on May 5, 1989 (PAS-00023086). In addition, lead was also detected in soils collected outside the foundry building. Lead was detected at a maximum concentration of 7900 µg/g from sample 4b-2 at a depth of 0-6 inches bgs on May 1989 (PAS-00023061).

Mercury

Unlike copper and lead, the specific use of mercury in the pump process has not been identified. However, reports do state that the material was stored on site through 1992 in two of the manufacturing buildings and may have been used as part of the manufacturing operations (PAS-00023017). These buildings had roofs and concrete floors, and mercury was stored in a closed glass bottle or jug (PAS-00023610). In addition, unlike other metals, mercury was listed as being stored in Building 3 and 55, both of which are in the center of the Worthington facility (PAS-00022964; PAS-00023583). However, mercury was detected along the eastern property line at a maximum concentration of 35.4 µg/g from soil sample SP-2A collected at a depth of 0.5-1 feet (ft) below ground surface (bgs) in a February 1990 investigation (PAS-00023178). Mercury was also detected in other soil samples collected along the eastern property line, including the cooling tower sump and spray pond sump-1, 2, and 3 (PAS-00023178).

Surface water runoff at the Worthington Avenue facility was historically directed to the 54 catch basins located across the site, and water collected from these catch basins was discharged the PVSC (PAS-00023118).

Fifty-four catch basins were located on the Dresser Facility. During the course of the field investigations conducted in May 1989, each of these catch basins were cleaned out and inspected. Sediments from the most up-gradient and most down-gradient catch basins were analyzed for PCBs and metals. In addition, soils adjacent to the catch basins were also collected and analyzed for metals and PCBs (PAS-00023083). Mercury was detected in sediment samples collected from catch basins (C28, C33, C34, C50, and C51) and was detected at a maximum concentration of 11 µg/g in a sediment sample collected from catch basin C34 on May 5, 1989 (PAS-00023086). In addition, mercury was also detected in soils collected adjacent to the cracked catch basins and was detected at a maximum concentration of 6.20 µg/kg from sample C-40 at a depth of 1-3 feet bgs on June 16, 1989 (PAS-00023090).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00023024; PAS-00023178; PAS-00023171).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	7,900 mg/kg
Copper	61,000 mg/kg
Mercury	35.4 mg/kg
Benzo(a)anthracene	104.44 mg/kg
Benzo(a)pyrene	148 mg/kg
Benzo(b)fluoranthene	122.64 mg/kg
Benzo(k)fluoranthene	54.352 mg/kg
Dibenzo(a,h)anthracene	11.24 mg/kg
Indeno(1,2,3-cd)pyrene	21.476 mg/kg

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Sanitary Sewer

As reported in the Response to CERCLA *Section 104(e) Request Letter*, dated December 2000, Dresser during the course of its manufacturing operations did not generate process waste water which contained any hazardous substances. Dresser affirms that they did not generate any process waste water. In addition, there were no floor drains in the manufacturing or production areas of any buildings. There were floor drains in the restroom areas of certain buildings, which were connected to the sanitary sewer system operated by the Passaic Valley Sewer Authority (PVSA) (PAS-00063877).

Dresser was permitted to send non-contact cooling water to the PVSC combined sewer, along with sanitary waste (PAS-00023326-27; PAS-00022954).

Storm Sewer

There was one cooling pond located adjacent to the Worthington Avenue facility's powerhouse. There were also storm sewers which discharged to numerous catch basins located at various locations at the Worthington facility. The catch basins were connected to the sanitary sewer system operated by the PVSA (PAS-00063877). The potential pathway from the facility to OU2 was via the various catch basins at the facility which discharged to the sanitary sewer system operated by the Passaic Valley Sewer Authority (PAS-00063878). , Samples from the catch basins were collected between 1989 and 1992. Lead, copper, mercury, PCBs and PAHs were detected in catch basin sediment samples and in some instances, these concentrations were detected at levels above the cleanup levels (PAS-00023084-90, 194, 212-214, 219-27).

Historic PVSC reports state that wastes were routinely bypassed from the PVSC main interceptor to the Passaic River at the Worthington Avenue CSO overflow location during wet weather events (PAS-00023485). The overflow may have been obstructed during 1976 and 2002. A *Response to the September 11, 2006 Notice of Potential Liability for Response Actions in the Lower Passaic River* (the EPA Notice), reported that the Worthington CSO outfall pipe was obstructed when examined in 1976 and 2002 (PAS-00124468). Reports referenced in the response to the EPA Notice state that flow was unable to be measured from the Worthington CSO to the Passaic River due to blockage and provided an estimated flow (PAS-00124468). A 1976 Overflow Analysis stated that the outfall was obstructed and full of debris and a 2002 report stated that the outflow pipe was not free flowing and flow was unable to be determined (PAS-00124468).

6. Regulatory History/Enforcement Actions

Permits

The facility was authorized to discharge treated groundwater back into the ground via an injection well under NJPDES/DGW Permit No. NJ7000821 effective December 31, 1995 and expiring December 30, 2000 as part of the groundwater remediation (PAS-00023265; PAS-00023628).

Permit No. 13402044 authorized the facility to discharge directly into the PVSC sewer system (PAS-00023275) and was set to expire in June 1991.

PVSC Sewer Connection Permit No. 13402043 authorized two outlets to the PVSC system. In February of 1990, the outlet designated as 2 was closed because it was dry (PAS-00023273). By the end of 1993, the site was inactive and the Permit No. 13402043was terminated (PAS-00023279, PAS-00023325-28).

Inspections and Violations

In the CERCLA *Section 104(e)* Request Letter, dated December 2000, Dresser stated that with respect to the approximate period of 1985 to 1993 at the Worthington Avenue facility, Dresser did not recall any civil, criminal, or administrative proceeding against the company for any such type of violation (PAS-00063880).

The *Response to CERCLA Section 104(e) Supplemental Report*, dated March 2003, which is included as an attachment within the *Indirect Discharge PRP Cases Volume II*, dated July 2006, noted that during the time period of approximately 1985 to 1993, Dresser did not recall any leaks, spills, explosions, fires, or other incidents of accidental material discharge at the Worthington facility (PAS-00121840).

The *Response to CERCLA Section 104(e) Supplemental Report, dated March 2003,* also states that Dresser did not recall any flooding occurring at the Worthington facility during the time period of 1985 to 1993. In addition, Dresser did not know whether any flooding occurred at the Worthington Avenue facility prior to 1985. However, Dresser notes that some minor flooding of the property occurred in or around July 24, 1995. The minor flooding was the result of several days of heavy rain storms. Dresser did not possess any information that would document that the flooding was the result of overflow from sanitary or storm sewer backup. The minor flooding was not due to flood overflow from the Passaic River (PAS-00121841).

There is one violation citing N.J.A.C. 7:26-9.4 (g) 8 et seq. – failure to conduct semi-annual drills. 9.6(f) 4 – failure to familiarize local hospitals with properties of hazardous waste handled onsite. 9.7(a) – failure to have a written contingency plan (PAS-00122350).

7. Response Actions

The following is a list of major response action documents identified in the available file material:

- Soil Delineation Report – UST East of Spray Pond, Dresser Worthington Pump Facility, Harrison, New Jersey, dated September 1994 (PAS-00023231);
- Investigation of Harrison Baking Company's Underground Gasoline Release and Its Impact on Dresser-Worthington Facility, Harrison, New Jersey, dated July 1992 (PAS-00023244);

- FEDCO/Worthington Solvent Area Groundwater Investigation, dated May 1995 (PAS-00122270);
- Catch Basins: "Area Q" Remediation Report, Dresser Worthington Pump Facility, Harrison, New Jersey, dated September 1994 (PAS-00122574); and,
- Addendum to the Remedial Action Report, Dresser-Worthington Pump, Harrison, New Jersey, ISRA Case No. 85034, dated June 2000 (PAP-00033677).

Characterization Activities

Sewer

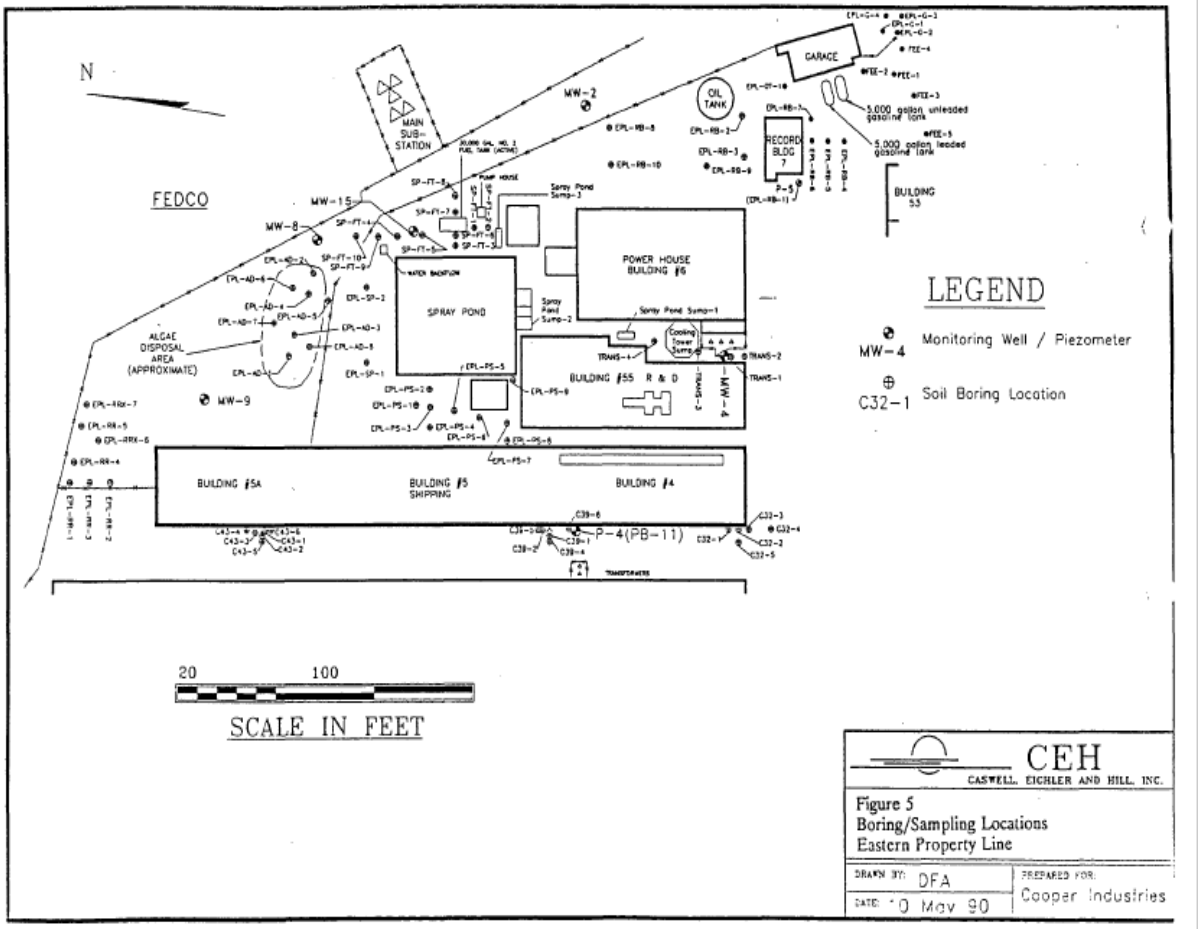
There is no information regarding sewer sampling in the available file material.

Soil

Reports state that there are three 30,000 gallon underground storage tanks that contained No. 2 fuel oil (PAS-00023039) and a 200,000 gallon aboveground tank that contained No. 6 fuel oil (PAS-00023541; PAS-00122235). There may have also been an additional two 5,000 gallon underground storage tank that contained No. 2 fuel oil. The exact amount of PAHs present in these fuel oils is unknown (PAS-00022963; PAS-00023035-36).

Site soil sampling conducted during Dresser's tenure shows the presence of the following contaminants at the levels presented below:

- Copper up to 61,000 ppm; 4B-2 (PAS-00023024)
- Lead up to 7,900 ppm; 4B-2 (PAS-00023024)
- Mercury up to 35.4 ppm; EPL-SP-2A (PAS-00023178)
- Benzo(a)pyrene up to 148 ppm; EPL-RB-5A (PAS-00023171)
- Benzo(b)fluoranthene 122 ppm; EPL-RB-5A (PAS-00023171)



PAS-00023125

Sediment

Site sediment sampling conducted during Dresser's tenure showed the presence of the following contaminants at the maximum levels as listed below (PAS-00023482):

- Benzo(a)anthracene – 0.46 ppm; Catch Basin C-40 (PAS-00023214)
- Benzo(a)pyrene – 0.047 ppm; C-40 (PAS-00023212)
- Benzo(b)fluoranthene – 1.3 ppm; C-40 (PAS-00023212)
- Dibenz(a,h)anthracene – 0.25 ppm; C-40 (PAS-00023212)
- Indeno(1,2,3-cd)pyrene – 0.87 ppm; C-40 (PAS-00023212)
- Lead – 4,900 ppm; C-50 (PAS-00023086)
- Mercury – 11 ppm; C-34 (PAS-00023086)

8. Summary of Asserted Defenses

No legal defenses were identified in the available documents.

Drum Services of Newark, Inc.

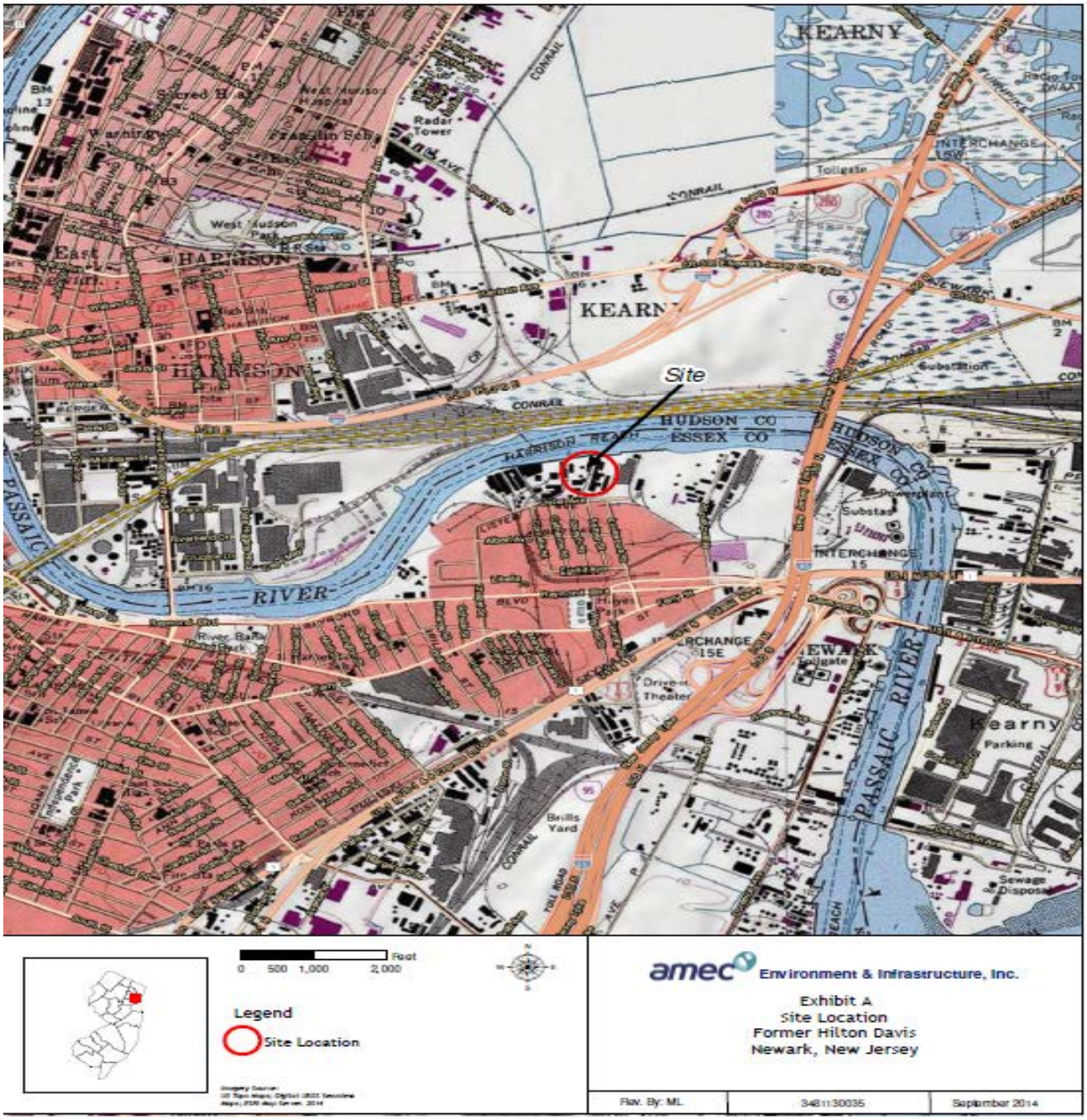
Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

DRUM SERVICES OF NEWARK, INC.

Facility Name, Address and Size: Drum Services of Newark, Inc., (Drum Services); 120 Lister Avenue, Newark, New Jersey; 2.2 acres (PAS-00107863; PAS-00125787). The approximate location of the facility and its proximity to the Passaic River is shown in the map below.



(PAP-00195021)

Drum Services of Newark, Inc.

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Facility Data Report

1. **Business Type:** Drum refurbishing (PAP-00026394).

2. **Time Period of Ownership/Operations**

   Operator: May 1997 – approximately 2004
   Owner: May 1997 – 2008 (PAS-00055188-189; PAP-00057514).

   A *Supplemental Remedial Investigation Report (RIR)* states that in May 1996, Hilton-Davis ceased operations, and the property was sold to Drum Services in May 1997. From May 1997 to approximately 2004, Drum Services washed and painted steel drums for resale or crushed drums for recycling. Historical aerial photograph review indicated that a change in site use to tractor-trailer parking had occurred by 2006 (PAP-00057514). The current owner, Sydney Equities, LLC acquired the site in 2008 (PAP-00057514).

3. **Operational History/COC Use and Presence at the Facility**

   In May 1996, Hilton-Davis ceased operations at the facility. The property was sold to Drum Services in May 1997. The site had a brief period of vacancy between May 1996 and May 1997 (PAS-00055188-189; PAP-00057514).

   From May 1997 to approximately 2004, Drum Services washed and painted steel drums for resale or crushed drums for recycling (PAP-00057514). A NJDEP Site Inspection Report (May 17, 2001) conducted under ISRA Case No. E86941, states that Drum Service was a drum refurbishing company that washed and painted drums for resale or alternatively crushed and discarded drums (PAP-00026394).

   A Passaic Valley Sewer Commission (PVSC) Industrial Inventory shows that Drum Services at 104 Lister Avenue reconditioned steel drums and was deleted from the Inventory within the period of August 1, 2003 to July 31, 2004 (PAP-00097504). A Third Party Complaint notes that 120 Lister Avenue is also referred to as 104-12 Lister Avenue (PAP-00165397).

   Historical aerial photograph review indicated that a change in site use to tractor-trailer parking had occurred by 2006. The current owner, Sydney Equities, LLC acquired the site in 2008 (PAP-00057514).

4. **Identified COCs**

   There is no information regarding COCs in the available file material.

   Historic Fill

   The June 28, 1996, Deed Notice for the Facility includes Historic Fill PAHs and lead (PAP-00194956-972).

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

There is no information regarding fill materials in the available file material.

5. COC Pathways

No information was found in the available records regarding COC pathways during operation of the site by Drum Services. However, wastewater would have been generated in the process of washing drums and it likely would have included residues from whatever the drums contained.

6. Regulatory History/Enforcement Actions

Permits

No permits for Drum Services were identified in the available records. It should be noted that the facility was under a sewer use permit (No. 20402690) from May 15, 1981 through May 15, 1986 for discharge of effluent to PVSC. This permit was renewed by PVSC effective May 27, 1986 for five years (PAS-00002721). However, available references did not include copies of the permit indicating flow rate limitations and effluent monitoring requirements.

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Violations

Drum Services is listed as a company that was issued fines from PVSC during the August 1, 1997 to July 31, 1998; August 1, 1998 to July 31, 1999 and the August 1, 2000 to July 31, 2001 time periods (PAS-00017752; PAS-00021364). No additional information was provided in the files reviewed.

7. Response Actions

Available references did not provide information indicating whether Drum Services has ever been required to undertake Industrial Site Recovery Act (ISRA) or Environmental Cleanup Responsibility Act (ECRA) compliance activities.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

ELAN CHEMICAL CO., INC.

Facility Name, Address and Size: Elan Chemical Co., Inc.; 268 Doremus Avenue, Newark, New Jersey; approximately 4 acres (PAP-00115558; PAS-00061331); In 1979, 62 employees working 5 days per week, 3 shifts per day (PAS-00014534).

1. **Business Type:** Development and manufacturing of food additives, flavorings, and ingredients for the food and beverage industry, and specialty chemicals (PAP-00115780; PAS-00061331).

2. **Time Period of Ownership/Operations**

Operator: December 30, 1977 to present
Owner: 1977/1983 to present (various lots as noted below)

1968: Elan Chemical Company, a Connecticut company (Elan-Conn), acquired the site from Essex Chemical Company in 1968.[1] (PAS-00059896-97; PAP-00115559; PAP-00115958)

1977: In September 1977, Felton International, Inc. organized the present Elan Chemical Company, Inc. (Elan) as a New Jersey subsidiary for the purpose of acquiring Elan-Conn. Elan acquired the main parcel of 268 Doremus Avenue from the New Jersey Economic Development Authority on December 30, 1977. Elan thereafter began its operations at the property (PAS-00059886, 96-97, 904; PAP-00115559).

[1] According to Elan's Response to EPA's Request for Information, in May 1964 a corporation under the name Elan Chemical Company ("Elan-Conn") was incorporated under the laws of the State of Connecticut. Elan-Conn acquired the assets of another chemical company in 1964 and commenced business operations as a manufacturer of chemicals in Springdale, Connecticut. In 1968, Elan-Conn qualified to do business in New Jersey and began operating at the Doremus Avenue site. In 1971, the owners of Elan-Conn, via a tax-free "F Reorganization," organized a New Jersey corporation and liquidated Elan-Conn into the new New Jersey corporation. The effect of this reorganization was to convert Elan-Conn from a Connecticut corporation into a New Jersey Corporation ("Old Elan-NJ").
In September 1977, Felton International, Inc. ("FII"), a New York corporation doing business in Brooklyn, organized the present Elan Chemical Company, Inc. ("Present Elan") as a New Jersey subsidiary for the purpose of acquiring Old Elan-NJ from its then-owners, Messrs. Herbert Halpern, Herman Kaplan and Harold Kwart. The acquisition was effected via a complex transaction designed to provide for the availability of New Jersey Economic Development Authority ("E.D.A.") financing for a portion of the assets to be acquired. Present Elan was originally incorporated by FII under the name Elan Acquisition Corporation. The acquisition transaction was comprised of a series of steps, which were all concluded on the same day:
1. First, Elan Acquisition Corporation (as a subsidiary of FII) purchased 56% of the shares of Old Elan-NJ and the E.D.A. purchased the remaining 44% of the shares. E.D.A. paid for its shares by issuing E.D.A. bonds to the sellers.
2. Then, Elan Acquisition Corporation and E.D.A. immediately liquidated Old Elan-NJ, with the real estate and tangible depreciable assets of Old Elan-NJ being distributed to E.D.A. and the remaining assets of Old Elan-NJ being distributed to Elan Acquisition Corporation.
3. Then, all of the real estate and tangible depreciable property received by E.D.A. on the liquidation was sold to Elan Acquisition Corporation for an amount equal to the face amount of the E.D.A. bonds issued to the sellers.
4. Elan Acquisition Corporation, after the foregoing series of steps, acquired all of the assets of Old Elan-NJ, and the sellers held E.D.A. bonds having a value equal to the value of the corporation's real estate and tangible depreciable property.
5. Elan Acquisition Corporation then changed its name to Elan Chemical Company, Inc. (referred to above as Present Elan). (PAS-00059896-97).

1983: On April 24, 1983, Elan acquired a second parcel from Consolidated Rail Corporation. Since 1983, the Elan facility has consisted of both parcels of property that currently make up 268 Doremus Avenue (PAS-00059886, 909; PAP-00115559).

It is noted that the property also contains an approximately 12,000-square-foot building formerly leased by Natural Flavors, Inc., which lies in the northeast corner of the site and consists of a single-story warehouse and production facility. Natural Flavors, Inc. was a flavor compounding facility that leased the facility from January 1986 to January 2019. (PAP-00115916).

3. Operational History/COC Use and Presence at the Facility

The facility is used for the development and manufacturing of food flavor ingredients, and other aromatic chemicals. Various catalysts and processing aids are typically utilized in the manufacturing process (PAS-00059887).

According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, the property is improved with a variety of structures which include office space, warehouses, processing facilities, aboveground storage tank farms within concrete-lined and walled secondary containment, a site water treatment facility, site runoff management floor drains and sumps with associated hoses and overhead piping, as well as material storage drum racks, and shipping and receiving areas (PAP-00115916).

The manufacturing process is a batch process and typically consists of three major steps:

1. Reaction: During the reaction step the raw materials, catalysts and processing aids (solvents, etc.) are loaded into a reactor. Typically, heat is applied for a period of time during which the reaction mixture is agitated.

2. Washing: At the end of the reaction step the reaction mixture is typically washed with water or a mildly caustic solution to remove the un-reacted acids. This is accomplished in the reactor or a wash tank.

3. Purification: Purification is typically achieved by vacuum distillation. During this step the solvents and unreacted raw materials are removed from the reaction mixture, thereby isolating the finished product. This is accomplished in specially equipped distillation stills. The recovered solvents are reused until they are degraded. After purification, the finished product is drummed and shipped to customers (PAS-00059887).

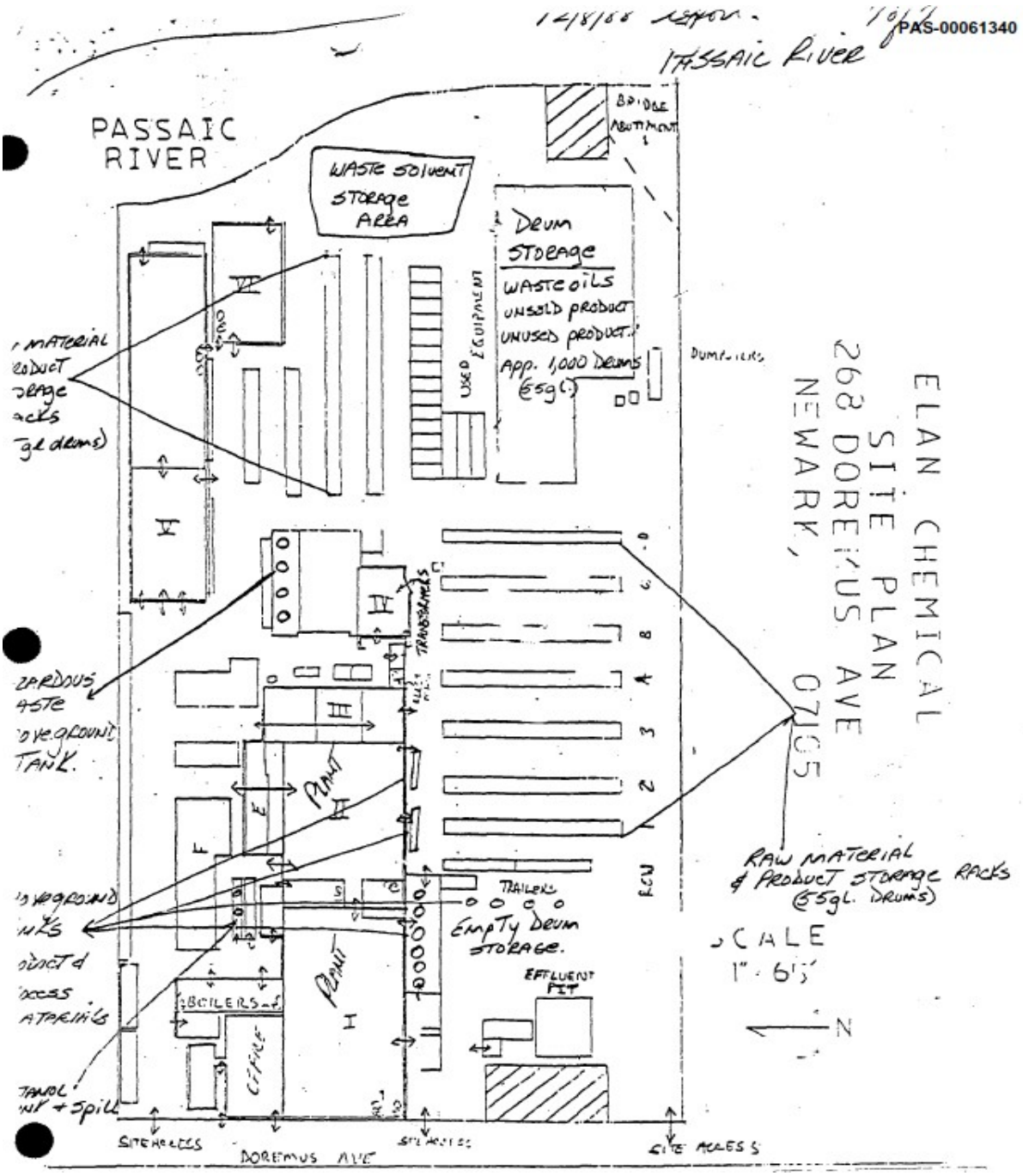
Based on review of Elan's raw materials list included in their Response to Environmental Protection Agency Request for Information, dated February 16, 1995, with the exception of copper, no OU2 COCs are used in production (PAS-00059971-81).

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Elan used copper shot and copper chromite from approximately 2002 to 2006. Copper was used solely as a structural component (reactor vessel body) for its heat transfer characteristics and chemical compatibility (catalyst). When the copper was no longer usable as a catalyst in the manufacturing process, it was sold as copper scrap. Copper powder has also been used in small amounts for research and stored in Elan's laboratory. The copper compounds are all in solid form (PAS-00059973).

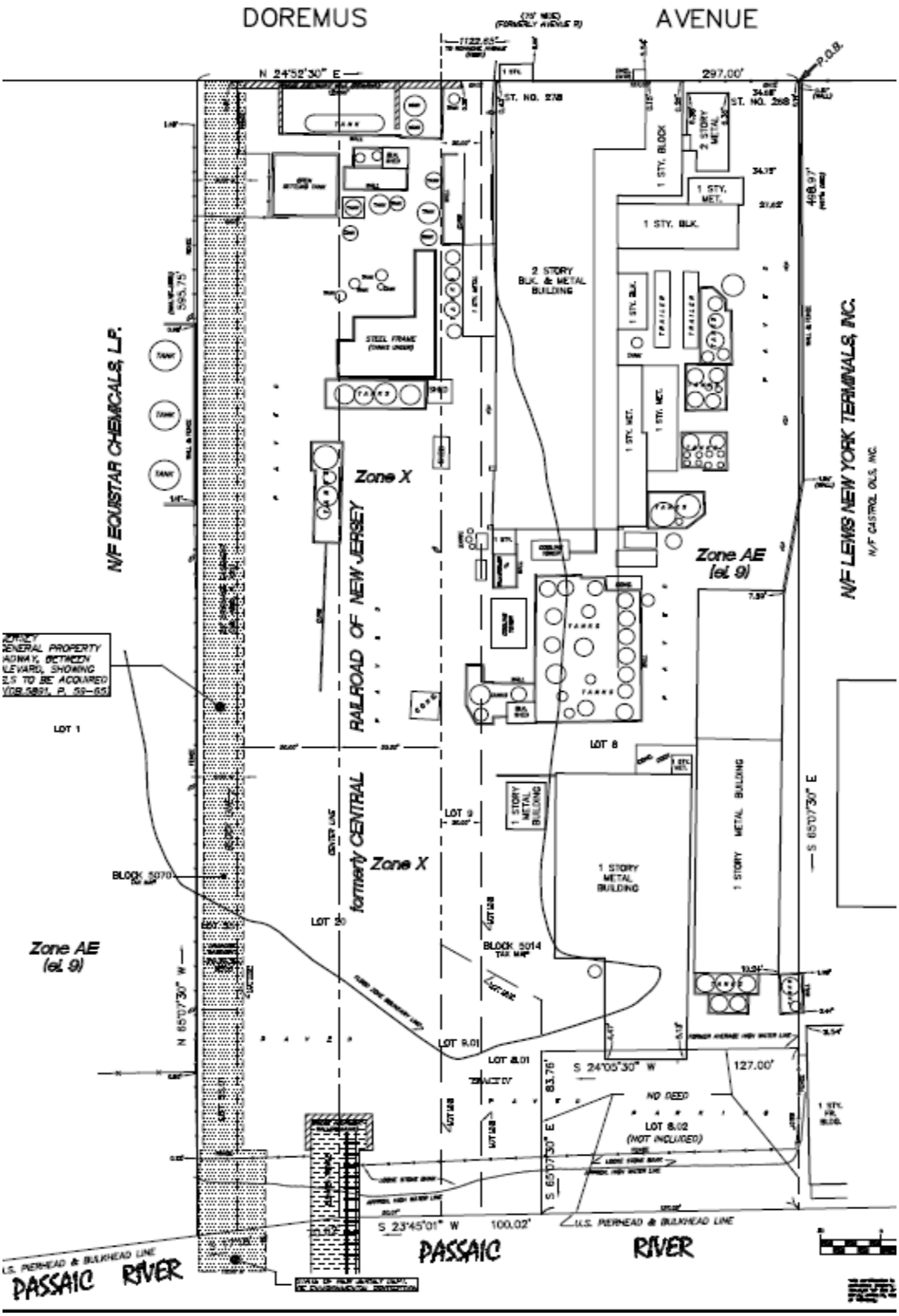
An historical facility layout is depicted below (PAS-00061340):



Elan Chemical Co. Inc.

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The current facility layout is depicted below (PAP-00445831):



4. Identified COCs

- PAHs (used, detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

PAHs

According to a Community Right to Know Survey for 2014, the facility used diesel oil or No. 2 heating oil in the maintenance shop. A maximum daily inventory of 1,000 to 2,499 pounds was listed as being present (PAP-00115718).

According to a Community Right to Know Survey for 2015, the facility used diesel oil or No. 2 heating oil in the maintenance shop. A maximum daily inventory of 500 to 999 pounds was listed as being present (PAP-00115706).

According to a Community Right to Know Survey for 2017, the facility used diesel oil or No. 2 heating oil in the maintenance shop. A maximum daily inventory of 100 to 499 pounds was listed as being present (PAP-00115692).

PAHs were detected in soil as discussed in Section 7 below. According to a deed notice filed for the site on June 7, 2018, concentrations of PAHs at the site are typical of that in historic fill (PAP-00433512).

Copper

Elan used copper shot and copper chromite from approximately 2002 to 2006. Copper was used as a structural component (reactor vessel body) for its heat transfer characteristics and chemical compatibility (catalyst). When the copper was no longer usable as a catalyst in the manufacturing process, it was sold as copper scrap. Copper powder has also been used in small amounts for research and stored in Elan's laboratory since 1977. The copper compounds are all in solid form (PAS-00059973).

In 1979, copper was reported in wastewater at a concentration of 0.741 milligrams per liter (mg/L) (PAS-00014539).

In addition, copper was detected in soil at the site as discussed in Section 7 below. According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, previous environmental reports from 1992 and 2001 confirmed the presence of fill containing metals on the property (PAP-00115938).

Lead

There is no information regarding lead use by the facility in the available file material. However, in 1979, lead was reported in wastewater at a concentration of 0.111 mg/L (PAS-00014539).

In addition, lead was detected in soil at the site as discussed in Section 7 below. According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, previous environmental reports from 1992 and 2001 confirmed the presence of fill containing metals on the property (PAP-00115938).

Mercury

There is no information regarding mercury use by the facility in the available file material. However, mercury was detected in soil at the site as discussed in Section 7 below. According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, previous environmental reports from 1992 and 2001 confirmed the presence of fill containing metals on the property (PAP-00115938).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[2]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[3] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[4] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[5]

According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, previous environmental reports from 1992 and 2001 confirmed the presence of fill on the property (PAP-00115938). According to a deed notice filed for the site on June 7, 2018, concentrations of PAHs at the site are typical of that in historic fill (PAP-00433512).

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[2] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[3] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[4] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[5] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00060200; PAP-00115569).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,120 mg/kg
Copper	1,370 mg/kg
Mercury	2.07 mg/kg
Benzo(a)anthracene	17.1 mg/kg
Benzo(a)pyrene	21.6 mg/kg
Benzo(b)fluoranthene	21.9 mg/kg
Benzo(k)fluoranthene	17.8 mg/kg

5. COC Pathways

According to a *Stormwater Pollution Prevention Plan* dated May 2014, in the general region in which Elan is located, precipitation runoff generally runs to the Passaic River, to the east. Elan is located adjacent to the west bank of the Passaic River (PAP-00433517). As stated below, precipitation runoff (stormwater) is retained on-site within secondary and tertiary containment, and remains within the facility's drains, catch basins, sumps, trenches, and underground conduits unless it is pumped by manual activation of pump controls to the facility's physical wastewater pretreatment unit for conveyance to an off-site industrial wastewater treatment plant (PAP-00433517-18).

Sanitary Sewer

Wastewater Discharges

According to Elan's Response to Environmental Protection Agency Request for Information, dated February 16, 1995, since at least 1977, the date of Elan's organization, the process wastewater stream from the facility has been connected to a sanitary sewer system (PAS-00059890).

In December 1979, Elan filed a Passaic Valley Sewerage Commission (PVSC) Sewer Application Permit. According to the permit, wastewater discharge was continuous over a 24-hour period, and wastewater was discharged to the sanitary sewer only. In 1979, no pretreatment was required (PAS-00014536).

Historically, the manufacturing effluent discharged into a cistern on the north side of the property and then directly to the PVSC system until approximately 1985, according to the *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016. In 1985, Elan installed a separate pre-treatment facility for the manufacturing effluent. The former effluent conveyance pipe was sealed in 1985, and the cistern tank was filled with sand (PAP-00115933; PAS-00061127).

From 1986 through approximately December 1991, the pretreatment process consisted of aeration and pH adjustment. In January 1992, extraction with "Isopar H" to remove organics was added to the pretreatment process (PAS-00059890).

According to the *Stormwater Pollution Prevention Plan* dated May 2014, sanitary and industrial wastewater related to facility operations are collected within the facility and are conveyed to the facility's wastewater pre-treatment unit, which then discharges to a sewer that transports this wastewater to a permitted off-site wastewater treatment plant. The document states there are no discharges of non-stormwater to surface waters, or to groundwater at Elan (PAP-00433518).

The *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, also states that runoff from facility operations is treated in the on-site effluent sump, which is part of the wastewater treatment system which Elan operates (PAP-00115932). It goes on to state the facility has an "extensive" network of concrete-lined surface drains and sumps which collect process spillage, precipitation, and wash down liquids which are conveyed by pumps through hoses or aboveground piping to a concrete-lined effluent sump where the water is tested, treated, and then discharged to the sanitary sewer system. The document states that Elan maintains a New Jersey Pollution Discharge Elimination System (NJDPES) permit to operate the on-site treatment system (PAP-00115931).

Stormwater Discharges

During an inspection of Elan by the NJDEP in December 1988, inspectors noted all drains, internal floor and outside stormwater, are connected to an effluent pit located on the southwest corner of the property. The effluent pit generates a discharge to PVSC (PAS-00061336).

According to a letter prepared by legal counsel for Elan, dated August 5, 1992, in 1992, a new sump was installed in the northeast portion of the site to collect stormwater runoff. The letter states the sump would be connected with "an existing line" which, since 1985, had routed stormwater runoff through the on-site pre-treatment facility prior to discharge to the PVSC system. The letter states that a surface drain which collects stormwater runoff also is located in approximately the center of the property (PAS-00061126-27).

According to the *Stormwater Pollution Prevention Plan* dated May 2014, the facility includes a discharge valve located in a drain at the northeast corner of the facility that is capable of conveying stormwater to the Passaic River. However, the document states this drain is in the locked position at all times and is not used for any stormwater discharge. The document states stormwater is retained on-site within secondary and tertiary containment, and remains within the facility's drains, catch basins, sumps, trenches, and underground conduits unless it is pumped by manual activation of pump controls to the facility's physical wastewater pretreatment unit for conveyance to an off-site industrial wastewater treatment plant. If accumulated stormwater needs to be removed from any point from Elan's facility, it is only pumped to the wastewater pretreatment unit after "it is first checked and verified to be free of oil and hazardous substance spillage." Pumps at drainage collection points are activated only manually to direct accumulated stormwater to Elan's on-site pre-treatment system prior to discharge to the PVSC industrial wastewater treatment system (PAP-00433517-18).

Direct Release

A December 1988 NJDEP inspection report states that though "there is not a point source discharge for Elan into the Passaic River… there is a possibility that surface runoff discharges into the Passaic River" (PAS-00061351). A prior December 1988 NJDEP inspection noted no evidence of discharge along the Passaic River bank (PAS-00061337).

As noted above, according to a *Stormwater Pollution Prevention Plan* dated May 2014, the facility includes a discharge valve located in a drain at the northeast corner of the facility that is capable of conveying stormwater to the Passaic River. However, the document states this drain is in the locked position at all times and is not used for any stormwater discharge (PAP-00433517-18).

According to a letter prepared by Elan's legal counsel, dated July 10, 2017, a NJDEP inspection report dated June 14, 1990, documented a six-inch discharge pipe running from the Elan property directly into the Passaic River. The letter states that the property containing the pipe was not purchased until 1983 and was purchased from Consolidated Rail Corporation. It states that this pipe was never used by Elan and was neither connected to any Elan operation nor was this pipe used by Elan for stormwater control or discharge (PAS-00049352-53).

Spills

According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, a potential release was investigated in 1992 at a drum storage area on site. Impacts of "organic compounds" identified in the area were attributed to historical fill and resolved by installing an impermeable cap within the drum storage area. The presence of historical fill was confirmed in 1992 and 2001 (PAP-00115928, 38). Sampling data for the drum storage area is discussed in Section 7 below.

Floods

According to Elan's Response to Environmental Protection Agency Request for Information, dated February 16, 1995, on November 8, 1993, the facility was flooded by overflow from the Passaic River. The flood lasted approximately 5 hours. On December 11, 1992, the facility was flooded by overflow from the sanitary sewer system and overflow from the Passaic River. The facility was flooded for 3 days. In January 1988, the facility was flooded by the overflow from the Passaic River. The facility was flooded for 6 hours (PAS-00059892). It is not stated whether these floods resulted in the discharge of OU2 COCs from the facility to the Passaic River.

6. Regulatory History/Enforcement Actions

Inspections

During an inspection of Elan by the NJDEP in December 1988, inspectors noted that a drum storage area was sloped down into drainage depressions, which flowed to the Passaic River. The drum storage area contained approximately 1,000 drums of waste

oils, unused materials, and unsold product. Oil was observed to be leaking from the drums and evidence was found of past spills of other materials in the area. The inspection report states that "It is likely that contaminants on the ground surface reach the depression." It also states that "It should be noted that evidence (visual) depicting this scenario could not be seen along the river bank" (PAS-00061334-37).

The inspection also states that all drains, internal floor and outside stormwater, are connected to an effluent pit located on the southwest corner of the property. The effluent pit generates a discharge to PVSC (PAS-00061336). It is unclear if OU2 COCs were associated with the leaking drums. According to a figure in a NJDEP inspection report, the drums contained unsold and unused product and waste oils (PAS-00061340).

Violations

According to Elan's Response to Environmental Protection Agency Request for Information, dated February 16, 1995, on January 5, 1994, the PVSC filed suit against Elan alleging that Elan discharged pollutants in excess of the discharge limitations of its PVSC Permit No. 20403242 (PAS-00059893, PAS-00060847 et seq.). No OU2 COCs were alleged to be associated with these discharges (PAS-00060849-50).

Permits

Wastewater

In December 1979, Elan filed a PVSC Sewer Application Permit. According to the permit, wastewater discharge was continuous over a 24-hour period, and wastewater was discharged to the sanitary sewer only. In 1979, no pretreatment occurred or was required (PAS-00014536). Wastewater was discharged via one outlet and daily flow was reported to be 126,000 gallons per day (PAS-00014537). In 1979, copper was reported in wastewater at a concentration of 0.741 mg/L and lead was reported at a concentration of 0.111 mg/L (PAS-00014539).

Elan was first issued PVSC Sewer Connection Permit No. 20403240 on April 14, 1981. Elan was also issued a PVSC Sewer User Permit No. 20200064 beginning in 2001. The permit was renewed through present day. The permits apply to the same discharge point (PAS-00059952-64, 937-51, 922-36; PAP-00206026-69, PAP-00115739-60). Elan was required to monitor the discharges for lead with a maximum daily limitation of 690 and a maximum monthly average limitation of 320 (concentration units were not listed in the cited document) (PAS-00059926-30).

In 2016, a maximum daily discharge limit for copper was listed in the PVSC permit as 3.98 mg/L, and for mercury as 0.06 mg/L (PAP-00115746). Lead was listed at a maximum of 690 µg/L (PAP-00115748). The permit also states that Elan was permitted to discharge 0.089 million gallons per day (PAP-00115742).
According to a *Phase I Environmental Assessment*, dated October 1992, the facility discharged between 60,000 to 70,000 gallons/day of treated wastewater (PAS-00061069).

Stormwater

According to a *Stormwater Pollution Prevention Plan* dated May 2014, Elan has a Basic Industrial Stormwater General Permit (No. NJ0088315), which became effective February 1, 2013. The permit governs the discharge of any stormwater from the Elan site to surface water and groundwater (PAP-00433517). The permit was renewed on February 1, 2018 (PAP-00115831). No monitoring for OU2 COCs was required under the permit (PAP-00115836-48).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- *Sampling Results Report*, dated April 1, 1992 (PAS-00060189);
- *Remedial Action Report*, dated June 2018 (PAP-00115556).
- *Response Action Outcome*, dated January 2020 (PAP-00445864)

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

According to Elan's Response to Environmental Protection Agency Request for Information, dated February 16, 1995, in or about the summer of 1989, certain drums (some determined to contain hazardous substances) stored in a then-unpaved gravel area of the property, were determined by the NJDEP to have corroded and leaked. NJDEP required a delineation of the contamination in this area (PAS-00059891-92).

According to a letter prepared by Elan's legal counsel, on July 26, 1990, NJDEP conducted a site inspection, and recommended that Elan conduct pre-excavation sampling to determine whether areas of soil staining were contaminated with hazardous or toxic substances. On December 11, 1990, an initial soil sample was collected from the zero to six-inch interval biased toward the most visually contaminated area (PAS-00060168-69). PAHs and metals were detected as follows:

- Chrysene – 14,300 J µg/kg
- Benzo(a)pyrene – 3,900 J µg/kg
- Indeno(1,2,3-cd)pyrene – 3,180 J µg/kg
- Copper – 137 mg/kg
- Lead – 935 mg/kg
- Mercury 2.07 mg/kg (PAS-00060175, 79).

According to a *Sampling Results Report*, dated April 1, 1992, soil samples were collected on March 25, 1991, to screen three visually stained areas at the former drum storage area for contamination. Samples were collected from 1.5 to two feet below ground surface (PAS-00060191, 94). Mercury was detected at a maximum concentration of 1,130 µg/kg (PAS-00060199). PAHs (in units of µg/kg) were detected at the following maximum concentrations in a background sample collected at zero to six inches as follows (PAS-00060200):

Benzo (a) anthracene	17100
Chrysene	16400
Benzo (b) fluoranthene	21900
Benzo (k) fluoranthene	17800
Benzo (a)pyrene	21600
Indeno (1,2,3-cd) pyrene	ND
Benzo (a,h) anthracene	ND

According to the report, Elan's consultant concluded that PAH detections in the former drum storage area were characteristic of the poor quality urban fill material used to reclaim the land from the former tidal marsh that the site is located on. In addition, ash, cinders, and decomposed brick were observed throughout the borings as in the previous sampling episode (PAS-00060195-96).

According to the *Remedial Action Report*, dated June 2018, the following maximum concentrations of copper and lead were detected in surface soil in the drum storage area (the PAH data reported are the same as those discussed in the paragraph above):

- Copper – 1,120 mg/kg
- Lead – 1,370 mg/kg (PAP-00115569).

Remedial Activities

A letter report summarizing results of soil sampling of the former drum storage area described above was sent to NJDEP on April 2, 1992 (PAS-00060762). Following the sampling, a Memorandum of Agreement was executed between Elan and NJDEP on August 8, 1992, requiring that the area of the former drum storage area be capped with asphalt (PAP-00115562). According to correspondence between Elan and NJDEP dated January 6, 1993, Elan had capped the property and requested that NJDEP terminate the Memorandum of Agreement (PAP-00115565; PAS-00060777).

A *Remedial Action Report*, dated June 2018, was prepared to support a restricted use, NJDEP "Area of Concern Response Action Outcome" for the drum storage area. The report addressed soil in the former drum storage area containing PAHs at concentrations greater than NJDEP Residential and Non-Residential Soil Remediation Standards. The report provided the basis to establish a site-wide deed notice with remedial action permit for historic fill (PAP-00115558). According to the report, the Passaic River is less than 100 feet from the former drum storage area, but the former drum storage area has not impacted Passaic River due to its "relatively low PAH concentrations, which are typical of historic fill," as well as the fact that the drum storage area had been capped (asphalt cover) since 1992. The remainder of the Elan property also is covered by buildings, asphalt, or concrete pavement (PAP-00115565).

According to a deed notice filed for the site on June 7, 2018, soil at the site contains concentrations of PAHs [namely benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene] at concentrations above the New Jersey Department of Environmental Protection Residential Direct Contact Soil Cleanup Criteria. It states that concentrations of contaminants of concern are typical of fill. In addition, it notes that soil impacted with lead in the drum storage area had been removed as a part of asphalt placement. Finally, it notes the site is completely covered with building foundations and asphalt, both of which will act as the engineering control for this area (PAP-00433512). A NJDEP Soil Remedial Action Permit was subsequently issued for the site on April 25, 2019, which establishes the monitoring and maintenance requirements for the engineering control described in the deed notice (PAP-00433487).

8. Summary of Asserted Defenses

CERCLA. 42 U.S.C. §9607(j) prohibits recovery for CERCLA response costs or damages resulting from federally permitted releases. All wastewater discharges from the Elan Facility were federally permitted discharges pursuant to valid permits (i.e. PVSC, Stormwater, etc.).

With respect to PAHs, should there be any allegations of a discharge, which there was not, Elan asserts the petroleum exclusion would exempt all PAHs alleged to be found at Elan's facility. 42 U.S.C. § 9601(14).

EnPro Holdings

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

ENPRO HOLDINGS, INC

Facility Name, Address and Size: EnPro Holdings, Inc., previously known as Colt Industries Inc. and Coltec Industries Inc., which has assumed liability for Crucible Steel Corporation (Crucible Steel). There are two properties formerly owned and operated by Crucible Steel: 1) the western property located at 900-1000 South Fourth Street (now known as Frank E. Rogers Boulevard), Harrison, New Jersey, known as the Guyon property, and 2) the eastern property located at 600 Cape May Street, Harrison, New Jersey, known as the Spiegel property.

The Guyon and Spiegel properties are approximately 48 acres and 14.84 acres, respectively (PAP-00031286; PAP-00030677). There was a roadway approximately 50 feet wide and an open area approximately 75 feet wide separating the properties and the Passaic River (PAS-00083092). Crucible Steel employed 13,000 workers at the properties during World War II, which was reduced to 950 workers post-World War II. An additional reduction to 244 workers occurred during the period between 1960 and 1970 (PAP-00027916).

1. **Business Type:** Steel manufacturing and arms production (PAP-00028062).

2. **Time Period of Ownership/Operations**

Operator: Guyon property – July 25, 1900 to 1947; Spiegel property – 1938 to May 30, 1973

Owner: Guyon property – July 25, 1900 to 1947 and 1967; Spiegel property – July 25, 1900 to April 9, 1974

1900: Crucible Steel acquired the property in 1900 as part of the merger transaction that created Crucible Steel. Crucible Steel acquired additional property over time, including 20 acres in 1917. Crucible Steel operated Atha Works steel mill at the Guyon property from 1900 until 1947 (PAP-00361904).

1938: Crucible Steel operated the British Shell Shop during World War II on the Spiegel property (PAP-00361904).

1947 and 1967: Crucible Steel sold 38 acres of the Guyon property to Charles F. Guyon, Inc. in 1947 and sold the additional 7 acres to Charles F. Guyon, Inc. in 1967 (PAP-00027918).

1949 - 1973/1974: Crucible Steel operated its Spaulding Works steel rolling mill at the Spiegel property (PAS-00048071).

1974: Crucible Steel sold the Spiegel property to Spiegel Trucking, Inc. (PAP-00027917-18).

1999: On July 12, 1999, BFGoodrich completed a merger with Coltec Industries, Inc. by exchanging 35.5 million shares of BFGoodrich common stock for all of the common stock of Coltec Industries Inc. (PAS-00129265-66).

2007 - 2012: The Harrison Redevelopment Agency conducted demolition and remediation concurrently at the Spiegel property (PAP-00030699).

2016: Coltec Industries, Inc. underwent internal corporate restructuring on December 31, 2016, that resulted in the transfer of assets and certain liabilities and obligations to a newly formed entity, EnPro Holdings, LLC and a merger of Coltec Industries Inc. with OldCo, LLC (PAS-00048491-92).

3. Operational History/COC Use and Presence at the Facility

Guyon Property

Structures/activities at the Guyon property under Crucible Steel ownership/operations included furnaces (crucible, open hearth, electric arc, heat treating, annealing, and tempering furnaces), mills (rolling mills, bar mills, a wire rod mill, and a billet mill), presses (hydraulic and hydraulic forging, drawing, and piercing presses), hammers (steam hammers and a hammer shop involving forging and finishing hammers), upsetting and forging machines, foundry equipment, a forge shop, a warehouse, a low pressure turbine system, an inter-mill railroad line, a steel pickling plant, a chipping building, a machine shop, a gun barrel shop, a tin shop, a treating building, a pipe cutting and fitting building, a hydraulic plant, a substation, an ordnance shop, a locomotive and machine repair shop, a magnet foundry, storage buildings, a reservoir, above-ground oil storage tanks, an offices and laboratories building, and a research building (PAS-00048071). According to the *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001, there was a 10-inch oil pipeline along the eastern portion of the Guyon property based on the 1950 Sanborn Fire Insurance Map (PAP-00027960).

The 1943 Moody's Manual of Investments stated that the Atha Works (which was located on the Guyon property) included seven Heroult arc-type electric furnaces and one induction-type electric furnace (180,000 net tons of ingots); 11 forging and finishing hammers (1 ton to 8 tons); 15 steam hydraulic and hydraulic forging, drawing, and piercing presses (120 tons to 2,000 tons); four bar mills; one wire rod mill; one billet mill; heat treating and annealing furnaces; upsetting and forging machines; foundry equipment; machine tools; and, other finishing and incidental equipment. Finished products included bars, rods, forgings, etc. and ordnance materials (PAP-00028034).

According to the *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001, site plans were destroyed over the years, so little information is available regarding the site plans and facilities during the ownership/operation by Crucible Steel (PAP-00027961). However, the following information regarding site features for the Guyon property was available in the file material:

- A small reservoir or tank was located in the eastern-central portion of the Guyon property during 1940. Three small vertical tanks were also located in this area during this timeframe (PAP-00028017).

- A drainage outlet into the river was located in the southeast corner of the Guyon property, but no surface drainage leads to this area, and a retaining wall separates the outlet from the rest of the property. The drainage outlet may be a sewer or other underground liquid outlet (PAP-00028017).

- An area of disturbed ground and piles of unidentified material extended from the retaining wall to the southeast and into the river (PAP-00028017).

- A small complex of horizontal tanks was located east of South Fourth Street, just north of the river (PAP-00028017).

The buildings at the Guyon property have had many different occupants in the 50 years prior to 2013, and were used mostly for metal and plastics manufacturing (PAP-00030251).

Spiegel Property

Structures/activities at the Spiegel property under Crucible Steel ownership/operations included production of ordnance for the British government at the British Shell Shop starting in 1938, including barrels for large cannon, shells for such cannons, submarine periscope tubes, torpedo launching tubes, and rifle barrel steel. Metal working as Spaulding Works starting in 1949, producing cold rolled alloy, stainless, and high carbon steel specialties, including magnets, precision castings, cast alloy tools, and alloy welding rods (PAS-00048071). According to the *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001, site plans were destroyed over the years, so little information is available for the Crucible Steel site plans and facilities (PAP-00027961). However, the following information regarding site features was available in Appendix F of the *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001:

- Three steel 150,000-gallon capacity water tanks and associated piping, present along the northern boundary of the Spiegel property from the late 1930s to the late 1980s. Approximately 580 feet of 2.5-inch diameter piping extended to two furnaces at Building No. 98 (PAP-00028005-06).

- Nine steel 1,000-gallon capacity oil tanks at Building No. 138, present along the northeastern portion of the Spiegel property from after 1940 to approximately 1998 (PAP-00028006). However, an Aerial Photograph Review appendix does not include the nine tanks in a 1953 aerial photograph description; while the description of the 1961 aerial photograph does, so it is unclear when the tanks were first present (PAP-00027999-28000). The 1953 aerial photograph is missing from the file material as only the aerial photographs for 1940, 1961, and 1974 were included in the document.

- Three steel 275-gallon capacity waste oil tanks of unknown age at the northern end of the Spiegel property east of Building No. 54 (PAP-00028006). The tanks were identified adjacent to an automotive repair operation during a site inspection and held automotive fluids (PAP-00028007).

- One steel 550-gallon capacity tank of unknown age at the northern end of the Spiegel property east of Building No. 54 (PAP-00028007).

- One steel 275-gallon capacity tank of unknown age at the northern end of the Spiegel property east of Building No. 138 (PAP-00028007-08). The tank was identified adjacent to an automotive repair operation during a site inspection (west of Building 54) and held spent automotive fluids (PAP-00028008).

- One underground storage tank (UST) of unknown age and unknown size and material, assumed to be located at the northern end of the Spiegel property west of Building No. 138 based on the presence of a fuel dispenser pad (PAP-00028008).

- Former transformer present from the late 1940s to the early 1980s and located in the southwestern portion of the Spiegel property, assumed to have contained polychlorinated biphenyls (PCBs) based on the age (PAP-00028010-11).

- Former transformer present in the mid-1940s located south of Building No. 97, assumed to have contained PCBs based on the age (PAP-00028011).

Minor on-site incidents involving oily substances were discovered as part of the investigation related to a 1970 discharge of oily material (see Section 5, COC Pathways discussion below for more details regarding the 1970 discharge). Although the oily material was determined not be from Crucible Steel, several corrective actions were taken by Crucible Steel at the Spaulding Works facility:

- Prohibited the steam cleaning of equipment near manholes (PAS-00083106). Employees had been steam cleaning mobile equipment in the vicinity of some manholes (PAS-00083095).

- Stopped placement of waste oil into a pit near a surface drain (PAS-00083106). Employees were dumping waste oil into a pit which had previously contained a fuel storage tank and that was located near a surface drain (PAS-00083095).

- Sealed off an oil discharge from a pump used in Crucible Steel's hood annealing operation (PAS-00083106). The pump was discharging oil into a pit. The oil was collected in metal drums after the discharge was sealed off (PAS-00083095).
- Re-routed a drain line from the roll grinding operation away from a surface drain and into a holding reservoir (PAS-00083106-107).

Both Properties

Nitric acid and sulfuric acid, fuel oils, and rolling solutions/oils were used for operations. Rolling oils were spread on site as a dust abatement measure during the summer months, but this practice ceased after 1969 (PAS-00083094).

Chromium and nickel were constituents for the steel manufactured by Crucible Steel, and molten lead was used in quenching baths as part of the manufacturing process (PAS-00000914). During the quenching process, lead vaporized and as the vapors

cooled, lead oxide formed. The lead oxide was disposed of offsite as solid waste (PAS-00000914). The file material did not identify the quantities of lead oxide produced or discuss how lead oxide was handled/stored prior to disposal.

Some steel would go through acid treatment or pickling, which would result in dissolution of chromium, iron, and nickel. Steel was run through a water rinse following pickling, and rinse water may have contained “small quantities” of chromium, iron, and/or nickel. Rinse water was periodically discharged to the sanitary sewer system with no treatment until 1970 (PAS-00000914). According to an April 1, 2015, letter from Coltec to EPA, effluent from steel operations typically included de minimis concentrations of iron, chromium, lead, nickel, zinc, and other metals (PAS-00048071). The employees interviewed had no specific knowledge regarding the disposal of the liquids in the pickling baths. Raw acids were stored in stainless steel tanks (PAS-00000914-15). The 2015 letter also states that effluent from steel cold rolling operations typically included de minimis concentrations of iron, chromium, lead, nickel, zinc, and other metals, and lubricating and hydraulic oils (PAS-00048072). The file material did not identify the volume or frequency of discharges to the sanitary sewer system from Spaulding Works.

A figure of the property locations/extents and hand-drawn depiction of the discharge points are presented below (PAS-00083136):

EnPro Holdings

Diamond Alkali OU2 Allocation

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Facility Data Report

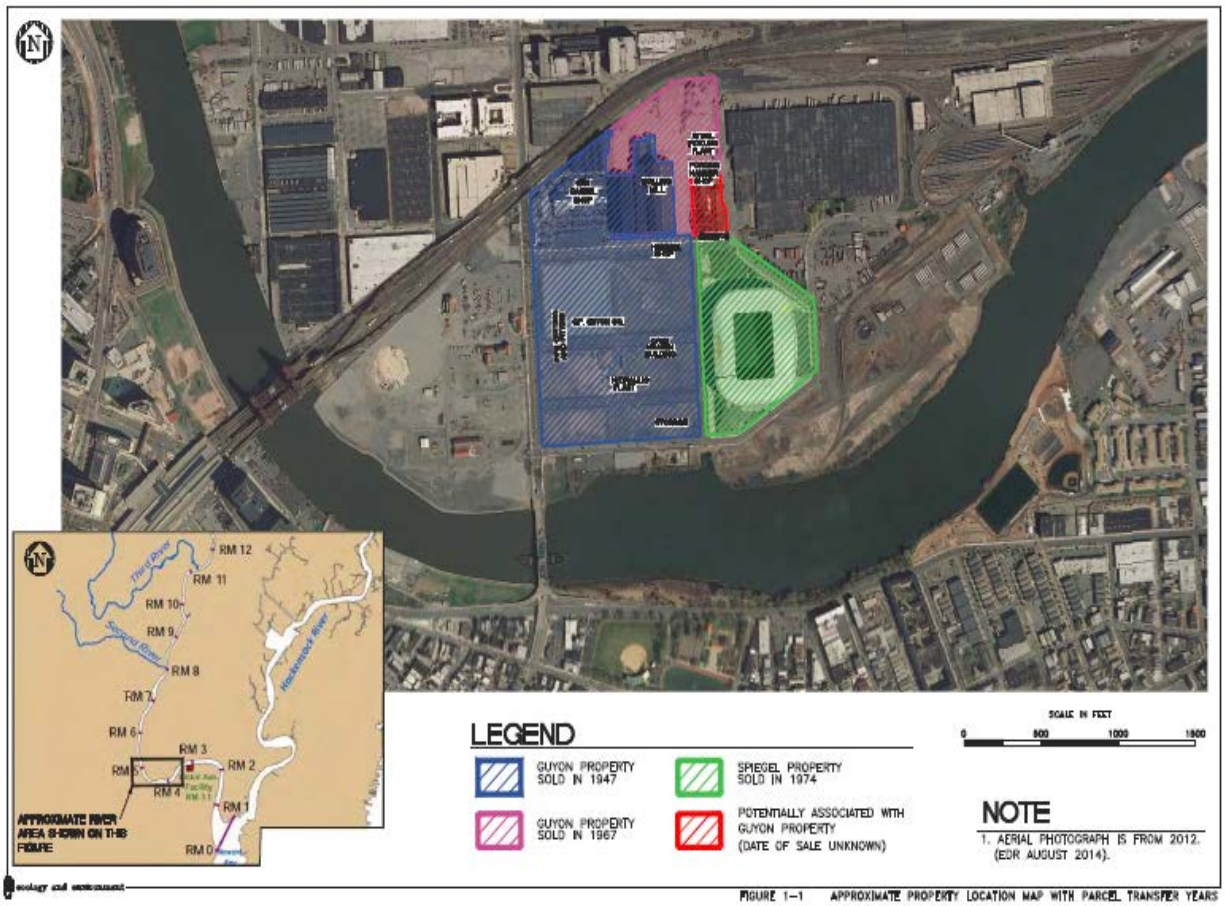
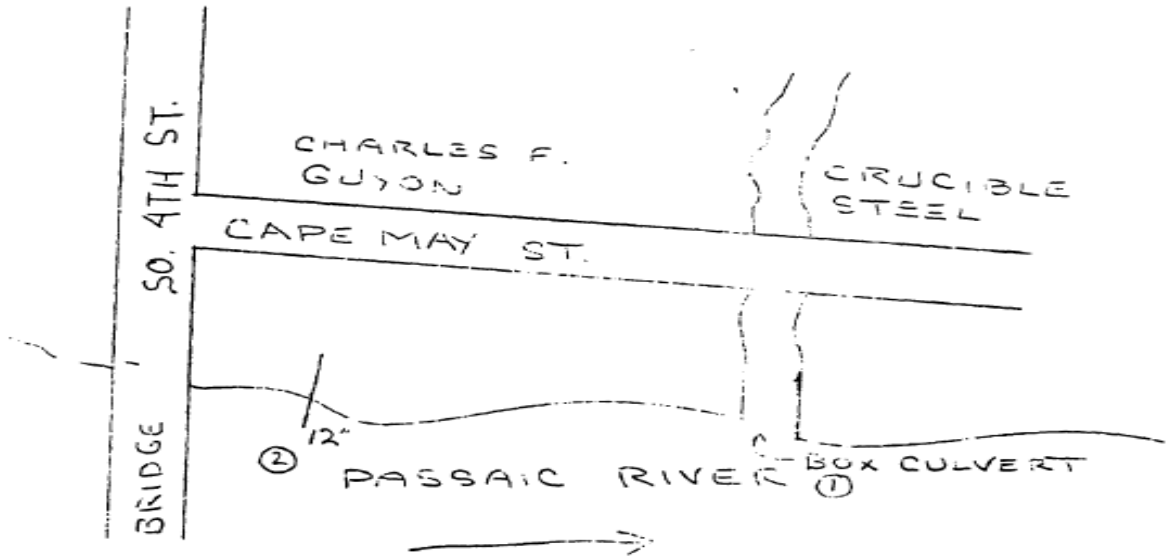


FIGURE 1-1 APPROXIMATE PROPERTY LOCATION MAP WITH PARCEL TRANSFER YEARS
PASSAIC RIVER LITIGATION STUDY
HARRISON, NEW JERSEY



4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Dieldrin (detected)
- DDx (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

PCBs were not manufactured or used by Crucible Steel and are not typically found in discharges from steel operations (PAS-00048071-72).

Guyon Property

Three Public Service Electric and Gas Company (PSE&G) transformers located along the east side of a paint shop at the Guyon property contained less than 50 parts per million (ppm) PCBs (PAS-00083226, 55). During the Industrial Site Recovery Act (ISRA) investigations in 2005, isolated "low-level" PCB soil contamination was detected at a railroad siding, a former oil tank location, and a former outdoor electrical substation (PAS-00048071).

Spiegel Property

During demolition for construction of Red Bull Stadium in 2007, concrete from several areas of the Spiegel property and sediment in one basement exceeded the New Jersey Department of Environmental Protection (NJDEP) Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) for PCBs (PAS-00048072). Concentrations of PCBs in two basement sediment samples ranged from 3.66 milligrams per kilogram (mg/kg) for Aroclor-1260 to 20.7 mg/kg for Aroclor-1254 (PAP-00028265). Concentrations of PCBs in basement water ranged from 13.1 micrograms per liter (ug/L) for Aroclor-1260 to 48.1 ug/L for Aroclor-1248 (PAP-00028309).

PAHs

PAHs may have been present in steel industry waste streams produced at both the Guyon and Spiegel properties.

Guyon Property

Results from the *Underground Storage Tank Remedial Investigation Report, Former Guyon General Piping Facility,* dated February 3, 1995, stated that all PAH concentrations were below method detection limits (PAP-00031082).

Spiegel Property

In 1970, the PVSC sent two cease and desist orders to Crucible Steel and filed a civil complaint due to the discharge of an oily waste to the Passaic River from the Spaulding Works through a box culvert (PAS-00083082-90). Samples collected at the outfall did

not contain sufficient quantities to identify the substance, which was described as having the appearance of fine number 2 type fuel oil or a mineral oil with a fine powdery or pulverized substance suspended in the oily material (PAS-00083093-94).

PAHs in soils at the Spiegel property were attributed to historic fill (PAP-00028108-110; PAP-00028527); however, PAHs were present in concrete at elevated levels with maximum concentrations as follows: benzo(a)anthracene-565 mg/kg; benzo(a)pyrene-294 mg/kg; benzo(b)fluoranthene-341 mg/kg; benzo(k)fluoranthene-255 mg/kg; dibenzo(a,h)anthracene-63 mg/kg; and, indeno(1,2,3-cd)pyrene-160 mg/kg (PAP-00028748-49).

Dieldrin

The soil and concrete sample results show sporadic detections and relatively low levels of dieldrin (PAP-00028777-793). No pesticides results could be located for the Guyon property in the file material.

DDx

The soil and concrete sample results show sporadic detections and relatively low levels of DDD, DDE, and DDT at the Spiegel property (PAP-00028777-793, 849). No pesticides results could be located for the Guyon property in the file material.

Copper

Copper may be present in steel industry waste streams. Based on investigations performed at the properties, copper detections are related to the historic fill (PAP-00028089).

Lead

During the quenching process, lead vaporized, and as the vapors cooled, lead oxide formed. The lead oxide was disposed of offsite as solid waste (PAS-00000914). The start date of lead quenching and the specific location of the quenching operations at the Spiegel property are both unknown, and the file material did not identify the quantities of lead oxide produced or discuss how lead oxide was handled/stored prior to disposal.

Mercury

Mercury is not an anticipated contaminant in steel industry waste streams. Based on investigations performed at the properties, mercury detections are related to the historic fill (PAP-00028089).

Historic Fill

The Allocation Team has determined that both the Guyon and Spiegel properties are located on regional Historic Fill as designated by the NJDEP.[1]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

It is also stated that, prior to 1940, all but the eastern edge of the Guyon property had historic fill (PAP-00028016). By 1940, several large areas along the eastern border of the Guyon property were filled with material of undetermined composition (PAP-00028017).

According to the *Phase 2 Site Investigation Report and Remedial Action Work Plan, Harrison Redevelopment Former Crucible Steel Site*, dated February 16, 2005, fill at the Guyon property ranges from two feet below ground surface (bgs) to 15 feet bgs and estimates the fill was placed prior to the late 1800s (PAP-00031288). This document also states that the fill was observed to be approximately 15 feet thick in the southern portion of the Guyon property and decreased to 10 feet thick in the central and northern portions of the property (PAP-00031292). According to the *Crucible Steel/Charles F. Guyon Complex Report*, dated August 30, 1996, the area east of the outlet into the river was filled and extended, enlarging the size of the property (PAP-00028020). No further information regarding this additional fill could be located in the file material.

According to the *Site Investigation Report/Remedial Action Work Plan*, dated February 1, 2002, at the Spiegel property, fill ranges in depth from five feet bgs along the southern portion of the property to 10 feet bgs along the central and northern portions of the property (PAP-00029345-46; PAP-00030296).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes in New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils		
COC	**Max Detected Concentration (Guyon Property)**	**Max Detected Concentration (Spiegel Property)**
Lead	3,710 mg/kg	72,800 mg/kg
Copper	432 mg/kg	7,900 mg/kg
Mercury	10.2 mg/kg	154 mg/kg
Benzo(a)anthracene	4.0 mg/kg	178 mg/kg
Benzo(a)pyrene	3.9 mg/kg	6.1 mg/kg
Benzo(b)fluoranthene	6.1 mg/kg	59.3 mg/kg
Benzo(k)fluoranthene	3.3 mg/kg	51.5 mg/kg
Dibenzo(a,h)anthracene	0.34 mg/kg	38.1 mg/kg
Indeno(1,2,3-cd)pyrene	1.1 mg/kg	43.9 mg/kg

5. COC Pathways

Groundwater underlying the Guyon and Spiegel properties may be in contact with river water given the close proximity of the properties to the river. Tidal influence was acknowledged by facility witnesses (PAS-00124662). A study of the water action states that as the tide came in, spots of oil from the river entered the outfall located at the Spiegel property, (PAS-00083130).

There were direct releases to the soil. Rolling oils were spread on site as a dust abatement measure, but this practice ceased after 1969 (PAS-00083094). According to the *Crucible Steel/Charles F. Guyon Complex Report*, dated August 30, 1996, roads and parking areas within the Guyon property were unpaved until after 1970 but were surfaced before 1979 (PAP-00028020).

Spiegel Property

Soil contaminants were determined to not be transported by overland flow since most of the Spiegel property was covered by asphalt or concrete (PAP-00030341).

According to the *Site Investigation Report/Remedial Action Work Plan*, dated February 1, 2002, groundwater seeps were not observed along the Passaic River during the site inspection (PAP-00030341). The *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*, dated October 9, 2007, discussed a tidal influence study that determined groundwater at the Spiegel property was not affected by tidal fluctuations in the Passaic River (PAP-00028065).

Sanitary and Storm Sewer

Guyon Property

During the 1970 discharge dispute, there were five laterals that ran from the Guyon property into the main storm draining system, located on the Spiegel property (PAS-00083095-96).

Spiegel Property

There are two outfalls to the Passaic River at the Spiegel Property: one at the 6-by-6-foot box culvert and the other was a 12-inch storm and cooling water sewer (PAP-00027919; PAS-00048071-72). The 12-inch outfall appears to be the same as the 12-inch diameter combined sewer and stormwater outfall adjacent to South Fourth Street, which served the Guyon property and which is referenced above.

During the 1970 discharge dispute, there were 16 known laterals running into the main storm draining system. Four of the laterals ran to the main from manholes on the Spiegel property, while the other 12 run into the main from points outside the Spiegel property (PAS-00083093). Five laterals ran into the main storm draining system from Charles F. Guyon (located at the Guyon property following sale by Crucible Steel); two laterals ran into the main from Miele Bros. Trucking Co.; one lateral ran into the main from Azco Steel Company; one lateral ran into the main from Gabest, Inc.; one lateral ran into the main from Prince Packaging Products, Inc.; and, two laterals ran into the main from Joseph Supor Trunking Co. (PAS-00083095-96).

Direct Release

The underground drainage system underlying the historical Crucible Steel facilities carried discharges of spent acid, water from equipment wash downs, and stormwater directly to the Passaic River through a 6-by-6-foot box culvert (PAS-00124662). No information regarding sampling of discharge for COCs could be located in the file material.

Guyon Lateral No. 1 was permanently closed on March 11, 1971 (PAS-00001023; PAS-00083118). The oil residue on the bank of the river was reduced following closure of Guyon Lateral No. 1 as evidenced by visual changes (PAS-00001023; PAS-00083119). A study of the water action stated that as the tide came in, spots of oil from the river entered the outfall, (PAS-00001024; PAS-00083130). A discharge sample collected on May 18, 1971, contained a chemical oxygen demand (COD) of 174 milliliters per liter (mL/L) (PAS-00083129). Information regarding the volume of discharge or the duration of the discharge could not be found in the file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material for the Guyon property:

- *Remediation/Decommissioning Results, Fabco Piping Inc.*, dated March 25, 1990 (PAS-00083210)
- *Sampling Plan Results and Cleanup Plan Addendum for Fabco Piping Incorporated*, dated December 14, 1990 (PAP-00030266)
- *Underground Storage Tank Remedial Investigation Report, Former Guyon General Piping Facility,* date February 3, 1995 (PAP-00031065)
- *Phase 2 Site Investigation Report and Remedial Action Work Plan, Harrison Redevelopment Former Crucible Steel Site*, dated February 16, 2005 (PAP-00031281)

The following is a list of major response action documents identified in the available file material for the Spiegel property:

- *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001 (PAP-00027937)
- *Site Investigation Report/Remedial Action Work Plan*, dated February 1, 2002 (PAP-00030289)
- *Site Investigation Report Addendum*, dated June 24, 2004 (PAP-00028383)
- *Groundwater Remedial Investigation Report*, dated July 29, 2004 (PAP-00028061)
- *Remedial Investigation Work Plan*, dated August 2005 (PAP-00028413)
- *Concrete Reuse Plan, Spiegel Trucking*, dated December 14, 2006 (PAP-00030393)
- *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*, dated October 9, 2007 (PAP-00028054)

- *Remedial Investigation/Remedial Action Report, 6th Street September 2006-September 2007, Netti Spiegel Trucking*, dated February 22, 2008 (PAP-00030469)
- *Remedial Action Work Plan Update, Netti Spiegel Trucking*, dated March 13, 2008 (PAP-00030624)
- *Interim Remedial Investigation Report II and Interim Remedial Action Report for January 2007-September 2007, Netti Spiegel Trucking*, dated May 28, 2008 (PAP-00028460)
- *6th Street Remedial Action Report Update, Netti Spiegel Trucking*, dated August 4, 2008 (PAP-00030694)
- *Remedial Action Report Addendum 6th Street Area during April 2009-August 2009, Netti Spiegel Trucking*, dated June 2010 (PAP-00030111)
- *Remedial Action Report - Soil, Former Netti Spiegel Trucking*, dated April 11, 2012 (PAP-00030870)

Sewer and Storm Drain Systems

Guyon Lateral No. 1 joined the central draining main approximately 150 feet west of the eastern boundary of the industrial complex and extended underground in a generally southerly direction beneath the Guyon property (PAS-00083107). Samples were taken from points in the drainage system within the boundaries of the Guyon property, and oil was found in samples collected July 15 and August 7, 1970, but was not found in samples collected after August 7, 1970. A fiberglass filter was kept in Guyon Lateral No. 1 between September 11 and 15, 1970, and collected a heavy concentration of oil (PAS-00083115). Temporary plugging of Guyon Lateral No. 1 occurred on November 30, 1970, and remained in place until January 7, 1971. While the temporary plug was in place, samples taken from the river outfall were clear of visible oil (PAS-00083108-109). Oily material had accumulated on the bank of the river at and near the outfall (PAS-00083110). Oil was present in the river itself upstream from the outfall on August 12, 1970 (PAS00083116). A discharge sample collected on May 18, 1971, contained a COD of 174 mL/L (PAS-00083129). This sampling information is from the court records related to the 1970 discharge dispute, but no analytical reports or other report of sampling results related to the sampling in 1970 and 1971 could be located in the file materials. It is unclear whether samples were analyzed for relevant COCs (i.e., PAHs, PCBs, and metals) as no information regarding analyses could be located in the file material.

Soil

Soil-Guyon Property

According to a *Remediation/Decommissioning Results, Fabco Piping Inc.*, dated March 25, 1990, soil samples were collected at the Guyon property on February 13, 1989, at three locations on the southeast side of a Paint Shop. Several metals exceeded New Jersey's Environmental Cleanup Responsibility Act (ECRA) guidelines, including copper at all three locations and mercury at one location (PAS-00083219-20).

The *Sampling Plan Results and Cleanup Plan Addendum for Fabco Piping Incorporated*, dated December 14, 1990, states that additional soil sampling was conducted at the Guyon property on October 2, 1990, along the perimeter of the paint shop. Lead was detected at levels ranging from 11.8 to 2,290 ppm at 18 to 24 inches bgs, and mercury results ranged from 0.264 ppm to 3.03 ppm at 42 to 48 inches bgs (PAP-00030272). This document also states that soil sampling was conducted at the sandblasting area on October 2, 1990 (PAP-00030274).

The *Underground Storage Tank Remedial Investigation Report, Former Guyon General Piping Facility,* dated February 3, 1995, describes soil sampling to investigate three USTs at the Guyon property (PAP-00031077). Samples were analyzed for total petroleum hydrocarbons (TPH) and PAHs, and all PAH results were below method detection limits (PAP-00031082-83). Based on a summary table provided in the report, it appears these tanks were 12 to +15 years old at the time of removal and/or in-place abandonment (PAP-00031071 and 74).

The *Phase 2 Site Investigation Report and Remedial Action Work Plan, Harrison Redevelopment Former Crucible Steel Site*, dated February 16, 2005, states that 38 soil borings were advanced during the Phase 2 Site Investigation (SI) (PAP-00031291). This document concluded that in general, soil contamination is associated with the presence of historical fill compounds (PAP-00031292).

Soil-Spiegel Property

According to the *Site Investigation Report/Remedial Action Work Plan*, dated February 1, 2002, soil samples were collected at the Spiegel property, and lead was determined to be associated with fill materials and not site operations (PAP-00030310).

As part of the *Site Investigation Report Addendum*, dated June 24, 2004, 53 soil borings were installed (PAP-00028063; PAP-00028383). The *Site Investigation Report Addendum* concluded that lead and copper exceedances in soil were consistent with the Historic Fill Database and were therefore related to historic fill (PAP-00028064; PAP-00028395).

The *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*, dated October 9, 2007, included 44 soils borings to investigate historic fill materials (PAP-00028081). Metallic slag was observed at three borings, and coal fragments/coal debris were observed at two borings (PAP-00028082). Soil samples were also collected from multiple areas of concern (AOCs) within the Spiegel property. Sampling of water and sediment within a basement, as well as sampling of concrete, were also conducted as part of the *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*. The *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*, dated October 9, 2007, concluded that exceedances of PAHs, lead, and copper in soil were consistent with the Historic Fill Database and were therefore related to historic fill (PAP-00028108-110).

The *Interim Remedial Investigation Report II and Interim Remedial Action Report for January 2007-September 2007, Netti Spiegel Trucking*, dated May 28, 2008, included sampling of soil and concrete as well as interim remedial actions (see Remedial Activities discussion below for more detail regarding these actions). The *Interim Remedial Investigation Report II and Interim Remedial Action Report for January 2007-September 2007, Netti Spiegel Trucking*, dated May 28, 2008, concluded that exceedances of PAHs, and metals were consistent with typical historic fill (PAP-00028527).

According to the *6th Street Remedial Action Report Update, Netti Spiegel Trucking*, dated August 4, 2008, sampling of soil borings and test pits occurred at the Spiegel property. PAH and metals concentrations were consistent with typical historic fill (PAP-00030707-08, 12).

Remedial Activities

Guyon Property

According to a R*emediation/Decommissioning Results, Fabco Piping Inc.*, dated March 25, 1990, contaminated soil at the Guyon property was excavated and disposed from the exterior of a paint shop, stained soils were excavated and disposed from between railroad ties, and stained sediments were removed and disposed from the concrete floor of a lean-to that housed a No. 2 fuel oil aboveground storage tank (AST), located at the north end of the annealing and bending operations (PAS-00083217, 25-26). The excavation occurred on March 2, 1990, and removed soils/sediments were stockpiled on site prior to off-site disposal. No confirmation sampling was conducted following the excavation between railroad ties (PAS-00083225). According to the *Sampling Plan Results and Cleanup Plan Addendum for Fabco Piping Incorporated*, dated December 14, 1990, 70 tons of contaminated soil were excavated, and excavation extended to depths of 16 to 22 inches (PAP-00030271).

According to a R*emediation/Decommissioning Results, Fabco Piping Inc.*, dated March 25, 1990, sandblasting grit was scrapped up on October 31 and November 1, 1989, and stockpiled on site. Off-site disposal occurred on December 11 and 12, 1990 (PAS-00083227). The *Sampling Plan Results and Cleanup Plan Addendum for Fabco Piping Incorporated*, dated December 14, 1990, states that 579.1 tons of sandblasting grit was removed (PAP-00030274).

The *Underground Storage Tank Remedial Investigation Report, Former Guyon General Piping Facility,* dated February 3, 1995, states that four USTs were removed and three USTs were closed in place, but the dates of closure/removal are not specified (PAP-00031074). Based on the information provided regarding the age of the tanks, it appears they were all installed after Crucible Steel sold the Guyon property (1970s and 1980s). On January 3, 1995, 130 tons of contaminated soil was removed from the former location of UST 9, along with its associated piping. Excavation extended to a depth of 7 feet bgs in the area of the former tank and 3.5 to 4.5 feet bgs along the piping trench (PAP00031087).

Spiegel Property

According to the *Interim Remedial Investigation Report II and Interim Remedial Action Report for January 2007-September 2007, Netti Spiegel Trucking*, dated May 28, 2008, soil excavation and removal of concrete, as well as removal of product from shallow groundwater, occurred at the Spiegel property (PAP-00028513). Contaminated soil not characterized as historic fill was excavated and disposed of off-site, and confirmation sampling was conducted, which showed that concentrations were consistent with historic fill (PAP-00028513-20, 26). Removed concrete with exceedances above the NRDCSCC were disposed of off-site, while removed concrete with concentrations below the NRDCSCC was reused on site (PAP-00028519).

The removal of a UST containing 1,500 gallons of oily water occurred on September 6 and 7, 2007, followed by confirmation sampling, which confirmed that the tank held diesel/fuel oil No. 2 (PAP-00028520-21, 52).

According to the *Remedial Action Report Addendum 6th Street Area during April 2009-August 2009, Netti Spiegel Trucking*, dated June 2010, the future construction of a sports complex will serve as part of proposed engineering controls (i.e., cap) in conjunction with institutional controls (PAP-00030115). During 2008 and 2009, 949.6 tons of material was excavated and disposed of offsite to remove soil hot spots and/or non-aqueous phase liquid (NAPL) source areas (PAP-00030118-19).

Approximately 500 feet of 2-inch diameter steel piping positioned approximately two feet bgs was discovered on June 2, 2009, during utility installations. The piping contained residual No. 2 and/or No. 4 fuel oil. On July 8, 2009, two 6-inch diameter steel pipes approximately 100 feet long were discovered near the intersection of 6th Street and Cape May Street, located parallel to Cape May Street and positioned approximately four feet bgs. The piping contained residual No. 2 and/or No. 4 fuel oil (PAP-00030120). The pipes were removed and disposed of offsite, along with 60 gallons of product collected from the pipes (PAP-00030121).

The *Remedial Action Report - Soil, Former Netti Spiegel Trucking*, dated April 11, 2012, states that all structures previously present at the Spiegel property were removed and the Red Bull Area was installed (PAP-00030877). This included installation and placement of certified clean fill; installation of impervious site improvements, including building foundations, playing field, concrete sidewalks/pavement, and asphalt driveways; and, installation of a sub-slab vapor mitigation system (PAP-00030884-85).

8. Summary of Asserted Defenses

EnPro asserts that if and to the extent PAHs were present in fuel oil that may have been released to the environment during Crucible operations, Respondent [EnPro Holdings, Inc.] contends that such releases are excluded from CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act] coverage pursuant to the petroleum exclusion, 42 U.S.C. § 9601(33).

Respondent [EnPro Holdings, Inc.] has, and Crucible Steel Corporation had, no relationship to any parties that released or disposed of COCs at the Facility following Crucible Steel Corporation's sales of the western portion (Guyon Property) in 1947 and 1967 and the eastern portion (Spiegel Property) in 1974.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

EPEC POLYMERS, INC.

Facility Name, Address and Size: Tenneco Chemicals, Inc., 290 River Drive, Garfield, New Jersey. The facility was 6.9 acres and had up to 250 employees with 3 shifts operating 7 days per week in 1970 and 1972 (PAP-00039956; PAP-00324651).

1. **Business Type:** Manufacturer of bulk intermediate chemicals such as formaldehyde, benzoic acid, salicylic acid, and fumaric acid for the resin, plastic, food, and pharmaceutical industries (PAP-00039956).

2. **Time Period of Ownership/Operations**

   Operator: ~1900 – December 1, 1982
   Owner: ~1900 – December 1, 1982

   1965: On March 1, 1965, Heyden Newport Chemical Corporation (Heyden Newport) changed its name to Tenneco Chemicals, Inc. (Tenneco) and Tenneco Corporation was identified as the sole stockholder of the company (PAP-00039737-42). A Revised ECRA [*Environmental Cleanup Responsibility Act] Sampling Plan Investigation Report*, dated September 1991, stated that Heyden had owned and operated the facility since the early 1900s as several forms of the Heyden name (PAP-00040999).

   1982: Tenneco Chemicals, Inc. operated at the Garfield facility until December 1, 1982, when the facility and the business that sold products manufactured at the plant were sold to Kalama Chemical Inc. (Kalama) in an Asset Sales Agreement. Assets identified in the sale included the machinery, equipment, furniture, fixtures, raw materials, work in progress, finished goods, operating supplies, etc. (PAP-00039792-95). Kalama Chemical Inc. took over the facility and is the current owner of the site. Kalama is a wholly owned subsidiary of Goodrich Corporation.

   On December 3, 1982, Tenneco Polymers, Inc. was incorporated in the State of Delaware (PAP-00039804-07). On December 15, 1982, Tenneco Polymers, Inc. was granted certain assets from Tenneco Chemicals, Inc. Some notable assets included all of the former Heyden's Newport's issued and outstanding shares, and notes, contracts and agreements relating to Tenneco's PVC, methanol, and former acetylene and ammonia businesses, as well as all owned or claimed real property. Several plant sites were listed, but the Garfield facility was not included because it was previously sold to Kalama (PAP-00039831-36).

   1983: On February 14, 1983, Tenneco Chemicals, Inc. changed its name to Tenneco Resins, Inc. (PAP-00039811). EPEC noted in its Statement of Position, dated May 24, 2012, that Tenneco Resins, Inc. continued to operate as a subsidiary of Tenneco Polymers, Inc. for three more years (PAP-00039758). On August 26, 1985, Tenneco Resins, Inc. filed for Dissolution (PAP-00039827).

1988: Pursuant to a Corporate Substitution Agreement between Tenneco Resins, Inc. and Kalama Chemicals, Inc. effective August 25, 1988, Tenneco Polymers, Inc. was substituted for Tenneco Resins, Inc. and agreed to assume Tenneco Resins ' responsibilities and liabilities for ECRA cleanup of the Garfield Plant if any as well as the obligations and liabilities to Kalama pursuant to Section 8(b) of the Asset Sales Agreement. This section stated that all liabilities arising out of the condition of the plant premises at or prior to the Closing Date and the operation of the plant prior to the closing date during the period of Seller's ownership, i.e., since October 4, 1963, would remain the liability of Tenneco Resins, Inc. and that Tenneco Resins had provided Kalama with evidence of liability insurance in customary form on an "occurrence" basis, which had been in effect during Tenneco's period of ownership (PAP-00039838-40).

1994: A Settlement Agreement between Tenneco Polymers, Inc. and Kalama dated April 28, 1994, describes the previous disputes between the two companies and t responsibilities with respect to remediation activities at the Garfield property. This Agreement also identified Tenneco Polymers, Inc. with the Tenneco, Inc. family of businesses (PAP-00039844-72).

1996: On December 12, 1996, Tenneco Polymers, Inc. changed its name to EPEC Polymers, Inc. (PAP-00039829). Based on several Remedial Investigation Reports and Remedial Action Progress Reports, EPEC participated in the remediation of the facility in the early 2000s (see PAS-00008864, PAS-00008946, PAS-00009143, PAS-00009261, PAS-00009298, PAS-00009411, PAS-00009458, PAS-00009505, PAS-00009545).

On December 11, 1996, El Paso Merger Company merged with Tenneco Inc. of Delaware into El Paso Tennessee Pipeline Co. (PAP-00039744). A Certificate of Conversion of a Delaware Corporation of El Paso Tennessee Pipeline Co. to El Paso Tennessee Pipeline Co., LLC, dated September 29, 2011, identified Tenneco Holdings, Inc. as the original name of the company (PAP-00039750, 52-53).

3. Operational History/COC Use and Presence at the Facility

A *Sampling Plan for Site Evaluation*, (Sampling Plan) dated August 1987, stated that the facility had been used to manufacture salicylic acid, formaldehyde, and methyl salicylate since 1903. As discussed in this Sampling Plan, the buildings used to manufacture benzoic acid and benzaldehyde were constructed in 1967. This operation was shut down in 1984. Manufacturing of formaldehyde ceased in 1982. Additional chemicals manufactured at the facility included methyl, propyl, ethyl, and butyl esters of para-hydroxybenzoic acid, methylene disalicylic acid, and sodium, potassium, and magnesium salicylate salts (PAP-00040251).

According to a Waste Effluent Survey dated May 19, 1972, the facility manufactured bulk intermediate chemicals such as formaldehyde, benzoic acid, salicylic acid, and fumaric acid for the resin, plastic, food, and pharmaceutical industries (PAP-00039956). The survey stated that water from the Passaic River was used for non-contact cooling water

and for barometric condensers. All manufacturing waste was reported to go to sanitary/chemical sewers (PAP-00039957, 59).

A report prepared for the EPA by Acurex Corporation titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, described the sampling of waste streams discharged to the wastewater treatment facility from five of the facility's products (PAP-00040067-68). Results for metal chemicals of concern (COCs) are reported in the table below, as well as results for two samples of inlet water from the municipal water system and the Passaic River. The processes used to manufacture these five products and their waste streams were described as follows:

- Benzoic Acid/Benzaldehyde: Benzoic acid was manufactured by liquid phase oxidation of toluene in the presence of a cobalt catalyst. The reactor overhead gas was condensed and sent to a scavenger tank, where water was separated and disposed. Reactor effluent was stripped and washed, then sent to the benzaldehyde still. The still bottoms were discharged as waste (PAP-00040071-74).

- Sodium Benzoate: Benzoic acid was reacted with sodium carbonate, condensate, and carbon. The reactor effluent was filtered and scrubbed. The solids were removed from a liquid product stream and disposed (PAP-00040076).

- Salicylic Acid: Phenol and 50 percent sodium hydroxide were mixed and dried in a spray dryer. The dried product was reacted with carbon dioxide in a reactor and then neutralized with sulfuric acid and water. The product was then carbon treated and precipitated by adding more sulfuric acid. The precipitator effluent was cooled using a non-contact flash cooler, and the overhead was condensed and then discharged as waste (PAP-00040078).

- Methyl Salicylate: Salicylic acid, methanol, and sulfuric acid were reacted and then neutralized with soda ash and water. The aqueous phase was recycled, while the non-aqueous organic phase from the neutralizer was washed then sent to a vacuum still to generate the product (PAP-00040081, 84).

- Fumaric Acid: Maleic acid was reacted with a catalyst and steam and then vacuum cooled. The vacuum cooler overhead went to a contact condenser, where fumaric acid was recovered via centrifuge (PAP-00040085).

Maximum Concentrations of Metals in Each Product Effluent					
Product	**Composite Sample Sources (flow in gallons per day [gpd])**	**Sample Location / Site**	**Copper (µg/L)**	**Lead (µg/L)**	**Mercury (µg/L)**
Benzoic Acid/ Benzaldehyde	Scavenger tank effluent, scrubber liquor, wash tank, still bottom residue (2,320 gpd)	OPQRS	18	<10	<1
Sodium Benzoate	Reactor scrubber effluent (72,000 gpd)	L	11	<10	<1
Salicylic Acid	Spray dryer scrubber, vacuum jet for Reactor No.3, flash cooler, "10E-1 sal acid nutsche" (194,720 gpd)	CDEG	450	<25	1.5
Methyl Salicylate	Spent acid tank and wash column overflow (7,140 gpd)	IJ	3,200	450	1
Fumaric Acid	Centrifuge effluent and contact condenser (91,300 gpd)	AB	39	<10	1*
Passaic River	River water	U	104	15	<1
Passaic Valley	Municipal water	T	14	<10	1.3
References	PAP-00040093, 96	PAP-00040093	PAP-00040130	PAP-00040131	PAP-00040132

µg/L: micrograms/liter

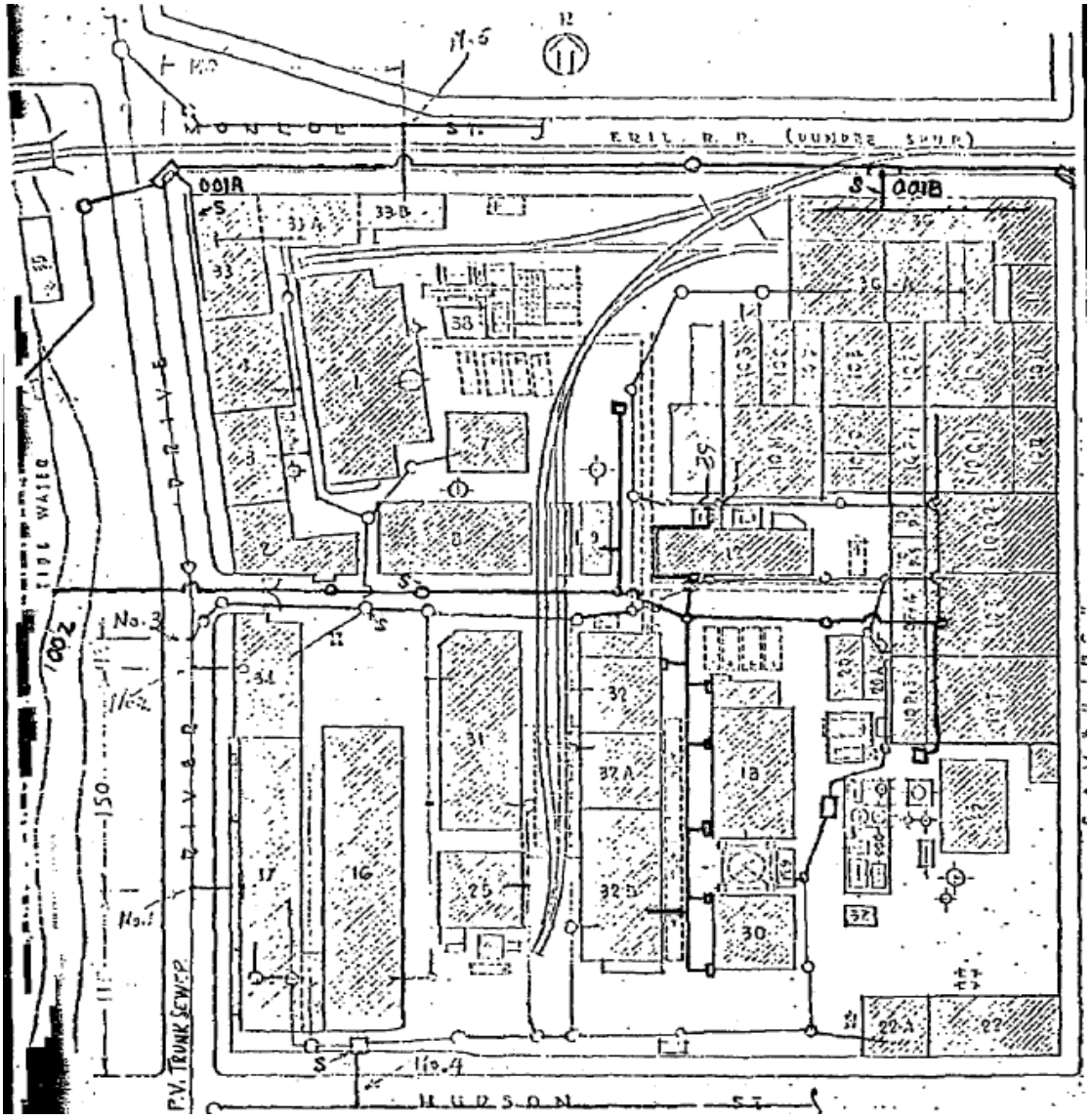
*Note: the mercury result was listed as 1 µg/L for Day 3 of sampling in the raw analytical data table, but the adjusted concentration table listed the mercury result for Day 3 as not detected (PAP-0040142). It is not clear how the data were adjusted.

A New Jersey Department of Environmental Protection (NJDEP) Pretreatment/Residual Waste Survey, dated July 27, 1981, stated that copper and mercury were present in the discharge of over 25,000 gallons per day to the publicly owned treatment works (POTW) (PAP-00040183, 188). An application for permit to discharge to a domestic treatment works, dated February 26, 1982, listed the City of Garfield sewer and the Passaic Valley Sewerage Commission (PVSC) treatment plant as the recipients of the effluent, which contained 19.53 milligrams/liter (mg/L) copper and 0.001 mg/L mercury. Polycyclic aromatic hydrocarbons (PAHs), PCBs, lead and pesticides were not detected in the effluent (PAP-00040202, 210-211).

Five outlets to the sanitary sewer (Outlets Nos. 1 through 5) were identified in an undated PVSC application for a sewer connection permit and a letter to the PVSC from Tenneco dated December 16, 1980. Outlet Nos. 3 and 4 were stated to contain industrial waste. Outlet No. 5 was stated to be eliminated as wastewater was diverted to

Outlet No. 3. It was also noted that Outlet No. 4 was in the process of being eliminated with most wastewater already diverted to No. 3 (PAP-00040044; PAP-00040165-66).

The PVSC permit application provided the following site map with Outlets Nos. 1 through 3 along River Drive, Outlet No. 4 to the south at Hudson Street, and Outlet No. 5 to the north at Monroe Street:



(PAP-00040045)

Outfalls to the Passaic River

Three outfalls to the Passaic River were identified in the facility's National Pollutant Discharge Elimination System (NPDES) permit to discharge No. NJ 0000124, effective June 30, 1974 (PAP-00039966). Outfalls with the following discharge serial numbers

were identified: 001A and 001B; 002; 005. Effluent limitations on these outfalls did not identify COCs. Outfall 005 was limited to containing chemicals or other substances less than or equal to what was found in the receiving waters (PAP-00039969).

An application to renew the NPDES permit No. NJ 0000124, dated November 28, 1978, stated discharges through outfall 001 began in 1940 and outfall 002 had been used since 1953 (PAP-00324735, 43).

A NJDEP Application for Approval of Plans, dated April 1, 1975, outlined Tenneco's plans to monitor its cooling water return to the Passaic River and reduce sources of pollution entering the Passaic River (PAP-00039995). The application identified the outfalls as follows (see above figure for locations along Monroe Street and at the middle of the facility):

- 001A: Cooling water effluent from Building 33 was connected to the Monroe Street drainpipe and discharged from the drainpipe into the Passaic River (PAP-00039997).

- 001B: Cooling water effluent from Building 36 was connected to a catch basin in the Monroe Street drainpipe (PAP-00039998).

- 002: The major effluent stream containing all of the river water returns from the plant, except Buildings 33 and 36 (PAP-00039998).

The plans stated that droplets of process water were entering the cooling water returned to the Passaic River and proposed a filter to remove the pollutants as well as discharging contaminated cooling water to the sanitary sewer (PAP-00039997-40000). An April 1, 1975 letter to the PVSC submitted with the application stated the contaminated cooling water would increase the volume of water discharged to the PVSC by "75M" gallons per day (PAP-00040008).

A letter to the NJDEP from Tenneco, dated April 18, 1975, identified outfall 005 as river water screens used at the pump house to keep leaves and debris out of the pumps. The screens were kept clean with a continuous backwash to the river (PAP-00040018).

4. Identified COCs

- PCBs (used, detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

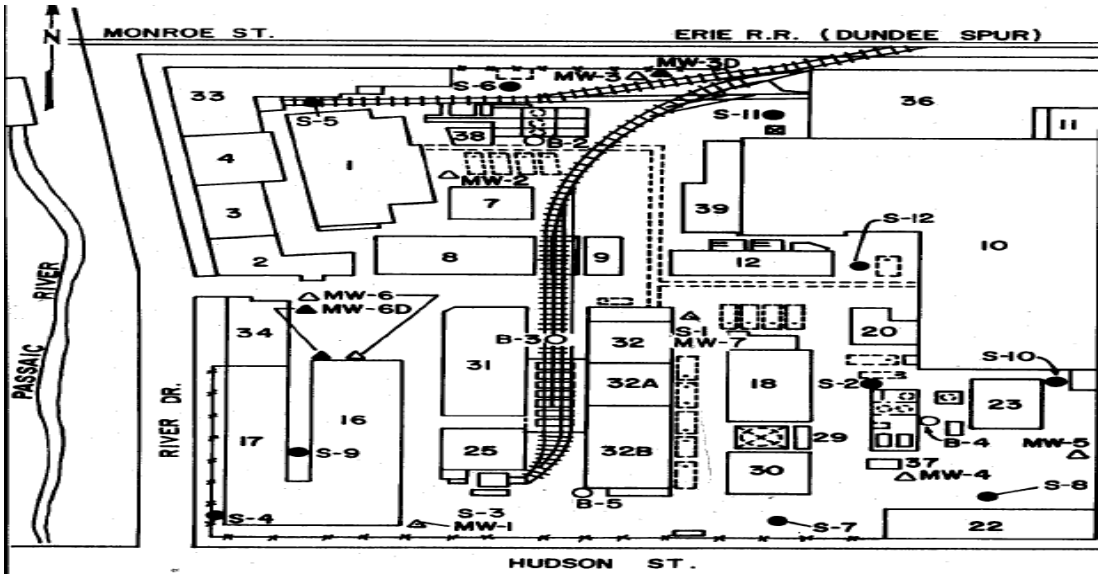
PCBs

A NJDEP Pretreatment/Residual Waste Survey, dated July 27, 1981, stated equipment such as transformers, high voltage capacitors, or heat transfer systems containing PCB fluids were present at the facility (PAP-00040185). According to a Revised Sampling Plan Addendum, dated March 1990, the transformers at Buildings 1 and 12 were

inspected in 1981 and found not to contain PCBs. Site personnel stated that these transformers had not contained PCBs for at least 10 years and it is possible that they may never have contained PCBs. Soil samples were proposed to verify the absence of contamination in soils in these areas due to leakage from the transformers (PAP-00040585).

Two areas containing transformers were identified as areas of environmental concern (AECs) in the *Revised Remedial Action Work Plan*, dated March 31, 1995 (1995 RAWP) (PAP-00041652). PCBs were not detected in site soil at AEC-23 (Transformers at Building 1), but were detected in soil samples collected from AEC-24 (Transformer at Building 12) at a maximum of 2.2 milligrams/kilogram (mg/kg) for Aroclor-1260 (PAP-00041881-2).

The *Remedial Investigation and Remedial Actions Report, Building 17 Former Sewer Lines*, dated February 26, 2003, (2003 RI/RAR) identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Fill was discovered within the foundation walls of the building and was analyzed for PCBs as part of the waste disposal characterization. PCBs were detected at 15.8 parts per million (ppm) in one soil sample, but additional delineation samples did not detect PCBs. An area of 19 feet by 27 feet was excavated to a depth of 4 feet around the sample location (PAP-00044391-92). Building 17 was located in the southwestern corner of the site. Note that the fill with PCBs was within the foundation walls of Building 17.



(PAP-00040419)

PAHs

According to a *Preliminary Investigation of Soil Quality Conditions at the Kalama Chemical, Inc. Facility in Garfield, New Jersey*, dated December 1986, PAHs were detected in soil samples collected from the following areas: underground storage tanks (USTs) containing fuel oil, the benzaldehyde production area, and a chemical transfer area (PAP-00040240, 43).

Further investigation noted that PAHs were detected in soil samples collected all over the site. According to the data reported in the 1995 RAWP, PAHs were detected at most AECs when soil samples were analyzed for these parameters (PAP-00041858-86). Concentrations were generally less than or equal to 1 mg/kg, which is less than average concentrations associated with historic fill (see discussion of historic fill below). The highest concentrations were detected at AEC-11 (Former No. 2 Fuel Oil USTs), AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39), and AEC-21 (Drum Storage Area Buildings 16 and 17). The maximum concentrations of PAHs were detected from soil sample AEC-15-1C at AEC-15 (see concentrations in the discussion of Historic Fill and in Section 7, Response Actions) (PAP-00042265).

The *Revised Remedial Action Work Plan Addendum*, dated February 29, 1996 (RAWP Addendum) stated that fill material, including sand, gravel, brick and rock fragments, cinders, and ash, had been noted at the site and extending off site. The RAWP Addendum investigated soil boring B-52-A, detecting concentrations of benzo(a)pyrene up to 42 ppm, and attributed the elevated PAH concentrations to the presence of fill (PAP-00042178-79).

The 2003 RI/RAR found elevated PAHs detected in mud from a concrete basin (AEC-32A) north of Building 17 (i.e., 6.1 ppm of benzo(a)anthracene; 4.45 ppm of benzo(b)fluoranthene; 3.04 ppm of benzo(k)fluoranthene; and 4.42 ppm of benzo(a)pyrene). It was stated that this basin drained sinks in the laboratory, but did not connect to a sewer and instead had vents to allow for evaporation (PAP-00044389, 91).

Copper

Although descriptions of the manufacturing processes did not specifically identify copper as being used at the facility, an application for permit to discharge to a domestic treatment works, dated February 26, 1982, stated copper was a component of a substance used and/or manufactured at the facility over the next five years (PAP-00040212).

A NJDEP Pretreatment/Residual Waste Survey, dated July 27, 1981, stated copper was present in the discharge to the POTW (PAP-00040183, 188). Furthermore, copper was detected in effluent samples collected in 1979, 1980, and 1982 as follows:

- An undated PVSC sewer connection application included results for composite samples collected from industrial waste outlet Nos. 3 and 4 in June 1979. Copper was detected at a maximum of 0.070 mg/L (PAP-00040046-47; PAP-00040048).

- According to a report for the EPA titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, copper was detected in all five waste streams from the facility's products (see Section 3, Operational History/COC Use and Presence at the Facility above). However, the report identified copper as detected above trace levels in only three of the product waste streams: salicylic acid (copper at 450 µg/L), methyl salicylate (copper at 3,200 µg/L), and fumaric acid (copper at 39 µg/L)

(PAP-00040067-68, 130). Copper was also detected in the municipal water (14 µg/L; see table in Section 3 above) (PAP-00040130).

- A *Heavy Metals Source Determination Study* by the PVSC, dated April 1980, identified Tenneco as discharging 0.189 mg/L (0.922 pounds per day) of copper (PAP-00322628).

- According to an application for permit to discharge to a domestic treatment works, dated February 26, 1982, copper was detected in the effluent discharged to the PVSC at 19.53 mg/L (PAP-00040210, 12).

Copper was detected in surface soil (Sample B-47-Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at a maximum concentration of 550 mg/kg (PAP-00041872). Copper was also detected in filter cake material at 223 mg/kg located between crushed white rock found in a 40-foot-long concrete trough at Building 17 (AEC-32C, Concrete Trough). The soil sample collected beneath the trough detected copper at 52.4 ppm. An area of 12.5 feet by 60 feet and 5 feet deep was excavated around the concrete trough in 2002, and included 216 tons of soil (PAP-00044395-97, 455).

Lead

According to a report for the EPA titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, lead was detected in the waste stream from the manufacture of methyl salicylate at 450 µg/L (PAP-00040067-68, 131). A *Heavy Metals Source Determination Study* by the PVSC, dated April 1980, identified Tenneco as discharging 0.394 mg/L (1.922 pounds per day) of lead (PAP-00322628).

Lead was detected in surface soil (Sample B-47-Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at an elevated concentration of 820 mg/kg. The 1996 RAWP Addendum attributed this concentration to fill material present at the site (PAP-00042177, 80).

According to the 2003 RI/RAR, lead was detected in filter cake material at 594 ppm found at AEC-32C (Concrete Trough) in Building 17. Soil beneath the trough contained lead at 43.6 ppm (PAP-00044395-97, 455). After the trough was excavated in 2002, the loading dock between Building 16 and Building 17 was investigated. Fill material consisting of crushed rock, brick, wood chips, and glass was found beneath the loading dock. The fill was 1 foot thick, while the native soil beneath consisted of a fine sandy silt. A sample from the fill material contained 42,000 ppm lead, while the native soil beneath this location detected lead at 35.9 ppm. Approximately 166 tons of soil were excavated from this area in 2002 (PAP-00044397-99, 457).

Mercury

Although mercury was not identified as used in the facility processes, purchase orders from 1973 identified the purchased caustic soda as mercury cell material. Analytical results from the caustic soda manufactured using the mercury cell process were not available to verify that the caustic soda did not contain any trace impurities of mercury (PAP-00324677; PAP-00324679; PAP-00324684).

A NJDEP Pretreatment/Residual Waste Survey, dated July 27, 1981, stated mercury was present in the discharge to the POTW (PAP-00040183, 188). Furthermore, mercury was detected in effluent samples collected in 1979, 1980, and 1982 as follows:

- An undated PVSC sewer connection application included results for composite samples collected from industrial waste outlets No. 3 and 4 in June of 1979. Mercury was detected at a maximum of 0.00123 mg/L (PAP-00040046-47; PAP-00040048).

- According to a report for the EPA titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, mercury was detected in the waste stream from the manufacture of salicylic acid (0.0015 mg/L), methyl salicylate (0.001 mg/L), and fumaric acid (0.001 mg/L), as well as the municipal water (PAP-00040067-68, 132).

- A *Heavy Metals Source Determination Study* by the PVSC, dated April 1980, identified Tenneco as discharging 0.001 mg/L (0.0044 pounds per day) of mercury (PAP-00322628).

- An application for permit to discharge to a domestic treatment works, dated February 26, 1982, stated mercury was detected at 0.001 mg/L in the effluent discharged to the PVSC (PAP-00040210).

Mercury was detected in subsurface soil (depth of 4 to 4.5 feet, Sample B-53 Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at a maximum concentration of 18.6 mg/kg (PAP-00041873). Mercury was also detected in filter cake material at 100 mg/kg located between crushed white rock found in a 40-foot-long concrete trough at Building 17 (AEC-32C, Concrete Trough). The soil sample collected beneath the trough detected mercury at 0.58 ppm. An area of 12.5 feet by 60 feet and 5 feet deep was excavated around the concrete trough in 2002, and included 216 tons of soil (PAP-00044395-97, 455).

According to the 2003 RI/RAR, mercury was detected in soil at a maximum concentration of 15.5 ppm from beneath the sewer line that ran from Building 17 south to the Hudson Street sewer line. The soil along the sewer line consisted of crushed stone/slag fill material underlain by sand, silt, and silty sands. Approximately 110 tons of soil were excavated from this sewer line (AEC-33) (PAP-00044400-1).

Historic Fill

The Allocation Team has determined that the majority of the facility site is not located on regional historic fill as designated by the NJDEP.[1] However, there may be historic fill present at the northwest corner of the site under Monroe Street. In addition, the 1996 RAWP Addendum attributed elevated concentrations of PAHs and lead at the former Salicylic Acid/Salicylate Production Buildings located at the northeast portion of the site to the presence of fill (PAP-00042177-80).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing historic fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of historic fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00041873; PAP-00042265).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	42,000 mg/kg
Copper	550 mg/kg
Mercury	18.6 mg/kg
Benzo(a)anthracene	41.0 mg/kg
Benzo(a)pyrene	42.0 mg/kg
Benzo(b)fluoranthene	38.0 mg/kg
Benzo(k)fluoranthene	13.0 mg/kg
Dibenzo(a,h)anthracene	5.5 mg/kg
Indeno(1,2,3-cd)pyrene	33.0 mg/kg
PCBs	15.8 mg/kg

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #42 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of historic fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area historic fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Sanitary and Storm Sewer

A letter from Tenneco to the PVSC, dated January 14, 1970, stated there was an unknown break in the sanitary sewer line near the south outfall from the facility. The facility stated they plugged the outfall and all discharge was diverted to the chemical sewer (PAP-00324649).

A PVSC questionnaire dated February 28, 1970, stated the facility discharged sanitary and industrial waste to the PVSC trunk line at an average rate of 355,000 gallons per day (PAP-00324652).

According to an application submitted to the Department of the Army Corps of Engineers for a permit to discharge or work in navigable waters and their tributaries, dated June 25, 1971, the facility used 0.5 million gallons of process water per day. The facility discharged 0.75 million gallons per day to the municipal waste treatment system (PAP-00039877; PAP-00039897, 901).

Tenneco submitted a Waste Effluent Survey, dated May 19, 1972, to the PVSC. This survey listed 750,000 gallons of water discharged to the sanitary sewer per day. The effluent was stated to contain less than 1 ppm (or 6.2 pounds per day) each of lead, copper, and mercury. The discharges were stated to continue 24 hours per day (PAP-00039957-58).

An undated PVSC sewer connection application stated that 488 million gallons were discharged to the sanitary sewer in 1978. Five outlets to the sewer were identified; three outlets were stated to contain industrial waste. Composite samples collected from industrial waste outlet Nos. 3 and 4 in June of 1979 contained maximums of 0.070 mg/L copper, less than 0.125 mg/L lead, and 0.00123 mg/L mercury (PAP-00040042, 44, 47; PAP-00040048).

Five outlets to the sanitary sewer were identified in an undated PVSC application for sewer connection permit (PAP-00040044) and a letter to the PVSC from Tenneco dated December 16, 1980 (PAP-00040165). The flow in 1980 was identified as:

- Outlet No. 1: 5,000 gallons per day to the sanitary sewer
- Outlet No. 2: 5,000 gallons per day to the sanitary sewer (PAP-00040044)
- Outlet No. 3: 540,000 gallons per day containing industrial waste
- Outlet No. 4: 1,000 gallons per day containing steam condensate
- Outlet No. 5: no flow as this outlet was eliminated (PAP-00040166)

Outlet No. 5 was stated to be eliminated with wastewater diverted to outlet No. 3. It was also stated that most of the wastewater from Outlet No. 4 was diverted to No. 3 (PAP-00040165). The undated PVSC permit application stated the flow through Outlet Nos. 4 and 5 were 150,000 and 4,000 gallons per day, respectively. The flow for Outlet No. 3 was 1,100,000 gallons per day, but was noted to be incorrect (PAP-00040044).

The report titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, stated 1.034 million gallons per day were discharged to the municipal sewage treatment plant (PAP-00040089). However, a Heavy Metals Source Determination Study by the PVSC, dated April 1980, identified a flow rate of 0.585 million gallons per day for Tenneco (PAP-00322628).

The individual flow rates for each process discharged through Outlet No. 3 to the City of Garfield sewer and the PVSC treatment plant were identified in an application for permit to discharge to a domestic treatment works, dated February 26, 1982:

- Formaldehyde: 100,800 gallons per day
- Benzoic acid/benzaldehyde: 36,000 gallons per day
- Sodium benzoate: 66,200 gallons per day
- Salicylic acid: 154,100 gallons per day
- Fumaric acid: 46,100 gallons per day
- Methyl Salicylate: 36,000 gallons per day (PAP-00040202).

A letter to the PVSC submitted with the Application for Approval of Plans, dated April 1, 1975, stated that diverting the contaminated cooling water to the sanitary sewer would increase the volume of water discharged to the PVSC by “75M” gallons per day (PAP-00040008).

Direct Release

A *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor*, dated November 1969, identified four outfalls from Tenneco with large flows at Passaic River mile 16.2. The remarks stated that the discharge may contain detergent and dead fish were noted in the outfalls (PAS-00114006).

A letter from Tenneco to the PVSC, dated January 14, 1970, stated Tenneco was investigating possible sources of pollution to the Passaic River from their plant. Tenneco found old drains which may have received overflows from the pilot plant. In addition, Buildings 32 and 36 were connected to conduits that fed to the river. Tenneco stated they would tie the floor drains from the pilot plant and the process area floor drains to the chemical sewer (PAP-00324647-8).

A PVSC questionnaire dated February 28, 1970, stated the facility discharged cooling water waste (thermal pollution only) to the Passaic River at an average rate of 2.8 million gallons per day (PAP-00324652).

According to an application submitted to the Department of the Army Corps of Engineers for a permit to discharge or work in navigable waters and their tributaries, dated June 23, 1971, the facility used 5.8 million gallons per day of cooling water sourced from the river. The river water return outfall was stated to be sampled and analyzed periodically, but the results were not available (PAP-00039877; PAP-00039897, 901).

Tenneco submitted a Waste Effluent Survey, dated May 19, 1972, to the PVSC. This survey listed 5.48 million gallons of water discharged to the Passaic River per day. The effluent was stated to contain less than 0.1 mg/L (or 5 pounds per day) each of lead, copper, and mercury. The river water was stated to be used for non-contact cooling water and barometric condensers (PAP-00039957, 59).

According to the PVSC Annual Report for 1973, Tenneco had a 2-inch boiler blow down line to the Passaic River, and it was confirmed that the discharge was polluting in November 1973 based on a collected sample. Information for this sample was not provided (PAS-00008608). According to the PVSC Annual Report for 1974, the equipment was installed to divert this discharge to the sanitary sewer, and this violation was eliminated on June 6, 1974 (PAS-00008610).

An Engineer's Preliminary Report, dated October 28, 1974, stated Outfalls 001 and 002 contained cooling water return and stormwater runoff from Monroe Street and the facility. It was stated that the discharge through 001 contained contact cooling water from Building 36. This report also identified potential sources of contamination in Outfall 002, including contact cooling water discharged from Building 12, effluent from a scrubber in Building 10-T, and floor drains in Building 32. The report recommended eliminating the contact cooling water from the outfalls and directing the potential sources of pollution to the sanitary sewer (PAP-00324693-95).

According to a Tenneco Status Report dated April 18, 1975, from August 1974 to March 1975, the daily volume of discharge from Outfall 001 ranged from 4.3 million to 15.3 million gallons per day. For the same time period, the daily volume discharged through Outfall 002 was 24 million to 32.5 million gallons per day (PAP-00040019).

A NPDES Plant Inspection performed on September 29, 1977 stated approximately 1.0 million gallons per day were discharged from Outfall 001, 3.2 million gallons per day were discharged through Outfall 002, and approximately 1 million gallons per day were discharged through Outfall 005 (PAP-00040027).

An undated PVSC sewer connection application stated that 1,100 million gallons per year were discharged to a storm sewer, river, or ditch in 1978 (PAP-00040042).

The report titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, stated 3.309 million gallons per day of untreated wastewater was discharged through two outfalls to the Passaic River (PAP-00040089).

A NJDEP Application for Approval of Plans, dated April 1, 1975, outlined Tenneco's plans to monitor its cooling water return to the Passaic River and reduce sources of pollution entering the Passaic River (PAP-00039995). The plans stated that process water was entering the cooling water returned to the Passaic River and proposed a filter to remove the pollutants as well as discharging contaminated cooling water to the sanitary sewer (PAP-00039997-40000). An April 1, 1975 letter to the PVSC submitted with the application stated the contaminated cooling water would increase the volume of water discharged to the PVSC by "75M" gallons per day (PAP-00040008).

6. Regulatory History/Enforcement Actions

Inspections

A NPDES Plant Inspection was performed September 29, 1977. The inspection report identified the three outlets and found several exceedances of the temperature limits (PAP-00040026).

Violations

A violation and elimination was identified in the PVSC Annual Report for 1972. According to this report, a leak developed in the sewer line under River Road and was sealed as soon as it was detected. An inspector noted that the by-passed waste was being pumped into a storm sewer that led to the Passaic River on December 28, 1972. The flow was then diverted to the sanitary sewer to halt the pollution. The sewer line was repaired on December 29, 1972 (PAS-00008606).

A violation was identified in the PVSC Annual Report for 1973. The report stated Tenneco had a 2-inch boiler blow down line to the Passaic River, and it was confirmed that the discharge was polluting in November 1973 based on a collected sample. Information for this sample was not provided. According to the Annual Report, Tenneco was purchasing equipment to divert this discharge to the sanitary sewer (PAS-00008608). According to the PVSC Annual Report for 1974, the equipment was installed and this violation was eliminated on June 6, 1974 (PAS-00008610).

The PVSC Annual Report for 1976 identified a violation and elimination due to a complaint of suds entering the Passaic River from Tenneco on September 1, 1971. Tenneco had been cleaning their 2,000-gallon Reactor No. 1 on the fourth floor and the soap drained into the sanitary sewer at too high a flow rate. The soapy water overflowed into the yard, draining into the storm sewer and then the Passaic River. The overflow was stopped and Tenneco stated they would use an alternate hose to drain the soapy water. A sample collected from the storm sewer was stated to be acceptable, but information for this sample was not provided (PAS-00008612-13).

Permits

NPDES permit No. NJ 0000124 to discharge to the Passaic River was effective for the facility on June 30, 1974, and expired June 30, 1979 (PAP-00039966). The following discharge serial numbers were identified: 001A and 001B; 002; 005. Limitations on these outfalls did not contain COCs. Outfall 005 was limited to containing chemicals or other substances less than or equal to what was found in the receiving waters (PAP-00039969).

On September 21, 1978, the NPDES permit was modified effective October 21, 1978, for the limitations of non-COCs (PAP-00324725-29). Tenneco applied to renew their NPDES permit on November 28, 1978 (PAP-00324732).

NJPDES SIU Permit No. NJ0000124 for the discharge of industrial wastewater to the PVSC facility was effective December 1, 1982, and expired November 30, 1987. The permit stated the facility was subject to effluent limits and monitoring requirements, but these criteria were not available (PAP-00040237).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, by Acurex Corporation (PAP-00040062).
- *Preliminary Investigation of Soil Quality Conditions at the Kalama Chemical, Inc. Facility in Garfield, New Jersey*, dated December 1986, by Geraghty & Miller, Inc. (PAP-00040239).
- *A Sampling Plan for Site Evaluation*, dated August 1987, by Geraghty & Miller, Inc. (PAP-00040248).
- *ECRA Soil and Groundwater Investigation at the Kalama Chemical, Inc. Facility, Garfield, New Jersey*, dated June 1988, by Geraghty & Miller, Inc. (PAP-00040387).
- *Revised Sampling Plan Addendum*, dated March 1990, by Geraghty & Miller, Inc. (PAP-00040575).
- *Revised ECRA Sampling Plan Investigation Report, Kalama Chemical, Inc. Facility*, dated September 1991, by Geraghty & Miller, Inc. (PAP-00040980).

- *Draft ECRA Investigation Report and Proposed Remedial Action Workplan*, dated December 1993, by Geraghty & Miller, Inc. (PAP-00041189).
- *Revised Remedial Action Work Plan*, dated March 31, 1995, by SECOR International Inc. (PAP-00041624).
- *Revised Remedial Action Work Plan Addendum*, dated February 29, 1996, by SECOR International Inc. (PAP-00042155).
- *Remedial Investigation and Remedial Actions Report*, dated September 17, 2001, by Sovereign Consulting Inc. (PAP-00043851).
- *Remedial Investigation and Remedial Actions Report, Building 17 Former Sewer Lines*, dated February 26, 2003, by Sovereign Consulting Inc. (PAP-00044382).
- *Comprehensive Remedial Action Work Plan Addendum*, dated March 14, 2008, by Sovereign Consulting Inc. (PAP-00323651).

Soil

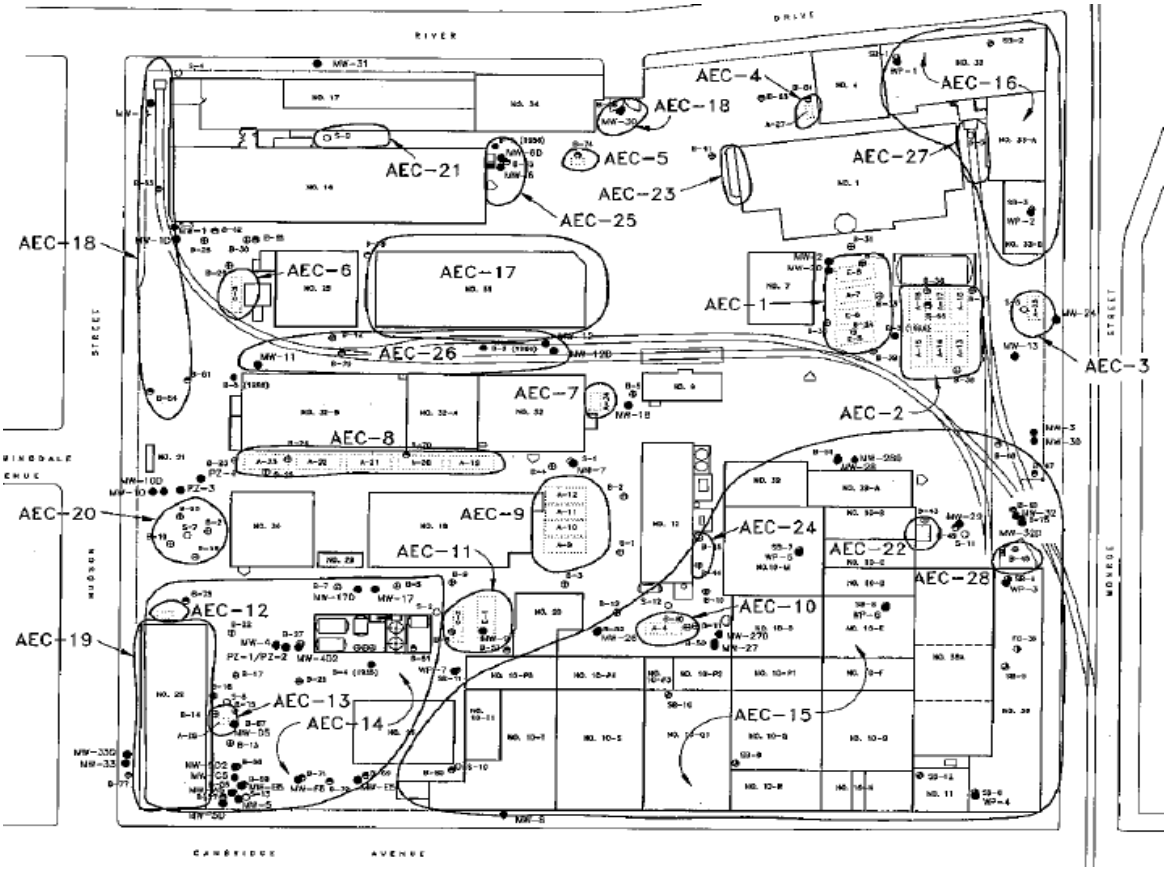
Soil sampling was performed from 1986 through 1993 and summarized in the 1995 RAWP. The 1995 RAWP identified 28 AECs that generally included former locations of USTs (e.g., AECs 1, 3, 6, 10, 11 contained fuel oil USTs), drum and scrap metal storage areas (AECs 19, 20, 21), production areas (AECs 14, 15, 16, 17), transformers (AECs 23, 24), and loading/unloading areas (AECs 24 through 28) (PAP-00041648-52).

EPEC Polymers, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



(PAP-00041795; note north is to the right in this figure)

Metal COCs were detected at AEC-14, AEC-15, and AEC-18 as listed in the table below. Highest levels of metals contamination in soil were noted at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39). The 1996 RAWP Addendum attributed the lead concentration at AEC-15 to the presence of fill at the site (PAP-00042180).

Metal COCs Detected in Soil				
AEC	**Description**	**Copper**	**Lead**	**Mercury**
AEC-14	Benzoic Acid/ Benzaldehyde Production Area	7.8 mg/kg	(3.4 U)	(0.11 U)
AEC-15	Salicylic Acid/ Salicylate Production Buildings 10/36/39	550 mg/kg	820 mg/kg	18.6 mg/kg
AEC-18	Sewer Lines	190 mg/kg	446 mg/kg	0.68 mg/kg

U: Not detected (PAP-00041871-73, 76)

PCBs were detected in site soil at AEC-24 (Transformer at Building 12) at a maximum of 2.2 mg/kg for Aroclor-1260 (PAP-00041882). In addition, according to the 2003 RI/RAR, PCBs were detected at 15.8 pm in one sample collected from the fill “within the foundation walls” of Building 17, but additional delineation samples did not detect PCBs (PAP-00044391-92).

PAHs were detected at most AECs, but concentrations were generally low (less than average concentrations associated with historic fill as discussed in Section 4, Identified COCs), with the highest concentrations detected at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39). The 1996 RAWP Addendum attributed these concentrations to the presence of fill at the site (PAP-00042179). The maximum concentrations of PAHs were detected as follows:

Maximum PAHs Detected in Soil Samples			
PAHs (ppm)	**S-2 at AEC-14**	**B-52-A at AEC-15**	**AEC-15-1C**
Anthracene	0.85	1.3	13.0
Benzo(a)anthracene	3.0	12.0	41.0
Benzo(a)pyrene	2.4	10.0	42.0
Benzo(b)fluoranthene	5.69	13.0	38.0
Benzo(ghi)perylene	0.96	3.0	43.0
Benzo(k)fluoranthene	NR	2.5	13.0
Chyrsene	4.0	12.0	45.0
Dibenzo(a,h)anthracene	NR	1.0	5.5
Fluoranthene	4.1	14.0	41.0
Fluorene	0.66 U	NR	1.8
Indeno(1,2,3-cd)pyrene	0.95	2.9	33.0
Naphthalene	2.8	0.12 J	0.27 J
Phenanthrene	3.4	4.6	39.0
Pyrene	6.91	20	260

NR: not reported J: estimated concentration U: not detected
(PAP-00041870, 72; PAP-00042265)

The *Remedial Investigation and Remedial Actions Report*, dated September 17, 2001, identified three additional AECs, where PAHs and metals were detected in site soil at concentrations less than the maximums reported above (PAP-00043883-9). The *Remedial Investigation and Remedial Actions Report, Building 17 Former Sewer Lines*, dated February 26, 2003, identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Elevated PAHs were detected in a concrete basin (AEC-32A) north of Building 17 (i.e., 6.1 ppm of benzo(a)anthracene; 4.45 ppm of benzo(b)fluoranthene; 3.04 ppm of benzo(k)fluoranthene; and 4.42 ppm of benzo(a)pyrene). It was stated that this basin drained sinks in the laboratory, but did not connect to a sewer and instead had vents to allow for evaporation (PAP-00044389, 91).

Sewer

In the 1995 RAWP, AEC-18 was identified as the western portion of the sewer line that ran along Hudson Street to south, as well as the sewer outfall 002 near the main gate (PAP-00041651). Metals and PAHs were detected in soil samples collected along the sewer lines at maximum concentrations of 190 ppm copper (Sample B-55-Fill), 446 ppm lead (Sample B-54-Fill), and 0.68 ppm mercury (Sample B-54-Fill) (PAP-00041876).

The sewer lines from Building 17 (AEC-33), Building 32 (AEC-34), and Hudson Street (AEC-35) were removed in 2002. Maximum concentrations of metals in soil beneath the Building 17 line were 92.9 ppm copper, 132 ppm lead, and 15.5 ppm mercury. The soil along the Building 17 sewer line consisted of crushed stone/slag fill material underlain by sand, silt, and silty sands. Soil samples collected at the Building 32 and Hudson Street sewer lines were not analyzed for metals. Approximately 110 tons, 756 tons, and 1,312 tons of soil were removed with each sewer line, respectively (PAP-00044401, 03-04, 13, 59).

Remedial Activities

The *ECRA Soil and Groundwater Investigation at the Kalama Chemical, Inc. Facility, Garfield, New Jersey*, dated June 1988, stated 11 of the 27 USTs were removed from the site in 1987. Five of these USTs contained No. 2 Fuel Oil and ranged from 5,000 to 16,500 gallons in volume (PAP-00040392, 406). According to the Revised Sampling Plan Addendum, dated March 1990, the remaining USTs containing methanol, hexane, MIBK (methyl isobutyl ketone), and No. 6 Fuel Oil were removed between 1987 and 1990 (PAP-00040593-94).

An Administrative Consent Order, dated December 8, 1988, was issued by NJDEP to Kalama Chemical, Inc. the owner of the site at the time (PAS-00008625-33). The remediation agreement was modified September 13, 1996, and Tenneco became the lead responsible party (PAS-00008621-24).

The 2003 RI/RAR identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Fill was discovered “within the foundation walls” of the building and was analyzed for PCBs as part of the waste disposal characterization. PCBs were detected at 15.8 ppm in one soil sample, but additional delineation samples did not detect PCBs. An area of 19 feet by 27 feet was excavated to depth of 4 feet around the sample location (PAP-00044391-92).

This investigation also excavated a concrete trough with elevated metals concentrations located at Building 17, including an area of 12.5 feet by 60 feet and 5 feet deep and consisting of 216 tons of soil (PAP-00044395-97). After the trough was excavated in 2002, the loading dock between Building 16 and Building 17 was investigated. Fill material consisting of crushed rock, brick, wood chips, and glass was found beneath the loading dock. The fill was 1 foot thick, while the native soil beneath consisted of a fine sandy silt. A sample from the fill material contained 42,000 ppm lead, while the native soil beneath this location detected lead at 35.9 ppm. Approximately 166 tons of soil were removed from this area in 2002 (PAP-00044397-99, 457).

The sewer lines from Building 17 (AEC-33), Building 32 (AEC-34) and Hudson Street (AEC-35) were removed in 2002. Maximum concentrations of metals in soil beneath the Building 17 sewer line were 92.9 ppm copper, 132 ppm lead, and 15.5 ppm mercury. Approximately 110 tons, 756 tons, and 1,312 tons of soil were removed with each sewer line, respectively (PAP-00044401, 04, 13).

According to a *Comprehensive Remedial Action Work Plan Addendum*, dated March 14, 2008, no further action (NFA) was approved by NJDEP for the following AECs in a letter dated September 6, 1995: AEC-1 through 8, 10, 16, 22 through 25, 27, and 28. This Work Plan also stated AEC-31 received NFA approval on June 18, 2002, and AEC-32A, 32B, 32C, 32D, 33, 34, and 35 were approved for NFA by NJDEP on October 21, 2003 (PAP-00323694-702, 708, 729, 737-739, 741-742, 749-766).

A letter from NJDEP dated December 30, 2008 approved NFA for the following AECs: 9, 12, 13, 15, 17, 18, 19, 20, 21, 26, and 32A. The letter stated a site-wide cap engineering control was required due to the presence of contaminated historic fill at the site (PAP-00324631).

8. Summary of Asserted Defenses

EPEC asserts that EPEC Polymers, Inc. (“EPI”) and El Paso Tennessee Pipeline Co. (“EPTP”) received GNL letters from EPA; however, EPI and EPTP never owned or operated the Facility, nor were either company ever successors to any party or parties that owned or operated the Facility. Further, neither party assumed any liability for the alleged discharges at the Facility that are at issue in this allocation. EPI and EPTP respond on behalf of Tenneco Chemicals, Inc. (“TCI”), which was a former owner and operator of the Facility during the Relevant Time Period [October 4, 1963 to December 1, 1983].”

The "Heyden Newport" entity that changed its name to Tenneco Chemicals, Inc. in 1965 was not the same entity that owned the Garfield Facility prior to Tenneco's acquisition. The following statement was provided: “In 1919, Heyden Chemical Company of America, Inc., a New York corporation, reportedly acquired the Garfield Site. In 1925, Heyden Chemical Company of America was consolidated with Denhey Corporation to form Heyden Chemical Corporation, a New York corporation. In March 1943, Heyden Chemical Corporation merged into its parent company, Denhey Holding Corporation, a Delaware corporation, and Denhey Holding Corporation was renamed Heyden Chemical Corporation, also incorporated in Delaware. In March 1943, the Garfield Site was transferred by deed from Heyden Chemical Corporation, a New York corporation, to Heyden Chemical Corporation, a Delaware corporation. Heyden Chemical Corporation then changed its name to Heyden Newport Chemical Corporation (“Old Heyden”). In 1963, Tennessee Gas Transmission Company (“TGT”), Old Heyden, and HDN Corporation, a subsidiary of TGT, entered into a transaction whereby Old Heyden sold its assets to HDN in exchange for shares of TGT common stock and the assumption by HDN of certain of Old Heyden’s liabilities. After the transaction, HDN changed its name to “Heyden Newport Chemical Corporation” (“Heyden Newport”) and filed and recorded in Delaware a change of name amendment on October 4, 1963. At the same time, Old Heyden changed its name to “Denport Corporation” and dissolved”” (2019 Letter, p. 2).

On December 15, 1982, Tenneco Chemicals and Tenneco Polymers entered into an agreement whereby Tenneco Chemicals transferred certain assets to Tenneco Polymers. Pursuant to that agreement, Tenneco Chemicals did not transfer any liabilities related to the Garfield Site, and any transfer of liabilities was limited to litigations and claims known or existing at the time of the conveyance—and expressly

referenced in exhibits consisting of litigation dockets generated at the time of the transaction. In 1983, Tenneco Chemicals changed its name to Tenneco Resins, Inc. ("Resins"), and filed for dissolution two years later, in 1985. Tenneco Polymers changed its name to EPEC Polymers, Inc. in 1996, shortly following El Paso Merger Company's acquisition of the energy assets of Tenneco Inc. As the aforementioned facts demonstrate, at no time did Tenneco Polymers merge or consolidate with Resins. In addition, Tenneco Chemicals was a separate corporation from Tenneco Polymers with assets and operations. Although Tenneco Chemicals was a party to various asset transfers over the course of its corporate existence, it retained any and all liabilities associated with the Garfield Site, and those liabilities ceased to exist upon its dissolution in 1985."

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

ESSEX CHEMICAL CORPORATION

Facility Name, Address and Size: Essex Chemical Corporation (Essex); 330 and 352 Doremus Avenue, Newark, New Jersey; 15 acres (PAP-00116509).

In 1989, the Essex property was bordered to the south by Hoechst-Celanese Corporation, to the north by Quantum Chemical Corporation and the Nimco commercial bus crushing facility, to the northeast and west by steel scrap salvage yards, and to the west by vacant property owned by the Housing Authority of the City of Newark and leased by the Waterside Urban Renewal Development Corporation. Conrail owned and maintained a 35-foot wide strip of land which ran parallel to Doremus Avenue adjacent to the eastern yard of the Essex facility (PAP-00116863).

1. **Business Type:** Manufacturer of sulfuric acid and related inorganic products (PAP-00116859)

2. **Time Period of Ownership/Operations**

330 Doremus Avenue	352 Doremus Avenue
Operator: 1956 to 1989	**Operator:** 1965 to 1989
Owner: 1955 to 1989	**Owner:** 1965 to 1989

1953: Dixon Chemical and Research, Inc. (DCR), a successor to Dixon Chemical, Inc., was established in 1953 (PAS-00061383).

1955/1956: DCR acquired the 330 Doremus Avenue property from Reilly Industries (at the time, known as Reilly Tar and Chemical Corporation), erected a sulfuric acid plant, and began operating in 1956 (PAP-00115992).

1962: DCR changed its name to Essex on June 20, 1962 (PAS-00061383).

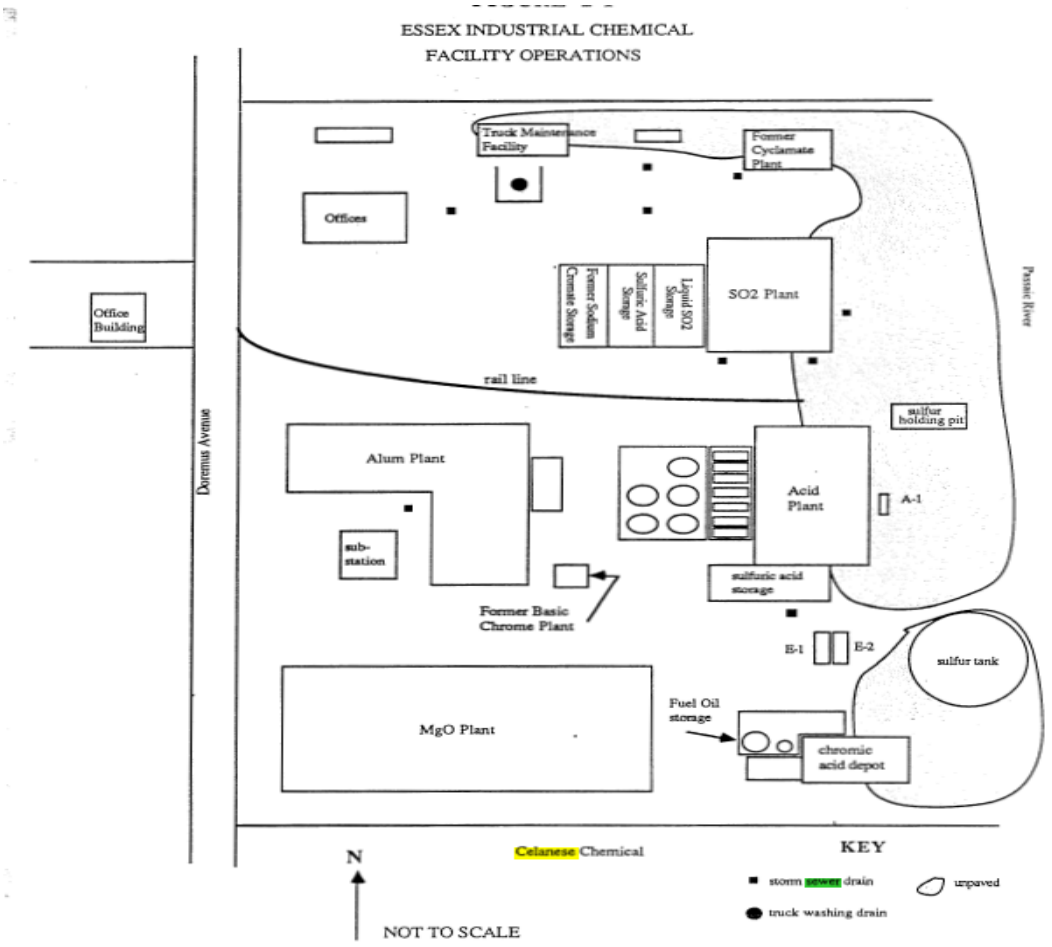
1965: Essex bought the 352 Doremus Avenue property from 352 Doremus Avenue Co., Inc. on June 25, 1965 (PAP-00115993).

~1982: Essex Industrial Chemicals, Inc. (Essex Industrial) was formed, and operated as a wholly-owned subsidiary of Essex (PAS-00061379).

1988: Dow Chemical Company acquired all the issued and outstanding stock of Essex in October 1988 (PAP-00116862).

1989: Essex sold the stock of Essex Industrial to Peridot Chemicals (New Jersey), Inc. (Peridot) on December 22, 1989 (PAP-00116862).

Note: Pan Am Sulfur Company leased one-half acre in the northeast corner of 352 Doremus Avenue from April 6, 1962 to March 31, 1970 on which it operated a large tank for the storage of molten sulfur (PAP-00115993).



(PAP-00115991)

Essex's manufacturing operations were situated on the east side of Doremus Avenue and administrative operations were conducted on the west side of Doremus Avenue (PAP-00115990).

3. Operational History/COC Use and Presence at the Facility

Essex manufactured industrial chemicals, including sulfuric acid, oleum, liquefied sulfur dioxide, and aluminum sulfate; warehoused chromium and phosphate chemicals; and operated a magnesium oxide regeneration plant for the Philadelphia Electric Company (PAP-00115988).

Available documents do not include information that Essex manufacturing processes entailed the use, storage, handling, or generation of Operable Unit 2 (OU2) contaminants of concern (COCs) (PAP-00115988; PAP-00115990; PAS-00061379, 81). According to a 1989 Essex Industrial Chemicals Newark Facility Hazardous Substance/Waste Inventory sheet, 15 pounds of mercury was present in the laboratory in 1989 (PAP-00116301).

4. Identified COCs

- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (used and detected)

PAHs

According to a Phase I ECRA Sampling Plan Results and Phase II Sampling Proposal, dated February 28, 1990 (1990 Phase I ECRA), total petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) were the primary organic constituents found at concentrations above the New Jersey Department of Environmental Protection's (NJDEP's) "informal ECRA [Environmental Cleanup Responsibility Act] action levels" in on-site soil. According to the 1990 Phase I ECRA, the extent of these substances appeared to be limited to an acid plant boiler area and a truck maintenance building area (PAP-00116505). The 1990 Phase I ECRA states that a suite of 5-10 PAHs were consistently identified in many of the soil samples analyzed (PAP-00116562).

The 1990 Phase I ECRA states that in some sample locations, PAH concentrations were found to increase with depth, especially in the eastern areas of the plant near the former underground tank locations. However, the 1990 Phase I ECRA also stated that in other areas, PAHs concentrations "appeared randomly with no apparent vertical distribution" (PAP-00116562). The 1990 Phase I ECRA states that, while these compounds may have originated from former Essex operations [e.g., leaks from fuel oil (No. 6) tanks or asphalt], "it is believed that historical operations at the site prior to Essex ownership may have also contributed to the levels found" (PAP-00116505, 562, 606).

According to the Phase II ECRA Sampling Plan Results and ECRA Cleanup Plan Proposal, dated April 1991 (1991 Phase II ECRA), several PAHs were detected in soil (PAP-00116908-10). Detections were identified at maximum concentrations that exceeded the calculated "RCRA [Resource Conservation and Recovery Act] Action Level" identified in the report (PAP-00116998-99). PAHs were reported at the following maximum concentrations (note that parts per million [ppm] is equivalent to mg/kg):

- Benzo(a)anthracene – up to 62 ppm
- Benzo(a)pyrene – up to 37 ppm
- Benzo(b)fluoranthene – up to 110 ppm
- Benzo(k)fluoranthene – up to 98 ppm
- Dibenzo(a,h)anthracene – up to 4 ppm
- Indeno(1,2,3-cd)pyrene – up to 26 ppm (PAP-00116999)

The following represents a complete table of samples with PAH concentrations exceeding calculated soil cleanup levels for the "Direct Contact Pathway":

Chemical	Direct Contact Action Level (mg/kg)	Phase II Soils Soil Sample	Phase II Soils Concentration (mg/kg)	Phase I Soils Soil Sample	Phase I Soils Concentration (mg/kg)
SVOAs					
chrysene	7.02E+01			AP-8C	8.50E+01
benzo(b)fluoranthene	2.22E+00	Q-3 (3.5-4)	4.10E+00	AP-6C	5.40E+00
				AP-7B	5.10E+00
				AP-8C	1.10E+02
				AP-9A	3.40E+00
				AP-11C	7.10E+00
				MGO-2B	1.20E+01
				TF-2	1.40E+01
				TF-5	2.50E+00
				CPP-1A	2.50E+00
				CPP-1C	2.30E+00
				CPP-3B	7.20E+00
				BK-1	5.30E+00
benzo(k)fluoranthene	4.72E+00			AP-8B	9.80E+01
benzo(a)pyrene	3.11E-01	TMB-2 (4-4.5)	9.10E-01	AP-6C	1.90E+00
		Q-1 (3.5-4)	9.90E-01	AP-7B	1.60E+00
		Q-3 (3.5-4)	2.50E+00	AP-8B	3.70E+01
		Q-4 (replacement)	4.90E-01	AP-8C	1.10E+01
		APS-1 (5.5-6)	3.30E-01	AP-9B	3.70E-01
		APS-5 (3.5-4)	3.20E-01	AP-11B	1.30E+00
		CP-5 (4-4.5)	4.20E-01	AP-11C	2.30E+00
		CP-7 (7.5-8)	1.10E+00	MGO-2B	3.00E+00
		CP-9 (4-4.5)	3.60E-01	E-3	7.60E-01
		CP-13 (5.5-6)	4.00E-01	TF-1	4.80E-01
		ALUM-1 (5.5-6)	9.20E-01	TF-4	4.10E-01
		ALUM-2 (3.5-4)	7.60E-01	CPP-1A	5.80E-01
		BC-7 (3.5-4)	7.10E-01	CPP-1B	1.40E+00
		BC-7 (5.5-6)	7.90E-01	CPP-1C	6.20E-01
		APS-6 (3.5-4)	7.40E-01	CPP-2A	1.20E+00
		APS-7 (5.5-6)	3.80E-01	CPP-3B	1.50E+00
		APS-10 (3.5-4)	1.80E+00	BK-1	2.50E+00
		APS-13 (5.5-6)	5.00E-01		
		ST-2 (3.5-4)	4.10E-01		
benzo(a)anthracene	2.14E+00	Q-3 (3.5-4)	2.70E+00	AP-7B	2.20E+00
				AP-8B	3.50E+01
				AP-8C	6.20E+01
				AP-8D	7.00E+00
				AP-11C	4.50E+00
				MGO-2B	8.20E+00
				TF-2	6.80E+00
				CPP-1B	3.50E+00
				CPP-2A	2.20E+00
				CPP-3B	3.30E+00
				BK-1	3.90E+00
dibenzo(a,h)anthracene	2.80E-01	CP-7 (7.5-8)	3.20E-01	AP-8C	4.00E+00
		APS-10 (3.5-4)	4.10E-01	AP-8D	3.50E-01
				AP-11C	6.10E-01
				MGO-2B	7.20E-01
				TF-2	3.50E-01
indeno(1,2,3-cd)pyrene	1.34E+00	APS-10 (3.5-4)	1.40E+00	AP-8B	1.70E+01
				AP-8C	2.60E+01
				AP-8D	2.50E+00
				AP-11C	1.60E+00
				MGO-2B	2.00E+00
				TF-2	2.60E+00
				BK-1	1.90E+00
benzo(g,h,i)perylene	1.42E+01			AP-8B	2.10E+01
				AP-8C	2.40E+01

(PAP-00117022)

Copper

According to the 1991 Phase II ECRA, copper was detected in site soil at a maximum concentration of 150 ppm at location TMB-3, at a depth of 4-4.5 feet below ground surface (bgs). This sample was described as “black sandy fill” in its boring log (PAP-00116912; PAP-00117390). Copper was detected in 9/9 samples collected (PAP-00116999).

Lead

According to a Memorandum: Responsible Party Investigation, received on April 3, 1991, the Division of Environmental Quality, Right to Know Survey states that Essex Industrial used several chemicals, including lead (PAP-00031631). Review of the available file material did not identify any other documentation of lead use.

According to the Phase II ECRA Sampling Plan Results and ECRA Cleanup Plan Proposal, prepared for Essex, dated April 1991, lead was detected in site soil at a maximum concentration of 7,000 ppm in sample Q-3 (3.5-4 ft bgs), within the Quantum Chemicals Property Area (PAP-00116922). Lead was also detected in several locations within the Truck Maintenance Building, including TMB-2 (4-4.5 ft bgs) at 100 ppm and TMB-4 (6.5-7 ft bgs) at 2,000 ppm. Additional detections were identified in the Chrome Sulfate and Chemical Unloading Area at location CR-4 (5-5.5 ft bgs) at 3,000 ppm (PAP-00117022). Lead exceeded the NJDEP ECRA "Action Level" identified in the report (PAP-00116922). Lead was detected in 9 out of 9 samples collected (PAP-00116999). Review of soil boring logs for the referenced sample locations shows that fill was identified at these locations (PAP-0017386, PAP-00117430, PAP-00117430).

A Remedial Action Report, dated September 2, 1994 (1994 Remedial Action Report) noted that lead was identified exceeding NJDEP cleanup levels in the Chromium Area. Following excavation, the confirmation samples collected were below cleanup criteria. The maximum concentration reported was 700 ppm at sample location CA-3 (PAP-00117542).

Mercury

According to the 1991 Phase II ECRA, mercury was detected in site soil at a maximum concentration of 7 ppm, at CR-4, at a depth of 5-5.5 feet bgs, beneath "coal fragments". Mercury exceeded the NJDEP ECRA "Action Level" identified in the report and was detected in 9 out of 9 samples collected (PAP-00116999; PAP-00116932; PAP-00117430).

A 1989 Essex Industrial Chemicals Newark Facility Hazardous Substance/Waste Inventory sheet noted that 15 pounds of mercury were stored in a laboratory (PAP-00116301).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to the 1990 Phase I ECRA, total petroleum hydrocarbons and PAHs were the primary organic constituents found at concentrations above NJDEP's "informal ECRA action levels" in on-site soil. The 1990 Phase I ECRA states that the extent of these substances appeared to be limited to an acid plant boiler area and a truck maintenance building area and that a suite of 5 to10 PAHs were consistently identified in many of the soil samples analyzed (PAP-00116505; PAP-00116562). According to the report, in some sample locations, PAH concentrations were found to increase with depth, especially in the eastern areas of the plant near the former underground tank locations. However, the report also stated that in other areas, PAHs concentrations "appeared randomly with no apparent vertical distribution" (PAP-00116562). The 1990 Phase I ECRA states that, while these compounds may have originated from Essex operations [e.g., leaks from fuel oil (No. 6) tanks or asphalt], "it is believed that historical operations at the site prior to Essex ownership may have also contributed to the levels found" (PAP-00116505, 562, 606).

The 1991 Phase II ECRA, states that "Soil (fill material) quality is impacted primarily by elevated levels of TPHCs [total petroleum hydrocarbons], BNs [Base/Neutral-Extractable organic compounds, which can include PAHs], and chromium. Although Essex has handled compounds containing these constituents, the widespread nature is believed partly attributable to combustion residues (coal, slag, cinders) deposited during the early development of the site and to historical operations by previous site owners" (PAP-00116859).

According to an ECRA Site Evaluation Submission, dated January 31, 1989 (1989 ECRA Site Evaluation), the facility is constructed on approximately 12-15 feet of man-made fill materials overlying former salt marsh deposits (PAP-00115999). The unconsolidated man-made fill at the site reportedly consists of rubble, construction debris, cinders, and varying amounts of silt and gravel (PAP-00116000). According to a

[2] Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils (2002) and Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] NJDEP, N.J.A.C. 7:26E Technical Requirements for Site Remediation, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated Historic Fill Technical Guidance (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Declaration of Environmental Restrictions, originally recorded on June 27, 1997, lead and PAHs, among other chemicals, are stated to be present in the Historic Fill (PAP-00116198; PAP-00116206-07). A review of available documents did not provide any evidence of disturbance of Historic Fill at the facility. As discussed in the 1994 Remedial Action Report, soil removed to address onsite contamination "appeared to consist primarily of fill material mixed with some construction debris. The fill was dark brown to black and consisted primarily of cinders and construction debris in a silty clay matrix. In general the debris consisted of brick, concrete, and wood" (PAP-00117522).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00116999).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	7,000 mg/kg
Copper	150 mg/kg
Mercury	7 mg/kg
Benzo(a)anthracene	62 mg/kg
Benzo(a)pyrene	37 mg/kg
Benzo(b)fluoranthene	110 mg/kg
Benzo(k)fluoranthene	98 mg/kg
Dibenzo(a,h)anthracene	4 mg/kg
Indeno(1,2,3-cd)pyrene	26 mg/kg

A review of available documents did not provide any evidence of disturbance of Historic Fill.

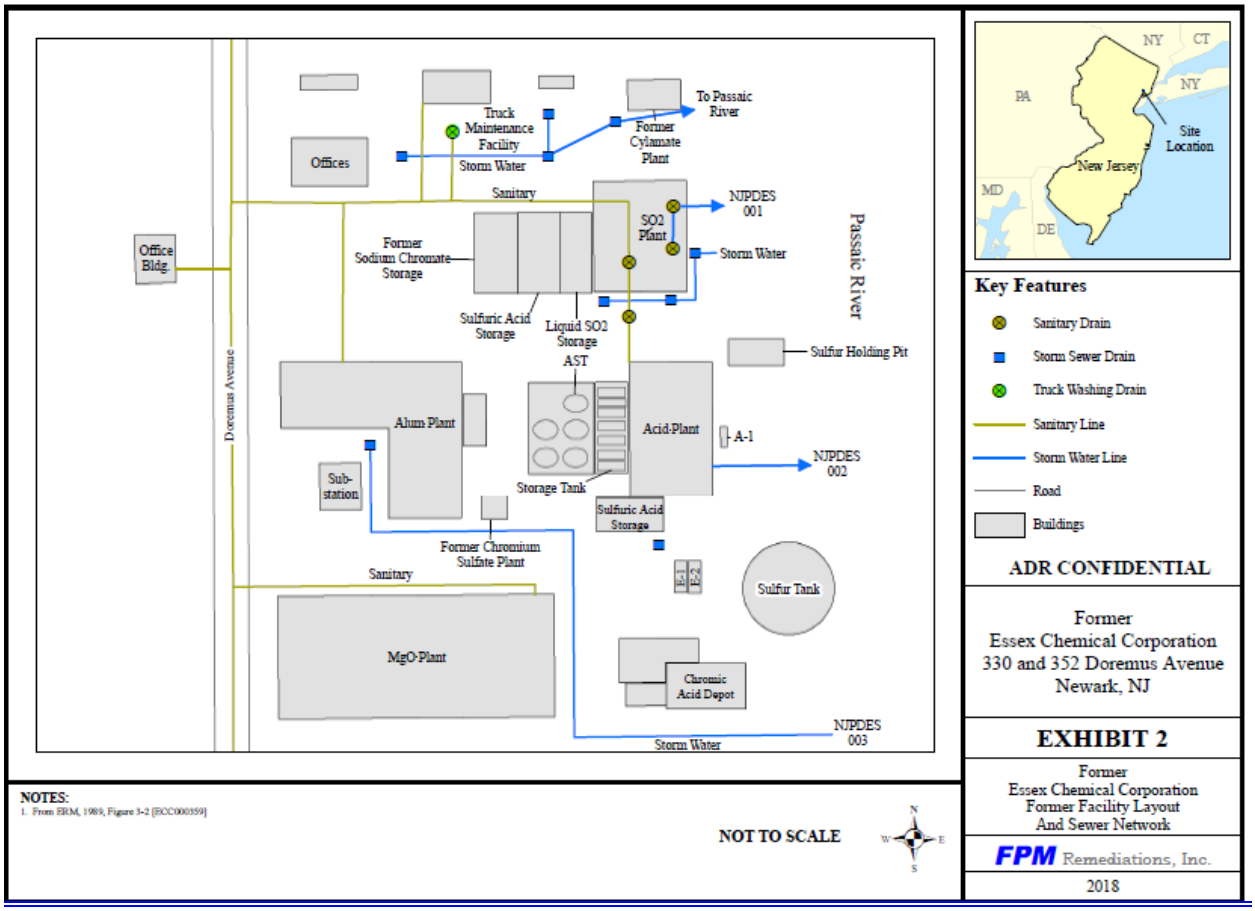
5. COC Pathways

Sanitary Sewer

Essex discharged all sanitary wastes from the facility and process effluent from the magnesium oxide regeneration operation, and wash water from a truck washing area to the PVSC system, pursuant to Sewer Connection Permit No. 20402313 (PAP-00116000; PAP-00116184). The ECRA Site Evaluation Submission, Request for Hydrogeological Assessment Facility Sampling Plan dated January 1989 (the 1989 Facility Sampling Plan) states that truck wash water was discharged from 1956-1987 (PAP-00115970).

Storm Sewer

Non-contact cooling water and condensate water associated with production of liquefied sulfur dioxide, along with storm water runoff, was discharged to the Passaic River via three outfalls pursuant to the New Jersey Pollutant Discharge Elimination System (NJPDES) Permit No. NJ0002283 (PAP-00115965, 5970, 5988-5989, 5970; PAP-00116075, 6102; PAP-116324; PAP-00117660).



(PAP-00116339)

Direct Release

There is no information regarding direct releases in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

According to a Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor, dated November 1969, the New Jersey State Department of Health issued “pollution abatement orders” to Essex (PAP-00140967). The reason for the order, including associated contaminants, is not specified in available file material.

Releases to the Passaic River from Essex were reported in 1972 and 1983; however, none of the releases involved OU2 COCs (PAS-00014546; PAS-00062738, 745).

Criminal charges were filed against Essex in United States District Court, District of New Jersey on July 11, 1974, arising from a 1972 release to the Passaic River from Essex (PAS-00062740). The charges were brought against Essex for "the unlawful discharge into the Passaic River of refuse matter, including acid and acid solutions" (PAS-00062738). As described by a PVSC inspector, a 20,000 gallon tank car with oleum and nitric acid overflowed through a vent pipe due to internal pressure. The ground was covered with soda ash and water to neutralize the overflow, and the fire department then washed the residue into the Passaic River (PAS-00062745).

Inspections

On May 2, 1974, PVSC inspected the facility and collected samples from their outlets for a routine inspection. Analysis revealed that a yard drain outlet "was polluting." The inspector contacted Essex and investigation revealed that some truckers, "despite orders to the contrary," had washed some trucks over a yard catch basin. To prevent this from recurring, it is reported that the yard catch basin in the truck area was plugged and the washing of trucks was moved to an area "whereby the waste enters the sanitary sewer (PAS-00034881)". No citations were noted in the provided sources.

Violations

There is no information regarding violations in the available file material.

Permits

From 1956 to 1989 non-contact cooling water and storm water were discharged without treatment; truck wash water was discharged and treated by PVSC from 1956 to 1987; and magnesium oxide plant effluent was discharged to PVSC from 1982 to 1989 (PAP-00115970).

Essex had three NJPDES permitted discharges to the Passaic River from 1956 to 1989: NJDEPS Permit No. NJ0002283 was issued for discharge into the Passaic River, with an issue date of September 2, 1988 and expiration date of October 31, 1993 (PAP-00115965, 5970) Outfalls No. 001 discharge included noncontact cooling water, boiler blowdown, and storm water runoff; Outfall No. 002 discharge included non-contact cooling water and storm water runoff; and, Outfall No. 003 discharge included non-contact cooling water from the magnesium oxide plant (PAP-00116116, 6118, 6120; PAP-00116283).

The NJPDES Permit No. NJ0002283 Summary Table lists monitoring of copper, among other chemicals (PAP-0016116-6121); however, copper was only required to be monitored if a corrosion inhibitor containing this metal was used for water treatment purposes (PAP-00116118). Review of discharge monitoring reports shows that Essex did not monitor for copper (PAP-00116139-83). Per a Public Notice regarding issuance of Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey, dated 1982, copper effluent was allowed a maximum limit of 1.0 milligrams per liter (mg/L) at a required monthly monitoring frequency for Outfalls No. 001, No. 002, and No. 003 (PAP-00116117, PAP-00116119, PAP-00116120).

PVSC Sewer Connection Permit No. 20402313 was issued and effective September 18, 1985 and expired September 13, 1990 (PAP-00116184). No monitoring related to OU2 COCs was required (PAP-0011686-89).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- ECRA Site Evaluation Submission, Essex Industrial Chemicals, Inc., Volumes 1 and 2 (January 31, 1989) (PAP-00115963-00116495)
- Phase I ECRA Sampling Plan Results and Phase II Sampling Proposal for Essex Chemicals Corporation (February 28, 1990) (PAP-00116496-PAP00116846)
- Phase II ECRA Sampling Plan Results and ECRA Cleanup Plan Proposal, Essex Chemical Corporation, Volumes 1 and 2 (April 1991) (PAP-00116847-7464)
- Remedial Action Report (September 1994) (PAP-00117511-644)

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

As discussed in the 1990 Phase I ECRA and 1991 Phase II ECRA reports, the Essex property underwent two phases of an ECRA Site Investigation. According to a 1994 Remedial Action Report, soils at this facility were found to contain PAHs and lead, among other chemicals. As a result, remedial actions were conducted to achieve the NJDEP “non-residential cleanup levels” for contaminated soils at the site and approximately 2,525 tons of soil and debris were removed from five on-site excavations and one off-site excavation (PAP-00117516). Because of the presence of chromium, zinc, and total petroleum hydrocarbons in soil, along with Historic Fill containing PAHs and lead, among other metal contaminants, a Declaration of Environmental Restrictions, originally recorded on June 27, 1997, was approved by NJDEP as a remedial measure and placed on the site in 1997 to restrict the use of the site to non-residential (PAP-00116197-98).

On June 30, 1997, NJDEP issued a “no further action” approval letter for the site and established a “Classification Exception Area” designation for a portion of the site “because levels of contaminants remain above their Ground Water Quality Criteria pursuant to the Ground Water Quality Standards (N.J.A.C. [New Jersey Administrative Code] 7:9-6.1 et seq.) and/or Primary Drinking Water Standards (N.J.A.C. 7:10), respectively” (PAP-00116195). These contaminants included lead and copper, among others (PAP-00117468).

Remedial Activities

A 1994 Remedial Action Report noted that lead was identified exceeding NJDEP cleanup levels in the Chromium Area. Following excavation, the confirmation samples collected were below cleanup criteria. The maximum concentration reported was 700 ppm at sample location CA-3, which was below the NJDEP non-residential soil cleanup criteria and no action was required (PAP-00117540-42). .

8. Summary of Asserted Defenses

Essex Chemical Corporation asserts that, “Essex is not a person responsible for the release of COC’s pursuant to the decision in CDMG Realty Co., et al. v. the Sharkey Landfill Agreement Group, 96 F. 3d. 706 (3rd Cir. 19946).

COCs detected at the former Essex property, other than minor petroleum spills, were exclusively from Historic Fill which was placed at the property well before Essex’ acquired it by parties unconnected to Essex.

In addition, any PAHs on site which may have resulted from tank or pipe leakage were contained in fuel oil and are subject to the petroleum exclusion under CERCLA. Any contaminants emanating onto the site from off-site sources are subject to the CERCLA contiguous property exception”.

Everett Smith Group Ltd.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

EVERETT SMITH GROUP LTD.

Facility Name, Address and Size: Everett Smith Group Ltd. (ESG) as successor to Blanchard Bro & Lane, 20 Bruen Street, Newark, New Jersey; 4.21 acres (PAS-00032776).

1. **Business Type:** Leather tannery (PAP-0044885).

2. **Time Period of Ownership/Operations**

Operator: 1937 to 1939
Owner: 1937 to 1941

Note: A company by the name of Blanchard Bro. appears in City of Newark directories at 20 Bruen street in 1872, 1874, and 1939 (PAS-00032777, -814).

However, it appears that there have been two Blanchard Bro. & Lane companies. One that was incorporated in 1887 ("Blanchard 1887") to operate a leather tannery at 20 Bruen Street and ceased to exist in 1937 pursuant to the terms of its 50-year incorporation certificate (PAP-00000009); and another incorporated in 1937 ("Blanchard 1937") operating a leather tannery at the same location incorporated in 1937 (PAP-00000053). The names of two officers of Blanchard 1887, H. Gay Crawford and Joseph H. Gay, are consistently listed as of two of the officers of Blanchard 1937 (PAS-00032899-900; PAP-00000052; PAP-00000010-14).

The corporate history of the Blanchard Bro. & Lane companies is as follows:

1887: An entity named Blanchard Bro. & Lane was incorporated (PAP-00000052). The New Jersey Secretary of State "List of Certificates" dated December 31, 1911 states that Blanchard 1887 was not given a "perpetual" existence when incorporated, but rather had a legal existence limited to 50 years (PAP-00000005-6).

Blanchard 1887 purchased the 20 Bruen Street property by a deed recorded on January 6, 1888 (PAP-00000039).

1937: The 20 Bruen Street property was sold by Blanchard 1887 to Frank Deckert (PAP-00000047-52). This sale was accompanied by a stamp of the common seal of "Blanchard Bro. & Lane, Incorporated 1887" (PAP-00000052).

Blanchard Bro. & Lane was incorporated (hereinafter "Blanchard 1937") on June 29, 1937 (PAP-00000007).

Frank Deckert sold the 20 Bruen Street property to Blanchard on July 1, 1937 (PAP-00000053) (describing, "Blanchard Bro. & Lane" as "a corporation of the State of New Jersey (organized 1937). Blanchard 1887's corporate existence terminated November 11, 1937, according to the terms of its charter (PAP-00000005-6).

1939: The last year in the available source documents that Blanchard Bro. & Lane was listed in the City of Newark directories for 20 Bruen Street (PAS-00032814).

1941: The 20 Bruen Street property was sold to Ironbound Land Development Company on December 26, 1941 (PAP-00000058).

1961: A 1961 letter from Warner, Norcross, and Judd Attorneys states that Eagle Ottawa Leather owns all of the "issued and outstanding stock of Blanchard 1937 (PAP-00432364-65).

1964: A liquidation plan was adopted to accomplish the dissolution of Blanchard 1937 on August 31, 1964. Eagle Ottawa Leather assumed all of Blanchard's debts, obligations and liabilities on that day (PAP-00432366-67; PAP-00432368). Blanchard 1937 was dissolved on February 24, 1965 (PAS-00032820).

1966: Articles of Merger for Eagle Ottawa Leather Company and Albert Trostel & Sons are dated December 19, 1966 (PAS-00032908-09).

2007: On May 15, 2007, Everett Smith Group Ltd. acquired Albert Trostel & Sons Co (PAS-00032797).

There is no information in the available files of a direct transaction between Blanchard 1887 and Blanchard 1937. Blanchard 1937 purchased the real estate at issue from an individual who had acquired it from Blanchard 1887. No information is available regarding the shareholders of Blanchard 1887 and Blanchard 1937 in 1939. The information available with respect to any overlap of officers of Blanchard 1887 and Blanchard 1937 is summarized below and states that two individuals, H. Gay Crawford and Joseph H. Gay, were associated with Blanchard 1887 and Blanchard 1937.

- The New Jersey Secretary of State "List of Certificates" dated December 31, 1911, lists the Agent of Blanchard Bro and Lane as Matthew T. Gay (PAP-00000006).

- According to *Newark, the City of Industry,* a 1912 publication of the Board of Trade of the City of Newark, Matthew T. Gay, had been with Blanchard Bro & Lane nearly a half century, was president, and his sons Joseph H. and Herbert S. Gay held the positions of secretary and treasurer (PAS-00032773, 899-900).

- The Treasurer listed on the sale of the facility in 1937 to Frank Deckert is listed as Herbert S. Gay and the Secretary is listed as H. Gay Crawford (PAP-00000052).

- A Certificate of Amendment dated December 28, 1939, lists the President of Blanchard Bro & Lane as Joseph H. Gay and the Secretary as H. Gay Crawford (PAP-00000010-14).

- The 1941 deed to Ironbound Land Development Company from Blanchard Bro and Lane was signed by Karl Koeniger, Vice President and H. Gay Crawford as Secretary (PAP-00000058-63).

3. Operational History/COC Use and Presence at the Facility

The operations at this facility involved tanning and finishing of leather (PAS-00032775-816; PAS-00032899-900). There are no facility records available. Information from other sources are provided below regarding the typical operations of leather tanning facilities and information available from Sanborn maps of the area.

An industrial health hazard survey done in Ohio in 1915 included an assessment of the leather tanning and dyeing industry. At the time, this involved clearing the hides with sulfuric acid and bleaching with lead acetate, as well as tanning with chromium. Hides also contained arsenic from preservatives and from arsenic sulfide added to the lime used in unhairing. This survey also states that in the leather coloring and japanning houses, lead-containing dye and aniline dyes were being used. Additionally, benzene was in use as a solvent and mottling was done with a solution made up of naphtha, amyl acetate and wood alcohol. White lead, lamp black, oil, ferrous sulphate, tannic acid, and logwood were in use at various locations to produce the leather coloring agents (PAS-00032841-45). This survey did not discuss the nature or content of any wastewater effluent generated through leather tanning and dyeing operations.

A 1922 book regarding leather manufacturing discusses wastes from tanneries and states that wash waters in large volumes contained undissolved or suspended solids which, when removed left practically pure water.[1]

A Sanborn map from 1926-1931 shows a section of the facility was used for Japanning and describes Blanchard Bro. as producing “patent enameled & fancy colored leather.” It also shows an underground naphtha tank and two coal storage buildings (PAS-00032816-18).

General references from the 1940s regarding leather tanning show the use of materials including naphtha, chrome, calcium sulfate, and linseed oil to process the hides, and carbon black, Prussian blue (ferric oxide and cyanide), raw umber (iron oxide and manganese oxide) and litharge (lead oxide) to finish it.[2] Copper and zinc may also have been used in the finishing process (PAS-00032852-53).

According to a 1967 Department of Interior report entitled *The Cost of Clean Water-Industrial Waste Profiles No. 7 - Leather Tanning and Finishing*, leather tanning generally involves the steps presented below, although the specifics may have changed over time. There are ten major steps in the tanning and finishing process:

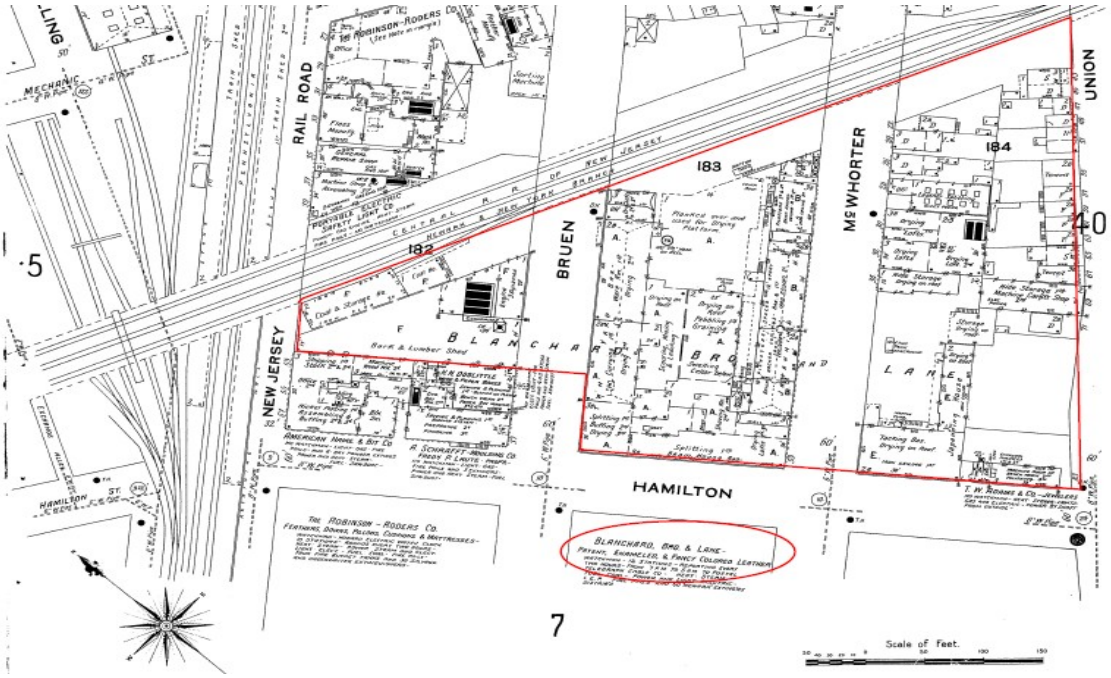
1. Shipping, storing & trimming
2. Soaking & washing (to remove salt, blood and dirt)
3. Green fleshing (to improve chemical penetration for later steps)
4. Unhairing (to improve appearance and remove unwanted protein)
5. Lime splitting (to separate the valuable grain layer from the flesh layer)
6. Bating (the first process in the tanhouse, to improve the feel of the grain)

[1] Rogers, A. (1922). *Practical Tanning*. New York, NY: Henry Carey Baird & Co., Inc. (pp. 665-666).
[2] Wilson, J. A. (1941). *Modern Practice in Leather Manufacture*. New York, NY: Reinhold Publishing Corporation. (pp. 607-613).

7. Pickling (to prevent precipitation of chromium salts during tanning)
8. Degreasing (to remove grease from sheep, pig or goat hides)
9. Tanning (to convert the hides into leather)
10. Retan-color-and-fatliquor processes (to ensure excellent leather and desired appearance) (PAS-00032773, 824-25).

The “significant pollutants” from a tannery identified in the 1967 Department of the Interior report were “1) free lime; 2) high pH; 3) potentially toxic chromium; 4) high BOD: 5) high suspended solids (hair and fleshings; 6) milky color from lime or green-brown color from tanning; 7) hardness; 8) high sulfides” (PAS-00032826). This list does not include any of the Lower Passaic River COCs.

ESG retained Steven Lange, an expert on the leather tanning process, to review the relevant information in the submission of information in a related State litigation, conduct his own research, and apply his own expertise to opine on the likelihood that any of the OU 2 COCs would have been a constituent in the wastewater effluent produced by the Blanchard 1937 manufacturing process. He has concluded that it is highly unlikely, given the period in which the manufacturing occurred and the type of products reported to have been manufactured at the Blanchard 1937 tannery, that any of the OU2 COCs would have been a part of the facility’s effluent (Early Settlement, p. 3). In a supplemental letter report dated September 7, 2018, Mr. Lange stated that the “observations and conclusions made with respect to operation of the tannery and the potential for discharge of Contaminants of Concern to the facility waste water from 1937 to 1939 apply equally to its operation and discharges to waste water prior to 1937” (Steven Lange Letter to Linda Benfield dated September 7, 2018).



(PAS-00032816)

4. Identified COCs

- Lead (possible use)
- Copper (possible use)

No records regarding facility operations during the relevant time-period were identified and provided by ESG. The possible use of these chemicals is taken from the description of leather tanning methods above.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[3]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[4] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[5] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[6]

There is no information regarding analytical data in the available file material.

5. COC Pathways

Sanitary Sewer

After the establishment and operation of the PVSC system in 1924, the facility would have discharged to the City Dock CSO district (PAS-00032870; PAS-00032915). However, no information documenting the volume or content of wastewater discharged from the facility was identified and no such records have been found from public sources as reported by ESG (PAP-00432360).

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[3] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[4] Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils (2002) and Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[5] NJDEP, N.J.A.C. 7:26E Technical Requirements for Site Remediation, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated Historic Fill Technical Guidance (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[6] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The overflow chamber for the City Dock CSO district is “on the east side of intersection of Raymond Blvd. and Raymond Plaza East.” The district is served by one 108” x 90” rectangular concrete sewer outfall to the Passaic River. A PVSC report states that this outfall served as the wet-weather overflow point for sewers within the district when the volume of combined flow was more than the system could handle. It states that “Under normal dry weather flow conditions, the flow is diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow enters the interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River” (PAS-00032869-70).

Storm Sewer

There is no information regarding storm sewers in the available file material.

Direct Release

There is no information regarding direct release in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations and Enforcement Actions

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

There is no information regarding characterization activities in the available file material.

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

There is no information regarding soil sampling in the available file material.

Remedial Activities

There is no information regarding remedial activities in the available file material.

8. Summary of Asserted Defenses

Everett Smith Group Ltd. asserts that, “ESG has no connection to or responsibility for Blanchard 1887’s ownership and operation of the Facility prior to May 3, 1937”. ESG states that, mere “substantial continuity” of business is no basis for successor liability under CERCLA. Rather a “de facto merger” must be proven which requires, among other things, an assumption of seller’s liability.

Additionally, Blanchard 1937 was dissolved in 1965 by the corporation that owned its stock at that time, Eagle-Ottawa Leather Company (PAS-00032820). In anticipation of such dissolution, Eagle Ottawa Company assumed on August 31, 1964, all existing fixed and contingent debts, obligations and liabilities of Blanchard 1937 (PAP-00432366-67; PAP-00432368). There was no merger of the Blanchard 1937 and Eagle Ottawa Leather Company corporate entities (PAP-00432366-67; PAP-00432368). Since there was no assumption of Blanchard 1937 debts, obligations, or liabilities that did not exist on August 31, 1964, and no merger of Blanchard 1937 and Eagle-Ottawa Leather Company, Everett Smith Group asserts that it could have no liability for any potential CERCLA liabilities associated with the dissolved Blanchard 1937 that may have arisen with the enactment of CERCLA in 1980.

Foundry Street Corp.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

FOUNDRY STREET CORPORATION

Facility Name, Address and Size: Foundry Street Corporation (Foundry); 185 Foundry Street, Newark, New Jersey; 9.4 acres (PAS-00044626). Available references did not include information on the number of employees and work shifts at Foundry.

1. **Business Type:** This property has been a multitenant facility.

2. **Time Period of Ownership/Operations**

   Owner: Foundry Street Corporation – 1970-At least 2006 (PAS-00109628-9; PAS-00114494)

   Foundry Street Corporation was started in 1970 and incorporated in the State of New Jersey as of April 14, 1971 (PAS-00114494; PAS-00109628). Various tenants operated at the Foundry Street Complex. Some are shown on the map on the next page.

   A subdivision of Lot 4 Block 5005 was approved by the City of Newark, and consequently, Lot 22, 159-169 Foundry Street was formed from the southern portion of Lot 4. Kem Realty Company conveyed this new parcel containing approximately 1.65 acres to the Foundry Street Corporation on May 3, 1971. The property was leased to Automatic Electroplating Corporation, Sun Chemical Corporation and Fleet Auto Electric (PAS-00044990).

   Foundry Street Corporation was an active corporation in New Jersey in 2006 (PAS-00114782).

   According to a letter July 1990 letter from a law firm to NJDEP, Foundry Street Corporation was planning to sell a portion of 185 Foundry Street to Sun Chemical consisting of a single building at the northwestern corner (PAP-00117800-2).

3. **Operational History/ COC Use and Presence at the Facility**

   The numerous chemical companies and other entities that operated at the Foundry Street Complex after 1960 include the following:

   - ABC Demolition Company (contractor)
   - Ace Chemical Corporation
   - Ashland Chemical Company (bulk chemical repackaging; See Ashland Data Report)
   - Automatic Electro-Plating Corporation (plating; See AEP Data Report)
   - Avon Drum Corporation (drum washing; known Aroclor 1248 soil detections)
   - Berg Chemical Company, Inc. (chemical repackaging)
   - Conus Chemical Company, Inc. (chemical repackaging; known Aroclor 1248 detections in drain sediment)
   - Coronet Chemical (reclaimed naphthalene; developing a sodium dispersion to destroy PCBs; known Aroclor 1248 in drain sediment)
   - County Lift Truck Service, Inc. (forklifts)

Foundry Street Corp.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

- CWC Industries, Inc. (solvent coatings)
- Fleet Auto Electric Company, Inc. (repairs)
- Grignard Chemical Company, Inc. (petroleum and chemical products; known Aroclor 1248 in drain sediment)
- Essex Chemical Company (inorganic chemicals; See Essex Chemical Data Report)
- Honig Chemical and Processing Company
- Hummel Chemical (organic and pyrotechnical chemicals)
- Morrel Truck Service (repairs)
- Ohmlac Paint and Refinishing Company (roofing felts and coatings)
- RFE Industries
- Sequa Corporation (organic pigment manufacturing); See Sequa Data Report)
- Sun Chemicals (organic pigment manufacturing); See Sun Chemicals Data Report)
- Tennant Chemical Corporation
- Weston Chemical Corporation (PAS-00044629-630).



(PAS-00044654)

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (used, detected)

There is no information pertaining to use of COCs by Foundry Street Corporation; however, there is evidence of use and generation of COCs by tenants of the Foundry Street Complex owned by Foundry Street Corporation. See individual Data Reports for Ashland Chemical, Automatic Electroplating, Sequa Corporation, Sun Chemicals and Essex Chemical as examples.

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

5. COC Pathways

During a November 1990 site inspection at the Foundry Street Complex conducted by NJDEP, NJDEP observed a series of strip drains outside on both the northern and southern sides of Buildings 21 and 22. It is reported that the two strip drains appear to connect to another strip drain located along the western side of the facility. This strip drain, in turn, appears to be routed through the Foundry Street Complex and towards

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Roanoke Avenue located to the north of the site (PAS-00105573; PAS-00105583; PAS-00114186).

It is reported that the Roanoke Avenue sewer connects to a sewer on Doremus Avenue, which flows to the Passaic Valley Sewerage Commission (PVSC) treatment works. There is a combined sewer overflow (CSO) outfall to the Passaic River at the foot of Roanoke Avenue (approximately River Mile 1.1). In 1969, the City of Newark constructed a dam near this CSO to increase flow to the Doremus Avenue sewer, and ultimately, the PVSC treatment works (PAS-00044625-PAS-00044626). It is reported that the Roanoke Avenue combined sewer system and outfall to the Passaic River was documented by PVSC to have been inoperative from 1971 through late 1979, and that discharges of hazardous substances into the sewer system of the Foundry Street Complex would have ultimately discharged directly to the Passaic River via the Roanoke Avenue CSO during periods when it was known to be in a chronic malfunctioning condition (PAS-00109572; PAS-00114295; PAS-00114311; PAS-00114320).

6. Regulatory History/ Enforcement Action

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

No information on response actions was documented in the available material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Franklin-Burlington Plastics, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

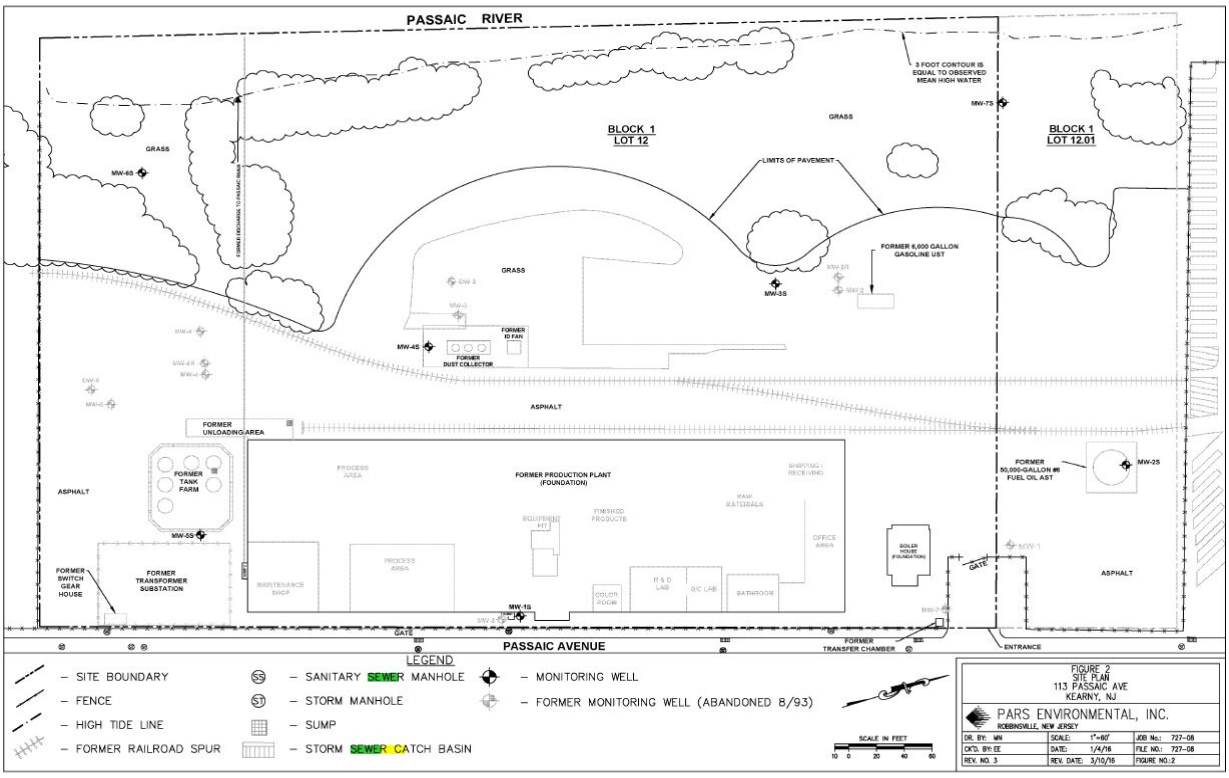
Facility Data Report

FRANKLIN-BURLINGTON PLASTICS, INC.

Facility Name, Address and Size: Franklin-Burlington Plastics, Inc., 113 Passaic Avenue, Kearny, New Jersey, Block 1, Lot 12 (PAP-00056120). Block 1, Lot 12 historically may have been known by other street addresses including 127 Passaic Avenue (PAP-00054083).

According to a New Jersey Department of Environmental Protection Preliminary Assessment Report, in 1976, when Franklin Plastics Corporation, which later became Franklin-Burlington Plastics, Inc., purchased Block 1, Lot 12, the facility occupied approximately 8.44 acres (PAP-00220430; PAP-00054646). In 1977, Franklin Plastics Corporation subdivided the parcel and sold 1.37 acres of the parcel (identified as Block 1, Lot 12.01 or 143 Passaic Avenue) to Kearny Holdings Corporation (PAP-00056121; PAP-00456789, 802-803). As part of the 1977 transaction, Franklin Plastics Corporation retained limited easement rights to access and use a 50,000-gallon No. 6 fuel oil above ground storage tank (AST) and the associated underground piping, railroad lines and a parking lot located under the eastern portion of Lot 12.01 (PAP-00056121; PAP-00456789-91, 800-801). Franklin Plastics Corporation did not own or have any rights to the remaining portion of Lot 12.01 after the 1977 sale (PAP-00456796; PAP-00056120-21). Franklin-Burlington Plastic's operations were conducted on the then 7.07 acre parcel known as 113 Passaic Avenue, Kearny, New Jersey (Block 1, Lot 12)(PAP-00056120).

In 1984, the Franklin-Burlington Plastics Facility employed an average of 70 people operating three shifts a day for five days a week (PAP-00054090). See site plan and property boundaries for Block 1, Lot 12 and Block 1 Lot 12.01 below.



(PAP-00056163)

Franklin-Burlington Plastics, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

1. **Business Type:** Compounder of polyvinyl chloride (PVC) cubes and pellets (PAP-00337323; PAP-00056122); manufacturer and prime supplier of vinyl compounds used for both injection molding and extrusion by its customers to manufacture finished products for automotive, aircraft, wire and cable, and shoe manufacturing industries, as well as extrusion processes (PAP-00057038; PAP-00054645).

2. **Time Period of Ownership/Operations**

   Operator: 1976 - 2010
   Owner: 1976 - 2017

   1946: Congoleum Corporation, Floor Covering Division (also known as Congoleum-Nairn, Inc. and Congoleum Industries, Inc.), an entity unrelated to Franklin-Burlington Plastics, Inc., owned the property between 1946 and 1976 and conducted operations thereon from approximately 1946 to 1974 (PAP-00337307; PAP-00337323; PAP-00056120-21).

   1950s: From the 1950s until approximately 1973 or 1974, Congoleum entities manufactured Asphalt Tile (AT) and (Vinyl Tile) in Building 115 on the property (PAP-00233590; PAP-00724244). Additional information concerning Congoleum entity ownership and operation of the Building 115 property is set forth in the *Congoleum Corporation Facility Data Report*.

   1962: According to a February 1997 Response to an EPA Request for Information completed by Franklin-Burlington Plastics, Inc. (hereinafter the February 1997 Response), Franklin Plastics incorporated in April 1962 in the State of New Jersey (PAS-00063625).

   1968: According to the February 1997 Response, Spartech Corporation (Spartech) incorporated in April 1968 in the State of Delaware (PAS-00063624) and was a plastics manufacturer (PAS-00063625).

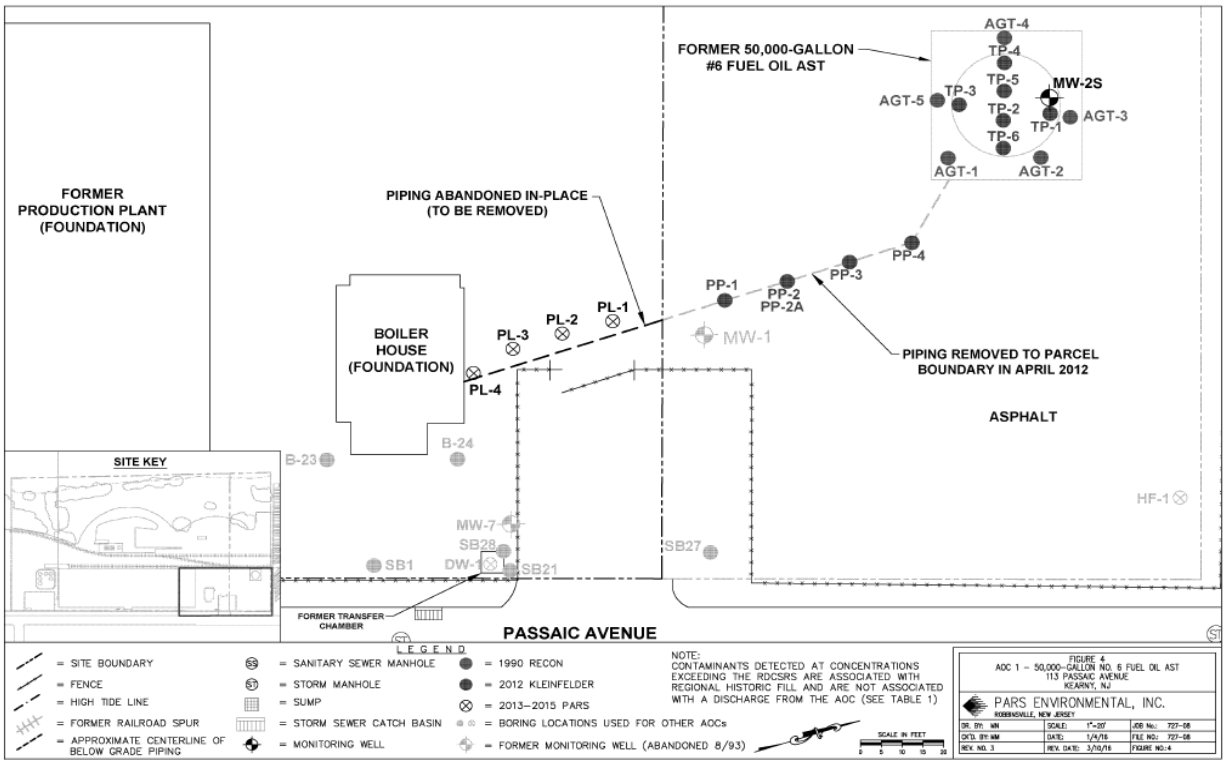
   1976: On February 16, 1976, Congoleum Corporation conveyed to Franklin Plastics Corporation a parcel of land (Block 1, Lot 12) that was described through metes and bounds (PAP-00220430). The EDR Chain of Title Report indicates this to be Block 1, Lot 12 (PAP-00456810).

   Franklin Plastics Corporation purchased an 8.44 acre parcel, which at the time was known as Block 1, Lot 12 on the Tax Map of the Township of Kearny, New Jersey (113 Passaic Avenue), from Congoleum Corporation and commenced plastics manufacturing compounding operations.

   1977: According to a *Remedial Investigation Report, Volume 1 of 4*, dated March 2016, prepared by PARS Environmental, Inc., for Franklin-Burlington Plastics, Inc. (the 2016 PARS RIR), a 1.37-acre adjoining parcel classified as Block 1 Lot 12.01, 143 Passaic Avenue was used by Franklin Plastics. After purchasing an 8.44 acre parcel from Congoleum in 1976, the parcel was subdivided and a 1.37 acre parcel (Lot 12.01) was sold in 1977 to Kearny Holding Corporation. As part of the 1977 transaction, Franklin Plastics Corporation retained limited easement

rights to access and use a 50,000 gallon No. 6 fuel oil AST and the associated underground piping, railroad lines and a parking lot located on and under the eastern portion of Lot 12.01 (PAP-00056121; PAP-00456789-91, 800-801). Franklin Plastics Corporation did not own or have any rights to the remaining portion of Lot 12.01 after the 1977 sale (PAP-00456796; PAP-00056120-21). The AST, which supplied fuel oil to the boiler house, was removed in April 2012 by Kleinfelder East, Inc. (PAP-00056121).

See figure below for 50,000-gallon No. 6 fuel oil AST location.



(PAP-00056165)

1986: In February 1986 Franklin-Plastics entered into an Administrative Order of Consent (AOC) with the New Jersey Department of Environmental Protection (NJDEP) Division of Waste Management, which allowed Franklin Plastics Corporation to sell all outstanding shares of capital stock of Franklin Plastics Corporation prior to completing the standard Environment Clean-up Responsibility Act (ECRA) administrative process. (PAP-00337244-50). According to the 1994 *Final Report on Cleanup Plan Implementation and Finalization of ECRA/Industrial Site Recovery Act (ISRA) Responsibilities*, Franklin Plastics Corporation was sold to Spartech and became Spartech-Franklin Plastics (PAS-00063471, 73).

1987: Franklin-Burlington Plastics, Inc. incorporated on November 25, 1987 in the State of Delaware (PAS-00063626-32).

1989: On August 17, 1989, a Registration of a Fictitious/Alternate Name was filed with the New Jersey Secretary of State by Franklin-Burlington Plastics, Inc. The fictitious name was Spartech Polymers (PAP-00338665). Later that year, on November 6, 1989, a Registration of a Fictitious/Alternate Name was filed with the New Jersey Secretary of State by Franklin Plastics Corporation. The fictitious name was Spartech-Franklin Plastics (PAP-00338666).

1990: On April 23, 1990, a Certificate of Merger was filed with the State of Delaware merging Franklin Plastics Corporation into Franklin-Burlington Plastics, Inc., and continued plastics compounding operations (PAP-00338667-69; PAS-00063633-36).

On June 29, 1990, a Registration of a Fictitious/Alternate Name was filed with the New Jersey Secretary of State by Franklin-Burlington Plastics, Inc. The fictitious name was Spartech Franklin Plastics (PAP-00338670). On July 17, 1990, a memo was sent to announce that Spartech-Franklin was now known as Franklin-Burlington Plastics, Inc., doing business as (d/b/a) Spartech-Franklin effective July 1, 1990 (PAP-00338671).

1993: On May 5, 1993, Franklin-Burlington Plastics, Inc. filed a Registration of Alternate Name in New Jersey for a period of five years. The alternate name to be used was Spartech Franklin Plastics (PAP-00338679).

2010: On February 16, 2010, Franklin-Burlington Plastics ceased manufacturing operations at 113 Passaic Ave (PAP-00056563; PAP-00054628).

2014: All buildings were demolished in April 2014. The buildings stood vacant from February 2010 until they were demolished in 2014 (PAP-00056563; PAP-00056121).

2017: On May 22, 2017, 113 Passaic Avenue Urban Renewal, LLC acquired the site from Franklin-Burlington Plastics (PAP-00338807).

3. Operational History/COC Use and Presence at the Facility

According to the 2016 PARS RIR, in 1976, Franklin Plastics Corporation purchased the Property then known as 113 Passaic Avenue and began operations in the Production Plant located on the Property, which was identified by the former owner/operator, Congoleum, as Building 115 (PAP-00056121; PAS-00048607). The site contained the 55,000-square foot Production Plant and an 840-square foot boiler house. The Production Plant included a maintenance shop in the southeastern corner and an office area in the northeastern corner. Two laboratories (research and development and quality control) were located on the eastern side of the Production Plant. Site manufacturing operations ceased in 2010 and all buildings were razed in April 2014 (PAP-00056121).

Plastic Compounding Operations

According to the 2016 PARS RIR, from 1976 to 2010 plastic manufacturing at the site included the addition of various colorants, stabilizers, and plasticizers to vinyl resin to create pellets and cubes. The pellets and cubes were manufactured in a variety of colors and hardness based on recipe variations and client specifications (PAP-00056122; PAS-00048607).

Three production lines were utilized where fully polymerized PVC resin was blended with plasticizers and additives to produce PVC compounds. According to the 2016 PARS RIR, during the manufacturing process solid resin was automatically weighed and fed by augers and then transferred into either one of eight blenders or directly into a mixer (PAP-00056122). The March 1986 *Site Evaluation Submission* prepared by Franklin Plastics Corporation (the 1986 Franklin Plastics SES) noted production began with weigh feeding resin into either of two lorry cars that transferred the resins into one of six or eight blenders or a mixer (PAP-00057020).

According to both the 2016 PARS RIR and the 1986 Franklin Plastics SES, fillers pigments and stabilizers were manually added, and liquid plasticizers and other select oils were pumped into the blenders or directly to the mixer to complete the loading. A Kleisler designed dust collector was continually employed and a combined ventilation exhaust system captured and removed free dust from the surrounding atmosphere to outdoor bins (PAP-00056122; PAP-00057020-21).

According to the PARS 2016 RIR, after cycle completion, the blenders discharged the powdered mix to feeders into continuous mixers or extruders, which fluxed the dry powder to create a plastic material. The plastic material was then cut into pellets or cubes before being packaged and shipped to customers (PAP-00056122).

According to the 1986 Franklin Plastics SES, the blenders discharged the powdered mix via covered containers to Vibra feeders for metered feeding into continuous mixers (similar to Banbury mixers). The hot plastic mass was continuously extruded and conveyed to feed the nip of a 2-roll mill. The rolled ribbon went through a refrigerated water bath to cool until it was semi-rigid. The cooled ribbon continued into a dicer and shaker to produce pellets for storage in hoppers. The hoppers contained the pellets until they were bagged, boxed, and at times, pneumatically loaded onto railroad hopper cars. Other bagged or boxed pellets were transferred to warehousing pending shipping (PAP-00057021). There was no chemical manufacturing or processing conducted at the Facility other than mechanical mixing and blending (PAP-00057021).

Product Unloading Procedure

According to a 1986 Franklin Plastics SES, the majority of purchased PVC resin was delivered to the facility via railcar and/or container truck and transported into any of three silos above the roof. The resin came in 50-pound bags (at times), and the plasticizers were delivered and pumped into storage tanks (PAP-00057020).

According to the *Combined Spill Prevention, Control, and Countermeasure Plan and Discharge Prevention, Containment and Countermeasure Plan/Discharge Cleanup and Removal Plan for the Facility*, dated July 23, 2009 (2009 SPCC/DPCC/DCR Plan), a tanker truck unloading station for plasticizers is located in the southwest corner of the Production Plant. The tanker truck unloading area was a concrete spill containment area that extended below grade to provide secondary spill containment for the contents of the tanker truck should a spill occur (PAP-00055759). The plasticizers were transferred from the delivery trucks to individual ASTs located in the tank farm and within the Production Plant. The tank farm located on the southwest portion of the Facility contained six plasticizer storage tanks constructed of steel and coated with a corrosion resistant material. The tanks were located in an epoxy-sealed block wall containment area, which provided secondary spill containment for these tanks (PAP-00055751-52). Pigments and stabilizers were delivered via truck to the Production Plant's exterior, asphalt paved receiving area in boxes, bags, and fiber drums. The receiving area, located on the north side of the Production Plant, was sloped towards the Production Plant, covered with an overhang, and did not contain any storm drains (PAP-00055758).

No. 6 fuel oil, which was stored in a 50,000-gallon AST, was delivered to the Facility via tanker truck. Unloading was performed within a bermed area adjacent to the 50,000-gallon AST (PAP-00055754). The *Spill Prevention, Control and Countermeasure Plan,* dated February 5, 1992 (1992 SPCC Plan) states that the 50,000-gallon No. 6 fuel oil AST was located north of the Production Plant within a containment area comprised of a concrete pad with concrete block walls. After the Facility was converted to natural gas circa 1992, fuel oil was not delivered to this AST on a regular basis (PAP-00338487). The 2009 SPCC/DPCC/DCR Plan specifically notes this AST was taken out of service in accordance with applicable New Jersey regulations (PAP-00055751).

No. 2 fuel oil was occasionally delivered to the two 275-gallon ASTs located on an asphalt-paved surface on the northeastern portion of the Facility. These two ASTs were used as a backup fuel supply for the boiler house, so fuel was not delivered to these ASTs on a regular basis. The 2009 SPCC/DPCC/DCR Plan specifically notes that these ASTs were taken out of service in accordance with applicable New Jersey regulations (PAP-00055751).

Powdered PVC resins are not a regulated substance as defined by the EPA SPCC and NJDEP SPCC regulations, so there is no discussion of their delivery and unloading procedure in the 2009 SPCC/DPCC/DCR Plan (PAP-00055745). According to the PARS 2016 RIR, powdered PVC resins were delivered to the west side of the Production Plant in bulk by rail cars and tank trucks. The resins were pneumatically transferred from the rail cars into one of three silos located on the roof of the Production Plant (PAP-00056122).

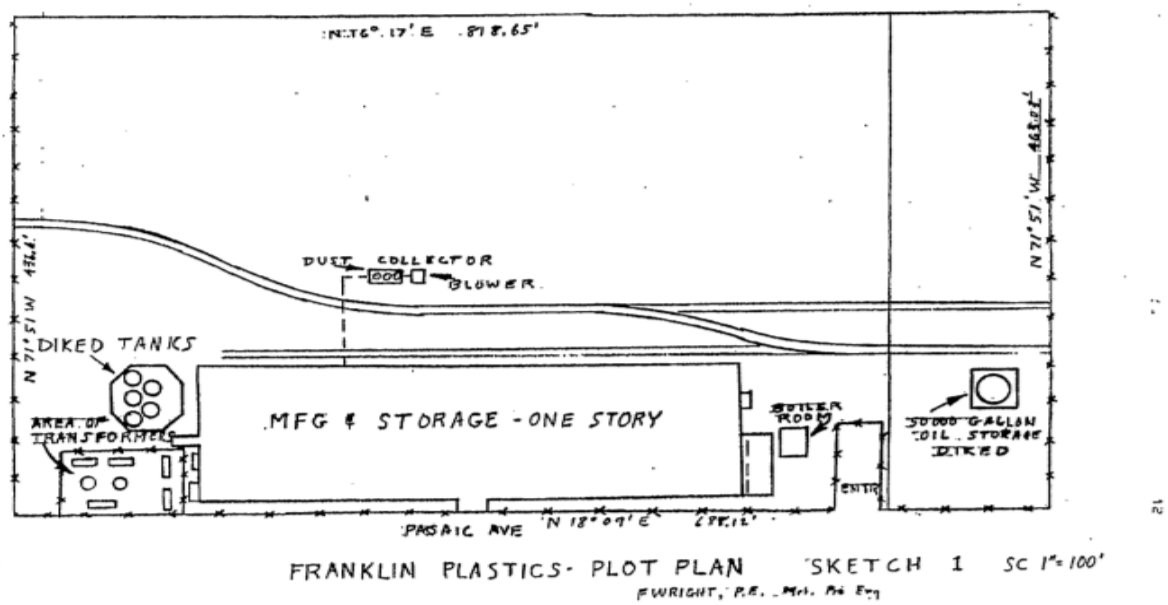
Product Waste Stream

According to the 1986 Franklin Plastics SES, there were three waste streams generated by plastic compounding at the facility:

- The mixer jacket and 2-roll mill were cooled by a closed, non-contact water cooling system. Overflows were discharged into the floor trench system to a sump located by the transformer substation at the southeast corner of the Production Plant. The sump flowed directly into the Passaic River through a nine-inch pipe via a permit (PAP-00057021). According to New Jersey Pollution Discharge and Elimination System (NJPDES) direct discharge permit No. NJ0002194, both contact and non-contact cooling water was discharged through an 8-inch outfall pipe from February 1976 through May 2004 (PAP-00057110; PAP-00057276; PAP-00057271; PAP-00056126).

- A Kleisler designed dust collector captured free dust that was “almost entirely” recycled back into the process (PAP-00057021). The dust collector located to the west of the Production Plant was continually employed and a combined ventilation exhaust system captured and removed free dust. The dust was collected in outdoor bins. Periodically the bins were emptied and the collected materials were reclaimed and recycled back into the process (PAP-00056122; PAP-00057021).

- Precipitate derived from electrostatic precipitators located on the roof was piped to a collection drum within the facility. The precipitate was largely recycled back into the process (PAP-00057021). See the following undated Plot Plan for the location of the dust collector and manufacturing building (also known as the Production Plant).



(PAP-00057048)

Raw Material

According to the 2016 PARS RIR, the approximate percentages of raw materials based on an air permit application from 1989 were 50% PVC resin, 30% plasticizers, 19% calcium carbonate filler, and 1% stabilizer and pigments (PAP-00056122). The approximate percentages of raw materials is the same in the air permit application from 1979 (PAP-00338652).

On August 17, 1990, Spartech-Franklin Plastics stated in an Industrial Waste Survey that the raw material used for their operations consisted of PVC Resin, (62% of material used in final product) and Phthalate Oils (30% of material used in final product). The unused material was internally recycled for future use (PAP-00338674). Spartech-Franklin also stated that 25 tons of PVC dry blend pellets and 25 tons of PVC pellets that it generated were classified as reusable material and were re-used in house (PAP-00338675).

According to the September 17, 1990 *Site Inspection Report*, prepared by NUS Corporation for the Environmental Protection Agency (the 1990 EPA SI), Franklin Plastics Corporation used phthalates such as bis(2-ethylhexyl) phthalate, butylbenzyl phthalate, di-n-butyl phthalate, and di-n-octyl phthalates as plasticizers in its manufacturing process (PAP-00337321).

An August 15, 2008 Spartech Polycom, Inc. letter to the EPA stated that the Facility was working to reduce the use of lead compounds. The Facility targeted lead compounds specifically through the reduction of non-product output (NPO) of lead compounds. Lead compounds were used as a PVC stabilizer in electrical insulators. Many of these applications were required in order for that the material to meet Underwriters Laboratory (UL) listing specifications related to electrical fire protection product properties. The Facility implemented efforts to reduce NPO in these applications of lead compounds. It was achieved through handling changes as well as product substitution (using barium and zinc compounds in place of lead compounds - a polybutylene terephthalate [PBT] - whenever the application or specifications did not require the addition of lead compounds to the product) (PAP-00338386-87).

Sumps

According to the 2016 PARS RIR, the plastics pelletizing process used cooling water. Contact cooling water from the dicer and pelletizer operations were released to trenches in the Production Plant floor and directed to the collection sump on the east side of the Production Plant (Sump No. 1) (PAP-00056126).

Non-contact cooling water consisting of water from the air compressor cooling jacket, lab mill and blender cooling water and cooling tower overflow was also directed to Sump 1 (PAP-00057133; PAP-00057203; PAP-00056126). Water in Sump 1 drained via a pipe to Sump 2, located at the south end of the Production Plant. Water was also discharged from the Production Plant's maintenance shop directly to Sump 2 (PAP-00056126).

Sump 2 contained two chambers. The water from Sump 1 and the maintenance shop entered the first, east side, chamber where water flowed across a baffle with a cutout weir that held back floating materials from entering the second, west side, chamber. The outlet from the second chamber was elevated and allowed solids to settle. Water from the second chamber of Sump 2 flowed through the 8-inch diameter outfall pipe into the Passaic River via a NJPDES Permit No. NJ002194 (PAP-00056126). The discharge from Sump 2 continued until prior to June 2004, when the discharge pipe was sealed. All water generated at the Facility at that time was redirected from Sump 1 to the Passaic Valley Sewerage Commission (PVSC) sanitary sewer system (PAP-00057271; PAP-00056126).

Facility Storage Area

A *Combined Spill Prevention, Control, and Countermeasure Plan and Discharge Prevention, Containment, and Countermeasures Plan/Discharge Cleanup and Removal Plan (Three-Year Plan Renewal)* prepared by Levine-Fricke (LFR) dated February 22, 2000 (the 2000 LFR Three-Year Plan Renewal) was submitted on behalf of Franklin-Burlington Plastics, Inc. (d/b/a Spartech Polycom). Additionally, a *Combined Spill Prevention, Control, and Countermeasure Plan and Discharge Prevention, Containment, and Countermeasures Plan/Discharge Cleanup and Removal Plan (Three-Year Plan Renewal)* prepared by LFR Levine-Fricke dated July 1, 2003 (the 2003 LFR Three-Year Plan Renewal) was submitted on behalf of Franklin- Burlington Plastics, Inc. (d/b/a Spartech Polycom). The plans incorporated the Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR) Plans required by the NJDEP and the Spill Prevention, Control, and Countermeasures (SPCC) Plan which is required by the EPA (PAP-00338541-637; PAP-00055157-294). The following is a brief description of the Facility storage areas as stated in the 2000 LFR Three-Year Plan Renewal and the 2003 LFR Three-Year Plan Renewal. It should be noted that SPCC plans were prepared for the site beginning in 1985 (PAP-00055011-28). The SPCC plan and DPCC/DCR plans were combined beginning in 1997 (PAP-00055072-115).

Outdoor Oil Storage Tanks

- The 2000 LFR Three-Year Plan Renewal states that a 50,000-gallon No. 6 fuel oil storage tank was located in a diked area. The storage tank was no longer in use and had been taken out of service. All associated piping has been disconnected and the contents of this tank were planned to be removed in the near future (PAP-00338551). In the 2003 LFR Three-Year Plan Renewal, the tank was listed as cleaned and its contents removed (PAP-00055167). The AST was removed in April 2012 (PAP-00337663).

- The 2000 LFR Three-Year Plan Renewal states that two 275-gallon No. 2 fuel tanks were located in an un-diked area. These fuel tanks had been disconnected and were located within a shed outside the eastern wall of the boiler room. These tanks were small enough and far enough from the Passaic River that a spill was not likely to pose an environmental threat. The tanks were located

below the Passaic Avenue elevation, so a spill would not pose a threat to the roadway (PAP-00338551).

- The 2000 LFR Three-Year Plan Renewal states that one 500-gallon waste oil storage tank is located outside within a brick wall containment area (5-feet high and 1-foot wide walls). The brick wall containment area has a capacity of approximately 100,000 gallons. The containment walls and floor were covered with concrete to prevent subsurface contamination. A valved drain extending out from the containment wall allowed for removal of any collected water inside the containment wall. Before removal, a sample of accumulated water was visually analyzed for contamination. If contaminated, the oil was removed from the water using absorbent pads, or the water was collected and properly disposed of (PAP-00338551-52).

- The 2003 LFR Three-Year Plan Renewal states that the block wall containment area was sealed with epoxy and repainted in September 2002. There is no mention of the valved drain beginning in the 2003 LFR Three-Year Plan Renewal. The 2003 LFR Three-Year Plan Renewal and subsequent plans state that a trained employee manually pumped accumulated water within the block wall containment area. Before removal, a sample of accumulated water was visually analyzed for contamination. If contaminated, the oil or hazardous material was removed from the water using absorbent pads, or the water was pumped into 55-gallon drums and properly disposed (PAP-00055167).

Outdoor Hazardous Substance Storage Tanks

- The 2000 LFR Three-Year Plan Renewal states that there were five hazardous substance storage tanks located outside the production area on the southwest portion of the Facility within a brick wall containment area (5-feet high and 1-foot wide walls). The floor inside the containment area was covered with concrete to prevent subsurface contamination. The brick wall containment area has the capacity of approximately 100,000 gallons. The combined storage capacity of the five tanks was approximately 72,500 gallons. A valved drain extending outside the containment area allowed for removal of any collected water inside the containment wall. Before removal, a sample of accumulated water was visually analyzed for contamination. If contaminated, the material was removed from the water using absorbent pads, or the water was collected and properly disposed of (PAP-00338552). It should be noted that this is the same brick wall (block wall) containment area as discussed above regarding the 500-gallon waste oil storage tank.

  The number of tanks located within this area changed depending on the time period. The 2003 LFR Three-Year Plan Renewal identified six plasticizer tanks in this area. The 2003 LFR Three-Year Plan Renewal also states that the block wall containment area (which was sealed with epoxy and repainted in September 2002) had a capacity to hold the largest tank volume plus six inches of rainwater. There is no mention of the valved drain beginning in the 2003 LFR Three-Year Plan Renewal. The 2003 LFR Three-Year Plan Renewal and subsequent plans

state that a trained employee manually pumped accumulated water within the block wall containment area. Before removal, a sample of accumulated water was visually analyzed for contamination. If contaminated, the oil or hazardous material was removed from the water using absorbent pads, or the water is pumped into 55-gallon drums and properly disposed (PAP-00055167-68).

Indoor Bulk Storage Tanks

- The 2000 LFR Three-Year Plan Renewal states that there are 13 plasticizer storage tanks located indoors throughout the Production Plant. These tanks were all located far enough away from outside doorways that a spill was unlikely to escape the Production Plant (PAP-00338553).

Raw Material Storage Area

- The 2000 LFR Three-Year Plan Renewal states that totes and drums of raw materials were stored outside and adjacent to the 100,000-gallon containment area. The property is relatively flat and a spill would not likely reach the storm drains, the river, or the street (PAP-00338554).

- The 2000 LFR Three-Year Plan Renewal states that fiber and metal drum storage was located inside the Production Plant. The indoor area is slightly pitched and because of its location a spill would not exit the Production Plant or enter a storm drain (PAP-00338553).

- The 2003 LFR Three-Year Plan Renewal states that the totes and drums of raw materials are stored inside the Production Plant within the shipping and receiving area. The materials are stored far enough away from any door entrances so that any spills would not likely exit the Production Plant (PAP-00055169).

Waste Oil Storage Area

- The 2000 LFR Three-Year Plan Renewal states that waste oil drums were stored outside near the 100,000-gallon containment area on the southwest portion of the Facility. These drums stored rags and speedy dry contaminated with used oils from minor spills and leaks that occur within the Production Plant. All wastes are stored in 55-gallon drums. The drums were stored for 90 days or less and were removed by a licensed waste handler. Since this waste was mostly solid material, spills from this area are not expected to reach the storm drains, the river, or the street (PAP-00338554).

Bulk Unloading Areas - Plasticizer Unloading Area

- The 2000 LFR Three-Year Plan Renewal states that plasticizers, D10P/J25 l and DINP were received in the outdoor tanks located outside of the Production Plant. The plasticizers were transferred from the delivery tank truck to the individual storage tanks at approximately 25 gallons per minute (gpm). Each tank had a level indicator which extended the full height of the tank and gave a clear liquid

level indication during filling of the tank. It was standard procedure for a Plant employee to be present at all times to observe the tank filling (PAP-00338554).

- The 2000 LFR Three-Year Plan Renewal states that the truck unloading station for plasticizers was located in the west corner of the Production Plant, near the Passaic River[1]. The unloading area was a bermed ramp that extended below grade to provide secondary containment for the contents of the truck. Any accumulated rainwater was usually left to evaporate; however, a manually operated 250 gpm pump was available to pump the rainwater into the adjacent diked area for Tanks 12 and 13 (the previously discussed 100,000-gallon brick wall containment area) (PAP-00338555; PAP-00338585).

Bulk Unloading Areas - Oil Unloading Area

- The loading area for the two disconnected 275-gallon No. 2 fuel tanks located outside the eastern wall of the boiler room was located on a gravel parking lot below the Passaic Avenue elevation (PAP-00338555).

Transformer Area

- The 2000 LFR Three-Year Plan Renewal states that there were five transformers and two oil-containing circuit breakers located outside, adjacent to the Production Plant and were completely enclosed by a chain-link fence. The total volume of oil contained within the five transformers and two circuit breakers was approximately 4,400 gallons (PAP-00338556). It should be noted that the Amended Stormwater Pollution Plan updated by Argus Regulatory Management, LLC on November 11, 2005 stated that the transformers were located outside on a concrete pad within a bermed area (PAP-00054786). The transformer substation was located within a wholly contained bermed and fenced area, approximately 375 feet east of the Passaic River (PAP-00056131; PAP-00056579).

- The transformer substation located on the Property was installed and used by the former owner of the Property, Congoleum Corporation (PAP-00725660-61; PAP-00725626; PAP-00725627; PAP-00725628-30). The transformer substation was utilized by Franklin-Burlington Plastics from 1976 until 2010. The substation was located within a wholly contained bermed area and contained by a chain-link fence (PAP-00056131). Polychlorinated biphenyl (PCBs) were a component of the dielectric mineral oil that was sealed within electrical equipment consisting of five pad-mounted transformers, two circuit breakers, and 17 brushings (PAP-00056565; PAP-00056163; PAP-00055954). The five transformers consisted of two Allis Chambers (K-14098 and K-14301), two Westinghouse (K-14463 and K-14306), and one Pittsburgh transformer (PAP-00338663-64; PAP-00056565).

[1] The description of the truck unloading station in the 2000 LFR Three-Year Plan Renewal is misleading. Figure 2 – Site Plan of the 2016 PARS RIR shows the location of the truck unloading area (denoted on the Figure as "FORMER UNLOADING AREA"). The location is approximately 285 feet east of the River (PAP-00056163).

- On October 7, 1987, RECON Systems Inc. (RECON) informed the Kearny Fire Department that the two Westinghouse transformers had levels of PCBs concentrations greater than 50 parts per million (ppm); K-14463 at 115 ppm and K-14306 at 80 ppm. The remaining three were below 50 ppm (PAP-00338663-64). One of the transformers was retrofitted in July 1996 by replacing the dielectric mineral oil to lower the PCB concentration of the transformer from 616 ppm to 18 ppm (PAP-00338683; PAP-00055088).

- The electrical equipment was removed from the Facility in August 2013 (PAP-00056565). Demolition of the concrete pads, supports, and switchgear house of the former substation was conducted in April 2014 (PAP-00056566). Further discussion on the decommissioning of the transformer substation is available in the "Remedial Activities" section below.

Process Areas

- The 2000 LFR Three-Year Plan Renewal states that Spartech Polycom's production processes consisted of three production lines in which polymer resins are blended with plasticizers to alter the physical properties of the polymer. The plasticizer was pumped from the storage tank to a process tank on the production line, from which it is fed to the blender. The process tanks were not contained but were indoors located sufficiently far away from the outside doorways, so that no material would be expected to escape the Production Plant to become a discharge in the event of a leak. Contact and non-contact cooling water were used in the process. Due to the design of the process, hazardous substances would not enter this cooling water even during a process upset (PAP-00338557).

Loading Dock Area

- The 2000 LFR Three-Year Plan Renewal states that the loading dock area was located on the east side of the Production Plant. Drums of raw materials were transferred in this area. The loading dock area did have an overhang to protect the area from rainwater (PAP-00338557).

- The 2003 LFR Three-Year Plan Renewal describes the location of the loading dock area as being on the North side of the Production Plant. The loading dock area was paved with bituminous macadam and sloped slightly back to the Production Plant in order to act as secondary containment. Since minimal amounts of drummed materials were unloaded in this area and no storm drains are present, spills would not likely reach a navigable waterway. This area was not located near the river and is below the elevation of Passaic Avenue (PAP-00055173)

Chemical Storage

The following table shows the types of chemicals, amount of chemicals stored, number of days being stored, and where the chemical was located at the Facility. The source of

Franklin-Burlington Plastics, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

the information contained in the table below was obtained from the NJDEP Community Right to Know form that was submitted by Franklin-Burlington Plastics. Date of document and document source can be found in the first column of the table.

Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
January 1 - December 31, 1989 (PAP-00338126)	Lead Phosphate (Solid)	1,001 - 10,000	365	Plant - Lead Section
January 1 - December 31, 1989 (PAP-00338126)	Lead Stearate (Solid)	101 - 1,000	365	Plant - Lead Section
January 1 - December 31, 1989 (PAP-00338126)	Lead Sulphate (Solid)	1,001 - 10,000	365	Plant - Lead Section
January 1 - December 31, 1989 (PAP-00338127)	Petroleum Oil (Liquid)	1,001 - 10,000	365	Plant, Machine Shop
January 1 - December 31, 1989 (PAP-00338128)	Fuel Oil	10,001 - 50,000	365	Yard
January 1 – December 31, 1991 (PAP-00338147)	Lead Phosphate (Solid in bag)	1,001 -10,000	365	Plant - Lead Section
January 1 – December 31, 1991 (PAP-00338147)	Lead Stearate (Solid in bag)	1,001 - 10,000	365	Plant - Lead Section
January 1 – December 31, 1991 (PAP-00338147)	Lead Sulphate (Solid in bag)	101 - 1,000	365	Plant - Lead Section
January 1 – December 31, 1991 (PAP-00338148)	Petroleum Oil (Liquid)	1,001 - 10,000	365	Plant, Machine Shop
January 1 – December 31, 1992 (PAP-00338152;	Lead Phthalate (Pure Solid in bag)	1,001 - 10,000	365	Plant - Lead Section
January 1 – December 31, 1992 (PAP-00338153)	Lead Stearate (Pure Solid in bag)	101 - 1,000	365	Plant - Lead Section
January 1 – December 31, 1992 (PAP-00338153)	Lead Sulphate (Pure Solid in bag)	1,001 - 10,000	365	Plant - Lead Section
January 1 – December 31, 1992 (PAP-00338154)	Petroleum Oil (Pure Liquid in Steel Drums)	1,001 – 10,000	365	Plant, Machine Shop
January 1 – December 31, 1993 (PAP-00054307)	Lead Phthalate (Pure Solid in Bag)	1,001 – 10,000	365	Plant – Lead Section
January 1 – December 31, 1993 (PAP-00054307)	Lead Stearate (Pure Solid in Bag)	101 – 1,000	365	Plant – Lead Section
January 1 – December 31, 1993 (PAP-00054308)	Lead Sulphate (Pure Solid in Bag)	1,001 – 10,000	365	Plant – Lead Section
January 1 –	Petroleum Oil (Pure Liquid in Steel Drum)	1,001 – 10,000	365	Plant – Machine Shop

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Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
December 31, 1993 (PAP-00054308)				
January 1 – December 31, 1995 (PAP-00338169)	Lead Phthalate (Pure Solid in Bag)	1,001 – 10,000	365	Plant – Lead Section
January 1 – December 31, 1995 (PAP-00338169)	Lead Stearate (Pure Solid in bag)	101 - 1,000	365	Plant – Lead Section
January 1 – December 31, 1995 (PAP-00338169)	Lead Sulphate (Pure Solid in steel drum)	1,001 -10,000	365	Plant – Lead Section
January 1 – December 31, 1995 (PAP-00338170)	Lead Compounds (Solid Mixture in bag)	1,001 -10,000	365	Warehouse (Pigment Area)
January 1 - December 31, 1996 (PAP-00338192)	Lead Compounds (Solid Mixture in fiber drum)	101 - 1,000	365	Color Area
January 1 - December 31, 1996 (PAP-00338192)	Lead Compounds (Solid Mixture in bag)	1,001 -10,000	365	Color Area
January 1 - December 31, 1996 (PAP-00338192)	Lead Compounds (Solid Mixture in steel drum)	1,001 -10,000	365	Color Area
January 1 - December 31, 1996 (PAP-00338195)	Lead Compounds (Solid Mixture in box)	100,001 - 250,000	365	Warehouse
January 1 - December 31, 1996 (PAP-00338196)	Lead Compounds (Solid Mixture in bag)	100,001 - 250,000	365	Warehouse
January 1 - December 31, 1997 (PAP-00338204)	Lead Compounds (Solid Mixture in fiber drum)	101 - 1,000	365	Color Area
January 1 - December 31, 1997 (PAP-00338204)	Lead Compounds (Solid Mixture in bag)	1,001 -10,000	365	Color Area
January 1 - December 31, 1997 (PAP-00338204)	Lead Compounds (Solid Mixture in steel drum)	101 - 1,000	365	Color Area
January 1 - December 31, 1997 (PAP-00338207)	Lead Compounds (Solid Mixture in box)	10,001 - 50,000	365	Warehouse
January 1 - December 31, 1997 (PAP-00338208)	Lead Compounds (Solid Mixture in bag)	10,001 - 50,000	365	Warehouse
1998 (PAP-00338222)	Lead Compounds (Pure Solid in bag)	101 - 1,000	365	Color Area – Southeast area of facility
1998 (PAP-00338222)	Lead Compounds (Solid Mixture in fiber drum)	101 - 1,000	365	Warehouse – Northwest area of facility
1998 (PAP-00338223)	Lead Compounds (Solid Mixture in box)	1,001 - 10,000	365	Color Area – Southeast area of facility

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Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
1998 (PAP-00338227)	PVC-Chloroethylene, Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
1998 (PAP-00338227)	PVC-Chloroethylene, Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail tracks at the west side of facility
1998 (PAP-00338228)	PVC-Chloroethylene Polymer (Pure Solid in bag)	50,001 – 100,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 1999 (PAP-00338290)	Lead Compounds (Solid Mixture in bag)	101 - 1,000	365	Color Area – Southeast area of facility
January 1 - December 31, 1999 (PAP-00338290)	Lead Compounds (Pure Solid in fiber drum)	101 - 1,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 1999 (PAP-00338290)	Lead Compounds (Solid Mixture in box)	1,001 -10,000	365	Color Area – Southeast area of facility
January 1 - December 31, 1999 (PAP-00338291)	PVC·Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
January 1 - December 31, 1999 (PAP-00338291)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	250,001 – 500,000	365	Rail tracks at west side of facility
January 1 - December 31, 1999 (PAP-00338291)	PVC·Chloroethylene Polymer (Pure Solid in bag)	50,001 – 100,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2000 (PAP-00338237)	Lead Compounds (Pure Solid in box)	10,001 - 50,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2000 (PAP-00338241)	Lead Compounds (Solid Mixture in fiber drum)	1,001 - 10,000	365	Color Area – Southeast area of facility
January 1 - December 31, 2000 (PAP-00338241)	Lead Compounds (Solid Mixture in bag)	101 - 1,000	365	Color Area – Southeast area of facility
January 1 - December 31, 2000 (PAP-00338242)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
January 1 - December 31, 2000 (PAP-00338242)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail Tracks at the West Side of Facility
January 1 - December 31, 2000 (PAP-00338243)	PVC-Chloroethylene Polymer (Pure Solid in bag)	50,001 - 100,000	365	Warehouse, Northeast Area of Facility
January 1 - December 31, 2001 (PAP-00338280)	Lead Compounds (Solid Mixture in bag)	1,001 - 10,000	365	Color Area – West side of facility
January 1 - December 31, 2001 (PAP-00338280)	Lead Compounds (Solid Mixture in bag)	101 - 1,000	365	Color Area – West side of facility
January 1 - December 31, 2001 (PAP-00338280)	Lead Compounds (Pure Solid in box)	101 - 1,000	365	Warehouse – Northwest area of facility

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Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
January 1 - December 31, 2001 (PAP-00338281)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos south end of roof
January 1 - December 31, 2001 (PAP-00338281)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail tracks at the west side of facility
January 1 - December 31, 2001 (PAP-00338281)	PVC-Chloroethylene Polymer (Pure Solid in bag)	1,001 – 10,000	365	Warehouse – Northeast area of facility
January 1 - December 31, 2002 (PAP-00054543)	Lead Compounds (Solid Mixture in bag)	1,001 – 10,000	365	Color Area West Side of Facility
January 1 - December 31, 2002 (PAP-00054543)	Lead Compounds (Solid Mixture in bag)	101 - 1,000	365	Color Area West Side of Facility
January 1 - December 31, 2002 (PAP-00054543)	Lead Compounds (Pure Solid in box)	101 - 1,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2002 (PAP-00054544)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail Tracks at the West Side of Facility
January 1 - December 31, 2002 (PAP-00054544)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on South End of Roof
January 1 - December 31, 2002 (PAP-00054544)	PVC-Chloroethylene Polymer (Pure Solid in Bag)	1,001 – 10,000	365	Warehouse – Northeast area of facility
January 1 - December 31, 2003 (PAP-00338330)	Lead Compounds (Solid Mixture in bag)	1,001 - 10,000	365	Color Area – East side of facility
January 1 - December 31, 2003 (PAP-00338330)	Lead Compounds (Solid Mixture in bag)	1,001 - 10,000	365	Sea box South end of facility
January 1 - December 31, 2003 (PAP-00338330)	Lead Compounds (Pure Solid in bag)	10,001 - 50,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2003 (PAP-00338331)	PVCChloroethylene Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail tracks at the west side of facility
January 1 - December 31, 2003 (PAP-00338331)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
January 1 - December 31, 2003 (PAP-00338331)	PVC-Chloroethylene Polymer (Pure Solid in bag)	1,001 - 10,000	365	Warehouse – Northeast area of facility
January 1 - December 31, 2004 (PAP-00338338)	Lead Compounds (Solid Mixture in bag)	1,001 - 10,000	365	Color Area – East side of facility
January 1 - December 31, 2004 (PAP-00338338)	Lead Compounds (Pure Solid in bag)	10,001 - 50,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2004 (PAP-00338339)	Lead Compounds (Solid Mixture in bag)	1,001 -10,000	365	Sea Box – South end of facility

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Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
January 1 - December 31, 2004 (PAP-00338339)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	500,001 - 1,000,000	365	Rail tracks at the west side of facility
January 1 - December 31, 2004 (PAP-00338339)	PVC-Chloroethylene Polymer (Pure Solid in bag)	10,001 - 50,000	365	Warehouse – Northeast area of facility
January 1 - December 31, 2004 (PAP-00338339-40)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
January 1 - December 31, 2005 (PAP-00338345)	Lead Compounds (Solid Mixture in bag)	500 – 999	365	Color Area – East side of facility
January 1 - December 31, 2005 (PAP-00338345-46)	Lead Compounds (Pure Solid in bag)	1,000 - 9,999	365	Warehouse – Northwest area of facility
January 1 - December 31, 2005 (PAP-00338347)	Lead Compounds (Solid Mixture in bag)	100 - 499	365	Sea Box South end of facility
January 1 - December 31, 2005 (PAP-00338347)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 – 99,999	365	Rail tracks at the west side of facility
January 1 - December 31, 2005 (PAP-00338347)	PVC-Chloroethylene Polymer (Pure Solid in bag)	10,000 – 24,999	365	Warehouse – Northeast area of facility
January 1 - December 31, 2005 (PAP-00338347-48)	PVC·Chloroethylene Polymer (Pure Solid in Silo)	25,000 - 99,999	365	Silos on south end of roof
January 1 - December 31, 2006 (PAP-00338366)	Lead Compounds (Solid Mixture in bag)	500 - 999	365	Color Area – East side of facility
January 1 - December 31, 2006 (PAP-00338366-67)	Lead Compounds (Pure Solid in bag)	1,000 - 9,999	365	Warehouse – Northeast area of facility
January 1 - December 31, 2006 (PAP-00338368)	Lead Compounds (Solid Mixture in bag)	100 - 499	365	Sea Box – South end of facility
January 1 - December 31, 2006 (PAP-00338368)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 – 99,999	365	Rail tracks at the west side of facility
January 1 - December 31, 2006 (PAP-00338368-69)	PVC-Chloroethylene Polymer (Pure Solid in bag)	10,000 – 24,999	365	Warehouse – Northeast area of facility
January 1 - December 31, 2006 (PAP-00338370)	PVC·Chloroethylene Polymer (Pure Solid in Silo)	25,000 – 99,999	365	Silos on south end of roof
January 1 - December 31, 2007 (PAP-00054896)	Lead Compounds (Pure Solid in Bag)	1,000 – 9,999	365	Northwest Area of Warehouse
January 1 - December 31, 2007 (PAP-00054896)	Lead Compounds (Pure Solid in Bag)	1,000 – 9,999	365	Warehouse, Northwest Area of Facility
January 1 - December 31, 2007 (PAP-00054897)	Lead Compounds (Solid Mixture in Bag)	100 – 499	365	Sea Box South end of the Facility

Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
January 1 - December 31, 2007 (PAP-00054897)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	25,000 – 99,999	365	Silos on South End of Roof
January 1 - December 31, 2007 (PAP-00054897)	PVC-Chloroethylene Polymer (Pure Solid in Bag)	25,000 – 99,999	365	Silos on South End of Roof
January 1 - December 31, 2007 (PAP-00054898)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 – 99,999	365	Rail Tracks at the West Side of Facility
January 1 to December 31, 2008 (PAP-00338451-52)	Lead Compounds (Pure Solid in bag)	1,000 - 9,999	365	Northwest area of Warehouse
January 1 to December 31, 2008 (PAP-00338453)	Lead Compounds (Pure Solid in bag)	1,000 - 9,999	365	Warehouse Northwest Area of the Facility
January 1 to December 31, 2008 (PAP-00338453)	Lead Compounds (Solid Mixture in bag)	100 - 499	365	Warehouse Northwest Area of the Facility
January 1 to December 31, 2008 (PAP-00338453-54)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	25,000 - 99,999	365	Silos on south end of roof
January 1 to December 31, 2008 (PAP-00338455)	PVC·Chloroethylene Polymer (Pure Solid in bag)	25,000 - 99,999	365	Warehouse - Northeast area of facility
January 1 to December 31, 2008 (PAP-00338455)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 - 99,999	365	Rail tracks at the west side of facility
January 1 to December 31, 2009 (PAP-00338467)	Lead Compounds (Pure Solid in bag)	500 - 999	365	Northwest area of warehouse
January 1 to December 31, 2009 (PAP-00338469)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	25,000 - 99,999	365	Silos on south end of roof
January 1 to December 31, 2009 (PAP-00338469)	PVC-Chloroethylene Polymer (Pure Solid in bag)	1,000 – 9,999	365	Warehouse - Northwest area of facility
January 1 to December 31, 2009 (PAP-00338469)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 - 99,999	365	Rail tracks at the west side of facility

4. Identified COCs

- PCBs (used, released, detected)
- PAHs (used, released, detected)
- Copper (used, released, detected)
- Lead (used, released, detected)
- Mercury (used, released, detected)

PCBs

On August 21, 1996, EPA was informed that the Westinghouse transformer K14306 (1995 Sample results that showed 616 ppm contamination) retrofill had been completed (PAP-00338683). After the retrofill, the PCB concentration in Westinghouse transformer K-14306 was 18 ppm (PAP-00055088). Upon success of the retrofill for transformer K14306, the spare transformer may be retro filled as well (PAP-00338683).

According to the 2017 *Former Transformer Substation Remedial Action Report, Volume 1 of 2*, prepared by PARS Environmental, Inc., for Franklin-Burlington Plastics (the 2017 PARS RAR) soil samples by PARS were taken between December 2013 and March 2015 within the former transformer substation. PARS installed 29 borings within the former substation and a soil sample was collected from each boring location at the ground surface or at 0.5 foot depth interval immediately below the gravel layer. PCBs were detected in the sample collected from No. TS-24 at a concentration of 2.05 mg/kg. Low concentrations of PCBs were detected in samples TS-8, TS-10, TS-15, and TS-15DUP (PAP-00056565). PCBs were not detected above the laboratory MDLs in the remaining samples.

In 2014, Dallas Industrial Services, Inc. demolished structures at the site that included the concrete pads, supports and the switchgear house for the former transformer substation. Prior to the demolition, PARS collected in-situ concrete samples as per the NJDEP Guidance for Characterization of Concrete and Clean Material Certification for Recycling. One concrete chip sample from the former transformer substation, No. C-3 had a PCB concentration of 0.044 mg/kg. PCBs were not detected above the laboratory MDL in the remaining samples(PAP-00056566).

PAHs

The sampling results from the 1984 Hart PSA identified 6,690 ug/kg pyrene, 5,100 ug/kg phenanthrene, and 5,740 ug/kg fluoranthene in sample No. TankSA (PAP-00057074).[2] All samples were collected from the tank area south of the Production Plant. The depth of the soil samples was not provided in the reviewed material. The location of the soil samples are shown in the 1984 Hart PSA map located in the Copper section. According to the 1987 RECON SAP Results report, the following results were found for PAHs. See the 1987 sample location map provided above in the Copper section.

RECON 1987 PAH Data Summary		
Analyte:	**High Range Result (mg/kg):**	**Sample/Depth:**
Acenaphthene	8.7	B31/3 3.5-4.0"
Acenaphthylene	1.5 J	B31/3 3.5-4.0"
Anthracene	26	B31/3 3.5-4.0"
Benzo[a]anthracene	39	B31/3 3.5-4.0"
Benzo[a]pyrene	36	B31/3 3.5-4.0"
Benzo[b]fluoranthene	47	B31/3 3.5-4.0"
Benzo[g,h,i]perylene	14	B31/3 3.5-4.0"
Benzo[k]fluoranthene	47	B31/3 3.5-4.0"
Chrysene	40	B31/3 3.5-4.0"
Dibenz(a,h)anthracene	5.0 J	B31/3 3.5-4.0"
Indeno[1,2,3-cd]pyrene	19	B31/3 3.5-4.0"
Naphthalene	4.2 J	B31/3 3.5-4.0"
Pyrene	91	B31/3 3.5-4.0"

ND = Compound not detected above laboratory method detection limit
J = Estimated concentration (PAP-00056319-20)

[2] The referenced sample results were originally taken as part of the 1984 Hart PSA. The 1984 Hart PSA is only available as an appendix to the 1986 Franklin Plastics SES. The 1986 Franklin Plastics SES does not include the lab data from the 1984 samples, so there is no way to verify the reported data is correct and/or to check whether there were any accidental transcription errors.

On June 5, 1990, soil samples collected by NUS Corporation as part of the 1990 EPA SI identified the following PAH concentrations:

- 1,500 ug/kg benzo(a)pyrene in soil sample No. NJEP-S8 (Dilution Factor of 1) collected near the Production Plant gate (PAP-00337330).
- 4,600 ug/kg phenanthrene was identified in soil sample No. NJEP-S8 and 1,300 ug/kg phenanthrene in soil sample No. NJEP-S9 (DUP) (PAP- 00337330). Both samples were collected near the Production Plant gate.
- An estimated concentration of 3,600 ug/kg benzo(b)fluoranthene (Dilution Factor of 1) was found in soil sample No. NJEP-S8 (PAP-00337330). The depth of the soil samples was not provided in the reviewed material.

NJEP SED1 was taken north of the tank farm and NJEP SED2 was collected from the facility's sump pit (PAP-00337317; PAP-00337372). NJEP SED3 and NJEP SED4 were taken from the two storm drains bordering the facility on Passaic Avenue (PAP-00337311). The following table shows the analytic results.

NUS Corporation June 1990 PAH Sediment Data Summary				
Sample ID -	NJEP-SED1	NJEP-SED2	NJEP-SED3[17]	NJEP-SED4
Dilution Factor -	1	13	7.2	7.2
Analyte:	**Results (ug/kg):**			
Acenaphthene	Not Detected	Not Detected	J	J
Acenaphthylene	Not Detected	Not Detected	J	Not Detected
Anthracene	Not Detected	J	3,900	J
Benzo[a]anthracene	J	J	5,000	J
Benzo[a]pyrene	J	J	7,500	J
Benzo[b]fluoranthene	J	16,000	9,500	4,000 EN
Benzo[g,h,i]perylene	J	J	3,600	J
Benzo[k]fluoranthene	Not Detected	Not Detected	8,300 E	Not Detected
Chrysene	J	17,000	13,000	3,500
Dibenz(a,h)anthracene	Not Detected	J	J	J
Fluoranthene	J	27,000	39,000	5,600
Fluorene	Not Detected	J	J	J
Indeno[1,2,3-cd]pyrene	J	J	4,000	J
2-Methylnaphthalene	Not Detected	Not Detected	J	J
Naphthalene	Not Detected	Not Detected	J	J
Phenanthrene	J	J	15,000	4,400
Pyrene	J	25,000	18,000	7,000

J = Estimated value, compound present below the Contract Required Quantitation Limit (CRQL) but above the Instrument Detection Limit (IDL)
E = estimated value
N = Presumptive evidence of the presence of the material
(PAP-00337327-28)

According to the 1990 EPA SI, no PAH compounds were identified in the surface water samples (No. NJEP-SW1 collected directly from the Facility's discharge pipe nor in samples No. NJEP-SW2 and No. NJEP-SW3 were collected from the sump pit) (PAP-00337327-28; PAP-00337317).

The 2016 PARS RIR showed the following results for PAHs for the below AOCs which had at least one PAH detection above the NJ RDCSRS:

- AOC 1 (50,000-gallon No. 6 Fuel Oil Aboveground Fuel Tank) had 0.85 mg/kg benzo(a)anthracene and 0.68 mg/kg benzo(b)fluoranthene in soil sample No. PL-1, collected on January 8, 2016 at a depth of 2.3 to 2.8 feet (PAP-00056183).

- AOC 5/7 - Unloading Area Tank Farm Soil ranged from non-detect to 52 mg/kg benzo(a)anthracene, 56 mg/kg benzo(a)pyrene, 69 mg/kg benzo(b)fluoranthene and 31 mg/kg indeno[1,2,3-cd]pyrene were found in soil sample No. TF-17 collected between 0.5 and 1.0 feet bgs from the southwestern outside corner of the Production Plant (PAP-00056192). In addition, 1.4 mg/kg dibenz(a,h)anthracene was noted in Tank Farm soil sample No. TF-12 collected between 0.5 and 1.0 foot bgs between the boundaries of the Production Plant and tank farm (PAP-00056189).

Copper

According to the *Preliminary Site Assessment* prepared by Fred C. Hart, Inc. dated September 1984 (1984 Hart PSA), four surface soil samples were collected for chemical analysis and subsurface soil samples for physical inspection and OVA analysis. One surface sample consisted of a composite of several samples in a spill and vegetative stress area near the air pollution control units, and the other three samples were collected inside the tank containment area (PAP-00057068). See the 1984 sample location map below.

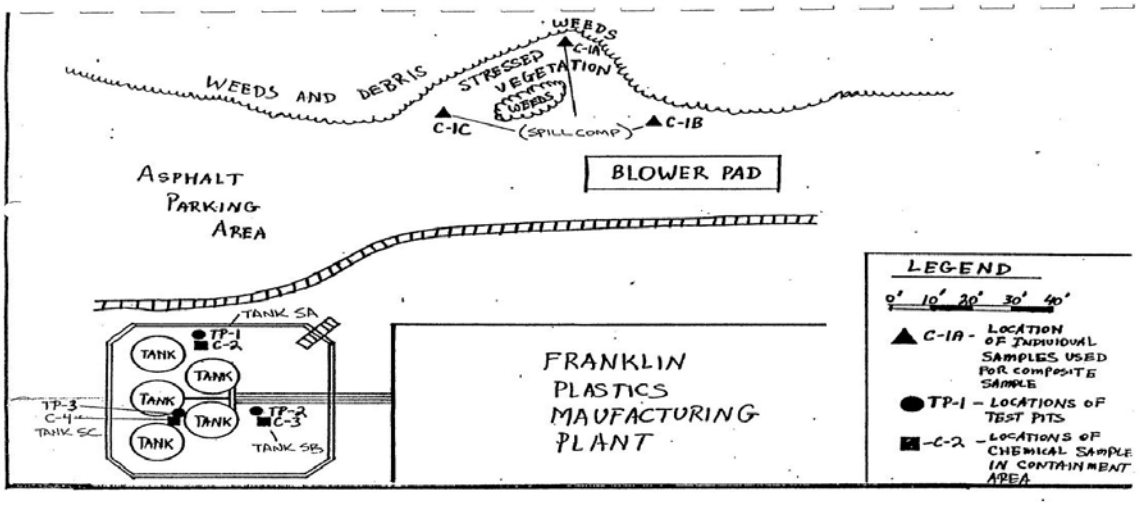


FIGURE 2. LOCATION OF SAMPLING SITES

(PAP-0057071).

The sampling results from the four samples collected on June 27, 1984 identified the following for copper:

- SPILLCOMP - 79,000 micrograms per kilogram (ug/kg)
- Sample Tank SA - 120,000 ug/kg
- Sample Tank SB - 290,000 ug/kg
- Sample Tank SC - 38,000 ug/kg (PAP-00057074)[3].

Note: The exact depth of the surface soil samples was not provided in the available file materials.

According to the *Sampling and Analyses Plan Results for Franklin Plastics Corporation* prepared by Recon Systems, Inc., dated October 1, 1987 (the 1987 RECON SAP) Results, Recon Systems, Inc. collected soil samples from 33 soil borings as part of the ECRA-required sampling. The following table shows location, depth and results for copper. See the following 1987 sample location map for locations.

RECON Soil Samples			
Location	**Sample**	**Depth (inches**	**Results**
Area 2- 275 gallon Aboveground Fuel Tanks	MW 1/1	0.5 – 1.0	37.6
Area 2- 275 gallon Aboveground Fuel Tanks	MW 1/2	3.5 – 4.0	212
Area 3- 6,000 Underground Gasoline Tank	MW 2/1	0.5 – 1.0	11.9
Area 3- 6,000 Underground Gasoline Tank	MW 2/2	3.5 – 4.0	11.7
Area 8- Dust Collector and Former Material Storage Area	MW 3/1	0.5 – 1.0	96.9
Area 8- Dust Collector and Former Material Storage Area	MW 3/2	2.5 – 3.0	20.9
Area 6- Expansion Chamber & Contaminated Soils	B 5/1	0.5 – 1.0	164
Area 6- Expansion Chamber & Contaminated Soils	B 5/2	2.8 – 3.3	64.6
Area 6- Expansion Chamber & Contaminate Soils	B 6/1	0.5 – 1.0	69.6
Area 6- Expansion Chamber & Contaminate Soils	B 6/2	3.3 – 3.9	31.5
Area 5- Plasticizer Tank Farm Area	B 7/1	0.5 – 1.0	40.2
Area 5- Plasticizer Tank Farm Area	B 7/2	3.6 – 4.1	232
Area 7- Loading/Unloading Area	B 8/1	0.5 – 1.0	123
Area 7- Loading/Unloading Area	B 8/2	1.1 – 1.7	89.7
Area 7- Loading/Unloading Area	B 9/1	0.5 – 1.0	12.9
Area 7- Loading/Unloading Area	B 9/2	3.3 – 3.9	31.8
Area 7- Loading/Unloading Area	B 10/1	0.5 – 1.0	291
Area 7- Loading/Unloading Area	B 10/2	2.5 – 3.0	29.9
Area 8- Dust Collector and Former Material Storage Area	B 11/1	0.5 – 1.0	60.2
Area 8- Dust Collector and Former Material Storage Area	B 11/2	2.7 – 3.2	21.7
Area 8- Dust Collector and Former Material Storage Area	B 12/1	0.5 – 1.0	53.0
Area 8- Dust Collector and Former Material Storage Area	B 12/2	2.1 – 2.7	32.1
Area 8- Dust Collector and Former Material Storage Area	B 13/1	0.5 – 1.0	34.0

[3] The referenced sample results were originally taken as part of the 1984 Hart PSA. The 1984 Hart PSA is only available as an appendix to the 1986 Franklin Plastics SES. The 1986 Franklin Plastics SES does not include the lab data from the 1984 samples, so there is no way to verify the reported data is correct and/or to check whether there were any accidental transcription errors.

Franklin-Burlington Plastics, Inc.

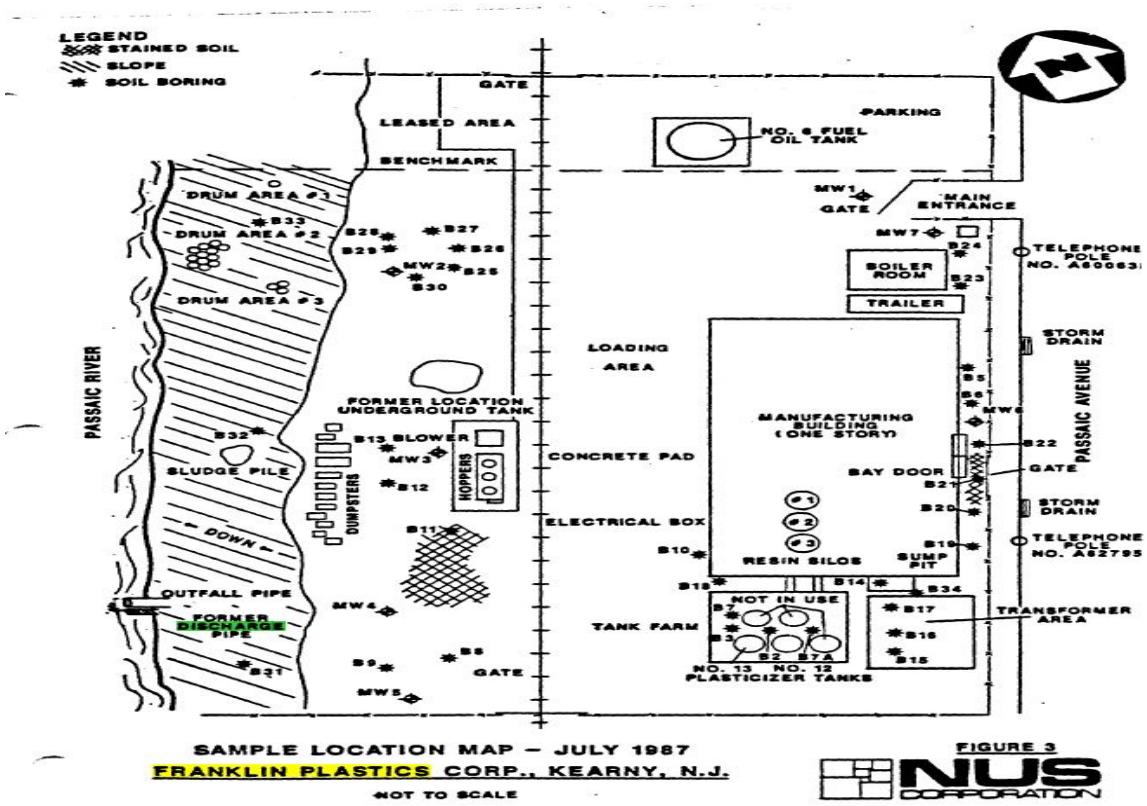
Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

RECON Soil Samples			
Location	**Sample**	**Depth (inches**	**Results**
Area 8- Dust Collector and Former Material Storage Area	B 13/2	1.6 – 2.1	24.1
Area 12- Random Sampling[4]	B 31/1	0.0 – 0.5	88.0
Area 12- Random Sampling	B 31/2	0.5 – 1.0	84.9
Area 12- Random Sampling	B 31/3	3.5 – 4.0	81.0
Area 12- Random Sampling	B 32/2	0.5 – 1.0	106
Area 12- Random Sampling	B 32/3	3.3 – 3.9	25.0
Area 12- Random Sampling	B 33/1	0.0 – 0.5	46.1
Area 12- Random Sampling	B 33/2	0.5 – 1.0	20.5
Area 12- Random Sampling	B 33/3	3.7 – 4.2	2070
Area 7- Loading/Unloading Area	MW 4/1	0.5 – 1.0	174
Area 7- Loading/Unloading Area	MW 4/2	3.5 – 4.0	136
Area 7- Loading/Unloading Area	MW 5/1	0.5 – 1.0	23.2
Area 7- Loading/Unloading Area	MW 5/2	3.5 – 4.0	717
Area 6- Expansion Chamber & Contaminated Soils	MW 6/1	0.5 – 1.0	75.8
Area 6- Expansion Chamber & Contaminated Soils	MW 6/2	6.3 – 6.9	136
Area 2- 275 gallon Aboveground Fuel Tanks	MW 7/1	0.5 – 1.0	124
Area 2- 275 gallon Aboveground Fuel Tanks	MW 7/2	3.6 – 4.1	210

(PAP-00337252-64; PAP-00056285-94; PAP-00056300-21)



(PAP-00337310)

[4] Random Sampling is clarified in the 1987 RECON SAP Results as soil samples collected at three borings (B-31, B-32 and B-33) in an area of urban fill between the Production Plant and the Passaic River (PAP-00337263).

On June 5, 1990, as part of the 1990 EPA SI, a total of 16 environmental samples were collected by NUS Corporation that included three surface water, four sediment, and nine surface soil samples. The copper concentrations were detected as follows:

NUS Corporation, June 1990, Copper Data			
Sample ID:	**Matrix:**	**Copper Result:**	**Units:**
NJEP-SW1	Surface Water	28.8	µg/L
NJEP-SW2	Surface Water	38.7	µg/L
NJEP-SW3	Surface Water	41.9	µg/L
NJEP-SED1	Sediment	327	mg/kg
NJEP-SED2	Sediment	3,200 E	mg/kg
NJEP-SED3[5]	Sediment	227	mg/kg
NJEP-SED4[6]	Sediment	103	mg/kg
NJEP-S1	Soil	162	mg/kg
NJEP-S2	Soil	23.5	mg/kg
NJEP-S3	Soil	81.8	mg/kg
NJEP-S4	Soil	21.8	mg/kg
NJEP-S5	Soil	23.4	mg/kg
NJEP-S6	Soil	112	mg/kg
NJEP-S7	Soil	103	mg/kg
NJEP-S8	Soil	56.3	mg/kg
NJEP-S9	Soil	54.4	mg/kg

E = estimated value
(PAP-00337311; PAP-00337332-22)

Lead

According to the 1984 Hart PSA, the sampling results from the four surface soil samples collected on June 27, 1984 identified the following for lead:

- SPILLCOMP - 6,900,000 ug/kg
- Sample Tank SA - 640,000 ug/kg
- Sample Tank SB - 1,100,000 ug/kg
- Sample Tank SC - 64,000 ug/kg (PAP-00057074).[7]

The depth of the soil samples was not provided in the available file materials. See the 1984 sample location map provided above in the Copper section.

In July 1987, Recon Systems, Inc. collected 33 samples from soil borings as part of ECRA-required sampling. See the 1987 sample location map provided above in the Copper section. The following table shows location, depth and results for lead.

[5] NJDEP-SED3 and NJDEP-SED4 were collected from two storm drains bordering the Facility on Passaic Avenue (PAP-00337311)

[6] NJDEP-SED3 and NJDEP-SED4 were collected from two storm drains bordering the Facility on Passaic Avenue (PAP-00337311)

[7] The referenced sample results were originally taken as part of the 1984 Hart PSA. The 1984 Hart PSA is only available as an appendix to the 1986 Franklin Plastics SES. The 1986 Franklin Plastics SES does not include the lab data from the 1984 samples, so there is no way to verify the reported data is correct and/or to check whether there were any accidental transcription errors.

RECON Soil Samples			
Location	**Sample**	**Depth (inches)**	**Results (mg/kg)**
Area 2- 275-gallon Aboveground Fuel Tanks	MW 1/1	0.5 – 1.0	229
Area 2- 275-gallon Aboveground Fuel Tanks	MW 1/2	3.5 – 4.0	179
Area 2- 275-gallon Aboveground Fuel Tanks	MW 2/1	0.5 – 1.0	51
Area 2- 275-gallon Aboveground Fuel Tanks	MW 2/2	3.5 – 4.0	69
Area 8- Dust Collector and Former Material Storage Area	MW 3/1	0.5 – 1.0	527
Area 8- Dust Collector and Former Material Storage Area	MW 3/2	2.5 – 3.0	68
Area 5- Plasticizer Tank Farm Area	B-2	Not specified	185
Area 5- Plasticizer Tank Farm Area	B-3	Not specified	83.4
Area 6- Expansion Chamber & Contaminated Soils	B 5/1	0.5 – 1.0	312
Area 6- Expansion Chamber & Contaminated Soils	B 5/2	2.8 – 3.3	739
Area 6- Expansion Chamber & Contaminated Soils	B 6/1	0.5 – 1.0	160
Area 6- Expansion Chamber & Contaminated Soils	B 6/2	3.3 – 3.9	48
Area 5- Plasticizer Tank Farm Area	B 7/1	0.5 – 1.0	67
Area 5- Plasticizer Tank Farm Area	B 7/2	3.6 – 4.1	1040
Area 7- Loading/Unloading Area	B 8/1	0.5 – 1.0	1740
Area 7- Loading/Unloading Area	B 8/2	1.1 – 1.7	523
Area 7- Loading/Unloading Area	B 9/1	0.5 – 1.0	31
Area 7- Loading/Unloading Area	B 9/2	3.3 – 3.9	126
Area 7- Loading/Unloading Area	B 10/1	0.5 – 1.0	283
Area 7- Loading/Unloading Area	B 10/2	2.5 – 3.0	2150
Area 8- Dust Collector and Former Material Storage Area	B 11/1	0.5 – 1.0	288
Area 8- Dust Collector and Former Material Storage Area	B 11/2	2.7 – 3.2	72
Area 8- Dust Collector and Former Material Storage Area	B 12/1	0.5 – 1.0	159
Area 8- Dust Collector and Former Material Storage Area	B 12/2	2.1 – 2.7	82
Area 8- Dust Collector and Former Material Storage Area	B 13/1	0.5 – 1.0	94
Area 8- Dust Collector and Former Material Storage Area	B 13/2	1.6 – 2.1	76
Area 12- Random Sampling[8]	B 31/1	0.0 – 0.5	360
Area 12- Random Sampling	B 31/2	0.5 – 1.0	265
Area 12- Random Sampling	B 31/3	3.5 – 4.0	225
Area 12- Random Sampling	B 32/2	0.5 – 1.0	229
Area 12- Random Sampling	B 32/3	3.3 – 3.9	123
Area 12- Random Sampling	B 33/1	0.0 – 0.5	161
Area 12- Random Sampling	B 33/2	0.5 – 1.0	44
Area 12- Random Sampling	B 33/3	3.7 – 4.2	802
Area 7- Loading/Unloading Area	MW 4/1	0.5 – 1.0	218
Area 7- Loading/Unloading Area	MW 4/2	3.5 – 4.0	217
Area 7- Loading/Unloading Area	MW 5/1	0.5 – 1.0	40
Area 7- Loading/Unloading Area	MW 5/2	3.5 – 4.0	436
Area 6- Expansion Chamber & Contaminated Soils	MW 6/1	0.5 – 1.0	302

[8] Area 12 Random Sampling is clarified in the 1987 Recon SAP Results as soil samples collected through three borings (B-31, B-32 and B-33) on an area of urban fill between the Production Plant and the Passaic River (PAP- 00337263).

RECON Soil Samples			
Location	**Sample**	**Depth (inches)**	**Results (mg/kg)**
Area 6- Expansion Chamber & Contaminated Soils	MW 6/2	6.3 – 6.9	1150
Area 2- 275-gallon Aboveground Fuel Tanks	MW 7/1	0.5 – 1.0	239
Area 2- 275-gallon Aboveground Fuel Tanks	MW 7/2	3.6 – 4.1	146

(PAP-00337252-64; PAP-00056285-94; PAP-00056300-21)

On June 5, 1990, samples collected by NUS Corporation identified the following highest lead concentrations:

- 818 mg/kg estimated value in sediment sample NJEP-SED2, collected from the facility's sump pit (PAP-00337311; PAP-00337332-33)[9]
- 2,520 mg/kg estimated value in soil sample NJEP-S6, collected near the sludge pile at a depth of 0 to 6" (PAP-00337311; PAP-00337332-33).[10]

The following table shows the results of the remaining samples collected by NUS in June 1990.

NUS Corporation, June 1990, Lead Data			
Sample ID:	**Matrix:**	**Lead Result:**	**Units:**
NJEP-SW1	Surface Water	3.4	µg/L
NJEP-SW2	Surface Water	4.4 E	µg/L
NJEP-SW3	Surface Water	10.7 E	µg/L
NJEP-SED1	Sediment	200	mg/kg
NJEP-SED3[11]	Sediment	596	mg/kg
NJEP-SED4[12]	Sediment	644 E	mg/kg
NJEP-S1	Soil	78	mg/kg
NJEP-S2	Soil	299	mg/kg
NJEP-S3	Soil	191	mg/kg
NJEP-S4	Soil	133	mg/kg
NJEP-S5	Soil	348	mg/kg
NJEP-S7	Soil	1,430 E	mg/kg
NJEP-S8	Soil	304	mg/kg
NJEP-S9	Soil	90.8	mg/kg

E = estimated value
(PAP-00337306; PAP-00337311; PAP-00337332-33)

According to the 2016 PARS RIR, the following soil sampling results exceeded the New Jersey Residential Direct Contact Soil Remediation Standards (RDCSRC) for lead of 400 mg/kg:

- AOC 5 – Plasticizer Tank Farm and AOC 7 – Unloading Area, 1,770 mg/kg lead was noted in Tank Farm soil sample No. TF-16 collected on October 30, 2014 between 2.0 and 2.5 feet below ground surface (bgs), south of the Former Tank

[9] The reported value in the 1990 EPA SI was 818 E. Per the notes from the sampling results chart, the "E" indicates that this was an estimated value.
[10] The reported value in the 1990 EPA SI was 2,520 E. Per the notes from the sampling results chart, the "E" indicates that this was an estimated value.
[11] NJDEP-SED3 and NJDEP-SED4 were collected from two storm drains bordering the Facility on Passaic Avenue (PAP-00337311).
[12] NJDEP-SED3 and NJDEP-SED4 were collected from two storm drains bordering Facility on Passaic Avenue (PAP-00337311).

Farm. 595 mg/kg lead was detected in Tank Farm soil sample No. TF-17, collected at 2.0 – 2.5 feet bgs (PAP-00056192).

- AOC 6 – Floor Drains, Trenches, and Piping, 2,220 mg/kg lead was noted in soil sample No. WL-01 collected on October 30, 2014, between 1.8 and 2.3 feet bgs in from within the trench system located in the foundation of the former Production Plant (PAP-00056212).

- Historical data contained in the 2016 PARS RIR showed that 3,100 mg/kg lead was found in March 2002 in soil sample No. SB2/B collected between 3.3 and 3.9 feet bgs a little north of the central gate (PAP-00056300).

As referenced in the 2016 PARS RIR, remaining structures at the site were demolished in April 2014. Prior to the demolition, PARS collected in-situ concrete and concrete block samples as per the NJDEP Guidance for Characterization of Concrete and Clean Material Certification for Recycling (PAP-00056148). The following concrete chip samples had concentrations of lead above the New Jersey RDCSRS of 400 mg/kg:

- 1,750 mg/kg lead was found in a concrete chip collected near the exit door from the Production Plant walls in sample No. C-21 C collected on March 14, 2014 (PAP-00056258).

- 623 mg/kg of lead was detected in the concrete chip sample collected from the Q/C lab Production Plant wall (PAP-00056256).

- 493 mg/kg of lead was detected in the concrete chip sample collected from the process area Production Plant concrete support (PAP-00056258).

Mercury

According to the 1984 Hart PSA, the sampling results from the four samples collected on June 27, 1984 showed the mercury concentrations for Sample Tank SA at 7,100 ug/kg and Sample Tank SB at 200 ug/kg. The other two results were detected below the method detection limit (MDL) (PAP-00057074, 76)[13]. The depth of the soil samples was not provided in the available file materials. See the 1984 sample location map provided above in the Copper section.

According to the 1987 RECON SAP Results, Recon Systems, Inc. collected soil samples from 33 borings as part of the ECRA-required sampling. The following table shows location, depth and results for mercury. See the 1987 sample location map for locations provided above in the Copper section.

[13] The referenced sample results were originally taken as part of the 1984 Hart PSA. The 1984 Hart PSA is only available as an appendix to the 1986 Franklin Plastics SES. The 1986 Franklin Plastics SES does not include the lab data from the 1984 samples, so there is no way to verify the reported data is correct and/or to check whether there were any accidental transcription errors.

Franklin-Burlington Plastics, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

RECON Soil Samples			
Location	**Sample Number**	**Depth (inches bgs)**	**Results (mg/kg)**
Area 2- 275 gallon Aboveground Fuel Tanks	MW 1/1	0.5 – 1.0	0.40
Area 2- 275 gallon Aboveground Fuel Tanks	MW 1/2	3.5 – 4.0	0.70
Area 2- 275 gallon Aboveground Fuel Tanks	MW 2/1	0.5 – 1.0	0.30
Area 2- 275 gallon Aboveground Fuel Tanks	MW 2/2	3.5 – 4.0	ND
Area 8- Dust Collector and Former Material Storage Area	MW 3/1	0.5 – 1.0	0.50
Area 8- Dust Collector and Former Material Storage Area	MW 3/2	2.5 – 3.0	ND
Area 5- Plasticizer Tank Farm Area	B-3	Not specified	ND
Area 6- Expansion Chamber & Contaminated Soils	B 5/1	0.5 – 1.0	0.70
Area 6- Expansion Chamber & Contaminated Soils	B 5/2	2.8 – 3.3	0.40
Area 6- Expansion Chamber & Contaminated Soils	B 6/1	0.5 – 1.0	0.40
Area 6- Expansion Chamber & Contaminated Soils	B 6/2	3.3 – 3.9	ND
Area 5- Plasticizer Tank Farm Area	B 7/1	0.5 – 1.0	ND
Area 5- Plasticizer Tank Farm Area	B 7/2	3.6 – 4.1	1.7
Area 5- Plasticizer Tank Farm Area	B 7/A	Not specified	0.10
Area 7- Loading/Unloading Area	B 8/1	0.5 – 1.0	0.10
Area 7- Loading/Unloading Area	B 8/2	1.1 – 1.7	0.40
Area 7- Loading/Unloading Area	B 9/1	0.5 – 1.0	ND
Area 7- Loading/Unloading Area	B 9/2	3.3 – 3.9	0.10
Area 7- Loading/Unloading Area	B 10/1	0.5 – 1.0	0.80
Area 7- Loading/Unloading Area	B 10/2	2.5 – 3.0	4.8
Area 8- Dust Collector and Former Material Storage Area	B 11/1	0.5 – 1.0	0.30
Area 8- Dust Collector and Former Material Storage Area	B 11/2	2.7 – 3.2	0.20
Area 8- Dust Collector and Former Material Storage Area	B 12/1	0.5 – 1.0	0.40
Area 8- Dust Collector and Former Material Storage Area	B 12/2	2.1 – 2.7	ND
Area 8- Dust Collector and Former Material Storage Area	B 13/1	0.5 – 1.0	ND
Area 8- Dust Collector and Former Material Storage Area	B 13/2	1.6 – 2.1	0.40
Area 12- Random Sampling[14]	B 31/1	0.0 – 0.5	0.60
Area 12- Random Sampling	B 31/2	0.5 – 1.0	0.30
Area 12- Random Sampling	B 31/3	3.5 – 4.0	0.60
Area 12- Random Sampling	B 32/2	0.5 – 1.0	1.4
Area 12- Random Sampling	B 32/3	3.3 – 3.9	0.30
Area 12- Random Sampling	B 33/1	0.0 – 0.5	0.20
Area 12- Random Sampling	B 33/2	0.5 – 1.0	ND
Area 12- Random Sampling	B 33/3	3.7 – 4.2	0.20
Area 7- Loading/Unloading Area	MW 4/1	0.5 – 1.0	0.30
Area 7- Loading/Unloading Area	MW 4/2	3.5 – 4.0	0.10

[14] Area 12- Random Sampling is clarified in the 1987 RECON SAP Results as soil samples collected at three borings (B-31, B-32 and B-33) in an area of urban fill between the Production Plant and the Passaic River (PAP-00337263).

RECON Soil Samples			
Location	**Sample Number**	**Depth (inches bgs)**	**Results (mg/kg)**
Area 7- Loading/Unloading Area	MW 5/1	0.5 – 1.0	0.10
Area 7- Loading/Unloading Area	MW 5/2	3.5 – 4.0	0.70
Area 6- Expansion Chamber & Contaminated Soils	MW 6/1	0.5 – 1.0	0.60
Area 6- Expansion Chamber & Contaminated Soils	MW 6/2	6.3 – 6.9	0.20
Area 2- 275 gallon Aboveground Fuel Tanks	MW 7/1	0.5 – 1.0	0.40
Area 2- 275 gallon Aboveground Fuel Tanks	MW 7/2	3.6 – 4.1	0.50

(PAP-00337252-64; PAP-00056285-94; PAP-00056300-21)

On June 5, 1990, samples collected by NUS Corporation identified the following highest mercury concentrations:

- 0.44 mg/kg in sediment sample NJEP-SED3, collected from an off-site storm drain located southeast of the Facility.

- 0.25 mg/kg estimated in soil sample NJEP-S-3, collected in Drum Area No. 3 at a depth of 0 to 6 inches (PAP-00337306, 311, 332-33)

The following table shows the mercury results of the remaining samples collected by NUS in June 1990.

NUS Corporation, June 1990, Mercury Data			
Sample ID:	**Matrix:**	**Mercury Result:**	**Units:**
NJEP-SW1	Surface Water	Not Detected[15]	µg/L
NJEP-SW2	Surface Water	Not Detected	µg/L
NJEP-SW3	Surface Water	Not Detected	µg/L
NJEP-SED1	Sediment	0.31	mg/kg
NJEP-SED2	Sediment	0.25 E	mg/kg
NJEP-SED4[16]	Sediment	0.33	mg/kg
NJEP-S1	Soil	0.17	mg/kg
NJEP-S2	Soil	0.16	mg/kg
NJEP-S4	Soil	0.1	mg/kg
NJEP-S5	Soil	0.2	mg/kg
NJEP-S6	Soil	0.12	mg/kg
NJEP-S7	Soil	Not Detected	mg/kg
NJEP-S8	Soil	0.16	mg/kg
NJEP-S9	Soil	0.11	mg/kg

E = estimated value
(PAP-00337311; PAP-00337332-33)

[15] According to the Notes of Table 4 of the 1990 EPA SI, a blank space indicated that the compound was analyzed for but not detected (PAP-00337332).
[16] NJDEP-SED4 was collected from a storm drain bordering the Facility on Passaic Avenue (PAP-00337311).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[17]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[18] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[19] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[20]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00056223-24).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	879 mg/kg
Mercury	168 mg/kg
Benzo(a)anthracene	8.8 mg/kg
Benzo(a)pyrene	9.1 mg/kg
Benzo(b)fluoranthene	5.3 mg/kg
Benzo(k)fluoranthene	6.2 mg/kg
Dibenzo(a,h)anthracene	2.8 mg/kg
Indeno(1,2,3-cd)pyrene	1.0 mg/kg

The Sampling and Analysis Plan Results Report - ECRA Case No. 86206 prepared by RECON Systems, Inc. dated October 1, 1987 (1987 RECON SAP Results) reported that the site is on the former flood plain of the Passaic River which forms the western property boundary. Substantial filling with urban refuse (excluding household waste) has taken place over the years. A substantial amount of urban fill has been placed in

[17] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[18] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[19] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[20] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

increasing depths as the Property gradually slopes westward toward the river (PAP-00337408).

According to the 2010 ISRA *Preliminary Assessment Report* (2010 ISRA PAR) prepared by Arcadis, the entire site contained nonindigenous fill material that was used to raise the elevation of the site. The material covered approximately 85% of the site and ranged in depth from between 5 and 7 feet deposited upon tidal marsh sediments. The western portion of the site along the Passaic River contained the most fill. A review of aerial photographs showed that the first stage of fill occurred between 1933 and 1946. The second stage occurred between 1953 and 1966. The fill was comprised of silty sand, course sand, cinders, gravel, brick fragments, rocks, wood pieces, glass, ceramics and scrap metal. Even with the fill events, the site was still subject to periodic flooding from the Passaic River (PAP-00054694).

According to a 1929 map prepared for Congoleum Nairn, Inc. depicting the land owned by Nairn Linoleum Co., bulkheading and fill operations on the Property began prior to 1929, when the Property was owned by "Watts Kearny" (PAP-00724491).

The 2016 PARS RIR confirmed the entire site was underlain by fill material (PAP-00056120). The 2016 PARS RIR subsurface investigation alleged that five to seven feet of fill material appeared to have been placed prior to development in 1946 PARS stated that additional fill material was placed along the riverbank circa 1966 (PAP-00056120). According to the 2016 PARS RIR, contaminants associated with Historic Fill included petroleum hydrocarbons, semi volatile organic compounds and metals that exceeded the RDCSRS. In the 2016 PARS RIR, PARS concluded that all contamination with the exception of extractable petroleum hydrocarbons (EPH) in the tank farm area, PCBs in the former transformer substation area, bis (2-ethylhexyl)phthalate (DEHP) and butyl benzyl phthalate (BBP) were related to Historic Fill (PAP-00056137). PARS Environmental, Inc. documented in the 2016 PARS RIR that remedial action was required to address Historic Fill. They recommended engineering controls for the entire site to cap soil impacts exceeding the RDCSRS and a deed notice (PAP-00056143).

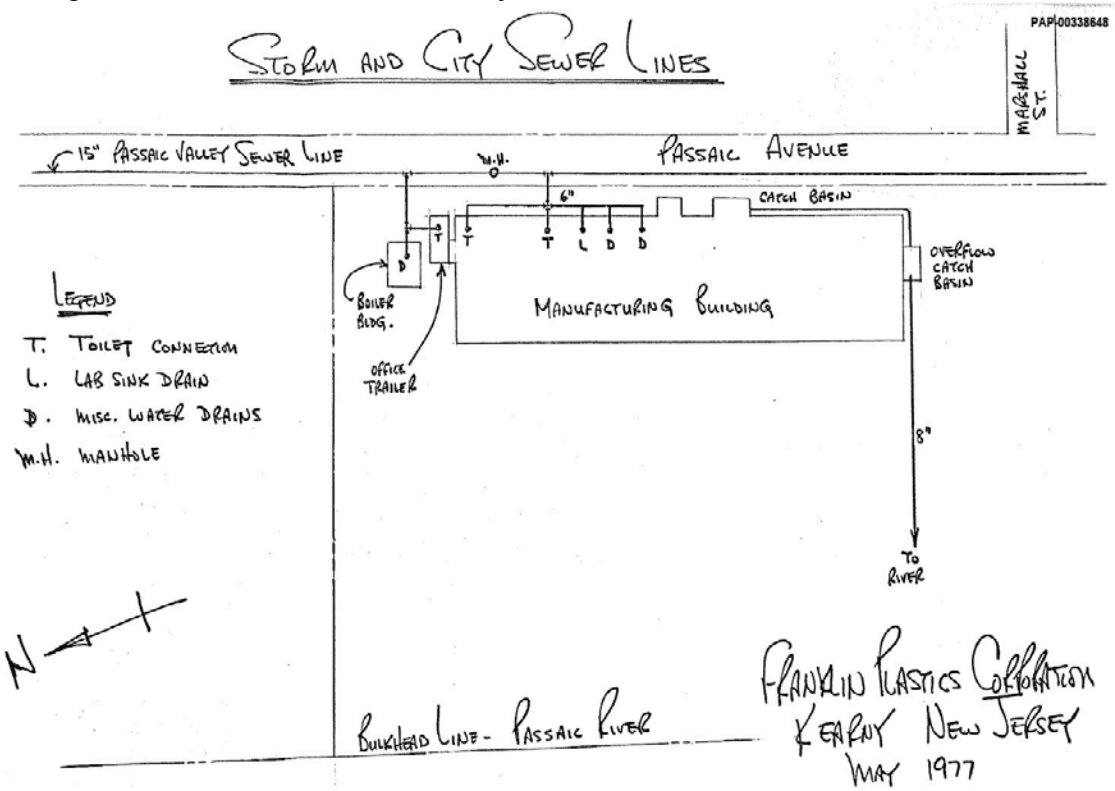
According to the 2017 PARS RAR, Historic Fill covers the majority of 113 Passaic Avenue and extends offsite to the north and south (PAP-00056563).

5. COC Pathways

Sanitary and Combined Sewer

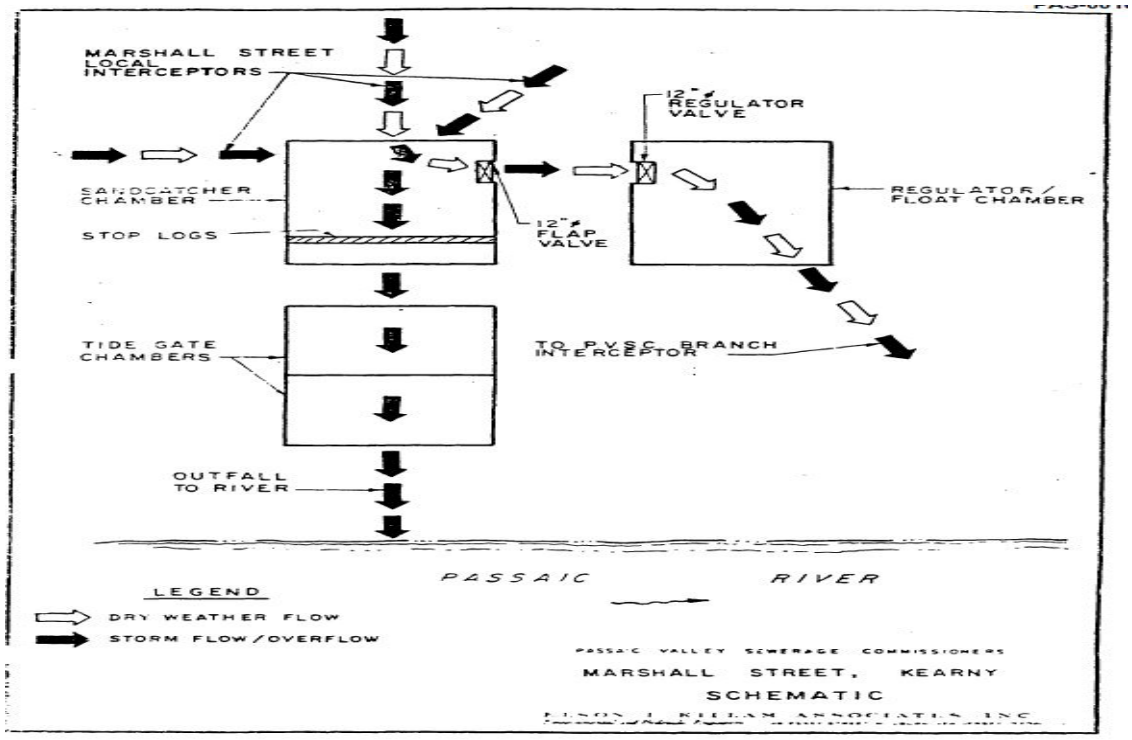
According to the 2016 PARS RIR, the Production Plant was connected to the municipal sanitary sewer system since its construction by the prior owner, Congoleum, in 1946 (PAP-00054650). The Facility was connected to the PVSC for the entire period of Franklin-Burlington Plastics' operations from 1976 to 2010. Sanitary waste and water from the laboratory, boiler blowdown, and floor drains in the boiler house and laboratory area were discharged to the sanitary sewer system at all times during Franklin-Burlington's operation of the Facility through two connections to a collection main along Passaic Avenue (PAP-00056128; PAP-00338648). One connection was for the boiler house. This connection carried boiler blowdown and water from a floor drain in the boiler

house. The other connection directed sanitary wastewater, water from the laboratory, and floor drains in the lavatory and laboratory areas to the PVSC (PAP-00338648). Contact and non-contact cooling water from the Facility was discharged to the PVSC from 2004 to 2010 (PAP-00057271). All buildings were razed in April 2014 (PAP-00056121). No discharges to PVSC occurred thereafter. See the 1977 drawing below showing the location of the storm and city sewer lines.

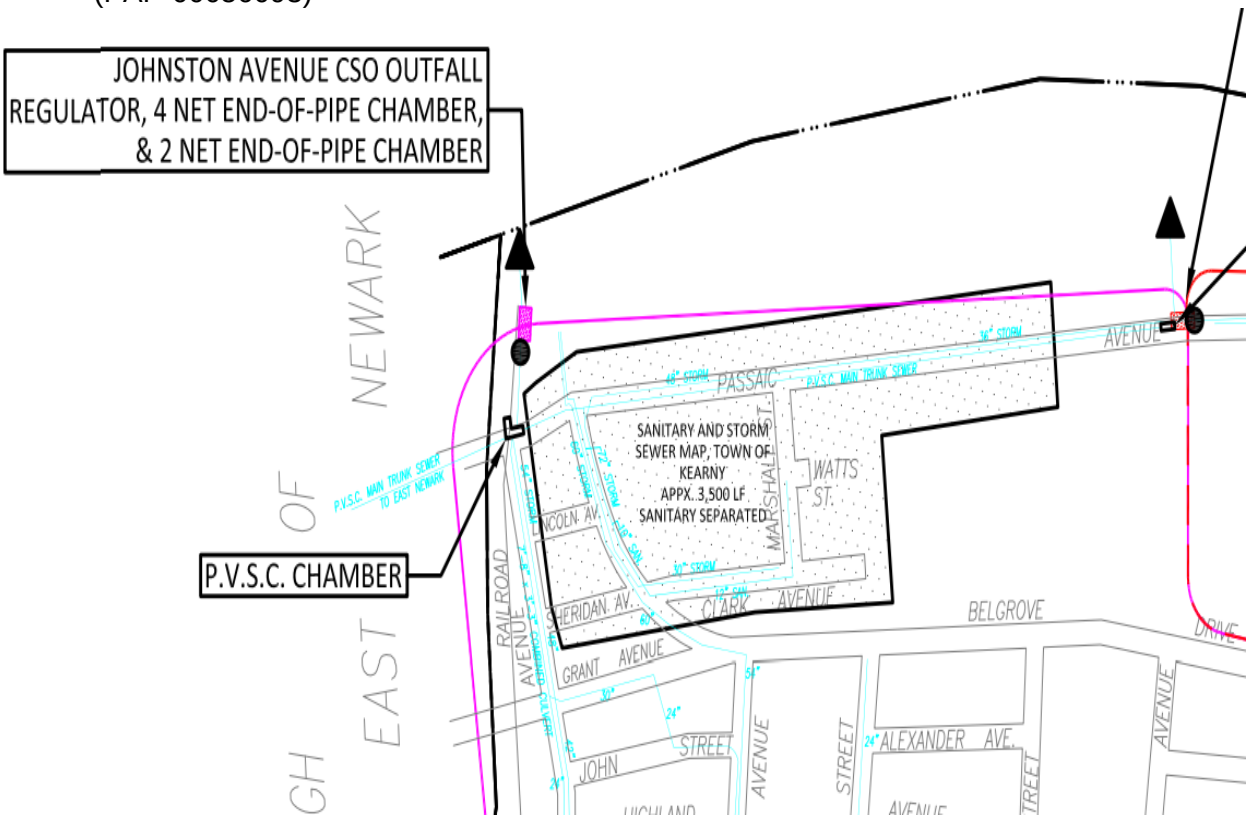


(PAP-00338648)

Flows in the Main Interceptor (Main Trunk Sewer) did not enter the Regulator. The Regulator's function was to divert flow into the Branch Interceptor. If the flow to the Regulator exceeded the capacity of the Regulator, the excess flow was diverted to the River as a combined sewer overflow (CSO). See Overflow Analysis Diagram below.



(PAP-00056093)



(PAP-00402441)

According to the 2014 Neglia Engineering CSO Map of Kearny above, the Marshall Street Regulator was located downstream (south) of Franklin's direct connections to the PVSC Main Interceptor. The Local Branch Interceptors connected to the Marshall Street Regulator were all on the east side of Passaic Avenue. The Franklin facility was on the west side and connected directly to the PVSC Main Interceptor (referenced as the PVSC Main Truck Sewer) through two direct connections. The flow from the Franklin facility entered the Main Interceptor pipe before the flow from the Marshall Street Regulator entered the PVSC Main Interceptor pipe (PAP-00402441).

The Marshall Street pump station was "sewer separated" sometime between May 27, 2005, where it was referenced in a Compliance Evaluation Report, and January 2014, where the sewer map prepared by Neglia Engineering Associates shows that wastewater from the Marshall Street collection area combined with and was transported to the Johnston Avenue pump station (PAP-00402441; PAP-00402441). After separation, the Marshall Street outfall is no longer a CSO.

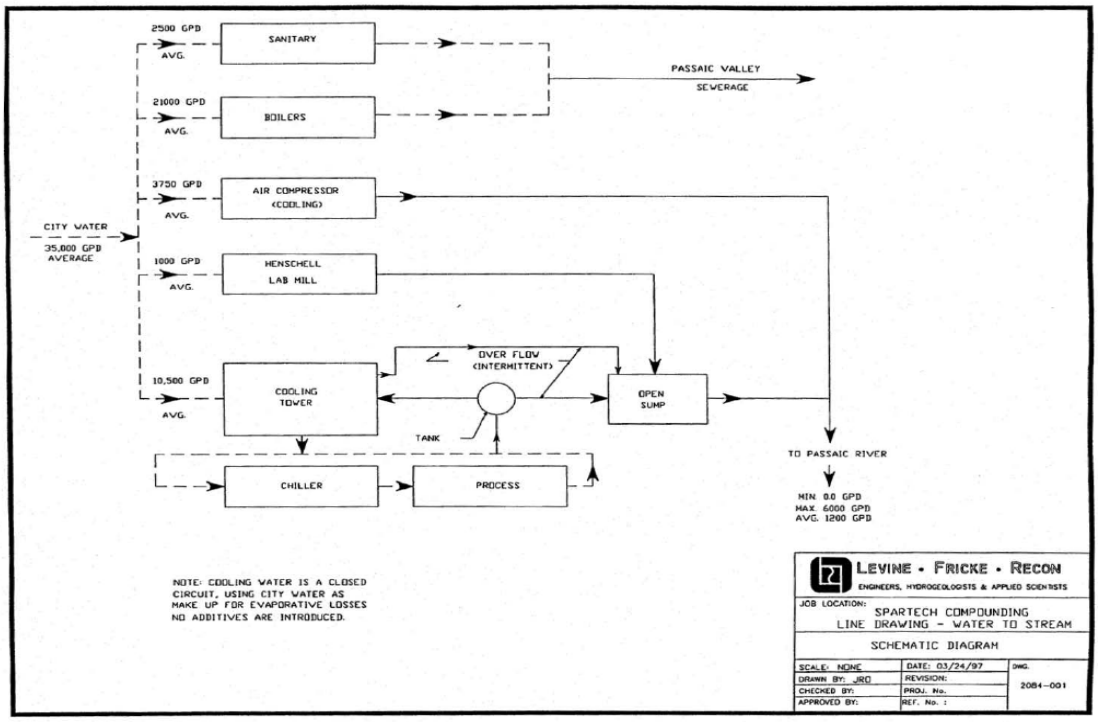
The Johnston Avenue CSO is located approximately 920 feet downstream from the Marshall Street Regulator and similarly collected combined wastewater and stormwater from Branch Interceptors and directed it into the PVSC Main Interceptor. The flow from the FBP Facility was already in the PVSC Main Interceptor at the point at which the flow diverted by the Johnston Avenue Regulator entered the PVSC Main Truck Sewer pipe (PAP-00402441).

Direct Release

Between 1976 and 2004, Franklin discharged water to the Passaic River via a NJPDES permit. The discharge water included both non-contact cooling water and contact cooling water from cooling baths (PAS-00048607). Non-contact cooling water was for a lab mill, air compressor cooling, and cooling tower overflow (PAP-00057133; PAP-00057203). According to the 2016 PARS RIR, the production plant at 113 Passaic contained floor drains and trenches that connected to two sumps (PAP-00056128). As discussed in more detail in the "Sumps" section above, Sump 2 flowed through the 8-inch diameter outfall pipe into the Passaic River via NJPDES Permit No. NJ002194 (PAP-00056126).

The 1990 EPA SI stated that overflow from the cooling tower, cooling water from the mixer jacket and roller mills, and drainage from indoor trenches was collected in the concrete-lined open sump pit along the south wall of the Production Plant (PAP-00337323).

See the following 1997 Schematic showing the flow of the water through the facility and to the Passaic River or Passaic Valley Sewerage.



(PAP-00057219)

According to the 2016 PARS RIR, in 2013 Production Plant trenches were cleaned and inspected by Arcadis. Significant cracks and deterioration were noted in the main trench in the central part of the Production Plant (PAP-00056128). PARS conducted an additional investigation of the drains and trenches in the Production Plant and found no OU2 COCs attributable to the former production activities at the site in the soil beneath the drains and trenches (PAP-00056128, 40).

On February 27, 2004, Spartech Polycom requested authorization for the discharge of non-contact and contact cooling waters to the sewerage collection systems serviced by PVSC. The proposed discharge consisted of an approximate maximum discharge of 11,000 gallons per day of non-contact cooling tower blowdown. The remainder of the Facility's discharge consisted of periodic discharges of approximately 2,000 gallons per week of pellet cooling water (PAP-00338803).

On September 16, 2004, Spartech Polycom sent a letter to NJDEP Division of Water Quality, Bureau of Point Source Management stating the facility had implemented wastewater re-use and conservation measures. The closed loop chiller was installed to replace the existing cooling tower thereby eliminating the facilities non-contact cooling water discharge to the Passaic River. The remaining small quantity of contact cooling water was discharged to the sanitary sewer as approved by PVSC. The discharge pipe utilized for the discharge of wastewaters to the Passaic River (under NJ0002194) was removed prior to June 1, 2004, from the river bank and the remaining underground portion capped securely at both ends (PAP-00338060).

On March 13, 2008, PVSC granted permission to discharge 100 gallons per day of mineralized cooling water blowdown that must be in compliance with all PVSC Rules and Regulations. The letter also notes that the Facility was authorized to discharge 2,000 gallons per week of contact pellet cooling water to the PVSC (PAP-00338804).

Flooding and Surface Water Runoff

Surface Water Runoff

A 1980 EPA *Potential Hazardous Waste Site Identification and Preliminary Assessment* form identified an open dump, landfill, drums, aboveground tanks, a railroad, and other major site activities. Overturned drums potentially contaminating the soil were noted onsite, as well as "many" 55-gallon drums that were leaking and overflowing.[21] The EPA staff member who prepared the form identified the apparent seriousness of the problems at the site as "low" (PAP-00337386-89).

As reported in the 1990 EPA SI, an onsite reconnaissance performed by NUS Corporation in April 1990 "noted a condenser blowdown drainage pathway between the southwest edge of the manufacturing building and the tank farm (PAP-00337303). The NUS Corporation also observed soil runoff from a stained soil area east of the Production Plant into two storm drains on Passaic Avenue (PAP-00337320-21). However, the Topographic Survey prepared by Dennis W. Sklar, Inc dated October 6, 2014 (the 2014 Topographic Survey) shows that these storm drains are topographically upgradient of the Facility (PAP-00056268).

The 2017 PARS RAR stated that storm water runoff from impermeable surfaces on the eastern portion of the Site flowed west toward the Passaic River. There were a few low lying areas on the central portion of the site where storm water may have accumulated. A drainage feature near the northwest corner of the Site (on Lot 12.01) collected storm water from paved areas at the site and from offsite run-on and drained into the Passaic River (PAP-00056563).

The 2009 SPCC/DPCC/DCR Plan states that stormwater runoff from the relatively flat site collected in a slight but broad general depression or basin on the West side of the property. Any spill would be contained in this basin and would not reach the Passaic River, which is adjacent to the Property. In addition, a vegetative buffer between this basin and the Passaic River served as a spill containment barrier between potential spill areas and the Passaic River (PAP-00055750).

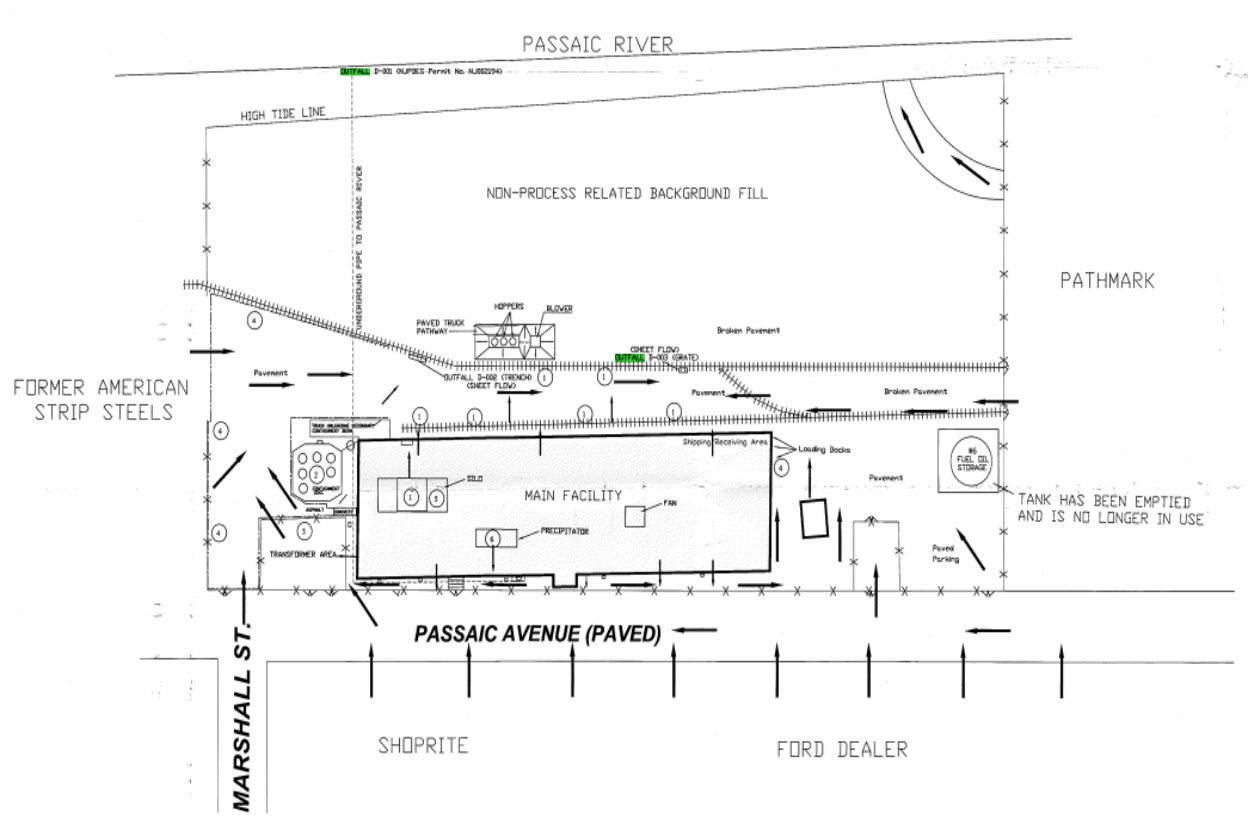
The 2009 SPCC/DPCC/DCR Plan also states that there were no storm sewers located on the Property (PAP-00055750). The Individual NJPDES Stormwater Discharge Permit issued by NJDEP on June 20, 2006 (the 2006 Individual Stormwater Permit) confirms that there were no storm drains, stormwater conveyance systems, or stormwater outfalls at the site. NJDEP further stated in the 2006 Individual Stormwater Permit that most of the Facility's stormwater was discharged to ground water (PAP-00056937). This is

[21] The Potential Hazardous Waste Site Identification and Preliminary Assessment form specifically notes that "The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections" (PAP-00337386).

consistent with the 2014 Topographic Survey which shows there were no major flow channels or ditches to direct stormwater across the 113 Passaic Avenue (PAP-00056268).

According to the *Amended Stormwater Pollution Prevention Plan* prepared by LFR dated October 10, 2002 (2002 Amended SPPP), stormwater flows entered the Franklin Burlington Plastics site from the neighboring properties. The 2002 Amended SPPP found that, based on conservative calculations, greater than three acres of the surrounding properties are located upgradient of the Facility. This drainage area corresponds to hundreds of thousands of gallons of stormwater for each inch of rainfall. A percentage of this drainage does enter the site during large rainfall events. The offsite drainage area that affect the Facility include two supermarket parking lots, an auto dealership, city streets, and abandoned manufacturing sites. Numerous contaminants originating from these offsite sources have the potential to negatively impact the site's stormwater quality (PAP-00056780). The significant water flow from the neighboring areas can be seen in the photos of the site taken during August of 2003 (PAP-00338070-78).

NJDEP stated in the 2006 Individual Stormwater Permit that the site is located on a low point of Passaic Ave., and "a large portion of offsite contaminated stormwater enters the property during periods of heavy rainfall." NJDEP further concluded that the Facility had no control over the event of receiving contaminated stormwater and that there was no reasonably available remedy (PAP-00056937). See the 2003 Surface Water Flow diagram below (PAP-00338638).



Site Flooding

According to the 1990 EPA SI, a portion of the property is occasionally flooded by high tides from the Passaic River. The Passaic River is located approximately 400 feet west of Franklin's Production Plant and forms the western border of the site (PAP-00337317). According to the 2016 PARS RIR, the site is periodically flooded by the Passaic River. Potentially contaminated sediments from the Passaic River are deposited onto the site during these flood events (PAP-00056133).

Spills

An August 1, 1984 Investigative Report for Franklin Plastics Corporation noted an oil-like substance that heavily contaminated the southwestern corner inside of the Production Plant. Two spills being cleaned by the workers were noted on the ground during the inspection in an area where a liquid plasticizer was discharged from tank trailers into pipes for storage (PAP-00338659).

The Sampling Analysis Plan (SAP) submitted as an appendix to the 1986 Initial Notice SES, focused on possible areas of spillage of the following:

- Phenols associated with asphalt storage in the tank farm at the souths side of the Facility during Congoleum Corporation ownership/operation of the Facility,
- Phthalates associated with unloading, storage, and processing of plasticizer compounds at transfer lines, around the dust collector system blower, and around the two storage tanks used for plasticizer storage,
- Heavy metal bearing pigments on and around process equipment within the Production Plant and the dust collector system blower,
- Transformer fluids associated with the transformer substation on the south side of the property,
- Petroleum hydrocarbons associated with oil lubricated compressor discharges throughout the Facility, and
- Gasoline from the underground storage tank or related plumbing system (PAP-00057055).

A NUS Corp. Region 2 FIT on-site reconnaissance of April 30, 1990 observed a stained soil area east of the manufacturing building (PAS-00063677). Surface soil samples were collected by NUS Corp. Region 2 FIT on June 5, 1990 from the stained soil area, from a run-off pathway outside the fence, and from two storm drains on Passaic Ave. The samples results were for constituents not related to this allocation (PAS-00063677).

6. Regulatory History/Enforcement Actions

Inspections

On January 7, 1980 NJDEP conducted a site visit for the Franklin Plastics facility. As a follow-up, EPA performed a Preliminary Assessment of Franklin Plastics on June 16, 1980. (PAP-00338653-56). Some overturned drums were identified as a potential hazard to the soil onsite, and "many" 55-gallon drums, both waiting for removal and stored for use, that were leaking and overflowing were identified as a potential hazard (PAP-00338653). On August 6, 1980, a Tentative Disposition, completed by the same government official who performed the Preliminary Assessment, determined that no further action was needed by EPA and recommended that there was no hazard (PAP-00338657).

According to the *Site Inspection Prioritization Evaluation*, dated September 29, 1995, in June 1984 a Preliminary Site Assessment (the 1984 PSA) was conducted by Hart Associates. As part of the 1984 PSA, Hart associates collected four soil samples. Sampling results showed plasticizers (phthalates), copper, lead, and mercury, along with other priority pollutant metals. The quality assurance/quality control (QA/QC) used for these samples was unknown (PAP-00054202).

On July 23, 1984, according to a memorandum dated August 16, 1984, the Bureau of Industrial Site Evaluation conducted a Preliminary ECRA Inspection and found that a waste paper basket fire in an office that occurred prior to the inspection had left "quite a few hundred gallons of water in the plant area." There were numerous violations that included spillage, discolored soils, oil saturated soils, improperly labeled drums, unmarked drums, disposal of drums, and other storage of material concerns. The inspector found thirty-three (33) 55-gallon drums in the parking lot that the plant manager, Joseph Ronzo stated was "rain water". Upon puncturing one of the drums, brownish, green liquid ran onto the ground and Joseph Ronzo stated "See, its"rainwater. Hundreds of unmarked sample bottles were noted in the Quality Assurance/Control Product Laboratory and were not mentioned in ECRA SES. The company was instructed to include documentation of wastes stored and disposed of from the Laboratory (PAP-00337237).

On August 1, 1984, the Division of Waste Management, Bureau of Field Operations conducted an inspection of the Facility for the purpose of checking on company storage practice of chemicals as stated in incident report No. 84-07-24-0lN. The following observations were made:

- On the area east of a boiler room there were four drums of No. 2 fuel oil and four drums of kerosene palletized and sitting on the ground. The inspector was informed by the Plant Manager that those drums would be transferred into the building (the Production Plant).

- On the yard by the south-western corner of the Production Plant, there was a large area of about 150-200 sq. yards, heavily contaminated with an oil-like substance. The area where the oil-like substance was observed corresponds to

the area where a liquid plasticizer was discharged from the tank trailers into the pipes for storage. The spill occurred when hoses were connected and some oils dripped from the tractors onto the asphalt paved surface.

- On the eastern side of the Production Plant and on the electric transformers area it was observed that the ground was heavily contaminated with and oil-like substance. The Franklin Plastics representative stated that the spots of contaminated ground by the Production Plant wall came from the steam releasing pipes, but there was no explanation regarding the transformer area.

- Some 40-50 steel, 35-gallon empty blue drums were noted to be stored on the southern area of the facility. The drums were palletized, stacked three high. The inspector was informed by the Plant Manager that the empty drums would be removed as soon as a scrap metal dealer willing to take them was located.

It was recommended that Franklin Plastics clean up all contaminated areas and to dispose of the clean out material properly (PAP-00338658-59).

According to the August 16, 1984 Preliminary ECRA Inspection memo, the Spill Prevention, Containment and Control (SPCC) Plan was never implemented and additionally, two gasoline underground storage tanks were not mentioned in the ECRA SES (PAP-00337238). Also reported was a large transformer substation containing PCB dielectric oil located at the Facility. The substation was located on an earthen surface, and no berms were present around the substation (PAP-00337238).

On December 20, 1984, a follow-up inspection of Franklin Plastics facility was conducted. The inspector found the premises clean and in good order except for minor spills of a white powder along the railroad tracks and minor spills of oil in the truck unloading area. The Franklin Plastics representative identified the white powder as resin used in the manufacturing process. The Franklin Plastics representative stated that the types of spills observed occur during working hours and are cleaned up each working day. The transformer area was observed to be free of any leaks or spillages and appeared to have new crushed stone in the area. The empty 35-gallon drums observed during the inspection on August 1, 1984 were gone and records showed that they were disposed properly. The inspector observed some oily spills on the eastern side of the Production Plant caused by the releasing of steam, and recommended cleaning those areas within the completion time. The Plant Manager agreed to start cleaning that spill the same day. There was a field Notice of Violation filed due to oily spills on the eastern side of the Production Plant. The inspector noted that there was a possibility of ground water contamination but since it was not determined, no recommendation were made on this matter (PAP-00338661). The inspector also noted that the operations and housekeeping appeared to be usual for this type of industry (PAP-00338662).

On January 5, 1985, Franklin Plastics informed the NJDEP that they had removed and disposed of the 25-45 pounds of material from the contaminated area on the eastern side of the Production Plant (PAP-00337303).

On July 22, 1986, NJDEP Bureau of Industrial Site Evaluation conducted a Preliminary Inspection under ECRA Case No. 86026. The inspector noted two deficiencies. First, there were two 20,000-gallon fuel oil tanks located outside the production area within a containment wall. The ground inside the wall was visibly contaminated with oil. Second, there was a wash sink south of the Production Plant which discharged to the ground. The inspector recommended that Franklin remove the contaminated soil and take measures to prevent subsurface contamination. The inspector also instructed that Franklin should cease the discharge to the ground from the wash sink (PAP-00057224).

An EPA contractor's on-site reconnaissance in April 1990, as part of the 1990 EPA SI, discovered three areas of abandoned drums along the Passaic River. The drums were in poor condition and some drums were partially buried. The contents of the drums appeared to be crumbled pieces of tile. Solidified sludge from the vinyl tile manufacturing process was also observed on the Property. According to the report, the former operator of the property, Congoleum Corporation/Floor Covering Division, manufactured asphalt and/or vinyl tile on site from approximately 1946 to 1974 (PAP-00337307; PAP-00054201-02). Based on the available file materials, there is no evidence that Franklin Burlington manufactured tile at any point during its operation from 1976 to 2010.

The site was also subject to periodic permit Compliance Evaluation and Assistance Inspections by the NJDEP. The NJDEP inspector noted no major deficiencies and found the Facility to be in compliance with requirements of the Facility's NJPDES permits based on the inspections and analysis of wastewater on multiple occasions, such as the inspections conducted on March 12, 1980 (PAP-00057289-90), March 29, 1982 (PAP-00057293-94), April 16, 1996 (PAP-00057311-12), and March 4, 2009 (PAP-00057405), among others. While some inspections reported that the Facility was not in compliance with one of the terms of its permits, none of the incidents of non-compliance related in any way to the storage, handling, or discharge of an OU2 COC (PAP-00057306; PAP-00057315; PAP-00057342; PAP-00057351-57).

NJDEP also inspected the Facility annually pursuant to the Discharge Prevention, Containment and Countermeasures and Discharge Cleanup and Removal Plans annual audit requirement. The available records for five of the inspections show that there were no violations found, and the Facility was in compliance when inspected on November 27, 2001 (PAP-00055147), November 21, 2002 (PAP-00055148), August 12, 2004 (PAP-00055297) and July 12, 2007 (PAP-00055348), and the Facility was substantively in compliance when inspected on November 30, 2000 (PAP-00055146).

Violations

According to the 1990 EPA SI, at an unknown date Franklin Plastics received a Notice of Violation for oily spills along the eastern wall of the Production Plant (PAP-00337303).

According to a NJDEP letter dated September 27, 1985, the NJDEP Division of Water Resources, inspected the facility in July 1985 and gave it an "unacceptable" rating due to permit limit exceedances of temperature, chromium, and zinc concentrations. The letter mandated that Franklin Plastics Corporation submit a written report detailing remedial

measures and an implementation timetable (PAP-00057085-89;). According to a letter from Franklin Plastics to NJDEP, dated October 22, 1985, after conversations with NJDEP about the exceedances, Franklin Plastics resampled the water and all constituents were below the levels required by the permit (PAP-00057090).

NJDEP sent a letter to Franklin Plastics Corporation in June 1998 notifying them that they had not received a response pertaining to a Declaration of Environmental Restrictions and a proposed Groundwater Classification Exception Area for the site. Franklin Plastics was notified that the company was currently in violation of ISRA and NJDEP, and was therefore permitted to draw upon the posted financial assurance to proceed with the appropriate compliance and enforcement actions, if it so chose. The ISRA Case number was No. E86026 (PAS-00105243-44).

The site was placed on the Known Comprehensive Site List, a listing of all contaminated sites in New Jersey. NJDEP additionally rescinded approval of the Remedial Action Workplan, dated August 22, 1990, because aerial photographs from 1940 to 1991 showed that all potential areas of environmental concern were not identified during the investigation phase. Areas of concern not identified included storage areas (possible drum and other vessels) throughout the site, and spills/discharges or unknown materials. These areas were not investigated during the Site Investigation/Remedial Investigation, nor were they addressed in the Remedial Action Workplan (PAS-00105243-44).

NJDEP also noted that an EPA evaluation report, dated September 20, 1995, and NJDEP files state that Franklin Plastics site operations contributed to the metals in soil at the site. A sediment sample collected from the open sump at the southern side of the manufacturing building exhibited significant concentrations of metals. According to the NJDEP, these metals could only have been generated from within the plant since the sump collects process water generated only from within the plant. The sump reportedly is cleaned out annually by Franklin Plastics. The metals detected in the sump sediment are generally the same metals contained within pigments reportedly used by Franklin Plastics. These metals are also generally the same metals as those found in the fill onsite (PAS-00105244).

In order for Franklin Plastics to be in compliance with ISRA according to NJDEP, they were to: 1) make a distinction between metals in fill due to site operations and metals in contaminated Historic Fill, 2) identify all potential areas of concern based on the aerial photographs and EPA SI and evaluate the remediation conducted at the site, 3) submit a Remedial Action Workplan that:

- identifies all potential and known areas of concern;
- evaluate previous remediation;
- evaluate the source of priority pollutant metals onsite;
- conduct a baseline ecological evaluation; and,
- Conduct a draft Declaration of Environmental Restrictions and Classification Exception Area (PAS-00105244-45).

In response to the June 3, 1998 letter, Franklin Plastics submitted a Remedial Investigation Report dated February 5, 1999 (1999 RIR) (PAP-00054673). In a letter dated February 8, 2000, NJDEP stated that it had rescinded Franklin Plastics Corporation's Remedial Action Workplan, dated August 22, 1990, and referred the case to the Bureau of Federal Case Management for enforcement actions due to Franklin Plastics Corporation's lack of response to outstanding NJDEP administrative requirements. In the same letter, the NJDEP indicated what Franklin Plastics would need to do to come into compliance and provided associated comments on the 1999 RIR (PAP-00054673-85). All of NJDEP's comments were responded to and ultimately resolved by the submission of subsequent ISRA/ECRA filings, culminating in the submission of the 2016 PARS RIR (PAP-00056115-466).

Permits

NJPDES NJ0002194 - Discharge to Surface Water Permit:

Permit Start Date: 04/24/1976 (PAP-00057096)
Expiration Date: 09/30/2004 (PAP-00057276)

Permit No. NJ0002194 did not contain any numerical effluent limitations involving OU2 COCs nor did it require monitoring for any OU2 COCs (PAP-00057123; PAP-00057169; PAP-00057178; PAP-00057234).

Permit No. NJ0002194 was renewed with the effective of August 1, 1979 and an expiration date of July 31, 1984 (PAP-00057122).

According to the Application for Renewal of NJPDES NJ0002194, dated July 31, 1984, the operations that contributed to the discharge were overflow from cooling tower; discharge from cooling system of Henschel Blender in lab; and overflow from central collection tank, which would have an average maximum flow of 250 gallons per minute (PAP-00337952).

In June 1985, Franklin Plastics Corporation received a letter from NJDEP, Division of Water Resources, acknowledging that Franklin Plastics had a Final NJPDES/DSW Permit and Notice of Authorization to discharge pollutants to the Passaic River under NJPDES Permit No. NJ0002194 (PAP-00057149). The permit was issued on June 28, 1985, effective August 1, 1985 and expired on July 31, 1990 (PAP-00057150).

According to the Application for Renewal of NJPDES NJ0002194, dated November 1, 1989, the operations that contributed to the discharge were overflow from cooling tower (normally no flow); discharge from cooling system jacket laboratory Henschel Blender (occasional use, normally inoperative, 1,000 gallons per day average flow); overflow from central collection tank (normally no flow); and air compressor cooling (200 gallon per hour average flow) (PAP-00337981).

A renewal of Permit No. NJ0002194 was issued on March 13, 1992 with an effective date of May 1, 1993 and an expiration date of April 30, 1997 (PAP-00057176). According to the Application for Renewal of NJPDES NJ0002194, dated April 22, 1997,

the operations that contributed to the discharge were overflow from cooling tower (normally no flow); discharge of cooling water jacket from laboratory Henschel Blender (normally inoperative, 1,000 gallons per day average flow); overflow from central collection no-contact cooling (normally no flow); and air compressor cooling jacket (200 gallon per hour, 16 hour operation average flow) (PAP-00057203).

A renewal of Permit No. NJ0002194 was issued on November 26, 1997 with an effective date of January 1, 1998 and an expiration date of December 31, 2002 (PAP-00057225). The permit stated that the Facility discharged an average of 11,124 gallons per day of non-contact cooling water from machinery used in plastics processing and contact cooling water (approximately 450 gallons) on an intermittent basis from tanks where plastic resins have been submerged through Discharge Serial Number (DSN) 001 (PAP-00057233).

According to the Application for Renewal of NJPDES NJ0002194, dated December 30, 2002, the operations that contributed to the discharge were discharge of noncontact cooling water at an average flow rate of 11,124 gallons per day and discharge of contact cooling water at an average flow rate of 0.00015 million gallons per day (PAP-00338016). The average frequency of the flow through outfall number 0001A was reported as 2 days per week, with an average monthly volume of 4,500 gallons (PAP-00338017).

In May 2004, the permitted direct discharge pipe to the Passaic River was capped at both ends, and the cooling water flow was redirected to the PVSC collection main along Passaic Avenue. On October 21, 2004, Spartech Polycom requested that NJDEP terminate the processing of the pending permit re-application and revoke permit No. NJ0002194 (PAP-00338061). By letter dated October 29, 2004, NJDEP administratively revoked Permit No. NJ0002194, effective September 30, 2004 (PAP-00057276).

According to the 1990 EPA SI, NJPDES Permit No. NJ0002194 approved 15,000 gallons of discharge per day into the Passaic River via outfall DSN001 located at the southwest corner of the property (PAP-00337304).

NJPDES NJ0088315 Industrial Storm water General Permit:

Permit Start Date: 1992 (PAP-00337719)
Expiration Date: 11/01/2002 (PAP-00056668; PAP-00056675)

Permit No. NJ0088315 did not contain numerical effluent limitations or monitoring requirements involving COCs or any other parameters (PAP-00337717-45).

On January 14, 1997, Franklin Burlington Plastics, Inc. submitted a Request for Authorization under NJPDES Industrial General Permit No. NJ0088315 to discharge stormwater from its thermoplastics compounding plant at 113 Passaic Avenue (PAP-00056623-28). On February 6, 1997, Franklin Burlington Plastics Request for Authorization, under NJPDES General Permit No. NJ0088315, was approved by the Bureau of Nonpoint Pollution Control of NJDEP. The Authorization to Discharge Stormwater to Surface Water was effective February 6, 1997 and expired on November

1, 1997 (PAP-00337715). Franklin Burlington Plastics' Authorization to Discharge under NJPDES General Permit No. NJ0088315 was approved again on May 5, 1997 with an expiration date of January 31, 2002 (PAP-00337718). The permit allowed all new and existing storm water discharges associated with industrial activity (PAP-00337724).

A renewal of Franklin Burlington Plastics Authorization to Discharge under General Permit No. NJ0088315 was issued on September 5, 2002, with an effective date of June 1, 2002 and an expiration date of May 31, 2007 (PAP-00056644). NJDEP revoked Franklin Burlington Plastics Authorization to Discharge under General Permit No. NJ0088315 on the effective date of NJDEP's authorization of the individual stormwater permit for the Facility (PAP-00056668).

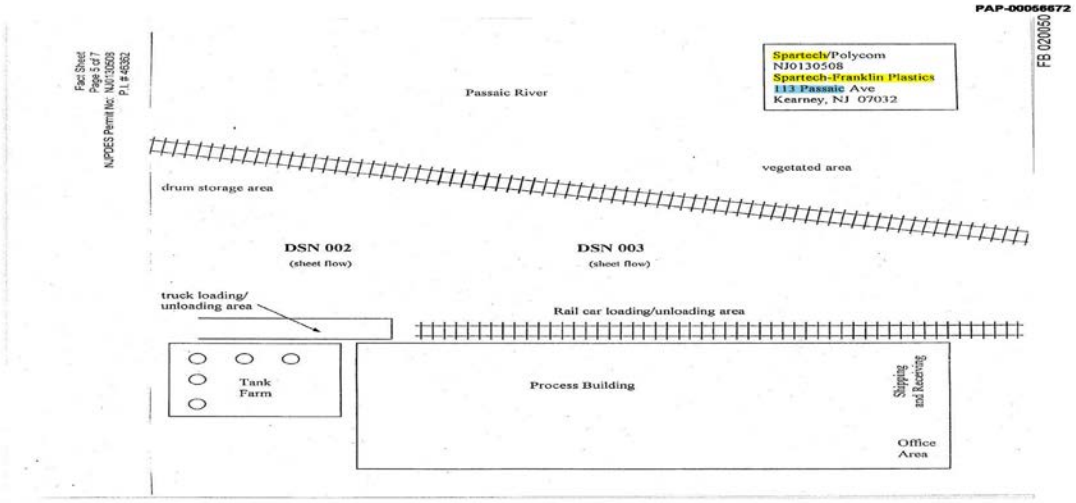
NJPDES NJ0130508 Individual Industrial Storm Water Permit:

Permit Start Date: 11/01/2002 (PAP-00056675)
Expiration Date: 03/31/2010 (PAP-00057091)

Individual Industrial Storm Water Permit No. NJ0130508 did not contain any numerical effluent limitations involving OU2 COCs, but did require the reporting of sampling results for O&G, COD, TSS, pH, phosphorus, lead, and zinc (on a quarterly basis) and volatile organic hydrocarbons (biannually) (PAP-00056669; PAP-00056940-42; PAP-00056960; PAP-00056985). The requirement to report a numerical value for O&G was removed from the permit on June 19, 2006 (PAP-00056933). In addition, the permit required a Stormwater Pollution Prevention Plan to be implemented at the Facility (PAP-00056669).

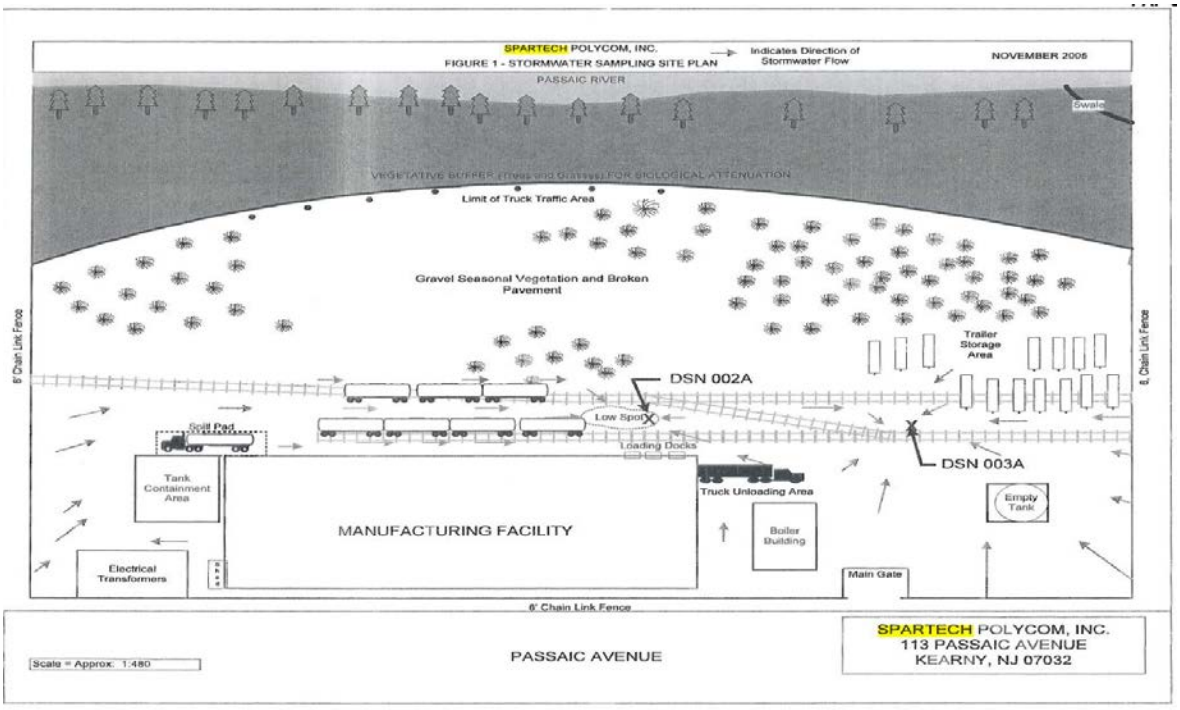
According to the permit issued October 15, 2002, Spartech was required to monitor its storm water discharge from the following DSNs (drainage areas not served by stormwater outfalls): See the following Site Plan from the Fact Sheet of the permit issued October 15, 2002 for the locations of the DSNs.

- DSN002 between the drum storage area and the tank farm
- DSN003 at the rail car loading/unloading area (PAP-00337769)



(PAP-00056672)

At some point prior to the first Discharge Monitoring Report submission required under the permit, the monitoring locations were changed to DSN002A (drum storage area/down-gradient from the tank farm and rail car area) and DSN003A (loading and unloading area/between the loading dock and trailer storage area) (PAP-00056933, PAP-00056939). See the following November 2005 Site Plan for the locations of these DSNs.



(PAP-00337773)

Surface Water Discharge Monitoring Report forms were submitted quarterly to the NJDEP Division of Water Quality, beginning with the fourth quarter of 2002 through the fourth quarter of 2010.

Surface Water Discharge Monitoring Report for monitoring period of April 1, 2008 to June 30, 2008 stated the following:

- Effluent gross value - concentration of lead at 31.2 µg/l. The sampling location was 002A located by the tank farm/rail car (PAP-00338085).
- Effluent gross value - concentration of lead at 90.4 µg/l. The sampling location was 003A located by the loading dock (PAP-00338088)

Surface Water Discharge Monitoring Report for monitoring period of January 1, 2010 to March 31, 2010 stated the following:

- Effluent gross value - concentration of lead at 2.4 µg/l. The sampling location was 002A located by the tank farm/rail car (PAP-00338095).
- Effluent gross value - concentration of lead at 1.1 µg/l. The sampling location was 003A located by the loading dock (PAP-00338098).

Surface Water Discharge Monitoring Report for monitoring period of October 1, 2010 to December 31, 2010 stated the following:

- Effluent gross value - concentration of lead at 2.4 µg/l. The sampling location was 002A located by the tank farm/rail car (PAP-00338115).
- Effluent gross value - concentration of lead at 128.0 µg/l. The sampling location was 003A located by the loading dock (PAP-00338118).

By letter dated August 8, 2011, NJDEP confirmed that Franklin Burlington Plastics was no longer performing any activities requiring a permit under the NJPDES permitting program and administratively revoked NJPDES Permit No. NJ0130508 effective March 31, 2010 (PAP-00057091).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Preliminary Site Assessment dated September 1984 (PAP-00057067);
- Sampling and Analysis Plan Results Report - ECRA Case No. 86206 dated October 1, 1987 (PAP-00337251; PAP-00337406);
- USEPA Site Inspection Report prepared by NUS Corporation dated September 17, 1990 (PAP-00337300);
- Remedial Investigation Report dated June 28, 2002 (PAP-00402442);
- Remedial Investigation Report dated July 14, 2004 (PAP-00402497);
- NJDEP Site Remediation Program Preliminary Site Assessment dated December 2010 (PAP-00054628);
- Receptor Evaluation Report dated June 29, 2011 (PAP-00337542);
- Remedial Action Report, Kearny Passaic Ave Waterfront BDA, Site Investigation Report, dated August 9, 2013 (PAP-00337659);
- Remedial Investigation Report, dated March 2016 (PAP-00056115);
- Former Transformer Substation Remedial Action Report, dated June 2017 (PAP-00056559); and,
- Interim Remedial Measures (IRM) Report and Remedial Action Workplan (RAW) dated October 2017 (PAP-00055492).

According to the 1984 Hart PSA, four soil samples were collected for chemical analysis and subsurface soil samples were collected for physical inspection and OVA analysis. One surface sample consisted of a composite of several samples in a spill and vegetative stress area near the air pollution control units, and the other three samples were collected inside the tank containment area (PAP-00057068).

Composite Sample: The surface soils of the locations chosen for the composite chemical sample were described as black, compact, and largely composed of fine sandy silt with large amounts of debris such as plastics, broken bottles, metal scraps, bricks, etc. At one of the composite sample locations, C1-A, the soils were covered with a silvery material (PAP-00057070).

Tank Containment Area: This area consisted of a square concrete walled structure within which was five columnar tanks formally used (by the previous owner of the Facility, Congoleum Corporation) for asphalt storage. One or two tanks were used in the plastics manufacturing process. Around the base of the tanks, and formerly covering a majority of the containment area, were solidified asphalt flows. Surface samples and test pit locations were selected to provide as fairly even distribution as well as possible worst case conditions (PAP-00057070).
A January 10, 1986 ECRA Initial Notice General Information Submission (GIS) was submitted to NJDEP for ECRA review due to the pending sale of all issued and outstanding stock of Franklin Plastics Corporation to Spartech-Franklin Plastics (PAP-00337241).

On February 14, 1986, Franklin Plastics entered into an Administrative Consent Order (ACO) with the NJDEP since Franklin Plastics Corporation was not able to comply with all of the requirements of ECRA and the Regulations prior to date of sale. Therefore, Franklin Plastics Corporation requested that NJDEP prepare an ACO which allowed the transaction to be consummated prior to the completion of all administrative requirements. The ACO required that Franklin initiate, complete, and submit to NJDEP the results from any NJDEP-approved Sampling Plan. The ACO also provided that if a Cleanup Plan was required, the Cleanup Plan shall address remediation of any contamination identified on or from Franklin Plastics Facility (PAP-00337244-46).

On March 25, 1987 NJDEP, Bureau of Environmental Cleanup and Responsibility Assessment (BEECRA) approved the SAP and SAP Amendments submitted on March 18, 1986 and February 12, 1987, respectively (PAP-00337272).

The 1987 RECON SAP Results report - ECRA Case No. 86206 identified the following environmental areas of concern:

- Area 1 - 50,000-gallon fuel tank;
- Area 2 - 275-gallon aboveground fuel tanks;
- Area 3 - 6,000-gallon underground gasoline tank;
- Area 4 - Discharge sump covered by NJPDES and Drywell;
- Area 5 - Plasticizer Tank Farm;
- Area 6 - Expansion Chamber and Contaminated Soils;
- Area 7 - Loading/Unloading Area;
- Area 8 - Dust Collector and Former Material Storage Area;
- Area 9 - Boiler Blowdown Discharged to Soils;
- Area 10 - Discharge Sink;
- Area 11 - The transformer substation; and,
- Area 12 - Random Sampling (PAP-00337251-70).

The 1987 RECON SAP Results report - ECRA Case No. 86206 made the following conclusions:

- The data showed that soil contamination is present on site however; it appears that shallow groundwater has not been materially impacted.

- Specific contaminants found were phthalates; polynuclear aromatic hydrocarbons (PAHs); lead; and cadmium.

- PAHs were found at various locations on the Site. Also found throughout the fill were coal cinders and ash. Coal cinders and ash are associated with PAHs which could account for the detection of PAHs.

- Phthalates were most often associated with areas where plasticizer oils were stored or loaded and were also found in areas where fugitive dusts may settle. (PAP-00337297)

The 1990 EPA SI identified the following Waste Management Areas and Areas of Concern:

- Stained Soil Area No. 1 located southwest of Blower Pad;
- Stained Soil Area No. 2 located east of Expansion Chamber;
- Noncontact Cooling Water Discharge under NJPDES Permit No. NJ0002194;
- Tank Farm Area located at the Plasticizer Tank Farm; and,
- Abandoned Drums and Sludge Pile (PAP-00337303).

According to the 1990 EPA SI, previous studies included an ECRA Investigation that involved installing seven onsite monitoring wells; collecting core samples to a depth of 6 to 12 inches below ground surface and at a depth of 6 inches above groundwater; and collecting 33 soil borings from depths ranging between 6 to 74 inches (PAP-00337307-08). In 1990, NUS Corporation Region 2 FIT collected four sediment and nine surface soil samples from the Franklin Plastics Corporation site. Two of the four sediment samples were collected from two storm drains bordering Franklin Plastics Corporation on Passaic Avenue (PAP-00337311). The 1990 EPA SI noted that at the time of the report, Franklin was implementing a second phase of ECRA sampling which involved the installation of three deep production wells and collection of six additional soil borings (PAP-00337324).

According to the letter summarizing the Site Inspection Prioritization Evaluation, dated September 29, 1995, quality assurance/quality controls were unknown for soil samples collected as part of the 1984 for the Preliminary Site Assessment, the 1986 ECRA Investigation (which also lacked adequate background sampling), and the 1990 ECRA Investigation (PAP-00054202).

According to the 2004 LFR Remedial Investigation, activities for the remedial investigation included the delineation of impacted soils identified at the former dust collector/drum storage areas (collectively known as Area 8) and the former boiler condensate transfer chamber; investigation of soil conditions beneath and downgradient of Sump No. 2 (Area 4); and documentation of an adequate physical boundary immediately east of the site within the Passaic Avenue road bed, to prevent lateral migration of impacted soils identified onsite (Areas 5 and 6). In addition, pursuant to the NJDEP letter dated July 17, 2003, a "hot spot" was excavated at the location of former soil sample SB13, near the southwestern corner of the site (PAP-00402506).

From November 2003 through February 2004, LFR excavated soil from the southwestern corner of the site and collected post-excavation soil samples. LFR also collected soil samples at other locations for the purpose of delineation and/or investigation, and consulted with Kearny and Hudson County officials regarding the construction specifications of the roadbed for Passaic Avenue, a manmade barrier to contaminant migration immediately east of the site (PAP-00402501).

Soil sample results for the post-excavation samples collected from the excavation state significant removal of the impacted soils, to which elevated total petroleum hydrocarbon (TPH) concentrations had previously been attributed. Although PAH concentrations were identified in post-excavation samples at concentrations exceeding the NJDEP Restricted Use Soil Cleanup Criteria (RUSCC), there is not a direct correlation between the PAH and TPH concentrations, thus confirming that the PAHs are present as the result of historic fill material (PAP-00402501).

Select compounds specifically analyzed to delineate the former boiler condensate transfer chamber were detected at concentrations below the UUSCC, thus completing delineation of these compounds previously identified in the vicinity of the transfer chamber. Soil samples collected to vertically delineate existing data for Sump #2 and to investigate conditions beneath and downgradient of the sump's base confirmed that the concentrations of detectable compounds are below the UUSCC, thus completing delineation of this area (PAP-00402501-02).

Soil samples collected towards the center of the property for delineation near the center of the site (Area 8) confirmed the presence of PAHs at concentrations in excess of the UUSCC in four of the five samples collected. Concentrations detected historically throughout Area 8 and other areas onsite confirm a randomness to the concentrations in relation to one another, indicative of the historic fill at the site. Select metals analysis for soil samples collected in this location were detected at concentrations below the RUSCC with one exception. Sample location SB32, which was collected to delineate Area 8 to the south, contained a lead concentration of 640 mg/kg, which marginally exceeds the RUSCC of 600 mg/kg. However, based on the absence of a consistent trend with regards to lead concentrations detected laterally and vertically sitewide, there is a randomness to the presence of elevated lead concentrations, as expected, based on the historical filling on-site (PAP-00402502).

It was concluded by LFR based on the findings, the delineation of all remaining AOCs has been completed. The implementation of engineering controls (i.e. asphalt cap or vegetative cover, fencing) and institutional controls (i.e. Deed Notice) are proposed to prevent exposure to the impacted soils and close this ISRA case (PAP-00402502).

According to the Preliminary Assessment Report prepared for the NJDEP Site Remediation Program dated December 20, 2010 (2010 NJDEP PAR), the 1986 acquisition was subject to the NJDEP Industrial Site Recovery Act (ISRA) and Case No. 86026 was assigned. When Franklin-Burlington Plastics ceased operations on February 16, 2010, it triggered the requirement to comply with ISRA. The 2010 NJDEP PAR was prepared to comply only with Franklin-Burlington Plastics, Inc. ISRA obligations in

support of the waiver request and covers the period from March 1986 to February 26, 2010 (PAP-00054628).

According to the Receptor Evaluation Report (RER) prepared by ARCADIS dated June 29, 2011 (2011 ARCADIS RER), from 2002 to 2004, ARCADIS U.S., Inc. (formerly known as LFR, Inc.) implemented a Remedial Investigation Workplan. The remedial investigation included soil sampling to delineate concentrations of BNs and metals in excess of the RUSCC to the property boundaries, inspect/investigate process water sumps and former boiler condensate chamber, and to collect sediment samples from the Passaic River. Analytical results for the sediment samples SB-15, SB-16, SB-17 and SB-18 collected immediately to the west of the site beyond the low tide line in the Passaic River confirmed that any potential contaminant sources previously identified on the Site have minimal, if any, impact upon the Passaic River (PAP-00337566).

According to the 2016 PARS RIR, AOC 1 was the 50,000-gallon No. 6 Fuel Oil Aboveground Storage Tank located on Block 1, Lot 12.01 (143 Passaic Avenue). Kleinfelder removed the tank and associated underground piping on behalf of the owner (not Franklin-Burlington Plastics) in April 2012 along with approximately five cubic yards of impacted soil. Benzo(a)pyrene was detected at a concentration that exceeded RDCSRS, and approximately ten cubic yards of soil were excavated in July 2012. Post-excavation soil samples identified no benzo(a)pyrene concentrations that exceeded RDCSRS (PAP-00056124).

Following soil investigation activities in 2013 and 2016, PARS Environmental determined that no further action or investigation was required for the 50,000 gallon No. 6 Fuel Oil AST (AOC 1); the discharge sump covered by NJPDES and drywell(s) (AOC4); floor drains, trenches and piping (AOC 6), boiler blowdown discharge to soil/transfer chamber (AOC 9), discharge sink (AOC 10), railcars and railroad spur (AOC 14), the spill area (AOC 22), the drum storage area (AOC 23) and the sludge pile (AOC 24). Remedial action in the form of engineering controls and a deed notice were required at the plasticizer tank farm (AOC 5) and unloading area (AOC 7) and remedial action was required at the transformer substation (AOC 11) (PAP-00056137-44). The fill area required remedial action to address Historic Fill contamination. Engineering and institutional controls were required to address the historic fill which is located throughout entire Site (PAP-00056159). All remaining structures at the Site were demolished in April 2014 (PAP-00056148-49).

The 2016 PARS RIR also identified a discharge sink in the Production Plant that discharged to the ground surface outside the Production Plant, adjacent to Sump 2 (AOC 10) (PAP-00056130). The Site Inspection Report prepared by NUS in 1990 referenced three drum storage areas were identified in the 1990 EPA SI in the northwest portion of the site with the drums reportedly in poor condition and partially buried. Contents of the drums appeared to be crumbled pieces of tile associated with the former Congoleum Corporation asphalt and vinyl tile plant. There was also a solidified sludge pile near the drum storage area identified in the 1990 EPA SI that was associated with Congoleum Corporation (PAP-00056135; PAP-00337307).

Remedial Activities

According to the Final Report on Cleanup Plan (CUP) Implementation and Finalization of ECRA/ISRA Responsibilities, Franklin Plastics Corporation submitted a CUP to NJDEP on August 22, 1990. The CUP proposed combining areas of environmental concern (AEC), encapsulating AECs 1 and 2 and encapsulation with pavement and recovering free product from a monitoring well. NJDEP required delineation of non-aqueous phase liquid (NAPL) near monitoring well MW-1 before approval (PAS-00063475). The approved CUP acknowledged NJDEP's approval of partial capping and use restrictions. Areas of Concern 1-12 were either encapsulated, capped, or received no further action, except Area 7 which required secondary containment pursuant to the Facility's Spill Prevention, Control, and Countermeasures Plan (PAS-00063480-82). With submission of the final CUP, final site inspection and institutional control approval, Franklin Plastics would satisfy all ISRA requirements (PAS-00063477).

The 1994 Final Report on Cleanup Plan Implementation and Finalization of ECRA/ISRA Responsibilities stated Areas 1 through 8 and the Tank Farm Area were encapsulated as required per the NJDEP final cleanup plan approval letter dated June 17, 1993. A secondary containment berm (to facilitate transfer of plasticizer oils from trucks) was constructed, as required by the Facility's SPCC Plan (PAS-00063471; PAS-00063488-92).

In August 2013, Kleinfelder submitted an unrestricted use Response Action Outcome for AOC-1 - 50,000-gallon No. 6 Fuel Oil Aboveground Storage Tank located at 143 Passaic Avenue, Block 1, Lot 12.01. It was concluded that remediation had been completed in compliance with the Administrative Requirements for the Remediation of Contaminated Sites N.J.A.C. 726C that is protective of public health, safety, and the environment. (PAP-00337614-16).

According to the *Former Transformer Substation Remedial Action Report (RAR), Volume 1 of 2*, prepared by PARS Environmental and dated June 2017 (the 2017 PARS RAR), the Transformer Substation contained five transformers, 2 circuit breakers and 17 bushings, that was decommissioned in 2013. The transformer oil was transported to Veolia ES Technical Solutions in Fort Arthur, Texas, and solids were transported to Chemical Waste Management located in Emelle, Alabama. Between December 2013 and March 2015 PARS Environmental, Inc. installed 29 borings within the area of the former transformer substation. A soil sample was collected from each location at the ground surface or at the 0.5 foot depth intervals immediately beneath the gravel layer. PCBs were detected in one sample at a concentration of 2.05 mg/kg. Low concentrations of PCBs were detected in three samples. PCBs were not detected in the remaining samples above the laboratory MDLs (PAP-00056565). In 2014, Dallas Industrial Services, Inc. demolished structures at the site that included the concrete pads, supports and the switchgear house for the former transformer substation (PAP-00056566). Remediation activities from three impacted areas within the transformer substation was performed between March 20 and 27, 2017. Post-excavation soil samples were collected from each excavation and analyzed for EPH and PCBs. PCBs were not detected in any of the samples above the laboratory MDLs from the PITTS and K-14306 Transformer Area. At the K-14463 Transformer Area, PCBs were detected at a

concentration of 0.22 mg/kg in sample No. 016, which slightly exceeded the most stringent Soil Remediation Standard of 0.2 mg/kg. PCBs were not detected above the laboratory MDL in the remaining post-excavation soil samples. The excavation was extended, and three additional soil samples were collected. PCBs were not detected in the additional post-excavation soil samples above the laboratory MDLs. At the K-14098 and K-14301 Transformer Area, PCBs were detected on one post-excavation soil sample at a concentration of 0.12 mg/kg, which was well below the most stringent Soil Remediation Standards. PCBs were not detected in the remaining samples from this excavation above the laboratory MDLs. A total of 103.38 tons of soil was excavation as part of the remedial action and transported to Pure Soil Technology in Jackson, New Jersey (PAP-00056568-70; PAP-00056575-76).

On February 12, 2019, a Deed Notice was issued for the property at Block 1, Lot 12, (7.82-acres), by the 113 Passaic Avenue Urban Renewal, LLC, (the current owner of the property) because Franklin Burlington Plastics, Inc. and 113 Passaic Avenue Urban Renewal, LLC have remediated contaminated soil at the site, such that soil contamination remains at certain areas of the property which contains contaminants in concentrations that do not allow for the unrestricted use of the property. Due to the presence and concentration of these contaminants, the current owner has agreed, as part of the remedial action for the site, to restrict the use of certain parts of the property and to the placement of engineering controls on the property. The objective of the institutional control is to provide notification of the impacted soil on the site and notification that the site has been capped with an engineering control to prevent direct contact with the impacted soil, which may contain exceedances of the NJDEP regulatory standards. The objective of the engineering control is to prevent direct contact with the impacted soil, which may contain exceedances of the NJDEP Soil Remediation Standards. The engineering cap, which encompasses the entirety of the residential use portion of the property, consists of the following elements:

- Building Foundation and Concrete: Building Foundation and Concrete elements consist of 4-inch minimum concrete over 4 inches of clean quarry material (or equivalent) with a visible demarcation boundary.

- Asphalt: Asphalt elements consist of 4-inch minimum bituminous surface course over a 4-inch minimum bituminous base course with a visible demarcation boundary.

- Landscape Area: The Landscape elements consist of 24 inches minimum of NJDEP compliant certified clean fill and topsoil material (12-inch barrier and 12-inch buffer layer) underlain by a contaminant boundary marker (geotextile liner).

- Lawn Area and Pavers: The Lawn Areas and Pavers elements consist of 12 inch minimum of NJDEP compliant certified clean fill and topsoil material (6-inch barrier and 6-inch buffer layer) underlain by a contaminant boundary marker (geotextile liner). In the Pavers element areas, approximately 3-inch landscape pavers have been placed over the 12-inch minimum of NJDEP compliant certified clean fill.

- Utility Corridors: The Utility Corridors element consists of 12 inches minimum of NJDEP compliant certified clean fill (6-inch barrier and 6-inch buffer layer) surrounding utilities with a visible demarcation boundary (PAP-00337696-714).

8. Summary of Asserted Defenses

Franklin-Burlington Plastics asserts that FBP cannot be held liable for or be required to pay response costs based on actions or inactions by FBP that arise out of conduct lawfully undertaken in compliance with permits or other approvals issued by relevant government agencies. Any discharges of COCs that may have contributed to the contamination of the Lower Passaic River were authorized under permits issued under federal and state laws – the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq.; the Clean Air Act, 42 U.S.C. § 7401 et seq.; the National Pollutant Discharge Elimination System, 40 CFR 122.1 et seq.; the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.; the Air Pollution Control Act, N.J.S.A. 26:2C-1 et seq.; and the New Jersey Pollutant Discharge Elimination System, N.J.A.C. 7:14A-1.1 et seq. In addition, CERCLA's petroleum exclusion is applicable to the FBP Facility.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

GARFIELD MOLDING COMPANY, INC.

Facility Name, Address and Size: Garfield Molding Company, Inc. (Garfield), 10 Midland Avenue, Wallington Borough, Bergen County, Block 71, Lot 1 and Block 26A, Lot 13 New Jersey 07057, approximately 3.43 acres (PAS-00102867; PAS-00123366). Garfield Molding Company, Inc., employed 28 people (PAS-00123364). Available references did not include the number of work shifts at Garfield.

1. **Business Type:** The Garfield Molding Company was engaged in the molding of plastics, cement, and other materials for use in the electrical industry (PAS-00123366).

2. **Time Period of Ownership/Operations**

   Operator: 1917 to 2014 (PAS-00123364)
   Owner: 1917 to 2014 (PAS-00123364)

3. **Operational History/COC Use and Presence at the Facility**

   Operations at the Garfield Molding Company principally involved the molding of plastics and other materials for use in the electrical industry (PAS-00123366).

   Types of molding operations conducted at the facility are known to have included (PAS-00123366):

   - Compression molding
   - Custom molding
   - Injection molding
   - Prototype and production runs
   - Thermoset molding
   - Transfer molding

   As reported by the *PRP Data Extraction Form* dated 2005, cold molding, thermal transfer molding, and injection molding are reported as all being “thermoset methods” that involve the heating of thermosetting materials. Cold molded pieces are impregnated with hot paraffin in certain processes at the facility. Operations at the Garfield Molding Site included the following process areas (PAS-00123366-67)

   - Administrative functions
   - Asbestos storage
   - Automotive repair
   - Boiler
   - Box shop
   - Coal storage
   - Drum storage
   - Electrical motor storage
   - Finishing – drill presses and grinders
   - Heat treatment
   - Hemit building
   - Impregnation building
   - Injection molding
   - Laboratory
   - Mixing and blending
   - Mold storage
   - Molding (press)
   - Motor room
   - Oven department – baking and high humidity
   - Pipe shop
   - Pipe storage
   - Power house

- Press department
- Receiving, shipping and inspection
- Sand blasting
- Sewer pump house
- Steel storage
- Storage shed
- Switch room
- Thermoset compounds storage
- Tool and die shop
- Transformers
- Vehicle parking

Manufacturing processes and waste materials used in or generated by site operations include the following (PAS-00123367-68):

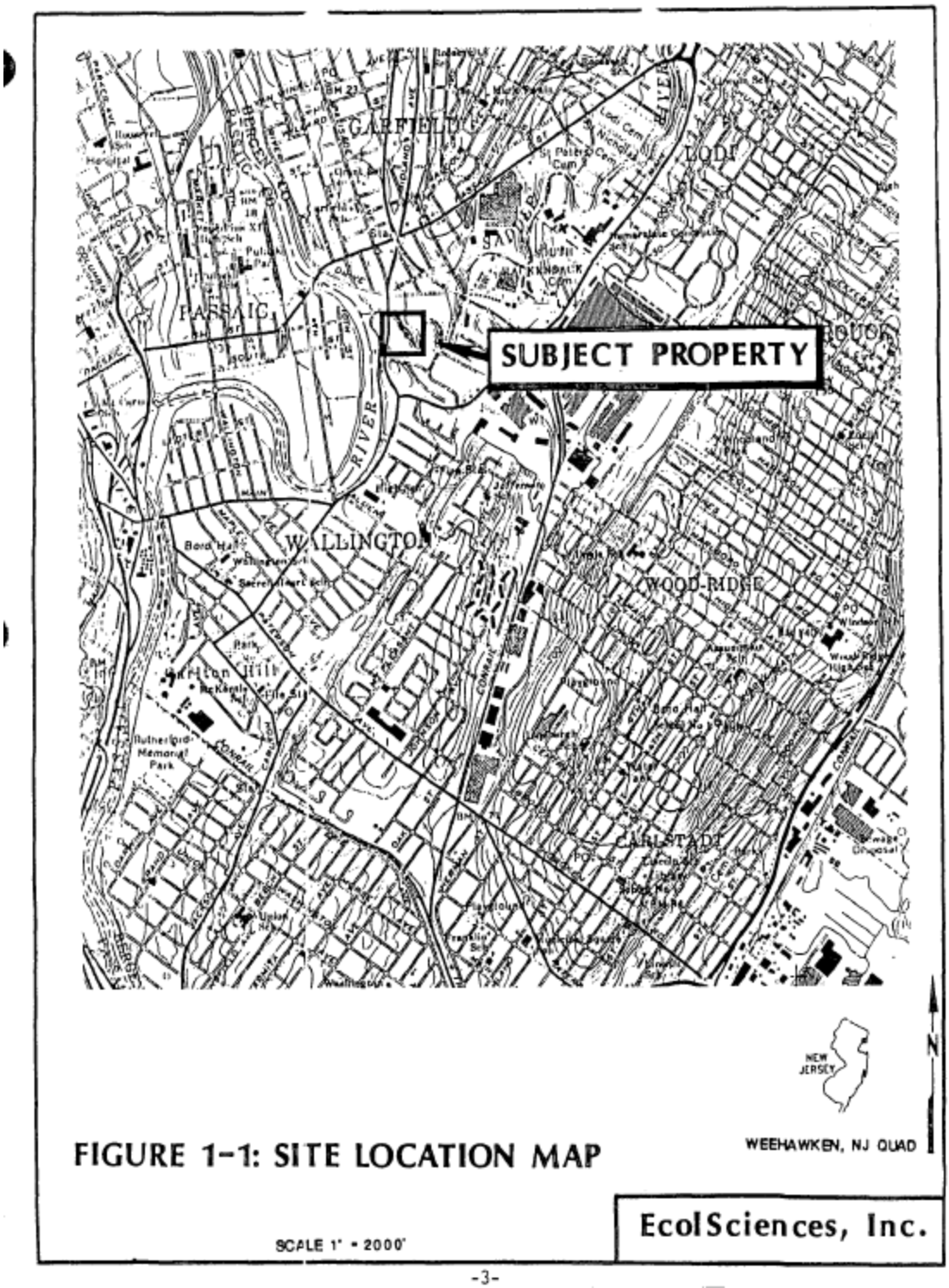
- Acetylene
- Aliphatic petroleum distillate
- Alkyd molding compounds
- Ammonia
- Asbestos
- Base resins (homopolymers)
- Bitumen (including uintaute)
- Cement
- Clay
- Cutting oils
- Fiberglass/additives
- Fibrous materials
- Fish oil
- Formaldehyde
- Fuel oil
- Furfural
- Gasoline
- Hydraulic oil
- Hydrocarbon waxes in solvents
- Isopropanol/Isopropyl alcohol
- Lead
- Lubricant/Lubricating Oil
- Melamine – formaldehyde resin
- Melamine-phenol formaldehyde
- Methylene chloride
- Mineral spirits
- Nonhalogenated solvents and still bottoms
- Number 2 fuel oil
- Paraffin
- Phenol formaldehyde polymeric molding compounds
- Polyester molding compounds (styrene based)
- Polyester molding compounds (vinyl toluene based)
- Polyester/alkyd polymeric molding compounds
- Resins/polymeric materials (commercial premixes)
- Tars
- Toluene
- Urea-formaldehyde molding compounds
- Used oil/waste oil
- Vegetable waxes
- Wollastonite

Garfield Molding Company, Inc.

Diamond Alkali OU2 Allocation

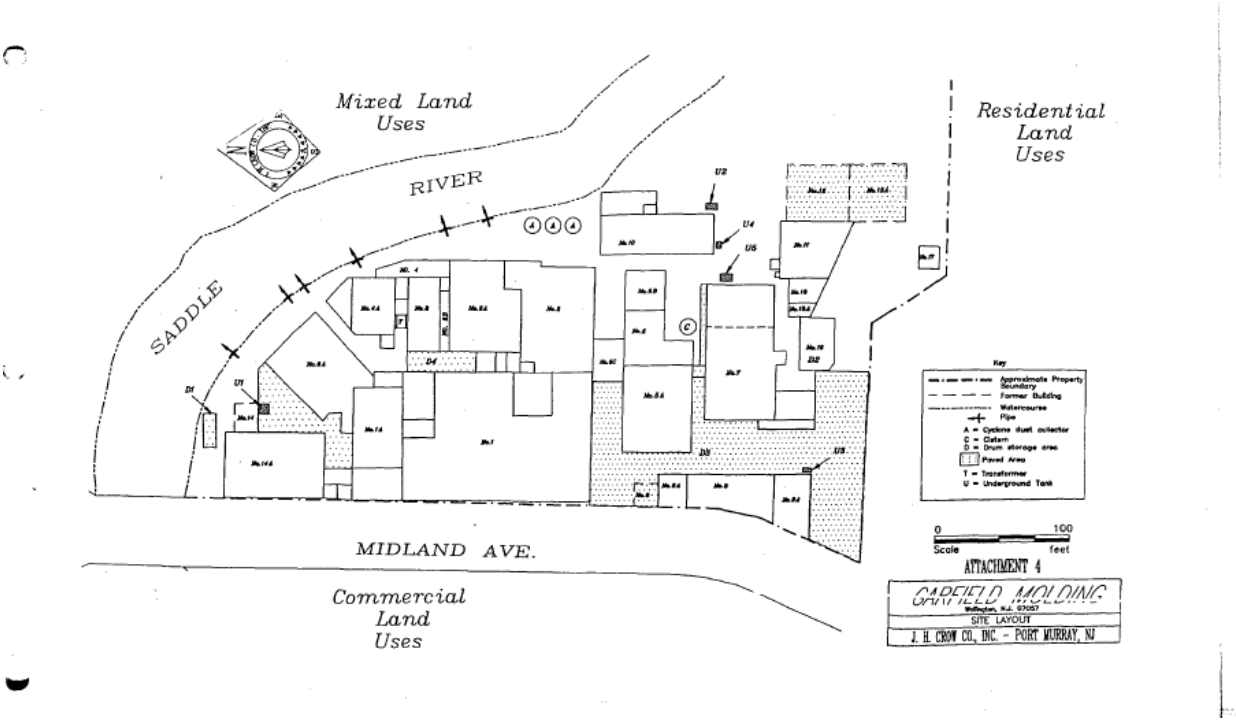
ADR Confidential

Facility Data Report



-3-

(PAS-00102868)



(PAS-00102959)

According to the *Data Presentation Report for Garfield Molding, ECRA Case 88439*, dated October 19, 1990, Report (1990 Report), a brief description of the manufacturing operations at the Garfield Molding Company with respect to each of the industrial buildings are as follows:

Building 1 – Injection presses used for thermal transfer molding of electrical switchboard components. The administrative offices of the Garfield Molding Company are also housed in Building 1 (PAS-00102869).

Building 1A – Building 1A houses mixing operations where water-based compounds are blended for cold molding processes (PAS-00102869).

Building 2 – Grinding and polishing machinery associated with finishing operations for the electrical switchboard equipment. Dust from these grinding operations is exhausted from the building via a network of ducts connected to the three cyclone dust collectors found immediately to the rear of the building (PAS-00102869).

Building 3 – Storage vault for the molds used in the cold molding of electrical switchboard components (PAS-00102869).

Building 3A – Drying ovens used in conjunction with the cold molding process (PAS-00102869).

Building 3C – Mold storage vault annex (PAS-00102869).

Building 4 – Natural gas fired high pressure steam boiler and hallway space linking cold molding production areas (PAS-00102869).

Building 4A – Impregnating operations associated with the cold molding process and contains two hot wax dip tanks (PAS-00102869).

Building 5 – Second active boiler unit and houses a small pipe fitting shop (PAS-00102869).

Building 5A – Centralized pumping equipment associated with the lubrication system for the thermal transfer molding presses. The injection presses found in Building 1 are interconnected by a common oil lubricating system, with the piping for this system found in a network of concrete troughs beneath the production area floor. Oil lines and oil return sump lines were connected to the pumping equipment in Building 5A via a tunnel connecting Building 1 and 5A (PAS-00102869-70).

Building 5B – Former coal fired boilers which were no longer in service as of 1990 (PAS-00102870).

Building 6A – Additional floor space associated with the preparation of water-based compounds for cold molding processes. Mixing facilities we on the first floor of Building 6A, while raw materials, mainly Type IV Portland cement, were stored on the second floor (PAS-00102870).

Building 7 – Housed the feedstocks used in the thermal transfer molding operations. Used to warehouse finished electrical switchboard components. Chemical feedstocks were stored on the first floor of the building while finished products were stored on the second floor (PAS-00102870).

Building 8A – Vacant storage (PAS-00102870).

Building 9 – Storage of heavy machinery being dismantled as part of the closure activities of the Garfield Molding Company (PAS-00102870).

Building 9A – Miscellaneous storage purposes (PAS-00102870).

Building 10 – Sublet to an automotive repair shop (PAS-00102870).

Building 11 – Open roofed structure that once served as a coal bin for the coal-fired boilers found in Building 5B. Was also used to store automobiles and trucks (PAS-00102870).

Buildings 13 and 13A – Vacant structures (PAS-00102870).

Building 14A – Machine shop facilities for the maintenance of onsite mechanical equipment (PAS-00102870).

Building 16 – Vacant (PAS-00102870).

Building 17 – Sanitary sewer pump station connecting the sewer units from the Garfield Molding Company to the sewer system for Wallington Borough (PAS-00102870).

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (use, storage)
- Lead (use, detected)
- Mercury (detected)

PCBs

According to the 1990 Report, post tank excavation sampling entailed the collection of soil samples beneath the six underground storage tanks removed from the subject property during June 1990 (PAS-00102880-83).

Post tank excavation soil sampling results revealed an elevated concentration of PCBs (Aroclor-1260) detected in soil beneath the 275-gallon waste oil tank at a concentration of 1,400 µg/kg (Aroclor-1260 in sample T-W-5) (PAS-00102882).

PAHs

According to the 1990 Report, post tank excavation sampling entailed the collection of soil samples beneath the six underground storage tanks (USTs)removed from the subject property during June 1990 (PAS-00102880-83).

Post tank excavation soil sampling results revealed elevated concentrations of PAHs detected in soils beneath the 275-gallon waste oil tank at concentrations ranging from 1,400 to 7,100 micrograms per kilogram (µg/kg) (PAS-00102878-82). The figure below presents the locations of the post tank excavation sampling locations.

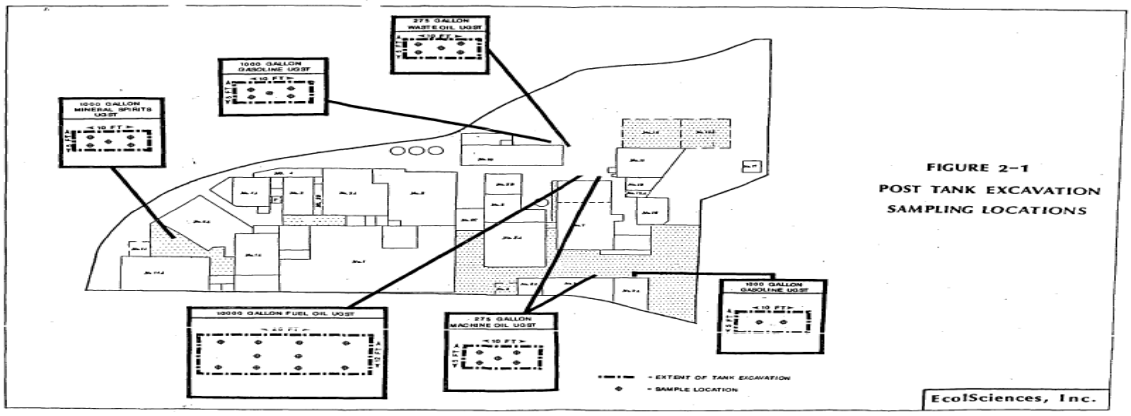
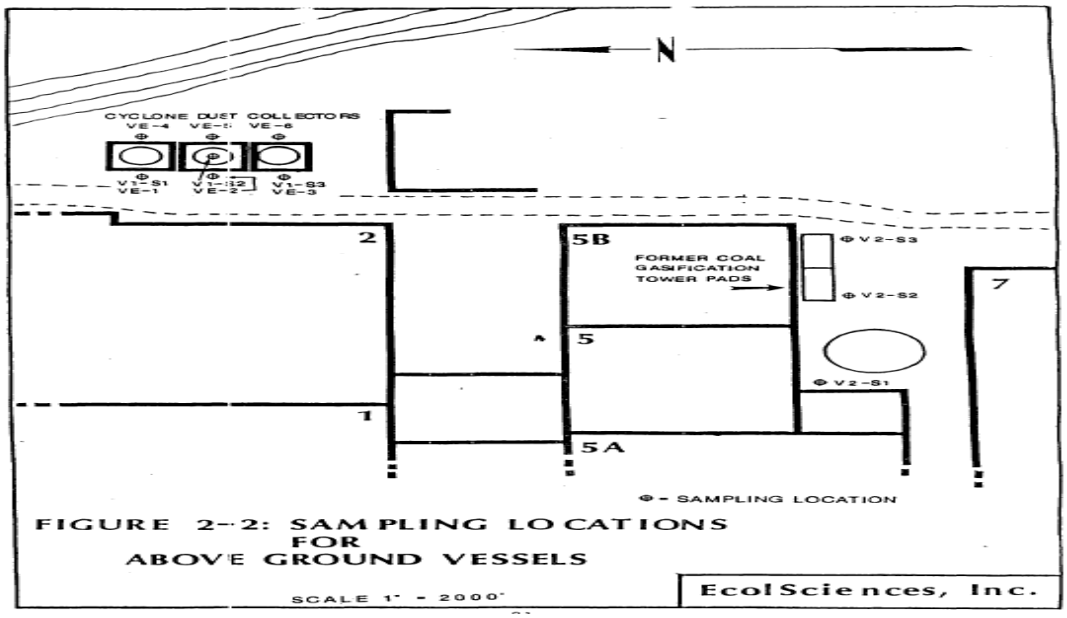


FIGURE 2-1
POST TANK EXCAVATION
SAMPLING LOCATIONS

(PAS-00102879)

In addition, soil samples were collected beneath three cyclone dust collectors found east of Building 2. Soil samples were also collected adjacent to the former coal gasification tower pads found along the south side of Building 5 (PAS-00102884). Soil samples surrounding the cyclone dust collectors showed elevated concentrations of phenanthrene from 550 µg/kg in sample V1-S2 at a depth of 0-6 inches to 640 µg/kg in sample V1-S3 at a depth of 0-6 inches) (PAS-00102888). The figure below presents the location of the cyclone dust collectors.

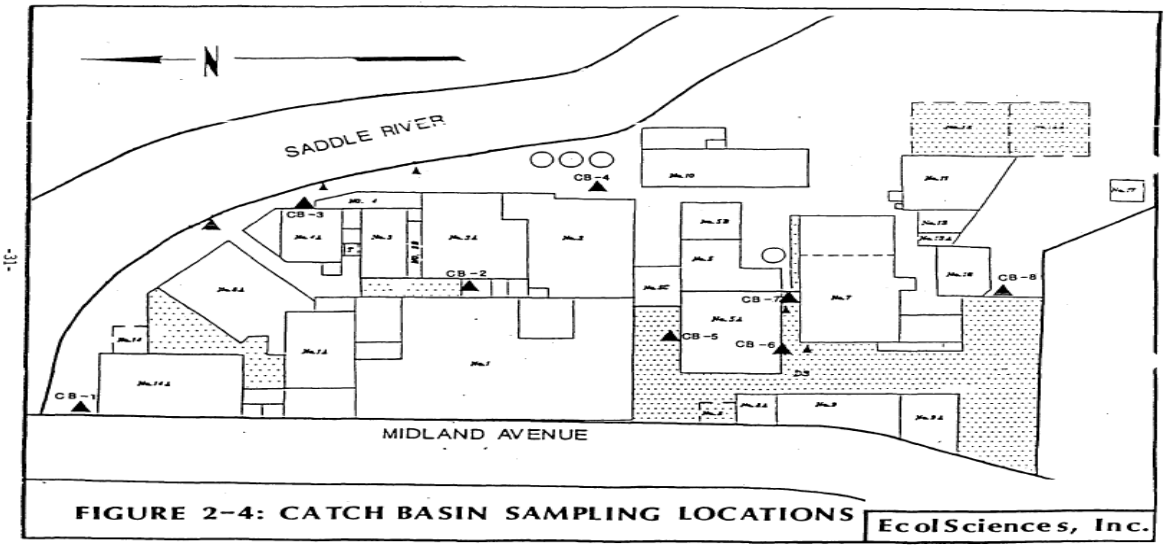


(PAS-00102886)

Soil samples were also collected at the former drum storage area. Sampling at the former drum storage areas entailed the collection of shallow surface soils at three temporary drum storage areas having permeable surfaces to determine if leakage or spillage from drums resulted in residual contamination of the underlying soils (PAS-00102890). Soil samples were taken from the former drum storage areas found in the alleyway separating Buildings 1 and 3A (Area D3), adjacent to the north side of Building 14A (Area D4), and adjacent to the northeast corner of Building 11 (Area D5) (PAS-00102890). Soil samples collected from this area revealed concentrations of PAHs ranging from 820 µg/kg (phenanthrene in sample D4-51) to 14,000 µg/kg (pyrene in sample D4-54) (PAS-00102892).

Twelve surface water inlets are connected to four NJPDES-permitted discharge points on the Garfield Molding Company property. Eight catch basins were sampled at the locations where these surface water inlets function as receiving points for site runoff or potential spills (PAS-00102894). Sediment samples collected from catch basins found to the south and west of Building 5A, to the southeast of Building 3A, and to south of Building 16 were used to assess the environmental impact associated with the past storage of drums at these locations. Further, sediment samples taken from the catch basins found to the north of Building 5A, to the east of Buildings 4A and 2, and to the

north of Building 14A were used to assess the potential Impact of site runoff upon the NJPDES-permitted discharge points (PAS-00102894). Elevated concentrations of PAHs were detected in five of eight catch basin sediment samples at concentrations ranging from 2,900 µg/kg (pyrene in sample CB-5) to 34,000 µg/kg (benzo(b)fluoranthene in sample CB-3) (PAS-00102895, 7). The catch basin sampling locations are presented on the figure below:



PAS-00102896

Copper

Soil samples were collected beneath three cyclone dust collectors found east of Building 2. Soil samples were also collected adjacent to the former coal gasification tower pads found along the south side of Building 5 (PAS-00102884). Soil samples surrounding the cyclone dust collectors showed elevated concentrations of copper from 586 to 1,800 mg/kg (PAS-00102887). Post excavation soil samples collected upon removal of potentially contaminated soils surrounding the dust collectors showed concentrations of copper from 704 mg/kg in sample VE-3 at a depth of 24-30 inches to 2,585 mg/kg in sample VE-1 at a depth of 24-30 inches (PAS-00102889). These concentrations are likely attributed to the presence of coal cinders and coal fragments in the soil base supporting the dust collection towers (PAS-00102887-9).

Lead

Soil samples were collected beneath three cyclone dust collectors found east of Building 2. Soil samples were also collected adjacent to the former coal gasification tower pads found along the south side of Building 5 (PAS-00102884). Post excavation soil samples collected upon removal of potentially contaminated soils surrounding the dust collectors showed concentrations of lead from 558 mg/kg in sample VE-6 at a depth of 24-30 inches to 738 mg/kg in sample VE-3 at a depth of 24-30 inches (PAS-00102889). These concentrations are likely attributed to the presence of coal cinders and coal fragments in the soil base supporting the dust collection towers (PAS-00102887, 9).

Lead was listed as a material used at the site, but no further information on how or where it was used was provided in the available references (PAS-00123367-68).

Mercury

Soil samples were collected beneath three cyclone dust collectors found east of Building 2. Soil samples were also collected adjacent to the former coal gasification tower pads found along the south side of Building 5 (PAS-00102884). Post excavation soil samples collected upon removal of potentially contaminated soils surrounding the dust collectors showed concentrations of mercury from 1.0 mg/kg in sample VE-6 at a depth of 24-30 inches to 2.5 mg/kg in sample VE-3 at a depth of 24-30 inches (PAS-00102889). These concentrations are likely attributed to the presence of coal cinders and coal fragments in the soil base supporting the dust collection towers (PAS-00102887).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[1] According to the 1990 Report, Historic Fill was identified during prior investigations conducted at the Garfield Molding Company (PAS-00102872, 83; PAS-00102913, PAS-00102922).

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00102889, 92).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	738 mg/kg
Copper	2,585 mg/kg
Mercury	2.5 mg/kg
Benzo(a)anthracene	2.8 mg/kg
Benzo(a)pyrene	3.8 mg/kg
Benzo(b)fluoranthene	5.4 mg/kg
Benzo(k)fluoranthene	2.1 mg/kg
Dibenzo(a,h)anthracene	ND
Indeno(1,2,3-cd)pyrene	ND

5. COC Pathways

Sanitary and Storm Sewer

Sanitary wastewater was discharged directly from Garfield Molding Company to Saddle River from 1908 through 1918 (PAP-00165373; PAS-00102790). In addition, humidity room condensate wastewater was discharged from the Garfield Molding Company to the Saddle River from 1960 through 1988 (PAP-00165373; PAS-00102790). From 1969 through 1974 boiler blowdown wastewater was discharged directly from the Garfield Molding Company to the Saddle River (PAP-00165373; PAS-00102790).

In accordance with NJPDES Permit Number NJ0027146, Garfield Molding Company was permitted to discharge site stormwater runoff through outfalls 001, 002, 003, 004, 005, and 006 (PAS-00102808; PAS-00123371). Available references did not include permit dates, permitted flow rates and effluent monitoring requirements or results.

Available references state that Garfield held Permit NJ0070211. This permit was for discharge of industrial site storm water runoff without toxic and hazardous pollutants to State surface waters, excluding those classified as FW1 or located within the Pinelands Area, from facilities not requiring an individual NJPDES Permit, a DPCC/DCR plan, or treatment other than gravity separation, and in accordance with effluent limitations, monitoring requirements, and other conditions as set forth in Parts I, II, III, and IV of the permit (PAS-00102809). The permit was effective from September 1, 1987 to August 31, 1992. Available references did not include permitted flow rates and effluent monitoring requirements or results.

6. Regulatory History/Enforcement Actions

Violations

According to the 1974 *PVSC Annual Report*, on June 6, 1974, Inspector Cupo inspected Garfield Molding Company. He discovered that one of four active discharge pipes were covered with debris, making it impossible to sample. Two others that were discharging were sampled, and the fourth was a 2-inch boiler blowdown pipe, which discharged at 7:00 A.M. for a short time. In addition, there were three other visible inactive pipes. The

samples of the two cooling water discharges were satisfactory, but the boiler blowdown was polluting, and Inspector Cupo informed Mr. J. Minaberry, Vice President, Mr. Lombardi, Plant Manager, and Mr. LaRose Jr., Safety Manager in addition to uncovering the outlet that was inaccessible to him so that a sample could be taken of the discharge. Mr. Cupo reported that they complied with Passaic Valley Sewerage Commission (PVSC) directions and that intended corrections to the boiler blowdown were planned for about July 15, 1974, when the plant was shut down for vacation (PAS-00102945).

According to the 1974 *PVSC Annual Report*, on July 2, 1974, Mr. Lubetkin wrote to Garfield confirming that their boiler blowdown was polluting, and directing them to make accessible the covered outlet. The available references did not specify the pollutants in the discharge. Mr. Lubetkin also informed them that they must have a NPDES permit from the USEPA in order to discharge into the Passaic River. Although no reply was received by PVSC, Inspector Cupo reported that he had questioned Mr. Bauer, a Vice-President, on July 22, and was told that the equipment delivery was causing the installation delay. He gave Inspector Cupo a copy of the report on a new Fulton Blowdown Separator, dated July 19, 1974, from the Fulton Boiler Works of Pulaski, New York (PAS-00102945)

According to the 1974 *PVSC Annual Report*, on August 24, 1974, Mr. Cupo inspected the work and reported that the boiler blowdown installation was completed and was now being discharged through a separator, into the sanitary sewer, thus eliminating this violation. Inspector Cupo also reported that the No. 3 outlet was now uncovered and it was sampled. Analysis showed that the discharge was satisfactory (PAS-00102945). According to an *Industrial Site Evaluation Element* dated June 1, 1989, in the past, stormwater, humidity room condensate, wastewater from slop sink, non-contact cooling water, boiler blowdown, and sanitary wastewater were all discharged to the Saddle River. Several unpermitted discharges and other violations of the NJPDES-discharge permit were noted to have occurred during the historical operations (PAS-00102947). Several deficiencies were noted at the Garfield Molding Company. These include: (PAS-00102948-9)

- Several unpermitted discharges and other violations of the existing NJPDES-discharge permit had occurred during the historical operations of the facility.
- It had been stated that past industrial practices at the facility included spreading waste oil on the unpaved driveways in an effort to control dust.
- Much of the machinery utilized on site was situated within concrete pits located inside the buildings. These pits were observed to contain lubricating oils. Drainage from these pits entered a concrete trough which ultimately emptied into a common concrete sump.
- Information addressing the plumbing/drainage system within the buildings was not provided.
- A suspected vent pipe was observed outside along Building 5 in the area of the cistern. It is unknown whether an additional UST was present in this area.
- A concrete trench was observed along the side of Building 5A. The trench was observed to be stained with an oily residue. This trench discharged to a catch basin located in the shipping/receiving area.

- Within a courtyard located between Building 14A and Building 1A, there was a pit covered with a steel plate and a discharge of a grayish dust which impacted the soils within the area.
- A catch basin was observed between Building 4A and Building 1A. This area had historically been used for drum storage.
- Overhead pipes were observed between Building 2 and Building 5B and also between Building 5B and Building 7. The insulation covering these pipes was deteriorated.
- Empty drums were stored outside of the former coal storage area (Building 11) and along the southwest corner of Building 16.
- The floor of Building 16 was heavily soiled. A portion of the roof was missing which had allowed rain water to reach the floor.
- A six-inch diameter pipe was observed along the south side of Building 7. This pipe apparently extended down to the water table.
- Two covered pits were observed in the area of the cistern; one located outside of the doors on the south side of the Building 5 and the other located immediately adjacent to the cistern.

Permits

In accordance with NJPDES Permit Number NJ0027146, Garfield Molding Company was permitted to discharge site stormwater runoff through outfalls 001, 002, 003, 004, 005, and 006 (PAS-00102808; PAS-00123371). The permit was effective from July 1, 1991 to August 31, 1992. Available references did not include permitted flow rates and effluent monitoring requirements or results.

Available references state that Garfield held Permit NJ0070211. This permit was for discharge of industrial site storm water runoff without toxic and hazardous pollutants to State surface waters, excluding those classified as FWI or located within the Pinelands Area, from facilities not requiring an individual NJPDES Permit, a DPCC/DCR plan, or treatment other than gravity separation, and in accordance with effluent limitations, monitoring requirements, and other conditions as set forth in Parts I, II, III, and IV of the permit (PAS-00102809). The permit was effective from September 1, 1987 to August 31, 1992. Available references did not include permitted flow rates and effluent monitoring requirements or results.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Data Presentation for Garfield Molding ECRA Case 88439*, prepared by EcolSciences, Inc., dated October 1990 (PAS-00102862).
- *Cleanup Plan for the Garfield Molding Company*, prepared by EcolSciences, Inc., dated October 1990 (PAS-00102926).

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

According to the 1990 Report, ten AECs were identified at the Garfield Molding Company. These AECs are (PAS-00102870-72):

- AEC 1 (Underground Storage Tanks (USTs)
- AEC 2 (Cistern)
- AEC 3 (Above Ground Vessels)
- AEC 4 (Former Drum Storage Areas)
- AEC 5 (New Jersey Pollutant Discharge Elimination System Discharge Points)
- AEC 6 (Unpaved Roadway Areas)
- AEC 7 (Groundwater)
- AEC 8 (Asbestos)
- AEC 9 (Former Production Wells)
- AEC 10 (Building Interiors)

Eight separate environmental sampling programs were designed and implemented to address the environmental concerns identified at the subject property. These sampling programs entailed the collection of 110 environmental samples for analyses of a combination of parameters including priority pollutants, petroleum hydrocarbons, and asbestos (PAS-00102873).

Remedial Activities

According to the 1990 Report, ten AECs were identified at the Garfield Molding Company (PAS-00102870). In addition, six USTs containing gasoline, fuel oil, light machine oils, waste oil and mineral spirits were previously found onsite. Following is a brief description of each AEC (PAS-00102871).

AEC 1 (USTs) – Following is an inventory of the USTs removed from the subject property listed by tank size, contents, age, and location relative to the onsite buildings:

USTs			
Tank Size	**Contents**	**Age**	**Location**
10,000 gallons	Fuel Oil	1957	East of Building 7A
275 gallons	Machine Oil	1908	East of Building 7A
275 gallons	Machine Oil	1908	East of Building 9A
275 gallons	Waste Oil	1985	South of Building 10
1,000 gallons	Gasoline	1975	East of Building 10
1,000 gallons	Mineral Spirits	1908	North of Building 6A

The 1,000-gallon mineral spirits tank was found to be leaking upon removal. All other tanks appeared to be intact (PAS-00102871).

AEC 2 (Cistern) – A brick-lined cistern was located onsite between Buildings 5 and 7. This cistern once contained non-contact cooling water for recirculation in thermal transfer molding process. Condensate from air compressors housed in Building 5A was also directed to the cistern (PAS-00102871).

AEC 3 (Above Ground Vessels) – Three cyclone dust collectors associated with product grinding and finishing operations were found to the east of Building 2. Normal operation of this dust collection system impacted the soils adjacent to the concrete pads supporting these towers. In addition to these cyclone dust collectors, two former coal gasification towers were once located adjacent to the south side of Building 5B; however, only remnant concrete pads were onsite. Former operations of a coal gasification plant raised several environmental concerns which were addressed through various onsite sampling programs (PAS-00102871).

AEC 4 (Former Drum Storage Areas) – Former drum storage areas were identified at the subject property. These drum storage areas consisted of drums stored in Building 16 and temporary drum storage areas at the southwest corner of Building 5A, at the northeast corner of Building 14A, and in the alleyway separating Buildings 1 and 3A (PAS-0010872).

AEC 5 (NJPDES Discharge Points) – Four surface water discharge points at the Garfield Molding Company were regulated under NJPDES permits. These discharge points received surface water runoff diverted from the subject property. NJPDES permitted discharge points posed an environmental concern, as this drainage network may have trapped contaminants associated with the surface areas of the subject property (PAS-0010872).

AEC 6 (Unpaved Roadway Areas) – An unpaved roadway traversed the eastern portion of the subject property, extending from the south side of Building 16, encircling Building 11 to the east, passing between Buildings 5B and 10, and finally ending at the east side of Building 6A. This roadway was an environmental concern as past maintenance practices included the spreading of motor oil across the roadway surface to control dust (PAS-00102872).

AEC 7 (Groundwater) – Groundwater contamination beneath the subject property is a potential environmental concern as the 1,000-gallon mineral spirits tank, at the north side of Building 6A was found to be leaking upon removal. Further, coal cinders found as fill material along the eastern-most perimeter of the site may have leached contaminants into the underlying groundwater (PAS-00102872).

AEC 10 (Building Interiors) – Floor space within several buildings showed oil staining attributed to manufacturing operations. The injection presses found in Building 1 were interconnected via a common oil lubrication system. Piping for this system was found in a network of concrete troughs beneath the production area floor. These oil lines and oil return sump lines were connected to a large central pump found in Building 5A, with the piping routed within a small tunnel connecting the two buildings. Portions of the concrete in Building 5 were oil stained as were major portions of the concrete trough network (PAS-00102872).

According to the 1990 Report, eight separate environmental sampling programs were designed and implemented to address the environmental concerns identified at the subject property. These sampling programs entailed the collection of 110 environmental samples for analyses of a combination of parameters including Priority Pollutants, petroleum hydrocarbons, and asbestos. The AEC sampling results are discussed below (PAS-00102873).

Post Tank Excavation Sampling Results – According to the 1990 Report, post tank excavation sampling entailed the collection of soil samples beneath the six USTs removed from the subject property during June 1990. Additional samples were also taken to screen an area suspected of once containing an underground tank, although no evidence of a former tank was found (PAS-00102878).

Overall, five of six USTs removed from the subject property visually appeared to be intact. Post tank excavation soil sampling results revealed elevated concentrations of PAHs and PCBs (one Aroclor-1260 detection) detected in soils beneath the 275-gallon waste oil tank. Potentially contaminated soil beneath the tank was excavated to the point of contact with the underlying water table and temporarily staged onsite prior to disposal (PAS-0010883). Soil samples collected from beneath the 275-gallon tank showed concentrations of the PAHs phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, ranging from 1400 µg/kg (benzo(k)fluoranthene in sample T-W-5) to 7100 µg/kg (pyrene in sample T-W-5). In addition, the PCB Aroclor-1260 was detected at 1,400 µg/kg (PAS-00102882).

Aboveground Vessel Sampling Results – According to the 1990 Report, the collection of soil samples surrounding the cyclone dust collectors showed that these soils contained elevated concentrations of phenanthrene 550 µg/kg in sample V1-S2 at a depth of 0-6 inches to (640 µg/kg in sample V1-S3 at a depth of 0-6 inches) and copper at a concentration of 586 mg/kg in sample V1-S3 at a depth of 0-6 inches to 1,800 mg/kg in sample V1-S1 at a depth of 0-6 inches. Post excavation samples collected upon the removal of potentially contaminated soils surrounding the dust collectors showed concentrations of copper (704 mg/kg in sample VE-3 at a depth of 24-30 inches to 2,585 mg/kg in sample VE-1 at a concentration of 24-30 inches), lead (558 mg/kg in sample VE-6 at a depth of 24-30 inches to 738 mg/kg in sample VE-3 at a depth of 24-30 inches), and mercury (1.0 mg/kg in sample VE-6 at a depth of 24-30 inches to 2.5 mg/kg in sample VE-3 at a depth of 24-30 inches) were detected in the post excavation soil samples. These elevated metal concentrations were likely attributed to the presence of coal cinders and coal fragments in the soil base supporting the dust collection towers. Upon removal of the upper 2 feet of soils beneath the dust collectors, the underlying material was found to consist primarily of coal cinders (PAS-00102887-89).

Soil samples were collected adjacent to the former coal gasification tower pads. The initial sampling results showed that these soils contained fluoranthene (3,000 µg/kg in sample V2-S3 at a depth of 24-30 inches) and pyrene (2,800 µg/kg in sample V2-S3 at a depth of 24-30 inches). Post excavation samples collected upon the removal of potentially contaminated soils surrounding the concrete pads showed slightly elevated concentrations of mercury (2.5 mg/kg). Again, as in the area surrounding the dust

collectors, soils beneath the former coal gasification tower pads contained varying amounts of coal cinders and coal fragments (PAS-00102887-89).

Approximately 90 tons of potentially contaminated soils were removed beneath the dust collectors and 30 tons of potentially contaminated soils were removed at the location of the former coal gasification tower pads. Soils at both locations were excavated to a depth of 2 feet below grade. Upon excavation, the underlying soil material was determined to consist primarily of coal cinders. Post excavation sampling results reflect the composition of these cinder deposits, with elevated concentrations of metals detected in the samples. Additional remediation was not proposed with respect to the soils beneath either the dust collectors or former coal gasification tower pads. Rather, the coal cinder deposits encountered at these locations were covered with a layer of certified clean fill material to minimize erosion and potential exposure to the underlying cinder-laden soil (PAS-00102919).

Former Drum Storage Area Sampling Results – Sampling at the former drum storage areas entailed the collection of shallow surface soils at three temporary drum storage areas having permeable surfaces to determine if leakage or spillage from drums resulted in residual contamination of the underlying soils (PAS-00102890).

Additional soil remediation was proposed for these areas, with each excavation to encompass a 20 by 20 foot area. Approximately 200 tons of potentially contaminated soils were expected to be staged for disposal (PAS-00102919).

Drum Storage Area D3 (East of Building 1) – Soil samples collected from this former drum storage area contained the PAHs phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(a) pyrene at concentrations ranging from 2,100 to 12,000 µg/kg (PAS-00102890; PAS-00102892).

Drum Storage Area D4 (North of Building 14A) – Soil samples collected from this former drum storage area contained the PAHs phenanthrene, fluoranthene, pyrene, benzo(b)fluoranthene and benzo(a) pyrene at concentrations ranging from 820 to 14,000 µg/kg (PAS-00102894; PAS-00102892).

Catch Basin Sampling Results – Twelve surface water inlets are connected to the four NPDES-permitted discharge points on the Garfield Molding Company property. Eight catch basins were sampled at those locations where these surface water Inlets function as receiving points for site runoff or potential spills. Once sampling was completed, all surface water inlets were cleared of sediment deposits and steam cleaned (PAS-00102894).

PAHs were detected in five of eight catch basin sediment samples. Maximum concentrations were as follows:

PAHs in Catch Basins		
Constituent	**Concentration (µg/kg)**	**Location**
Dibenzofuran	7,100	CB-3
Naphthalene	5,600	CB-3
Acenaphthene	7,900	CB-3
Fluorene	9,000	CB-3
Phenanthrene	19,000	CB-3
Anthracene	9,700	CB-3
Fluoranthene	17,000	CB-3
Pyrene	17,000	CB-3
Benzo(a)anthracene	19,000	CB-3
Benzo(b)fluoranthene	34,000	CB-3
Benzo(k)fluoranthene	12,000	CB-3
Benzo(a)pyrene	27,000	CB-3
Chrysene	26,000	CB-3
Indeno(1,2,3-cd)pyrene	17,000	CB-3
Dibenz(a,h)anthracene	4,500	CB-3

(PAS-00120897)

Unpaved Roadway Sampling Results – Unpaved roadway sampling entailed the collection of shallow soil samples from beneath the gravel roadway traversing the eastern portion of the subject property. The gravel roadway extends from the south side of Building 16, encircles Building 11 to the east, passes between Buildings 5B and 10, then follows the eastern boundary of the property to the end of the roadway at the east side of Building 6A. Sampling of this roadway corridor was undertaken to address potential environmental concerns arising from past practices of spreading oil on the roadbed to control dust (PAS-00102895). PAHs were detected at low concentrations. No PCBs were found in the roadway samples (PAS-00102899).

Groundwater Sampling Results – Four overburden monitoring wells were installed at the Garfield Molding Company property on August 9 to 13, 1990, as part of an initial hydrogeological assessment of the subject property (PAS-00102902).

The initial groundwater sampling results showed that leakage from the former 1,000-gallon mineral spirits tank had impacted the adjacent groundwater. PAHs were found at concentrations ranging from 29 to 430 micrograms per liter (µg/L). Only trace concentrations of metals were detected in groundwater (PAS-00102913).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

GENERAL ELECTRIC COMPANY

Facility Name, Address and Size: General Electric Company and RCA; 1000 South 2nd Street, Harrison, New Jersey (known as 2nd Street Facility or Building No. 55); approximately 2.66 acres (PAP-00075203; PAP-00341690); 450 employees, 1 shift per day, 5 days per week (PAP-00075203).

1. **Business Type:** Manufacturing of vacuum tubes (PAP-00342923; PAP-00340701-02)

2. **Time Period of Ownership/Operations**

   Operator: 1950 to 1975
   Owner: 1950 to 1976

   1940s: Otis Elevator Company owned the property prior to World War II, and deeded the property to the Defense Plant Corporation during the early 1940s (PAP-00075178).

   1943: Defense Plant Corporation constructs Building No. 55 on the property (PAP-00341711).

   1945: The 2nd Street Facility sold to Zauzner Cheese Corp. (PAP-00075178).

   1950: RCA purchased the 2nd Street Facility from Zauzner Cheese Corp. (PAP-00075179, PAP-00341711; PAP-00343578).

   1975: RCA ceased operations at the 2nd Street Facility on December 31, 1975 and the property was vacant until it was sold in 1976 (PAP-00341690).

   1976: RCA sold the 2nd Street Facility to International Fastener Research Corporation in June 1976 (PAP-00343486). In November 1976, the David Weist Auctioneer Company held a 12-day public auction to liquidate all of the RCA machinery, equipment, instruments, and supplies at Harrison (PAP-00074229).

   1986: GE acquired RCA (PAS-00122713, 843). GE combined the consumer electronic operations of both RCA and GE into what was known as the GE Consumer Electronics Business (PAS-00122776-77).

   1987: GE sold the GE Consumer Electronics Business to Thomson S.A. on December 31, 1987 (PAS-00122777, 837, 843).

3. **Operational History/COC Use and Presence at the Facility**

   There is a single 147,000-square-foot building, located adjacent to the Pennsylvania Path Railroad. The building was constructed by Defense Plant Corporation, for manufacturing heavy equipment, such as the Sherman Tank (PAP-00075178; PAP-00343741). The building, Building No. 55, was constructed in 1943 and acquired by

RCA in 1950 (PAP-00341711). Building No. 55 has two floors and is constructed of brick walls, steel frame, and concrete floors (PAP-00341710).

Operations included production of receiving tubes, photo tubes, power tubes, and other products (PAP-00075179). Raw materials used in tube manufacturing included nigrosine, porcelain, petroleum jelly, zinc, calcium aluminum fluoride, resin, ethyl alcohol, lead acetate, malachite green, glycerine, zinc chloride, iron, marble dust, wood fiber, strontium nitrate, lead oxide, zinc oxide, mica, tin, sodium carbonate, sodium nitrate, silver oxide, barium carbonate, isolantite, molybdenum, alumina, borax, barium, copper, carbon, chromium, calcium, cesium, cobalt, iridium, monel, mercury, calcium oxide, barium nitrate, calcium carbonate, ammonium chloride, potassium carbonate, bakelite, phosphorus, silicon, shellac, tungsten, titanium, silica, glass, magnesia, platinum, strontium, magnesium, rosin, nickel, cobalt oxide, and thorium nitrate. (PAP-00074226; PAP-00074217-23). Equipment used included grid winders, cathode sprayers, test consoles, glass sealing machines, spot welders and tube aging racks (PAP-00074229).

Materials containing copper, lead and mercury were used in vacuum tube production (PAP-00074226). Exterior parapet lighting was self-ballasted mercury vapor (PAP-00075183).

Former employees testified in a litigation relating to an insurance coverage dispute that process wastes were not disposed down floor drains, but instead would be poured into a special container and hauled off-site for disposal (PAP-00341794).

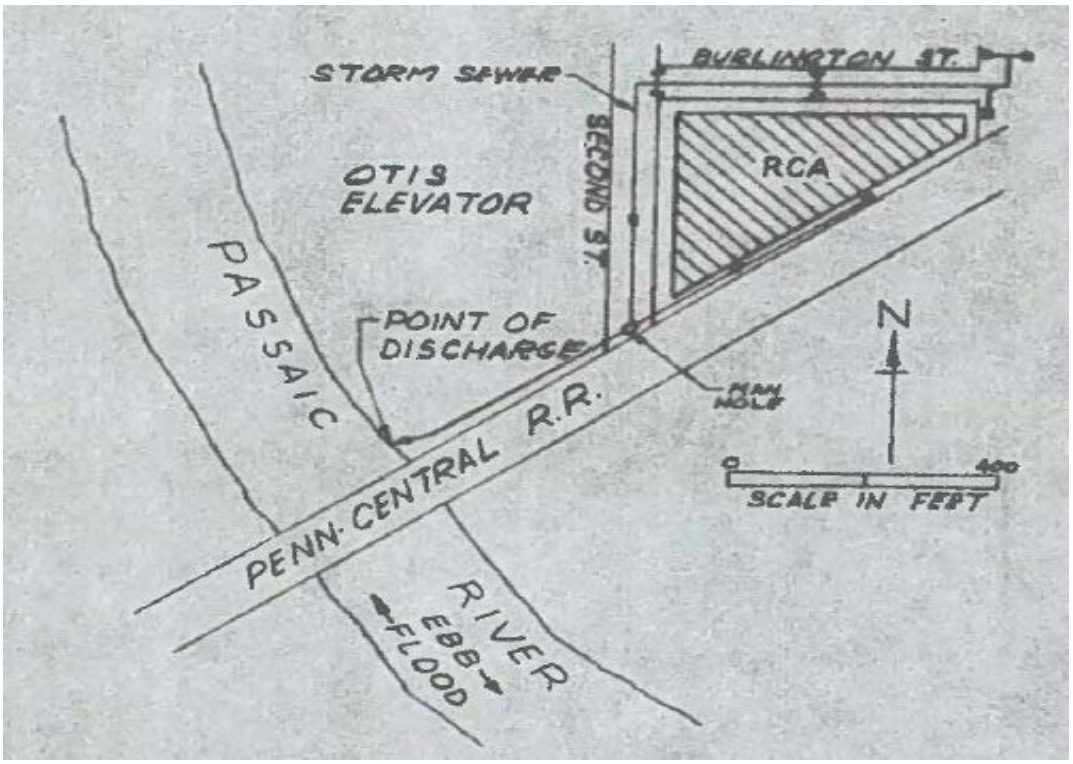
The large plating room had a cyanide collection tank. Separate acid drains passed into neutralizing tanks and then passed into the sanitary sewer system which discharged to the Passaic Valley Sewerage Commissioners (PVSC) system. Cooling water entered a drain piping system in the overhead utility distribution rack and joined with roof drains, cooling tower discharge, and various sprinkler and street drains, to the combined storm sewer drain system that passes through the adjacent Otis Elevator property and into the Passaic River (PAP-00075182).

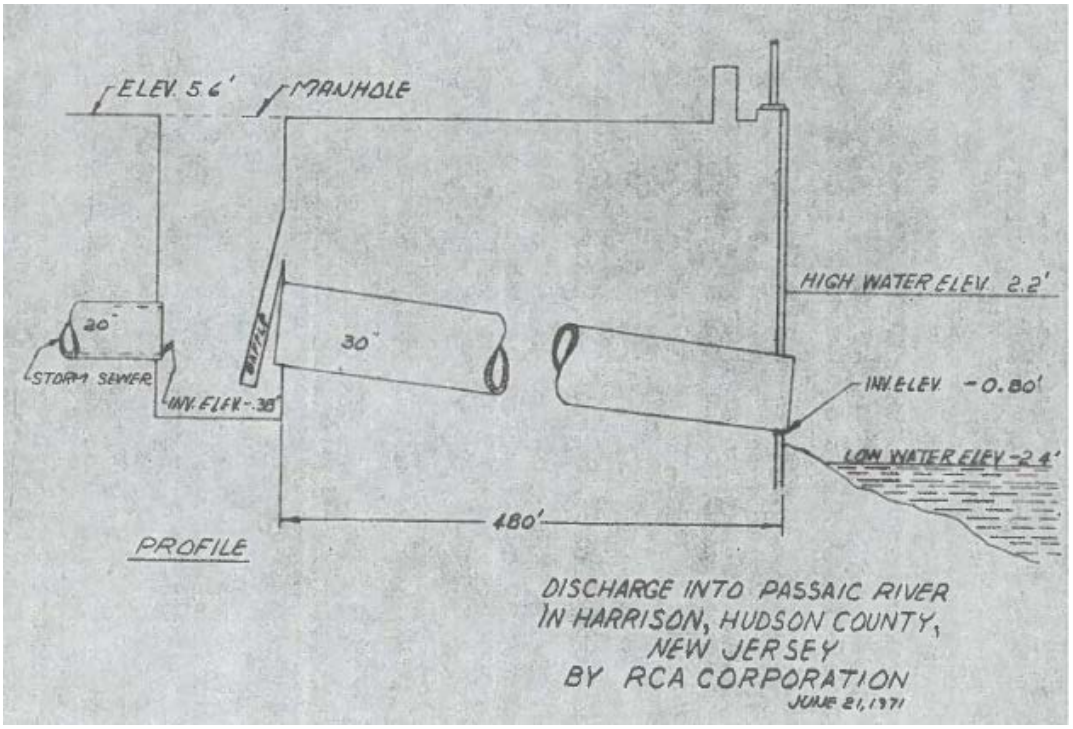
A drawing of the discharge point, as well as a profile drawing of the discharge point, are presented below (PAP-00074199):

Diamond Alkali OU2 Allocation

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Facility Data Report





4. Identified COCs

- PCBs
- Copper (use)
- Lead (use)
- Mercury (use)

Detections of COCs in environmental samples are not reported in the available references. No sampling data for the 2nd Street Facility was located in the available file materials. The majority of the historic information and investigations in the file materials focused on the main plant, located on South 5th Street, which is addressed in a separate Data Report.

PCBs

According to an *RCA Plant Facilities Survey*, dated December 31, 1975, the main service transformers were owned by RCA (PAP-00341691). A summary table of PCB sales for Harrison New Jersey states that RCA purchased 1,850 pounds of Aroclor 1254 between 1958 and 1963, but the table does not specify which RCA facility made this purchase (PAP-00342156).

Copper

No information regarding the volumes of copper used and/or stored at the 2nd Street Facility was identified in the available file materials.

Lead

No information regarding the volumes of lead used and/or stored at the 2nd Street Facility was identified in the available file materials.

Mercury

No information regarding where mercury was used and/or stored at the 2nd Street Facility was identified in the available file materials.

Historic Fill

The Allocation Team has determined that the 2nd Street Facility is located entirely on regional Historic Fill as designated by the NJDEP.[1]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

There is no information regarding sampling results in the available file material.

5. COC Pathways

The 2nd Street Facility is located approximately 500 feet from the Passaic River (PAS-00048608). The entire property is covered by the single building present, Building No. 55 (PAP-00341690).

Sanitary and Storm Sewer

Effluent from the 2nd Street Facility passed into neutralizing tanks and then into the sanitary sewer system which discharged into the PVSC system. The 2nd Street Facility is not located within the Bergen Street combined sewer outfall (CSO) district. Effluent from the 2nd Street Facility discharged into a 10-inch sewer line that emptied directly into the PVSC trunk line at the intersection of Middlesex Street and 2nd Street, which then transported the effluent to the PVSC treatment works (PAP-00075182).

Process equipment cooling water, water from roof drains, cooling tower discharge, blowdown, and various sprinkler and street drains discharged to a storm sewer drain system that passed through the adjacent Otis Elevator property and discharged into the Passaic River (PAP-00075182). Application Number 000051 to the Army Corps of Engineers covered this discharge (PAP-00075182).

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[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Documented wastewater discharge volumes are as follows:

- According to a *PVSC Waste Effluent Survey*, dated May 22, 1972, the 2nd Street Facility, in 1971, discharged 32,250,000 gallons of waste water to the sanitary sewer (PAP-00075204). The waste effluent sampling results for this discharge contained 97 µg/L copper (PAP-00075207; PAS-00124484). Lead was <10 µg/L (PAP-00075207; PAS-00124484).

- According to a *PVSC Waste Effluent Survey*, dated May 22, 1972, the 2nd Street Facility, in 1971, 12,900,000 gallons of water were discharged to the "Storm Sewer, River, or Ditch" (PAP-00075204). This effluent consisted of cooling water with 75 percent of the volume consisting of untreated city water and the remaining 25 percent of the volume being from the air conditioning cooling towers. The cooling water contained no metals (PAS-00048608). The discharge point is located just north of the Penn-Central Railroad Bridge, on the adjacent Otis Elevator property (PAP-00075204).

- According to an *RCA Plant Facilities Survey*, dated December 31, 1975, there was no liquid waste including, sanitary, industrial, cooling water, and other (PAP-00341693).

Direct Release

Process equipment cooling water, water from roof drains, cooling tower discharge, blowdown, and various sprinkler and street drains discharged to a storm sewer drain system that passed through the adjacent Otis Elevator property and discharged into the Passaic River (PAP-00075182). Application Number 000051 to the Army Corps of Engineers covered this discharge (PAP-00075182). No additional information on direct releases to the Passaic River was identified in the available file materials.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

Application Number 000051 to the Army Corps of Engineers covered the discharge of process equipment cooling water, water from roof drains, cooling tower discharge, blowdown and various sprinkler and street drains discharged to a storm sewer drain system that passed through the adjacent property and discharged into the Passaic River (PAP-00075182).

According to a letter to EPA dated April 9, 1980, RCA submitted a signed Affidavit of Exemption from NPDES No. NJ0000230 for the Harrison Plant (PAP-00343675). However, no location information was provided in this letter, so it is not clear which property the exemption pertains to. No other permit information specific to the 2nd Street Facility was identified in the available file materials.

7. Response Actions

Characterization Activities

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

There is no information regarding soil sampling in the available file material.

Remedial Activities

There is no information regarding remedial actions in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

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Facility Data Report

GENERAL ELECTRIC COMPANY

Facility Name, Address and Size: General Electric Company and Radio Corporation of America (RCA); 415 South 5th Street, Harrison, New Jersey (known as the 5th Street Facility or Main Plant); also identified as 400 South 5th Street (PAP-00074230; PAS-00122713); approximately 12.75 acres (PAP-00341685); other addresses used for this facility include 420 South 5th Street for Building C, 530 Bergen Street for Building B, and 400 South 5th Street for Building A (PAS-00049080; PAP-00074238); up to 20,000 workers with round the clock shifts 7 days per week during World War II (PAP-00074228); 2,900 employees, 2 shifts per day, 5 days per week in 1972 (PAS-00122720); reduced to 1,300 employees, 1 shift per day, 5 days per week in 1975 (PAS-00122728).

1. **Business Type:** Manufacturing of incandescent lamps and vacuum tubes (PAP-00075192, PAP-00075193, PAP-00075193)

2. **Time Period of Ownership/Operations**

   Operator: 1882 to 1976
   Owner: 1882 to 1976

The *Remedial Action Work Plan*, dated July 15, 2015 (2015 RAWP), the *Onsite Remedial Investigation Report*, dated January 28, 2015 (2015 RI Report), and an undated *Archive of Industry for Harrison, NJ* provided a corporate history of the site as follows. Any discrepancies in the dates as noted in other sources are identified.

1877: The property was developed by Peters Manufacturing Company (PAP-00074237; PAP-00074666).

1882: The Edison Lamp Company acquired the property to manufacture incandescent lamps (PAP-00074237; PAP-00074666; PAP-00075192). It is noted that a Building Assessment Summary Report, dated January 2019 (2019 Building Assessment), stated that The Edison Lamp Company acquired the property in May 1881 (PAP-00342922).

1889: The Edison Lamp Company was consolidated into the Edison General Electric Company (PAP-00074237; PAP-00074666). The undated Archive of Industry for Harrison, NJ stated that this occurred in 1885 (PAP-00075192).

1892: The Edison General Electric Company and the Thompson-Houston Electric Company were consolidated to create General Electric Company (GE) (PAP-00074237; PAP-00074666). GE owned/operated the 5th Street Facility until 1929 (PAP-00074237).

1919: According to a Media Profile Chronology, RCA was incorporated in 1919 (PAS-00122833).

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Facility Data Report

1930: RCA purchased the 5th Street Facility from GE to manufacture radio vacuum tubes (PAP-00074237; PAP-00075193). According to the 2019 Building Assessment, RCA purchased the 5th Street Facility in 1927 (PAP-00342923).

1932: Based on an online article, RCA was spun off as an independent corporation in 1932 (PAS-00122713, 834).

1943: According to the 2006 Extraction Form, RCA had operated at the 5th Street Facility on or before August 27, 1943 (PAS-00122713).

1976: According to a letter from RCA to the Passaic Valley Sewerage Commissioners (PVSC), dated March 9, 1977, RCA phased out operations at the Harrison facility in June 1976 (PAS-00122770). RCA sold the 5th Street Facility to International Fastener Research Corporation on June 17, 1976 (PAP-00074238; PAP-00343542). The article titled "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 stated that the David Weisz Auctioneer Company held a 12-day public auction in November 1976 to liquidate all of the RCA machinery, equipment, instruments, and supplies from the Harrison Plant (PAP-00074229).

1977: International Fastener Research Corporation sold the 5th Street Facility to Vo-Toys, a subsidiary of VIP Realty Associates (PAP-00074238). VIP Realty Associates leased portions of the 5th Street Facility to various tenants over time (PAP-00074237).

1986: The 2006 Extraction Form stated GE acquired RCA in mid-1986 (PAP-00342923; PAS-00122713, 843). A letter from Thomson Consumer Electronics to EPA, dated February 21, 1997, stated that GE combined the consumer electronic operations of both RCA and GE into what was known as the GE Consumer Electronics Business (PAS-00122776-77).

1987: The February 21, 1997 letter from Thomson Consumer Electronics to EPA stated that GE sold the GE Consumer Electronics Business to Thomson S.A. on December 31, 1987 (PAS-00122777).

1990: VIP Realty Associates acquired the 5th Street Facility from Vo-Toys on December 17, 1990 (PAP-00074238; PAP-00074666). Vo-Toys used the 5th Street Facility for warehousing and distribution until May 2015, according to a *Mercury Data Summary Report*, *Vo-Toys Site*, dated October 2016 (2016 Mercury Report) (PAP-00074842).

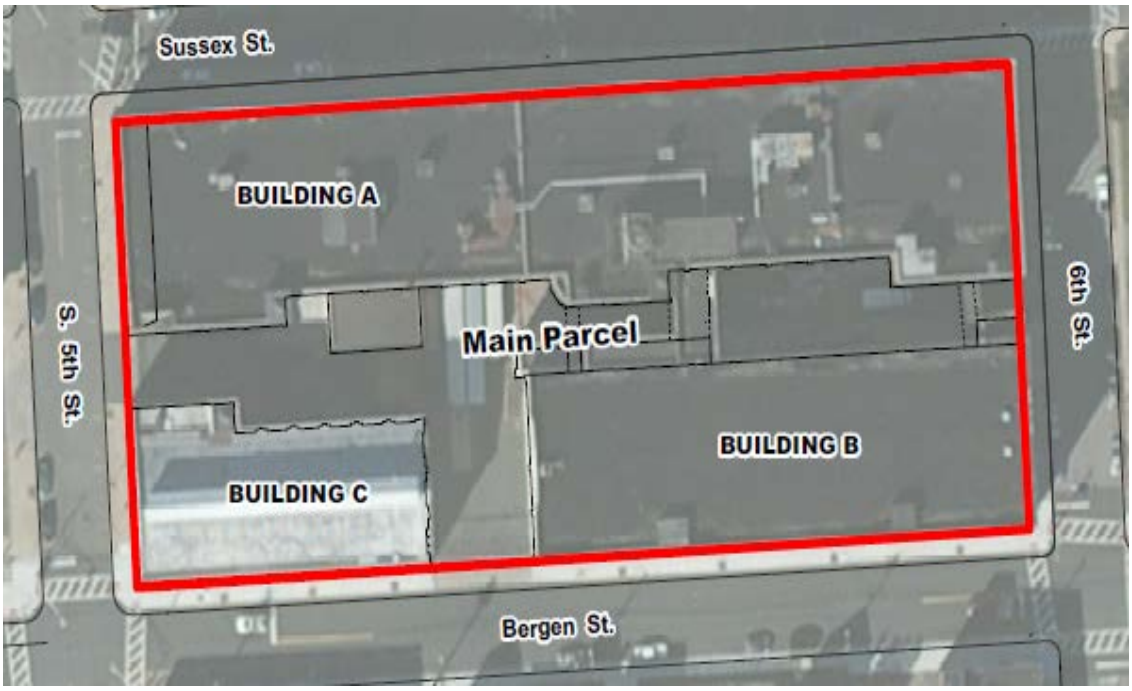
2015: According to the 2016 Mercury Report, VIP Realty Associates sold the 5th Street Facility to BRG Harrison Lofts Urban Renewal, LLC (BRG) in May 2015 (PAP-00074842). The First Amended Complaint brought by BRG against GE, filed November 17, 2016, stated that BRG acquired the 5th Street Facility on June 9, 2015 (PAS-00049079). BRG is still the current owner of the 5th Street Facility as of January 2019 (PAP-00342919).

3. Operational History/COC Use and Presence at the Facility

As discussed in the 2015 RAWP, the 5th Street Facility was developed in the early 1900s with three multi-story industrial buildings designated as Buildings A, B, and C, which covered a total area of approximately 68,000 square feet. Buildings A and B were connected by two enclosed, elevated walkways. The parking lot is approximately 0.46 acres and paved with asphalt (PAP-00074238).

According to the 2019 Building Assessment, Building A was also known as Building No. 36/37, Building B was also known as Building No. 33, and Building C was also known as Building No. 34 (PAP-00342921). A *RCA Plant Facilities Survey*, dated December 31, 1975, documented the total areas of the buildings as follows: Building A was a three story slab on grade building with an interior area of approximately 109,500 square feet. Building B was a three story slab on grade building with an interior area of approximately 60,700 square feet. Building C had a basement and two floors, with an interior area of approximately 30,700 square feet (PAP-00341704-07). The 2019 Building Assessment and the 1975 Plant Facilities Survey stated Building A was constructed in 1913 and 1914, Building B was constructed in 1907, and Building C was constructed in 1902 (PAP-00341705, 07; PAP-00342921).

A figure of the 5th Street Facility buildings from the 2015 RAWP is presented below (PAP-00074296):



According to the undated Archive of Industry for Harrison, NJ, operations at the Harrison plant consisted of incandescent lamp manufacturing from 1882 until approximately 1929 (PAP-00075192-93). During this time, the raw materials used in incandescent lamp manufacturing included lead glass, wood, plaster, metals, cotton, zinc chloride, alcohol, and filaments made of cellulose, tantalum, and tungsten (PAP-00075192; PAP-00075196-98). Lamp making was largely done by hand until mechanization in 1895 (PAP-00075200).

According to an article titled "*History Corner, A Short History: The Role of Mercury in Vacuum and PVD Technology*," by Donald M. Mattox in a 2016 SVC Bulletin publication, Thomas Edison patented an all-mercury combination vacuum pump in 1881 that used banks of pumps in parallel to evacuate incandescent lamps, and these pumps were used by Edison up to 1896. This pump type required continuous cleaning, maintenance, repair, and replacement (PAP-00341717).

In 1930, RCA purchased the 5th Street facility to make vacuum tubes, according to the 2015 RAWP and 2015 RI Report (PAP-00074237; PAP-00075193). An article titled "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 stated that sixty-five various types of metal, chemical compounds and gases were used to manufacture these tubes, including mercury, copper, lead acetate, and lead oxide . During World War II, RCA developed tubes for communications, radar, sonar and related defense electronics at the 5th Street Facility (PAP-00074226-28). According to a United States Navy Security Report, dated February 26, 1942, the 5th Street Facility was producing glass and metal radio receiving and power tubes, phototubes, gas triodes and tetrodes, cathode-ray and television tubes, voltage regulation tubes, acorn tubes and special amplifier tubes (PAP-00074212). The article titled "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 identified equipment used as including grid winders, cathode sprayers, test consoles, glass sealing machines, spot welders and tube aging racks (PAP-00074229).

Former employees testified in a litigation relating to an insurance coverage dispute that solvent wastes were not disposed down floor drains, but instead were poured into containers and hauled off-site for disposal (PAP-00341796-98).

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (used, detected)

PCBs

PCBs were not noted to be used in manufacturing either incandescent lamps or vacuum tubes. According to the 2015 RI Report, historical records stated that a transformer substation was located adjacent to the western side of Building No. 33 (also known as Building B) (PAP-00074681), and PCBs appeared to have been used in the transformer substation in 1958, 1959 and 1963 (PAP-00074681). According to the *RCA Plant*

Facilities Survey, dated December 31, 1975, the main service transformers were owned by RCA (PAP-00341686). A Sales Summary Analysis table of PCB sales for Harrison, New Jersey stated that RCA purchased 1,850 pounds of Aroclor 1254 between 1958 and 1963 (PAP-00342156; PAP-00304327-33).

Soil and building material samples were collected in 2014 and reported in the 2015 RAWP and 2015 RI Report. PCBs were detected in shallow soil adjacent to a transformer substation and in concrete and wood floor material in Building B. An area of approximately 750 square feet of PCB-impacted soil was identified between 0.5 feet below ground surface (bgs) to 4.5 feet bgs at the former transformer substation (PAP-00074246; PAP-00074682). Concentrations ranged from non-detect to 2.12 milligrams per kilogram (mg/kg) (PAP-00074308).

Floor scape samples from Building B and samples of wood and concrete debris were analyzed for PCBs and concentrations ranged from 0.8 to 736 mg/kg, but PCBs were not detected in soil samples beneath the building floors (PAP-00074247; PAP-00074684).

PAHs

According to the 2015 RAWP and 2015 RI Report, PAH-impacted soil was encountered to a depth of approximately 3 feet bgs in a small area stained with hydraulic oil at Building B (PAP-00074249). Concentrations were as high as 380 mg/kg for benzo(a)anthracene, 290 mg/kg for benzo(a)pyrene, 360 mg/kg for benzo(b)fluoranthene, 54 mg/kg for dibenzo(a,h)anthracene, and 150 mg/kg for indeno(1,2,3-cd)pyrene (PAP-00074732).

Six of the seven concrete filled pits in the western concrete floor area of Building B were analyzed for PAHs and all six had detections of PAHs (PAP-00074797). Sampling determined that approximately one-third of the slab in Building B was impacted with PAHs. Redevelopment is anticipated to require removal of the first floor of Building B as well as the underlying soils to a depth of 3 feet below the top of the existing floors (PAP-00074688). Concentrations were as high as 11 mg/kg for benzo(a)anthracene, 7.8 mg/kg for benzo(a)pyrene, 15 mg/kg for benzo(b)fluoranthene, 2.0 mg/kg for dibenzo(a,h)anthracene, and 7.7 mg/kg for indeno(1,2,3-cd)pyrene (PAP-00074726, 797).

Copper

It is possible that copper was used as a raw material in the manufacture of incandescent lamps. Early production of lamps involved a copper plated wire connected to the filament (PAP-00342147).

Copper was used in the manufacture of RCA radio tubes, as listed in the article "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 (PAP-00074226). A RCA Standardization Notice 34-36-5A, dated September 9, 1941, reported the use of DuPont's high speed copper solution in copper plating operations (PAP-00075219). Another Standardization Notice 34-36-7D, dated April 14,

1942, was for silver plating of copper radiator fin spacers for power tubes (PAP-00075213). In addition, the United States Navy Security Report, dated February 26, 1942, identified copper sulfate, copper flashed steel wire, and copper wire as used at the facility (PAP-00074217, 20-21). No information regarding the volumes of copper used at the 5th Street Facility was identified in the available file materials.

The 2015 RI Report included metals results for soil and building material samples at AOC-A and AOC-L. Copper was reported at a maximum concentration of 100 mg/kg in soil samples collected at AOC-A. The maximum concentration of copper in wood and concrete pit samples collected from Building B at AOC-L was 3,400 mg/kg, while soil samples contained up to 200 mg/kg copper (PAP-00074775, 97).

Lead

The publication titled "A Century of Light" dated 1979 stated leaded glass was used in incandescent lamp manufacturing until 1914, when lime glass was developed for machine production (PAP-00075192). Raw materials containing lead were used in vacuum tube production, according to the article "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 (PAP-00074226). No information regarding the volumes of lead used at the 5th Street Facility was identified in the available file materials.

According to the 2015 RI Report, lead was detected at AOC-L in soil beneath the eastern wood floor area of Building B, as well as in the soil beneath the seven concrete filled pits in the western concrete floor area of Building B, with a maximum concentration of 130 mg/kg (PAP-00074683, 770). Lead at the seven concrete filled pits was detected as high has 2,500 mg/kg (PAP-00074726, 95).

Lead was also detected in soil at the former UST areas, including AOC-A (Former 550 Gallon Unknown Oil UST), at a maximum concentration of 37 mg/kg, and AOC-E2 (Historical Gasoline ASTs [Aboveground Storage Tanks]) at a maximum concentration of 76 mg/kg (PAP-00074770, 90).

Mercury

Mercury was not noted to be used as a raw material in incandescent lamp manufacturing at the 5th Street Facility, according to the undated Archive of Industry for Harrison, NJ and a publication titled "A Century of Light" dated 1979 (PAP-00075192; PAP-00075196-98), but an article titled "*History Corner, A Short History: The Role of Mercury in Vacuum and PVD Technology*," by Donald M. Mattox in a 2016 SVC Bulletin publication stated that mercury pumps may have been used to create a vacuum in lamp bulbs during incandescent lamp production until 1896 (PAP-00341717).

The manufacturing of vacuum tubes by RCA was reported to include mercury (PAP-00074226). Mercury was identified as a raw material in the manufacturing of radio vacuum tubes at the 5th Street Facility in a United States Navy Security Report, dated February 26, 1942 (PAP-00074211, 20). In addition, RCA Radiotron Company, Inc. issued a Standardization Notice No. 34-8-1, dated June 19, 1942, to standardize the

process of reclaiming mercury that had been used at the laboratories and factories (PAP-00075216-18).

The 2015 RI Report identified two Areas of Concern (AOCs) at which mercury was detected: AOC-A (Former 550 Gallon UST) and AOC-L (Sumps and Pits) (PAP-00074677, 83). At AOC-A, it was determined that an area of soil approximately 200 square feet extending to an approximate depth of 6.0 feet bgs was impacted by mercury in the vicinity of the former 550-gallon unknown petroleum hydrocarbon underground storage tank (UST) (PAP-00074677-78). According to the 2015 RAWP, concentrations in soil ranged from non-detect to 3.4 mg/kg (PAP-00074305-07).

At AOC-L, concrete slab samples were collected from seven concrete filled pits based on field observation, and soil samples were collected directly beneath the wood floor as well as beneath the concrete pits in Building B. Mercury was detected in soil beneath the eastern wood floor area of Building B, as well as in the soil beneath the seven concrete filled pits in the western concrete floor area of Building B up to 26 mg/kg (PAP-00074683, 798). Mercury at the wood area and seven concrete filled pits was as high as 650 mg/kg (PAP-00074726, 95).

According to the 2016 Mercury Report, the maximum mercury concentration in soil at Building A was 7.3 mg/kg within an elevator pit at a depth of 5.5 feet bgs. The maximum mercury concentration in soil at Building B was 75 mg/kg at a depth of 4.2 feet bgs. The maximum mercury concentration in soil at Building C was 56 mg/kg within an elevator pit at a depth of 11.5 feet bgs (PAP-00074857-58).

As discussed in the 2016 Mercury Report, elevated concentrations of mercury vapors were identified during the 2013 Preliminary Assessment in two areas on the third floor of Building C (PAP-00074842). Mercury vapor was detected at a concentration of 0.370 micrograms per cubic meter (ug/m^3) (PAP-00074849). Additional mercury vapor investigations in October 2015 and January 2016 determined that concentrations of mercury vapors were higher than the 2013 concentrations and mercury vapors were detected on all three floors in all three buildings (PAP-00074843). The maximum vapor concentrations were as follows:

- Building A: October 2015 maximum reading of 10.39 ug/m^3 on the second floor, at floor level (six inches above the floor). January 2016 maximum reading of 5.06 ug/m^3 on the first floor at floor level.

- Building B: October 2015 maximum reading of 274 ug/m^3 on the first floor at the breathing zone (5 feet above the floor). January 2016 maximum reading of 25.26 ug/m^3 on the first floor at floor level.

- Building C: October 2015 maximum reading of 34.546 ug/m^3 on the first floor at the breathing zone. January 2016 maximum reading of 34.128 ug/m^3 on the first floor at floor level (PAP-00074850-51).

As noted in the 2016 Mercury Report, elemental mercury beads were found in two locations within the subfloor of the first floor of Building B. One area contained one mercury bead, and the other area contained elemental mercury beads over an area of approximately 40 feet by 10 feet (PAP-00074859).

Historic Fill

The Allocation Team has determined that the 5th Street Facility is not located on regional Historic Fill as designated by the NJDEP.[1]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to cross-sections included in the 2015 RI Report, fill is present and ranges in thickness from approximately 8 feet to 20 feet (PAP-00074707-11). However, this fill is not identified as Historic Fill.

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS & lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils from the 2015 RI Report are presented in the table below (PAP-00074732, 95).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,500 mg/kg
Copper	3,400 mg/kg
Mercury	650 mg/kg
Benzo(a)anthracene	380 mg/kg
Benzo(a)pyrene	290 mg/kg
Benzo(b)fluoranthene	360 mg/kg
Benzo(k)fluoranthene	Not Applicable
Dibenzo(a,h)anthracene	54 mg/kg
Indeno(1,2,3-cd)pyrene	150 mg/kg

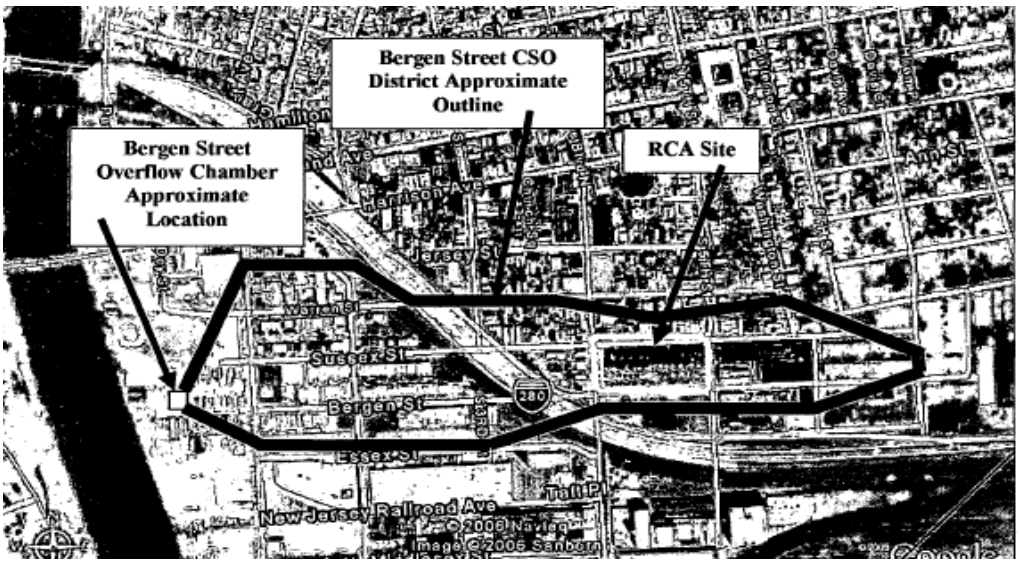
5. COC Pathways

Approximately 75 percent of the 5th Street Facility is occupied by buildings, and the remaining area is paved. The 5th Street Facility is located approximately a half a mile inland from the Passaic River (PAP-00074239; PAS-00048608).

Sanitary and Storm Sewer

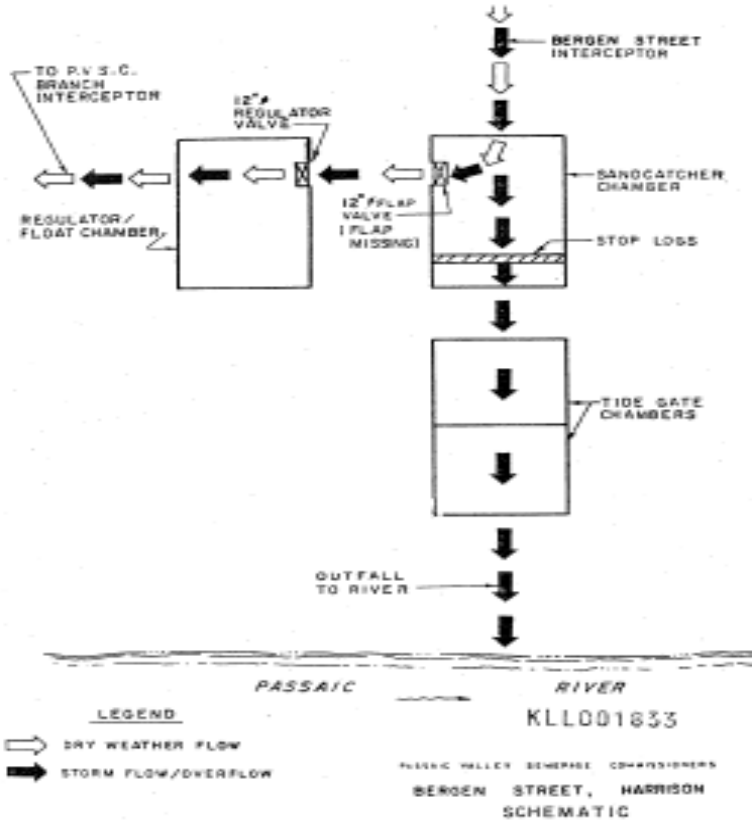
The 5th Street Facility was connected to the PVSC system in 1924 (PAP-00342795). The 2006 Extraction Form stated that the 5th Street Facility was located within the Bergen Street combined sewer outfall (CSO) district (PAS-00122715).

A figure showing the extent of the Bergen Street CSO as provided in the 2006 Extraction Form is presented below (PAS-00122716):



Historical PVSC reports stated that during wet weather events, a portion of the combined sewer and storm water flow from the Bergen Street CSO entered the main interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River (PAS-00122716, 36). The approximate length of the combined sewers in the Bergen Street district was 9,200 linear feet, and the estimated combined flow needed to produce an overflow was 4.4 MGD (million gallons per day), according to the PVSC *Report Upon Overflow Analysis, Bergen Street, Harrison*, dated 1976. The Bergen Street CSO served 72 acres and had an average daily flow of 0.83 MGD during dry weather and 1.13 MGD during wet weather. Of the 9,200 linear feet of combined sewer, 5,800 linear feet are made up of 8 to 12-inch diameter pipes, while 3,400 linear feet are made up of 15 to 24- inch diameter pipes (PAS-00122740, 42).

A schematic of the Bergen Street CSO is presented below (PAS-00043989):



According to the 2015 RI Report, historical foundation plans showed floor drains from Building A that were connected to piping that led to sewers in 5th Street, 6th Street, and Sussex Street in Harrison. Floor drains were also observed in the Vo-Toys rawhide flavoring production area on the second floor of Building A, as well as the wash room, in the northwestern part of the warehouse area in Building B, and in the boiler room. Some floor drains were noted to be clogged; however, an attempt to clean out clogged drains was not successful. No evidence of discharge to the floor drains was observed (PAP-00074685).

In addition, there were seven catch basins located at the 5th Street Facility. The seven catch basins were located within the courtyard area between the buildings; one of these seven catch basins was situated on top of the former methanol and trichloroethene USTs and was removed during removal of these USTs, but the other six catch basins remain in place at the 5th Street Facility (PAP-00074685). No information regarding when the catch basins were installed could be located in the available file materials.

Waste Effluent Surveys from 1972 and 1975 reported effluent sample results for copper and lead; mercury was not reported in either survey. The waste Effluent Survey dated June 16, 1972 reported a result for copper only (<0.05 milligrams per liter [mg/L]). The Waste Effluent Survey dated October 2, 1975 reported copper detected at 0.097 parts per million (ppm) and lead detected at 0.010 ppm (PAS-00122717, 22, 32). Available references did not include specific effluent sampling/monitoring data reports.

Documented wastewater discharge volumes were as follows:

- According to a *PVSC Waste Effluent Survey*, dated June 16, 1972, for the 5th Street Facility in 1971, 184,985,038 gallons of waste water were discharged to the sanitary sewer. No volume was discharged to "Storm Sewer, River, or Ditch." No COCs were detected above detection limits in the effluent (PAS-00122721-22). The principal discharge was from 8 am to 4 pm, Monday through Friday. The average discharge rate was 791.43 gallons per minute over the sampling period (PAS-00122722).

- According to a *PVSC Waste Effluent Survey*, dated October 2, 1975, for the 5th Street Facility in 1974, 145,094,048 gallons of waste water were discharged to the sanitary sewer. No volume was discharged to "Storm Sewer, River, or Ditch" (PAS-00122729, 32).

- According to the *RCA Plant Facilities Survey*, dated December 31, 1975, the 5th Street Facility reported that sanitary wastewater was discharged at a rate of 173 gallons per minute, industrial wastewater at 209 gallons per minute, cooling water at 8 gallons per minute, and other discharges at 15 gallons per minute (PAP-00341688).

Direct Release

There is no information regarding direct release in the available file material.

Spills

As discussed in the 2015 RAWP and 2015 RI Report, during the 2012 UST removals, visual evidence of a release from the 550-gallon UST was observed in soil. NJDEP was notified and case No.12-06-06-0920-51 was assigned to the 550 gallon UST (contents unknown). Case No.12-06-07-1005-05 was assigned to the 3,000 gallon trichloroethene (TCE) UST when holes were noted in the UST (PAP-00074242; PAP-00074662).

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

The PVSC discharge permit number for the Bergen Street CSO is 015/H-006 (PAP-00211195).

According to a letter from RCA to EPA dated April 9, 1980, RCA submitted a signed Affidavit of Exemption from NPDES No. NJ0000230 for the Harrison Plant due to its closure in 1976 (PAP-00343675-77). No permits specific to the 5th Street Facility were included in the available file materials.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Onsite Remedial Investigation Report, Vo-Toys Site*, dated January 28, 2015 (PAP-00074652);
- *Remedial Action Work Plan, Vo-Toys Site*, dated July 15, 2015 (PAP-00074230);
- *Mercury Data Summary Report, Vo-Toys Site*, dated October 2016 (PAP-00074833); and.
- *Building Assessment Summary Report, Vo-Toys Site*, dated January 2019 (PAP-00342910).

Sewer

According to the 2015 RAWP, sediments were removed from the catch basins and the catch basins were visually inspected. The catch basins were constructed of brick with pipe between them. The sidewalls had a cement coating, with the exception of CB-01, which had no cement on the sidewalls, and CB-04, which was constructed more recently and connected to the sewer system. Samples were collected at the catch basins, but the samples were not analyzed for COCs (analyzed for volatile organic compounds [VOCs] only) (PAP-00074248).

Soil

A remedial investigation was conducted between August 2013 and August 2014 to investigate ten AOCs (PAP-00074242-43). According to the 2015 RI Report, soil sampling included collection from multiple soil borings at multiple depths at each of the ten AOCs (PAP-00074749-56).

An area of approximately 750 square feet of PCB-impacted soil was identified between 0.5 feet bgs to 4.5 feet bgs at the former transformer substation (PAP-00074682). Concentrations ranged from non-detect to 2.12 milligrams per kilogram (mg/kg) (PAP-00074308). Floor scape samples from Building B and samples of wood and concrete debris were analyzed for PCBs and concentrations ranged from 0.8 to 736 mg/kg, but PCBs were not detected in soil samples beneath the building floors (PAP-00074684).

PAH-impacted soil was encountered to a depth of approximately 3 feet bgs in a small area stained with hydraulic oil at Building B (PAP-00074249). Concentrations were as high as 380 mg/kg for benzo(a)anthracene, 290 mg/kg for benzo(a)pyrene, 360 mg/kg for benzo(b)fluoranthene, 54 mg/kg for dibenzo(a,h)anthracene, and 150 mg/kg for indeno(1,2,3-cd)pyrene (PAP-00074732).

According to the 2016 Mercury Report, the maximum mercury concentration in soil at Building A was 7.3 mg/kg within an elevator pit at a depth of 5.5 feet bgs. The maximum mercury concentration in soil at Building B was 75 mg/kg at a depth of 4.2 feet bgs (PAP-00074857). The maximum mercury concentration in soil at Building C was 56 mg/kg within an elevator pit at a depth of 11.5 feet bgs (PAP-00074858).

Remedial Activities

According to 2015 RI Report and 2015 RAWP, one 550 gallon unknown content UST, two 1,500 gallon methanol USTs, and one 3,000 gallon TCE UST were removed between June and August 2012. Previously, in June 1998, a 10,000-gallon No. 2 fuel oil UST was decommissioned and NJDEP issued a “no further action” (NFA) letter for this decommissioning in February 1999 (PAP-00074242; PAP-00074662). Given the presence of fuel oil, water, and sand in the 550 gallon UST, it was determined to be an unknown petroleum hydrocarbon tank (PAP-00074254). Approximately 21 tons of soil excavated during the UST removals was disposed off-site (PAP-00074255).

The 2019 Building Assessment stated that lead paint abatement power washing was conducted at Building B and on the third floor of Building A in October 2015 (PAP-00342926).

The 2015 RAWP proposed removal of approximately 2,900 cubic yards of mercury impacted soil at AOC-A (Former Waste Oil UST) and removal of approximately 2,700 cubic yards of PCB impacted soil at AOC-J1 (Former Transformer Substation) (PAP-00074275). In addition, the removal of the entire floor slab of Building B, as well as three feet of soil below the slab, was proposed (PAP-00074276). According to the 2016 Mercury Report, this work began in December 2015 with saw cutting of the building

slabs, but work was stopped in January 2016 due to the mercury vapor survey results (PAP-00074845). The 2019 Building Assessment stated that a polyethylene sheeting cover was installed over the first-floor slab within Building B in June 2016 as a housekeeping measure until the RAWP implementation could be restarted (PAP-00342925).

Mercury vapor monitoring was conducted between January and July 2016 during site preparation for implementation of the RAWP. The maximum reading was 762 ug/m^3 recorded on June 22, 2016 on the first floor of Building B. The reading was from floor level and a visible bead of elemental mercury was present (PAP-00074851-52).

Several building materials were sampled for mercury in preparation for implementation of the RAWP. Maximum mercury concentrations were as follows:

- Concrete – 650 mg/kg (lab analysis of total mercury);
- Tar paper (part of wood subfloor) – 52 mg/kg (lab analysis of total mercury);
- Wood floor – 29,000 mg/kg (lab analysis of total mercury);
- Concrete columns – 655 mg/kg (x-ray fluorescence [XRF] reading);
- Concrete ceilings/beams – 1,156 mg/kg (XRF reading); and
- Masonry walls/windows – 1,099 mg/kg (XRF reading) (PAP-00074856).

During floor removal, elemental mercury was observed on the first floor of Building B (PAP-00074859).

According to the 2019 Building Assessment, building assessments were conducted at Buildings A, B, and C between June 26, 2018 and October 4, 2018 and included pre-investigation cleaning (bird guano and carcasses), mercury vapor and XRF surveys, building material sampling, and a subsurface structure assessment (PAP-00342928). Visible mercury was not observed at Building A (PAP-00342937). Visible mercury was observed in four locations within Building B: three locations were observed on the first floor and one location was observed on the third floor (PAP-00342945). Visible mercury was observed in six locations on the second and third floors within Building C during the building assessment activities (PAP-00342953).

Photographs of visible mercury observed at Buildings B and C are presented below (PAP-00342946 and 54):

Visible Mercury; Third Floor Building B



Visible Mercury; Second Floor Building C



Note:
Mercury observed on tar paper layer, between two layers of wood flooring.

The 2019 Building Assessment concluded that the presence of elemental mercury (based on the total mercury analytical results) within the various floor layers and walls of Buildings A, B, and C meant there may be multiple potential long-term mercury vapor sources that cannot be readily accessed and remediated. In addition, based on the distribution of mercury vapor readings in the buildings, the extent of building materials generating mercury vapors appears to be throughout the buildings, rather than concentrated within a single area of the buildings (PAP-00342942, 51, 60).

Tables of mercury results for samples of various building materials from Buildings A, B, and C are presented below (PAP-00342939, 49, 57):

Building A Building Material Sample Results Summary

Material	Total Mercury Range (mg/kg)	TCLP Mercury Range (mg/L)
Flooring – Concrete	ND–242	ND–0.0915
Flooring – Wood	0.093–207	ND–0.0755
Flooring – Cinder	8.26–1580	0.0005–0.019
Flooring – Debris	1160	0.0006
Flooring – Tar Paper	16.4–1800*	0.0092–3.355*
Roof – Tar Paper	ND–7.76	ND
Wall – Masonry and Concrete	ND–464	0.0035–0.955
Wall – Brick	0.287–58.4	ND
Wall – Wood	22.1	Not Analyzed
Column – Concrete	0.404–128	Not Analyzed
Window – Concrete	0.768	Not Analyzed

Notes:
*Highest reported concentration
ND not detected above the laboratory detection limit.

Building B Building Material Sample Results Summary

Material	Total Mercury Range (mg/kg)	TCLP Mercury Range (mg/L)
Flooring – Concrete	ND–1900	ND–0.1940
Flooring – Wood	0.274–2560	ND–2.764*
Flooring – Cinder	3.35–1420	0.0570–0.3535
Flooring – Tar Paper	2880*	1.900
Flooring – Expansion Joint	126	0.0112
Roof – Tar Paper	ND–1.94	ND
Wall – Masonry and Concrete	0.464–45.8	ND–0.0115
Wall – Brick	0.836–145	0.0011
Wall – Plaster and Parge	2.09–31.7	ND–0.0017
Wall – Wood	1.97–583	0.0180–0.0530
Column and Window – Concrete	1.00–59.2	Not Analyzed
Window – Wood	1.29–53.3	Not Analyzed

Notes:
*Highest reported concentration
ND not detected above the laboratory detection limit

Building C Building Material Sample Results Summary

Material	Total Mercury Range (mg/kg)	TCLP Mercury Range (mg/L)
Flooring – Concrete	0.032–418	ND–0.0228
Flooring – Wood	3.83–7310	0.0029–2.800
Flooring – Cinder	9.74	0.0011
Flooring – Tar Paper	182–10800*	0.7000–5.200*
Flooring – Linoleum	7.28–101	0.0021–0.0327
Wall – Brick	1.5–139	ND–0.0313
Wall – Parge and Miscellaneous	0.441–106	Not Analyzed
Column, Beam and Ceiling – Wood and Miscellaneous	0.256–929	0.0005–0.0955
Window – Brick	0.992–220	0.0032–0.0158
Window – Wood	0.395–38.5	ND–0.0035
Window – Masonry and Parge	1.57–184	0.0020–0.0408

Notes:
*Highest reported concentration
ND not detected above the laboratory detection limit.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

GIVAUDAN FRAGRANCES CORPORATION

Facility Name, Address and Size: Givaudan Fragrances Corporation (Corp.) former Clifton Facility; Burton T. Bush, Inc.; The Givaudan Corporation; Givaudan-Delawanna; Givaudan Roure; Givaudan; Givaudan Fragrances Corp.; 125 Delawanna Avenue, Clifton, New Jersey; maximum build-out was approximately 31 acres; approximately 750 employees, three shifts per day during peak operations (PAS-00035827).

1. **Business Type:** Fine chemicals and fragrances (PAP-00345884)

2. **Time Period of Ownership/Operations**

Operator: 1924 to 1998
Owner: 1924 to 1998 (with the exception of a two-acre parcel on block 73.03, Lot 2.02 (PAP-00345330)

1924: Burton T. Bush, Inc. acquired the assets of the Antoine Chiris company on March 1, 1924, which occupied approximately 12.9 acres of the site. On August 14, 1924, Burton T. Bush, Inc. purchased an adjoining parcel also owned by Antoine Chiris. Givaudan Fragrances Corporation (Givaudan) purchased the assets of Burton T. Bush, Inc. on February 25, 1924 (PAS-00048099).

Givaudan acquired additional portions of the site through the purchase of adjoining and nearby parcels between 1924 and 1982 (PAS-00122997).

1963: The Roche Group acquired Givaudan in 1963 (PAS-00083378).

1991: The Roche Group spun-off its flavors and fragrances division, known worldwide as the Givaudan Roure companies. The Givaudan Roure companies operating in the United States prior to the spin-off were “Givaudan Roure Corporation,” the fragrance operating company, and “Givaudan Roure Flavors Corporation,” the flavors operating company. As a result of this spin-off, Givaudan Roure Corporation was merged into a new Delaware corporation, Givaudan Fragrances Corporation, in 1991 (PAP-00175934; PAS-00083378).

1998: Givaudan ceased manufacturing operations in June 1998. The cleaning of plant processing equipment continued until September 1998. All raw materials and chemicals were removed from the facility by the end of October 1998 and by December 1999 the plant was demolished (PAP-00178473; PAP-00175640).

1999: On March 8, 1999, Givaudan executed an Agreement of Sale with Reckson Morris Operating Partnership, LLP (Morris) (PAS-00033758; PAP-00168962; PAP-00175933).

2000: Givaudan Roure spun off as Givaudan in 2000 (PAS-00083378). The parent company is identified as Givaudan, SA, a Swiss corporation (PAS-00083377).

2000: Properties on the north side of Delawanna Avenue were sold in 2000. The 125 Delawanna Avenue property was sold in 2001. Givaudan retained ownership of a two-acre parcel located at 275 River Road in Clifton, New Jersey (PAS-00122997).

3. Operational History/COC Use and Presence at the Facility

General Operations

This subsection describes the operations that occurred at the site in general.

According to a *Request for Information Response Document*, dated July 9, 2004, in the 1940s and 1950s, Givaudan manufactured fine chemicals and fragrances referred to generally at that time as aromatic chemicals. From the 1960s through 1998, Givaudan also compounded and stored flavors and essences at Buildings 103 and 105, located on the north side of Delawanna Avenue. As stated in a letter from Givaudan counsel to NJDEP, dated July 26, 1983, there was no chemical synthesis in operations on the north side of Delawanna Avenue, which is where Buildings 103 and 105 were located (PAS-00083416). Feedstock raw materials consisted mostly of spices, essential oils, solvents, and acids. The raw materials were processed onsite using various processing and refining techniques such as compounding, mixing, distilling, purifying, drying, and autoclaving. The majority of finished goods were transferred into steel drums (liquid product) or bags (powdered product). The final products were either stored indoors or outside for collection by truck or railcar for distribution (PAS-00083342; PAS-00083350). According to a 1975 *Waste Effluent Survey*, the average production was listed as 15,000,000 pounds per year (PAS-00035827).

In addition, it is noted that according to a letter prepared by Givaudan, dated May 25, 1983, 2,4,5-trichlorophenol (2,4,5-TCP) was used as a raw material by Givaudan to prepare hexachlorophene (HCP), an antiseptic and germicidal agent employed in surgical soaps and pharmaceutical preparations. The product, also known as G-11®, was manufactured at the site beginning in the early 1940s starting with “relatively small quantities” and reaching an annual volume of a few million pounds (PAP-00174267). The early 1940s represented a time when HCP pilot studies were completed and small-scale production was done before ramping up to full production. As noted in the July 26, 1983 letter to NJDEP, Givaudan started industrial production of HCP in 1947 (PAS-00083414). Givaudan reported that the process to manufacture HCP involved the condensation of 2,4,5-TCP with formaldehyde. The only waste material resulting from the process was reportedly bentonite clay (PAP-00174267). The May 25, 1983, letter states that 331,000 pounds of 2,4,5-TCP were brought onsite and consumed onsite per year on average from 1978 through 1982 (PAP-00174269). According to a *NIOSH Dioxin Registry Site Visit Report of Givaudan Corporation*, prepared by the National Institute for Occupational Safety and Health, dated March 1990 (1990 NIOSH Report), Givaudan produced HCP from 1945 to May 1984 (PAP-00170545). As noted above, actual industrial production did not start until 1947 (PAS-00083414).

Finally, according to the 1990 NIOSH Report, Givaudan also produced 2,4,5-TCP for use in HCP production between 1945 and 1949 (PAP-00170545); however, dates for 2,4,5-TCP production vary in the available file material. According to an *Administrative Consent Order*, dated March 5, 1987, Givaudan manufactured 2,4,5-TCP at the site in 1947 and 1948 (PAS-00001808). Similarly, in a letter from Givaudan to the U.S. Environmental Protection Agency (U.S. EPA), dated October 26, 1983, Givaudan stated that they produced 2,4,5-TCP in 1948 and 1949 (PAS-00048133-34).

According to a letter from Givaudan to EPA, dated October 26, 1983, Givaudan records show the purchase of a “small amount” of “technical grade” 2,4,5-TCP from Dow Chemical for experimental purposes only. In 1948 and 1949, Givaudan developed its own method to manufacture technical grade 2,4,5-TCP, which was distilled into "pre-purified" 2,4,5-TCP and used in HCP manufacture. During this time, Givaudan manufactured approximately 305,000 pounds of pre-purified 2,4,5-TCP for on-site consumption in making HCP (PAS-00048134). Givaudan licensed the pre-purified 2,4,5-TCP method to Hooker in return for Hooker producing pre-purified 2,4,5-TCP (using Givaudan’s method) exclusively for sale to Givaudan. This agreement was in effect from 1949 until 1971 (PAP-00168592; PAS-00084000).

HCP and 2,4,5-TCP production are discussed further in a subsequent subsection below.

OU2 COCs Associated with Operations

This subsection lists the OU2 contaminants of concern (COCs) identified in the available file material as being associated with site operations, organized by date.

In 1980, the facility reported that copper chloride (3,360 pounds), copper chromite (960 pounds), lead acetate (240 pounds), naphthalene (46,080 pounds), “trichlorophenol” (360,000 pounds), diesel fuel (34,560 pounds), No. 2 fuel oil (45,120 pounds), and No. 6 fuel oil (21,646,800 pounds) were “transferred, refined, processed or stored” at the site at that time (PAP-00182118-19, 21).

According to a *Hazardous Waste Investigation,* dated June 5, 1980, it was ascertained that Givaudan was generating and storing polychlorinated biphenyls (PCBs) onsite. The report states that U.S. EPA inspectors had a report concerning Givaudan's PCB practices, but additional details were not available (PAP-00172019). An undated record titled “Exhibit No. 2, Transformers – PCB Oil-Filled Electrical Transformers” states that the facility historically had 30 PCB-containing transformers (PAP-00176671-72). According to a *Plans for Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated July 1982, Givaudan had 38 transformers in operation containing PCBs (PAP-00182108). According to a *Plans for Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, Givaudan had 32 transformers in operation containing PCBs (PAP-00183371). Between 1975 and 1983, one drum of waste PCBs was shipped offsite for disposal (PAS-00083999).

According to a *Selected Substances Report,* dated August 13, 1980, cuprous chloride and copper chromite were used by the facility. The facility reported that cuprous chloride contained 64% copper, and that copper chromite contained 41% copper. The total amount of copper brought to the site at that time was reported as 1,997 pounds (PAP-00180568-70, 77).

According to a letter from Givaudan to U.S. EPA, dated October 26, 1983, although Givaudan manufactured HCP for many years, all the HCP manufactured and marketed by Givaudan was produced from pre-purified 2,4,5-TCP as opposed to technical grade 2,4,5-TCP. In 1948 and 1949, Givaudan also produced technical grade 2,4,5-TCP, which it purified (i.e. distilled) prior to use for the manufacture of HCP. HCP manufactured using technical grade 2,4,5-TCP may result in 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) contamination, while TCDD contamination "is not expected to occur" in the manufacture of HCP made with pre-purified 2,4,5-TCP, using a reaction which occurs at rather low temperatures and at an acidic pH (PAS-00048133-34; PAS-00033680). This is discussed further in a subsequent subsection below.

A *Community Right to Know Survey for 1995* identified copper chromate, creosote oil, No. 2 fuel oil, No. 6 fuel oil, naphthalene, and "trichlorophenol" as being present at the facility (PAS-00084216, 17, 25, 42, and 59).

Waste disposal records state the following OU2 COCs were disposed by the facility in 1999 during facility demolition:

- mercury (300 pounds)
- waste containing mercury (225 pounds)
- waste containing lead nitrate (200 pounds)
- mercury (600 pounds)
- PCBs (182 kilograms)
- mercury in manufactured articles (5 gallons) (PAS-00084328-34).

General Wastewater Disposal Practices

This subsection presents a description of wastewater disposal practices in general.

According to a *Documentation of Environmental Indicator Determination*, dated September 29, 2008, Givaudan and previous owners of the site used portions of the property for waste disposal including various cesspools, spent acid pits, a chemical landfill, and two chemical effluent pits. The document states a chemical sewer system was installed in the 1960s to collect and discharge process wastewater. However, Givaudan's December 3, 2009 Supplemental Response for Information confirmed that the date of original sewer installation was "prior to March 1946" and the reference to a sewer installation in the 1960s was incorrect (PAS-00033657-8). A sewer map dated March 1946 depicts the historical layout of the chemical sewer system at Givaudan (PAS-00084318). However, revisions were made to this drawing as late as 1969, as stated in the title block of the drawing. An aerial photograph from 1947 does not contain the infrastructure shown on the March 1946 drawing in the southern portion of the site

and an area of undisturbed land is present to the south of two surface impoundments observed in the eastern-central portion of the site (PAS-00048105-108). Based on this, it is unclear if the sewer line extending to the southernmost intersection with River Road where it connects to the City of Clifton sewer system existed in 1946. A 1949 photograph shows that a Spent Acid Pit and Wastewater Detention Pond appear as local depressions with defined embankments/berms as sidewalls. The photograph also states that a handwritten note from June 1949 states that according to a well driller, there are five wells at the facility and that waste is dumped into pits adjacent to the plant (PAS-00048109). In 1951, the Wastewater Detention Pond was no longer present and the area appeared to have been re-graded (PAS-00048474). A 1953 photograph shows the chemical sewer discharged to the City of Clifton sewer (PAS-00048114). In 1954, the Spent Acid Pit was no longer present (PAS-00048115).

According to a letter prepared by Givaudan, dated November 19, 1980, much of the operations included discharge of liquid waste, mostly aqueous, into a site sewer system which underwent pretreatment to adjust the pH before it was discharged to the Passaic Valley Sewage Commissioners (PVSC) system. Combustible waste, both hazardous and nonhazardous, after blending, was used as a noncommercial fuel to produce steam for the site's operation beginning in 1950 (PAP-00182084). The treatment system was in place at least as early as 1978 as it is referenced in regard to the sewer line break that occurred in the City of Clifton sewer line that was suspended along the bridge over the Third River (PAP-00170539).

Portions of the original sewer were abandoned and replaced in the mid-1980s, while other portions were retrofitted with the new chemical sewer that consisted of fiberglass-reinforced plastic pipe with secondary containment (PAP-00168962).

Wastewater disposal practices are discussed further in Section 5 below.

HCP Production

This subsection presents a description of the HCP (also known as G-11®) production process.

According to a letter prepared by legal counsel on behalf of Givaudan, dated July 26, 1983, production of HCP started in 1947 and continued in Buildings 58, 59, and 60. Additionally, in 1970, 1971, and 1972, HCP was produced in Building 9. Grinding and packaging of the final product was performed in Buildings 47, 75, and 75A (PAS-00083414; PAP-00176628; PAP-00170546). According to a letter prepared by Givaudan, dated May 25, 1983, the process to manufacture HCP involved the condensation of 2,4,5-TCP with formaldehyde (PAP-00174267). This is consistent with the 1990 NIOSH Report, which states that Givaudan produced HCP by the condensation of purified 2,4,5-TCP and paraformaldehyde in the presence of a sulfuric acid catalyst. A typical batch used 1,500 pounds of 2,4,5-TCP to produce 1,500 pounds of HCP (PAP-00170546-47). The only waste material resulting from the process was reportedly bentonite clay (PAP-00174267).

A schematic of the HCP production process is presented in **Appendix B-1**.

HCP production volume by year between 1947 and 1984 is presented in **Appendix A-1.**

According to *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, information from "published sources" stated that it was "highly unlikely" that Givaudan's HCP manufacturing process generated TCDD because it used acidic conditions and low temperatures in its process. It states that documents prepared by Dow Chemical (a 2,4,5-TCP supplier) state that TCDD may be produced during use of TCP under alkaline conditions and in temperatures greater than 100 degrees centigrade, which is distinct from the acid process employed at Givaudan (PAS-00048081).

Use of Technical Grade 2,4,5-TCP

This subsection describes documented handling and use of technical grade 2,4,5-TCP by Givaudan. This is relevant as, according to a letter from Givaudan to U.S. EPA, dated October 26, 1983, HCP manufactured using technical grade 2,4,5-TCP may result in TCDD contamination (PAS-00048133-34; PAS-00033680). As stated previously, according to a letter from Givaudan to EPA, dated October 26, 1983, Givaudan records show the purchase of a "small amount" of technical grade 2,4,5-TCP from Dow Chemical for experimental purposes only. From 1948 to 1949, Givaudan developed its own method to manufacture technical grade 2,4,5-TCP, which was distilled into pre-purified 2,4,5-TCP and used in HCP manufacture. During this time, Givaudan manufactured approximately 305,000 pounds of pre-purified 2,4,5-TCP for on-site consumption in making HCP (PAS-00048134).

According to a January 18, 1978, internal report prepared by Givaudan, samples of "Pure-Dow" and "Tech.-Dow" 2,4,5-TCP were analyzed for their suitability in making HCP (PAP-00168661). The report states that regardless of the method of analysis, it was apparent that Dow's "Tech. Grade of TCP" led to a HCP of much lower quality than either Dow's "TCP, Pure" or Celamerck's TCP (another 2,4,5-TCP supplier). It states that work was in progress to identify both the impurities in the "TCP, Tech." and in the HCP produced from it. In addition, it states that an attempt would be made to purify the "TCP, Tech." to the point where it could be used to produce an acceptable grade of HCP (PAP-00168665).

According to an internal document prepared by Givaudan, dated September 13, 1978, an internal report was prepared to put into record a proposed method by which it might be possible to make "acceptably pure" HCP from technical grade 2,4,5-TCP in existing equipment in Buildings 58-61 (PAP-00182221).

According to a December 8, 1978 internal report, three batches of HCP were produced in experimental runs, from 3,600 pounds of technical grade 2,4,5-TCP (94% purity) by a new process in plant equipment (PAP-00168698). The 2,4,5-TCP had a TCDD concentration of 8 parts per billion (ppb) (PAP-00168698-701).

According to a February 11, 1981 internal report, the plant had an inventory of 8,950 pounds of 2,4,5-TCP ("TCP, Tech grade"). Givaudan's production and marketing departments requested an investigation into the possibility of converting this 2,4,5-TCP into HCP (PAP-00168735).

According to a letter prepared by Givaudan, dated October 5, 1983, there are no records describing 2,4,5-TCP equipment decontamination procedures, but that isopropyl alcohol, soap solutions, caustic, and steam were used at the time to clean existing processing equipment. It was unknown if these practices were used in the early 1950s (PAP-00181273; PAS-00048135).

According to a letter from Givaudan to U.S. EPA, dated October 26, 1983, Givaudan stated that the following wastes in the following approximate quantities were generated during the 2,4,5-TCP purification step in 1948 and 1949: (1) 2-3 pound/pound of light fractions; and, (2) 0.2-0.3 pound/pound of still bottoms. It was believed that the light fractions and still bottoms were drummed; however, Givaudan had no records describing the methods of collection, storage, or disposal of such wastes, the names and addresses of haulers who might have hauled such wastes, or disposal site locations (PAS-00048135). Givaudan had no records from which the total amount of such wastes generated during the history of its facility could be determined, and no records from which the total amount of wastes generated in the manufacture of technical grade 2,4,5-TCP could be determined. Finally, Givaudan could not determine the dates of disposal, the amount disposed on each occasion, the waste hauler, or the disposal location (PAS-00048136).

2,4,5-TCP Production

This subsection describes Givaudan's manufacture of 2,4,5-TCP.

According to a letter prepared by legal counsel for Givaudan, dated July 26, 1983, 2,4,5-TCP production occurred in Buildings 54 and 60 in 1947, 1948, and 1949 (PAS-00083414). As discussed previously, the years during which Givaudan produced 2,4,5-TCP vary in the available records. According to the 1990 NIOSH Report, Givaudan produced 2,4,5-TCP for use in HCP production from 1945 to 1949 (PAP-00170545). According to an *Administrative Consent Order*, dated March 5, 1987, Givaudan manufactured 2,4,5-TCP in 1947 and 1948 (PAS-00001808). In a letter from Givaudan to the U.S. EPA, dated October 26, 1983, Givaudan stated that they produced 2,4,5-TCP in 1948 and 1949 (PAS-00048133-34).

A figure depicting the location of the 2,4,5-TCP production is presented in **Appendix B-2**.

According to an internal report on a U.S. EPA visit to the site, dated August 20, 1976, Givaudan stated that processing of 2,4,5-TCP was done in an acidic medium, and assured U.S. EPA that no TCDD was formed (PAS-00048294).

According to a letter from Givaudan to U.S. EPA, dated October 26, 1983, Givaudan manufactured technical grade 2,4,5-TCP, which was distilled into pre-purified 2,4,5-TCP and used in HCP manufacture. It states that 305,000 pounds of pre-purified 2,4,5-TCP was produced from technical grade 2,4,5-TCP. All technical grade 2,4,5-TCP was believed to have been used to produce pre-purified 2,4,5-TCP. The letter also notes that records show the purchase of a small amount of technical grade 2,4,5-TCP from Dow Chemical for experimental purposes only. Givaudan believes that technical grade 2,4,5-TCP was manufactured by the alkaline hydrolysis of 1,2,4,5-tetrachlorobenzene with caustic soda dissolved in ethylene glycol. After reaction, a batch was neutralized with muriatic acid and a sodium chloride precipitate was removed by filtration. The filtrate was diluted with water and the 2,4,5-TCP was extracted with benzene. The benzene extract was washed with water and the benzene was removed by distillation. Ethylene glycol was recovered by fractionation and was reused in the process (PAS-00048134-35, 254, and 256).

It is noted that according to the 1990 NIOSH Report, there are insufficient records to reconstruct the detailed process information for 2,4,5-TCP manufactured by Givaudan (PAP-00170546).

Documentation of TCDD Contamination Associated with HCP and 2,4,5-TCP Production

According to the 1990 NIOSH Report, TCDD is a contaminant found in 2,4,5-TCP and/or its sodium salt, which are raw materials used to produce chemical compounds such as 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and 2,2'-methylene-bis (3,4,6-trichlorophenol) hexachlorophene (HCP) (PAP-00170544).

The following is a discussion of documentation of TCDD contamination associated with HCP and 2,4,5-TCP production at the site:

- According to an undated file prepared by Givaudan, Givaudan's specification called for less than 10 ppb TCDD in 2,4,5-TCP. The file also reported that wastewater from the manufacture of HCP had been tested and no detectable quantities of TCDD were found (PAS-00033680).

- According to the 1990 NIOSH Report, Givaudan collected six HCP samples, each being a bulk from two to four lots of HCP, manufactured during the second half of 1969 and five samples of HCP from single, random lots produced in 1970. No detectable levels of TCDD were found in the 11 samples; the limit of detection ranged from 0.01 parts per million (ppm) to 0.03 ppm. An additional nine HCP samples were analyzed on October 27, 1970, and one sample on March 12, 1971. All 10 samples were non-detect for TCDD; the lower limit of detection ranged from 0.01 ppm to 0.1 ppm. Givaudan began monthly sampling of random lots of HCP for TCDD in January 1976. A total of 212 samples were analyzed between January 1976 and July 1977. It is reported that 90 percent of the HCP sample results contained less than 1.0 ppb TCDD. Seventeen samples had detectable concentrations of TCDD ranging from 1.5 ppb to 4.0 ppb with an arithmetic mean of 2.4 ppb (PAP-00170552-53).

- A sample data record, dated March 30, 1970 states that TCDD was detected at the following concentrations in various samples from the 2,4,5-TCP process at the Hooker facility:

  - Extractor feed sample: 3.0 ppm;
  - "Crude Charged to Still" sample: 12.0 ppm; and,
  - TCP Still Residue sample: 230 ppm.

  TCDD was not detected in a remaining nine samples, with detection limits ranging from 0.01 ppm to 1.0 ppm (PAS-00048146).

- According to an *Investigations Concerning the Possible Presence of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin in Givaudan's Commercial Hexachlorophene*, dated August 4, 1970, 2,4,5-TCP was purchased by Givaudan exclusively from Hooker Chemical Corporation who manufactured a specially purified grade of 2,4,5-TCP for Givaudan. Hooker Chemical Corporation gave Givaudan "firm assurance" that their TCP did not contain any TCDD down to a level of less than 0.1 ppm (PAS-00048356). According to the report, in the samples of commercial HCP investigated, no TCDD could be detected at a limit of sensitivity of 0.03 ppm (PAS-00048357).

- Analysis of three samples of 2,4,5-TCP from Givaudan's supplier in 1976, ICMESA, by U.S. EPA, identified TCDD at concentrations ranging from <2.0 ppb to 1.9 ppb. According to the memorandum, the TCDD concentrations reported by Givaudan for these same three samples are 2.0 ppb, 2.0 ppb and 14.0 ppb. However, the memorandum further states that "[t]he results are quite consistent with those reported by Givaudan … and indicate a very low level of 2,3,7,8-tetrachlorodibenzo-p-dioxin" (PAS-00048297-98).

- An inter-office memorandum, dated June 29, 1976 stated that a quality control specification should be officially established at the site governing the TCDD content of the 2,4,5-TCP used in the production of G-11®. It states that the TCDD limits should have been set to less than 50 ppb (0.05 ppm) (PAP-00183316).

- A subsequent inter-office memorandum, dated July 1, 1976, stated "most lots" of Icmesa 2,4,5-TCP, for which Givaudan had analyses, had TCDD contents below 50 ppb. However, some had concentrations up to "about 80 ppb." The memorandum states that Dow's specification sheet for TCP stipulated less than 0.1 ppm or 100 ppb TCDD (PAP-00183315).

- According to an inter-office memorandum, dated December 6, 1976, the "official Finished Product Specifications for G-11" was a TCDD concentration of less than 20 ppb (PAP-00168618).

- A letter prepared by Givaudan, dated December 17, 1976 states that the limit for TCDD in their final HCP had "recently been established at a value of 20 ppb maximum. This is a value that could possibly exist if 10 ppb of TCDD were in the T.C.P." (PAP-00168620).

- According to an internal report prepared by Givaudan, dated November 19, 1976, due to quality issues associated with Dow 2,4,5-TCP, Givaudan requested a lot of G-11® be analyzed by Dow. It was found to contain less than 1 ppb TCDD. This same material was analyzed by Givaudan and found to contain 15 ppb to 20 ppb TCDD after repetitive analyses (PAP-00169584).

- According to an inter-office memorandum, dated June 13, 1977, Dow committed to providing Givaudan with TCP with a maximum TCDD concentration of 0.01 ppm (PAP-00168658).

- According to an affidavit of the Givaudan Manager of Quality Assurance, the Quality Control Department began this routine analysis for TCDD content in HCP in May 1977. According to the document, review of the results since this laboratory began performing TCDD analysis stated that, prior to June 1978 the majority of samples analyzed were found to be less than 1.0 ppb with several samples (three to four) being below 4.0 ppb. It states that in many instances, the higher TCDD levels were attributed to interferences in the analysis which probably could be eliminated through reanalysis or additional sample clean-up. However, since the TCDD limit at that time was established at 10 ppb, these samples were not reevaluated. All samples evaluated after June 1978 were found to contain less than 1.0 ppb TCDD (PAS-00084004).

- According to an internal Givaudan letter, dated March 9, 1978, although the TCDD specification for pre-purified Dow TCP was less than 10 ppb, Givaudan believed that it consistently contained less than 1 ppb TCDD. Based on this, Givaudan personnel requested that Celamerck agree to provide TCP with less than 5 ppb TCDD. If this was not possible, Givaudan insisted that Celamerck provide the exact TCDD analysis for each batch or lot with a maximum of 10 ppb, noting that Celamerck proposed a maximum TCDD concentration of 15 ppb (PAS-00048194).

- According to a *NIOSH TCDD Registry Site Visit Report of Givaudan Corporation*, dated December 1990, eight samples of process by-products were collected in May 1983. The samples were analyzed for TCDD. Seven of the samples were non-detect for TCDD, with the lower limit of detection ranging from 0.1 ppb to 1.0 ppb. For the eighth sample, 150 nanograms per bottle was reported; however, no sample volume or concentration was given. In addition, three HCP process samples from Givaudan were analyzed by U.S. EPA as part of an analytical methods development study of process wastes and related materials from plants with potential TCDD contamination. No TCDD in excess of the minimum detectable concentrations, which ranged between 50 parts per trillion (ppt) to 140 ppt, was found in the Givaudan samples (PAS-00033689).

- Drums of HCP sampled in 1983 had concentrations of TCDD ranging from 16.1 ppt to 21.8 ppt, where the compendial limit was 50 ppb (PAS-00048299-302).

- According to a letter prepared by Givaudan, dated May 25, 1983, the only waste material resulting from the HCP production was reportedly bentonite clay. Analysis of the clay showed "some G-11," "about 1.0% Trichlorophenol," and no TCDD at the lowest detectable limit of 1.0 ppb. Process water was also analyzed for TCDD and found to be below detectable limits of 1 ppb (PAP-00174267-68).

- According to an interoffice memorandum, dated June 22, 1983, review of laboratory results stated that, prior to June 1978, the majority of samples of HCP analyzed were found to contain less than 1.0 ppb TCDD with several samples (three to four) having a concentration below 4.0 ppb. In many instances, the higher TCDD levels were attributed to interferences in the analysis "which probably could be eliminated through reanalysis or additional sample clean-up." However, since the TCDD limit at that time was established at 10 ppb, these samples were not reevaluated. All samples evaluated after June 1978 were found to contain less than 1.0 ppb TCDD (PAS-00048373).

- The 1990 NIOSH Report states that there was insufficient process information to comment on the potential degree of TCDD contamination of the 2,4,5-TCP. It states that the process was reported to have a distillation step, which would have removed "some or essentially all" of the TCDD. It goes on to state that the amount of TCDD contamination of the 2,4,5-TCP that would be carried through the subsequent production of HCP would depend on process operating conditions and the degree of purification that took place in the 2,4,5-TCP process, but that it was unlikely that any TCDD was formed during the production of HCP due to the process operating conditions. After 1949, with the closure of the on-site 2,4,5-TCP process, exposure to TCDD would have been limited to the amount of TCDD contamination in 2,4,5-TCP Givaudan purchased from outside suppliers (PAP-00170549).

A table presenting TCDD concentrations detected in 2,4,5-TCP feedstock from 1970 to 1983 is presented in **Appendix A-2**. A table presenting TCDD concentrations detected in HCP from 1970 to 1979 is presented in **Appendix A-3**.

4. Identified COCs

- PCBs (used, detected)
- Dioxins / Furans (generated, detected)
- PAHs (used, detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (used, detected)

PCBs

According to a *Hazardous Waste Investigation,* dated June 5, 1980, it was ascertained that Givaudan was generating and storing PCBs onsite. The report states that U.S. EPA inspectors had a report concerning Givaudan's PCB practices, but additional details were not available (PAP-00172019). An undated record titled "Exhibit No. 2, Transformers – PCB Oil-Filled Electrical Transformers" states that the facility historically had 30 PCB-containing transformers (PAP-00176671-72). According to a *Plans for*

Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR), dated July 1982, Givaudan had 38 transformers in operation containing PCBs (PAP-00182108). According to a *Plans for Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, Givaudan had 32 transformers in operation containing PCBs (PAP-00183371).

According to a *Remedial Action Work Plan for Soils*, dated April 2000, surface soil samples were collected from eight locations surrounding two transformer pads that did not have secondary containment, which were located in the vicinity of Building 99. In addition, surface soil samples were collected from immediately below the asphalt in front of the doorways to two electrical switching stations. No PCBs were detected (PAP-00175777-78).

Dioxins / Furans

As discussed in Section 3 above, TCDD contamination was identified at the site associated with HCP and 2,4,5-TCP production.

According to Givaudan's November 10, 2016, Supplemental Response to 104(e) Request for Information, documentation states that prior to 1947, waste was discharged onsite into cesspools and pits. Further, a 1951 Givaudan memo discusses the recovery of HCP from the former waste pits, which also supports the facility's practice of discharging and handling its process waste water from HCP on site before the plant connected to the city sewer line on River Road by 1951-52 (PAS-00048078-79). According to an inter-office memorandum prepared by Givaudan, dated September 14, 1982, it was necessary to capture all discharges before they entered the central sewer and to remove any contaminants that were present. In order to do this, the memorandum states that all "dumps" from equipment/leaks and wash waters must be collected. It went on to propose that G-11® (HCP) grinding be moved to Building 58 in order to consolidate operations, and a pipe within a trench on each side of the Buildings 58, 59, and 60 be constructed. The trench was to channel all leaks and floor washes, and the pipe was to conduct all equipment dumps and washes through a closed pipe. Contaminants would be removed and drummed for disposal, materials dissolved in water would be sent to a steam still for separation, and water would be sent to the chemical sewer when tested and accepted (PAP-00181773). Note: No discharge monitoring data from this time period was identified in the available file material.

According to an *Administrative Consent Order*, dated March 5, 1987, pursuant to New Jersey Pollutant Discharge Elimination System (NJPDES) Permit (No. NJ0099414), effective October 1, 1982, Givaudan discharged industrial wastewater into the PVSC system and analyzed that wastewater discharge for TCDD contamination on a monthly basis at a detection level at or below 1 ppb. The document states that no TCDD contamination had been detected in any of the industrial wastewater discharge from the site (PAS-00001812; PAP-00173361). Note: Related discharge monitoring reports were not identified in the available file material.

A *Discharge Surveillance Report,* prepared by the New Jersey Department of Environmental Protection (NJDEP), dated August 25, 1989, states that Outfall 001 effluent was monitored for TCDD. The concentration reported was 1 ppt (PAP-00170514). Note: Additional related discharge monitoring reports were not identified in the available file material.

According to a *NIOSH TCDD Registry Site Visit Report of Givaudan Corporation*, dated December 1990, samples of the sanitary sewer discharge from the facility were collected in October, November, and December of 1982 and analyzed for TCDD. All three samples were below the 10 ppb limit of detection (PAS-00033689).

According to a letter from Tierra Solutions, Inc. to NJDEP, dated October 20, 2008, sediment samples collected from the stormwater pond had a TCDD detection of 214 ppb (PAP-00179607). Note: The source of this data is unclear and additional details regarding this data were not identified in the referenced document. According to a *Status Report, Remedial Investigation, Dioxin Contamination Non-Process Area*, dated November 15, 1984, in July 1984, a composite of the liquid and a bottom sediment sample were obtained from the stormwater pond for analysis as part of the remedial investigation for TCDD contamination at the site. No TCDD “was present” in the pond sediment sample nor in liquid from the pond itself (PAP-00183454-58). Concentration data were not included in the referenced document.

Givaudan entered into an *Administrative Consent Order* with NJDEP on March 5, 1987; an *Amended Administrative Consent Order TCDD* was signed on February 16, 1988. These consent orders required the investigation and remediation of TCDD contamination in soil (PAS-00001767-73). It is noted that NJDEP originally established a 1.0 ppb action level and 7.0 ppb cleanup goal for TCDD; a site-specific cleanup goal of 20.0 ppb was established in the early 1990s (PAP-00179704). Subsequently, a remedial action objective of 2.0 ppb for TCDD-impacted soils from zero to 12 feet below ground surface (bgs) was established in 1999 (PAP-00180350).

The *Draft TCDD Feasibility Study Report*, dated March 16, 1992 summarized all historical data TCDD collected for soil between 1983 and 1990, including: eight soil samples had been collected at the site with concentrations greater than the site-specific cleanup goal of 20.0 ppb TCDD; concentrations of these eight samples ranged from 22 ppb to a maximum of 200 ppb. Sample depths ranged from zero to 12 inches bgs (PAP-00179717-18). Numerous additional samples which were collected had concentrations greater than 1 ppb but less than 20 ppb, as discussed in Section 7 below.

PAHs

In 1980, the facility reported naphthalene (46,080 pounds), diesel fuel (34,560 pounds), No. 2 fuel oil (45,120 pounds), and No. 6 fuel oil (21,646,800 pounds) were “transferred, refined, processed or stored” at the site at that time (PAP-00182118-19, 21).

According to a NJDEP *Discharge Surveillance Report*, dated November 15, 1991, in June, July, and September 1991, the concentration of petroleum hydrocarbons detected at Outfall 001 exceeded the permit limit of 100 milligrams per liter (mg/L). The maximum detected concentration was 837 mg/L (PAP-00170853-55; PAP-00170938).

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to an on-site stormwater pond (PAP-00183367). A sample of stormwater pond sludge had a fuel oil concentration of 1,700 milligrams per kilogram (mg/kg) (PAP-00181906-08).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). High molecular weight polynuclear aromatic hydrocarbons (PAHs) were detected in post-excavation soil samples collected along the sewer lines (PAS-00033862-84).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, high molecular weight PAHs were detected in a sample collected from the stormwater pond in 1998/1999 (PAS-00033887-88).

Copper

It is noted that the southern part of the Givaudan site previously was occupied by National Anoid, whose operations related to the cleaning and melting of copper wire into copper ingots. The plant burned down in 1926 (PAS-00083993).

According to a PVSC *Heavy Metals Source Determination Study*, dated April 1980, Givaudan contributed 5.661 pounds of copper per day to the PVSC system (PAS-00035841). Copper data reported in wastewater discharge monitoring reports are summarized in **Appendix A-6**. As shown in Appendix A-6, the concentration of copper in wastewater in November 1994 (0.105 mg/L and 0.188 mg/L) exceeded the permit limit of 0.092 mg/L; otherwise, none of the reported detections were above the discharge limit of the permit.

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to an on-site stormwater pond (PAP-00183367). A sample collected from the stormwater runoff collection pond collected in 1982 contained copper at a concentration of 0.17 mg/L (PAP-00181896, 98). A sample of pond sludge had a copper concentration of 490 mg/kg (PAP-00181906-08).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were

collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). Copper concentrations detected in post-excavation soil samples along the sewer lines ranged from 660 mg/kg to 53,000 mg/kg (PAS-00033862-84).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, copper (1,100 mg/kg) was detected in a sample collected from the stormwater pond in 1998/1999 (PAS-00033887).

Lead

According to a PVSC *Heavy Metals Source Determination Study*, dated April 1980, Givaudan contributed 17.039 pounds of lead per day to the PVSC system (PAS-00035841). Lead data reported in wastewater discharge monitoring reports are summarized in **Appendix A-6**. As shown in Appendix A-6, the concentration of lead in wastewater in November 1994 (0.464 mg/L) exceeded the permit limit of 0.029 mg/L; otherwise, none of the reported detections were above the discharge limit of the permit.

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to an on-site stormwater pond (PAP-00183367). A sample collected from the stormwater runoff collection pond collected in 1982 contained lead at a concentration of 2.01 mg/L (PAP-00181896, 98).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). Lead concentrations detected in post-excavation soil samples along the sewer lines ranged from 440 mg/kg to 92,000 mg/kg (PAS-00033862-84). In addition to sewer lines, excavation was conducted in areas of subsurface features identified during sewer decommissioning activities such as cesspools and tanks (PAS-00033781-82). In the area of the former cesspools, lead was detected at a concentration of 19,000 mg/kg (PAS-00033854, 85).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, lead (1,500 mg/kg) was detected in a sample collected from the stormwater pond in 1998/1999 (PAS-00033887-88).

Mercury

According to a PVSC *Heavy Metals Source Determination Study*, dated April 1980, Givaudan contributed 0.0947 pounds of mercury per day to the PVSC system (PAS-00035841). Mercury data reported in wastewater discharge monitoring reports are summarized in **Appendix A-6**. As shown in Appendix A-6, none of the reported detections were above the discharge limit of the permit.

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to an on-site stormwater pond (PAP-00183367). A sample of stormwater pond sludge had a mercury concentration of 0.24 mg/kg (PAP-00181906-08).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). Mercury concentrations detected in post-excavation soil samples along the sewer lines ranged from 15 mg/kg to 130 mg/kg (PAS-00033862-84).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, mercury (23 mg/kg) was detected in a sample collected from the stormwater pond in 1998/1999 (PAS-00033887-88).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the U.S. EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a *Geotechnical Investigation*, dated July 2, 1981, a review of a 1955 topographic map of the site showed that a difference in ground surface elevation of approximately 20 feet previously existed across the site. At the time of the report, the difference in elevation at the site was approximately eight feet, which led to the conclusion that portions of the site were filled since 1955. It appeared that the fill may have been placed between about 1955 and 1960, possibly during the construction of nearby Route 3 (PAP-00181329).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00033862-84, 86).

COCs Found in Onsite Excavation Soils		
COC	**Max Detected Concentration**	**Location**
Lead	92,000 mg/kg	Post-Excavation taken along stormwater sewers (PAS-00033852)
Copper	53,004 mg/kg	Former cesspools (PAS-00033854)
Mercury	130 mg/kg	Post-Excavation taken along stormwater sewers (PAS-00033852)
Benzo(a)anthracene	49 mg/kg	Excavation FYI samples (PAS-00033858)
Benzo(a)pyrene	79 mg/kg	Excavation FYI samples (PAS-00033858)
Benzo(b)fluoranthene	29 mg/kg	Post-Excavation bottom samples (PAS-0003384)
Benzo(k)fluoranthene	120 mg/kg	Excavation FYI samples (PAS-00033858)
Dibenzo(a,h)anthracene	14 mg/kg	Excavation FYI samples (PAS-00033858)
Indeno(1,2,3-cd)pyrene	25 mg/kg	Excavation FYI samples (PAS-00033858)

5. COC Pathways

According to an *Administrative Consent Order*, dated March 5, 1987, the Passaic River is located approximately one-third of a mile southeast of the site (PAS-00001783). According to a *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, there is no evidence of a defined drainage swale either on or off the property to the Passaic River in any of historical aerial photographs (PAS-00048077).

Sanitary and Storm Sewer

Process Wastewater Discharges

According to a *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, the site was connected to the Clifton City sewer system as early as 1926 and no later than 1951/1952. In the early 1950s, the chemical sewer system was connected to the City of Clifton sewer system on River Road. The earliest engineering drawing referencing a plant sewer system for the site was originally dated 1946 and contains a revision through 1969. Until 1946, the documentation stated some sanitary wastewater and process wastewater generated by

the plant was disposed of in cesspools and pits, with some waste used as supplemental fuel in the plant boiler (PAS-00048079-80, 114). A *Request for Information Response Document*, dated July 9, 2004, also states that up until approximately the 1950s on-site sanitary wastewater from Buildings 2, 3, 4, 5, and 6 was discharged to septic cesspools located onsite (PAS-00083366). The installation of a dedicated plant sewer system in 1946 and the appearance of a spent acid pit in 1947, followed by the development of a third surface water impoundment by 1949, supported the conclusion that plant process wastewater was initially handled onsite. The document goes on to state that an on-site stormwater management system was evident by 1947 and was supported by the appearance of a stormwater pond and a stormwater conveyance system, which remained in use until the plant closed (PAS-00048079).

According to the *Request for Information Response Document*, dated July 9, 2004, during the 1940/1950 timeframe, Givaudan had two sewer systems in place:

(1) Sanitary sewers collected sanitary wastewater via six-inch vitrified clay pipelines connected to an eight-inch vitrified clay main sanitary sewer line located on Delawanna Avenue. The six-inch vitrified clay sanitary sewer line collected sanitary sewage from Buildings 3, 4, 5, 6, 12, 34, 36, and 21 and directed the sanitary sewage to the City of Clifton via Delawanna Avenue.

(2) Industrial wastewater was collected by a chemical sewer and directed south to River Road for treatment by the City of Clifton. The chemical sewer collected wastewater from the manufacturing buildings. Wastewater was collected from floor drains and trenches constructed within concrete or tiled flooring. The drains consisted of vitrified clay pipe of various sizes that led to a main 18-inch vitrified clay chemical sewer that ran directly south and then southwest towards River Road (PAS-00083349).

According to the *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, the connection of the plant process waste stream (subsequently identified as Outfall 001) to the River Road sewer system appeared to have been made no later than 1951/1952, and perhaps several years earlier (PAS-00048080).

A *Remedial Action Report for Sewer Decommissioning*, dated February 2000, states that in the mid-1980s, portions of the original chemical sewer were abandoned and replaced, or retrofitted with the new chemical sewer consisting of secondary contained fiberglass reinforced plastic pipe. In addition, as manufacturing operations at the facility were altered or shut down, portions of the old chemical sewer were abandoned and not replaced (PAS-00033773; PAS-00083367-68).

In addition, Givaudan constructed a primary wastewater pretreatment plant in the mid-1980s to treat industrial wastewater that was being discharged to the PVSC system. Prior to construction of the pretreatment system, Givaudan discharged industrial wastewater directly to PVSC without pretreatment, pursuant to a user's fee arrangement with PVSC (PAS-00083365-66). According to a letter prepared by Givaudan, dated April 6, 1978, several steps were taken to eliminate the reoccurrence of pipe corrosion

including the repair of liming equipment and the purchase of additional equipment to better control the pH of effluent (PAP-00170539).

According to a letter prepared by Givaudan, dated September 26, 1988, the only wastewater pretreatment conducted was pH correction and an oil-water separation to comply with PVSC permit requirements. The wastewater was not physically or chemically treated to reduce suspended solids using a clarifier, settling tank or other means (PAP-00168740).

It appears that prior to the 1980s, contaminated wastewater may have been discharged to the PVSC system directly. According to an inter-office memorandum prepared by Givaudan, dated September 14, 1982, it was necessary to capture all discharges before they entered the central sewer and to remove any contaminants that were present. In order to do this, the memorandum states that all "dumps" from equipment, leaks and wash waters must be collected. It went on to propose that G-11® (HCP) grinding be moved to Building 58 in order to consolidate operation, and a pipe within a trench on each side of the Buildings 58, 59, and 60 be constructed. The trench was to channel all leaks and floor washes, and the pipe was to conduct all equipment dumps and washes through a closed pipe. Contaminants would be removed and drummed for disposal, materials dissolved in water would be sent to a steam still for separation, and water would be sent to the chemical sewer when tested and accepted (PAP-00181773).

The facility first received a NJPDES permit (No. NJ0099414) from NJDEP to discharge industrial wastewater to the PVSC system on October 1, 1982, effective through September 30, 1987 (PAP-00173361). The permit identified three outfalls (001, 002, 003) through which the site was allowed to discharge wastewater. Monitoring requirements included that for TCDD at Outfall 001. The TCDD discharge limit was "below method detection limit" (PAP-00173364).

According to historical aerial photograph notes, Outfall 002 discharged to the City of Clifton sewer line located on Delawanna Avenue which connected directly to the PVSC system. This line is believed to have been used primarily for sanitary waste water discharge (PAS-00048106, 114). Outfall 003 received "non-regulated wastewaters" from the cafeteria, laboratory, Building 105, Building 106 (used for storage of furniture and unused equipment), and Building 102 (used for packaging of printed material) (PAS-00036518).

The first record of a PVSC Sewer Connection Permit identified in the available file material following the NJPDES permit was a PVSC Sewer Connection Permit (No. 03401024) effective beginning March 17, 1991 (PAP-00170725). It is noted that a fourth outfall was identified in this permit (PAP-00170732). Details of this permit and other related records (and subsequent permits) are presented in the table below, which summarizes wastewater sources (or outfall descriptions), monitoring requirements for OU2 COCs, and discharge volumes for each outfall, as available.

It is noted that according to a letter prepared by Givaudan, dated September 12, 1995, Outfalls 003 and 004 were combined into one outfall (003) (PAP-00172207).

Summary of PVSC Outfall Information by Reference				
Reference	**Outfall**	**Wastewater Source/Description**	**Monitoring Requirements**	**Discharge Volume**
NJPDES Permit (No. NJ0099414), effective October 1, 1982, to September 30, 1987	001	Not documented (identified as "River Road outlet")	TCDD = below method detection limit	Not documented
	002	Building 103	None	Not documented
	003	Building 105	None	Not documented
Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR), dated July 1982 (PAP-00182102-03)	001	Effluent from chemical plant and sanitary waste	Not documented	30 million gallons/month
	002	Waste from sanitary and cleaning sources	Not documented	20,000 gallons/month
	003	Waste from office and non-chemical laboratory Building 100, also Flavor Manufacturing Center	Not documented	one million gallons/month
PVSC Sewer Connection Permit #03401024, effective March 17, 1991 to March 17, 1996 (PAP-00170725, 29-32)	001	River Road	None	Not documented
	002	Building 103	None	Not documented
	003	Building 105	None	Not documented
	004	Buildings 34, 36, and 72	None	Not documented
Letter prepared by Givaudan, dated June 15, 1993 (PAP-00171801, 06)	001	Aroma chemical manufacturing operation	Lead = 690 microgram per liter (µg/L) (maximum per day)	Not documented
	002	Fragrance compounding	Not documented	Not documented
	003	Sanitary wastewater, previously flavor operations	Not documented	Not documented
	004	Sanitary wastewater	Not documented	Not documented
Application for a Sewer Connection Permit, dated March 1996 (PAP-00172478)	001	River Road	Not documented	302,400 gallons/day
	002	Building 103	Not documented	26,100 gallons/day
	003	Buildings 100 and 102	Not documented	71,600 gallons/day
	004	Sanitary wastewater to Delawanna Ave.	Not documented	21,600 gallons/day
PVSC Sewer Connection Permit #03401023, effective March 17, 1996 to March 17, 2001 (PAP-00172521, 23-28, 30)	001	River Road	Copper = 3.02 mg/L Mercury = 0.08 mg/L (monthly averages) Lead = 690 µg/L (maximum per day)	Not documented
	002	Building 103	Copper = 3.02 mg/L Lead = 0.54 mg/L Mercury = 0.08 mg/L (monthly averages)	Not documented

The PVSC Sewer Connection Permit (No. 03401023) was terminated in February 1999 (PAP-00175005) following facility closure in 1998.

The City of Clifton sewer system connects to the Yantacaw Bypass operated by the PVSC. At the direction of PVSC, this manual bypass discharged to the Third River at the confluence with the Passaic River (PAP-00345562). In 1976, the overflow was classified by PVSC as inactive (PAP-00345562).

The locations of the wastewater outfalls are presented in **Appendix B-3**. Wastewater flow diagrams are presented in **Appendix B-4**.

According to a *Selected Substances Report* dated August 13, 1980, the facility discharged 2,000,000 to 3,000,000 gallons of wastewater per day to the PVSC system (PAP-00180554). According to an *Application for a Sewer Connection Permit*, dated March 1996, between July 1994 and June 1995, the facility discharged 2,000,000 gallons of sanitary wastewater; 102,147,000 gallons of process wastewater; and, 17,312,000 gallons of cooling water to the combined sewer (PAP-00172475).

A summary of wastewater discharge volumes identified in the available file material by year and outfall is presented in **Appendix A-4**.

Figures depicting the layout of the facility sewer system are presented in **Appendix B-5**.

Stormwater Discharges

A stormwater detention pond is visible onsite in aerial photographs as early as 1947 (PAS-00048105).

According to the *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, there was no overland path for runoff to the east from the site to the Passaic River and that any surface runoff would have been collected in the City of Clifton storm sewer system on River Road near the railroad underpass (PAS-00048077-8). It also states that historical aerial photographs stated that there was no visible channelized flow or surface drainage feature visible on or off of the plant property, and that the alleged existence of a possible surface water pathway that could have conveyed storm water flow from the site directly to the Passaic River was not supported by historical aerial photographs (PAS-00048077).

According to a document titled “Plant Storm Water” dated December 30, 1981, runoff from “a large part” of the plant went into the stormwater retention pond (capacity of 250,000 gallons) outside of Building 50. This included water from the surface as well as that which was piped; it then evaporated or seeped into the ground. In addition, water from the land surrounding Building 93 ran over the drum farm area onto River Road, and water from the area along the railroad tracks, Buildings 79, 93, and 95, drained onto the railroad property. Stormwater from remaining areas percolated into the ground (PAS-00048426).

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to the on-site stormwater pond, a gully adjacent to the railroad tracks, the gutter of River Road, and the Passaic River via an existing storm sewer (PAP-00183367). There were originally two locations where stormwater exited from the site to the Clifton stormwater system: one at Delawanna Avenue; one at River Road. A third location was added along River Road as part of road work completed to improve Route 3 and Route 21 in 1961-1962. The Delawanna stormwater system discharged into Yantacaw Pond; the River Road storm sewer system at the eastern end of the site discharged into the Passaic River; the storm sewer at the River Road railroad overpass juncture conveyed stormwater to the Third River (PAS-00048128).

Stormwater drainage patterns in 1991 are depicted in **Appendix B-6**.

The facility held a NJPDES permit (No. NJ0088374), effective July 1, 1992 through June 30, 1997, for discharge of stormwater to "infiltration/percolation lagoons." Discharges to the pond were not required to be monitored for OU2 COCs (PAP-00170994-995, 1000).

Stormwater runoff rates in 1993 identified in the available file material are presented in **Appendix A-5**.

A *Lagoon Closure Plan*, dated May 1, 1996, states that stormwater sewer inlets were located throughout the facility. At that time, the stormwater sewers and overland flow discharged to the Clifton stormwater sewer at Delawanna Avenue, a stormwater collection lagoon, the swale beside the railroad, River Road at the railroad crossing, and an inlet at River Road that all discharged through the City of Clifton storm sewer system and, ultimately, into the Passaic River (PAP-00181291).

According to the *Request for Information Response Document*, dated July 9, 2004, the stormwater pond was decommissioned (drained and filled) in 1999 (PAS-00083368-69).

It is noted that according to a *Request for Information Response Document*, dated July 9, 2004, Givaudan maintained a Stormwater Pollution Prevention Plan and stormwater permit (No. NJ0088315), which required monthly monitoring of stormwater effluent (PAS-00083363); however, no permits related to the discharge of stormwater to the Clifton storm sewer were identified in the available file material. Therefore, information related to discharge volumes, receiving water bodies, and monitoring requirements potentially presented in the permits are unavailable. A letter from NJDEP dated May 5, 1999, states the permit was revoked on that date (PAP-00175062).

Spills

According to a 1983 *Summary of Fires/Explosions/Accidents* document, three "TCP accidents" occurred at the site: one on August 13, 1976; one on January 17, 1977; and, one on September 11, 1980. The accidents were described as "TCP drum spilled in hot box." In addition, a "G-11 accident" occurred on April 21, 1981, and was described as "G-11 reactor raw materials flew out of unsecured manhole cover onto building floor"

(PAP-00183358-59). According to an internal memorandum, dated January 18, 1977, the TCP accident on January 17, 1977 involved the spillage of one drum of TCP (PAP-00183530). Note: Additional information related to these spills/incidents was not identified in the available file material, and it is unclear if these incidents resulted in releases of OU2 COCs.

According to a letter prepared by Givaudan, dated April 6, 1978, the sanitary sewer line on River Road failed on March 15 and 21, 1978. The letter stated that the quantity of effluent discharged into the Third River because of these leaks was "extremely difficult to determine." The letter states it could have varied from 10 gallons to 100 gallons per hour depending on the flow from the plant. The nature of the effluent at the time of the breaks was also "difficult to determine" (PAP-00170539; PAP-00181215). According to a memorandum, dated March 21, 1978, on March 20, 1978, PVSC personnel visited Givaudan in order to review their pH control system. This visit was due to the failure of the sanitary sewer line. The memorandum states that Givaudan was the largest contributor to this sewer line, and improper pH control by Givaudan "most likely" was the major cause of the failure. It was noted that Givaudan had replaced this section of sewer line at the end of July 1977 (PAP-00181217). According to a letter prepared by Givaudan, dated May 5, 1978, in August of 1977, Givaudan had replaced a leaking sanitary sewer line owned by the City of Clifton which was suspended from Passaic County Bridge No. 80 crossing the Third River. Although the line was actually owned by the City of Clifton, it carried domestic sewerage as well as industrial waste. The new sewer line was "eaten through" in eight months resulting in a "serious spill" into the river on March 15, 1978, and a less serious spill on March 21, 1978. As of April 10, 1978, the line had again been replaced (PAP-00181224). According to the April 6, 1978 Letter wastewater analysis taken in 1977 contained 0.212 copper, 0.766 lead and 0.0038 mercury the units were not specified (PAP-00181220).

According to an interoffice memorandum, dated August 5, 1981, because the "spent acid tank" was full, spent acid from the G-11® process was to be disposed by "very slowly" discharging to the sewer until the disposal problem could be resolved. The rate of dumping was specified to be approximately 2,750 pounds of acid every other day (PAP-00178319). Note: It is unclear if OU2 COCs were associated with the spent acid based on review of available file material.

According to an undated document titled *Investigation of G-11 Loss*, in August 1982, approximately 1,212 pounds of G-11® was accidentally washed down the sewer (PAP-00177132). Note: Additional details of this incident were not identified in the referenced document.

6. Regulatory History/Enforcement Actions

Inspections

According to correspondence issued by NJDEP, dated December 26, 1990, the facility received an "unacceptable" rating following a compliance evaluation inspection in part due the lack of a "Discharge to Ground Water (DGW) Permit" for the stormwater collection system which carried condensate from various pipes around the facility and

stormwater from the chemical storage areas into the on-site pond. The facility was directed to submit an associated permit application within 45 days (PAP-00170661-62). Givaudan filed the associated discharge permit application on April 12, 1991 (PAP-00170756). On May 29, 1992, the facility received a NJDPES permit (No. NJ0088374) which included amendments for a proposed surface impoundment and closure of the existing pond (PAP-00170991; PAP-00170994).

Violations and Enforcement Actions

On June 17, 1983, the governor of New Jersey issued an Executive Order declaring a state of emergency due to TCDD contamination at the site (PAS-00001801). The order required that all areas where TCDDs were detected at concentrations greater than or equal to 1.0 ppb be restricted from access, and that HCP production be suspended (PAS-00001801-03).

Givaudan entered into an *Administrative Consent Order* with NJDEP on March 5, 1987; an *Amended Administrative Consent Order TCDD* was signed on February 16, 1988. These consent orders required the investigation and remediation of TCDD contamination in soil (PAS-00001767-73).

On March 12, 2002, NJDEP issued a “no further action” letter for soils containing TCDD, which included the site use restrictions (PAS-00106564-66).

Permits

The facility first received a NJPDES permit (No. NJ0099414) from NJDEP to discharge industrial wastewater to the PVSC system on October 1, 1982, effective through September 30, 1987 (PAP-00173361).

The first record of a PVSC Sewer Connection Permit identified in the available file material following the NJPDES permit was a PVSC Sewer Connection Permit (No. 03401024) effective beginning March 17, 1991 (PAP-00170725). The PVSC Sewer Connection Permit was renewed on March 17, 1996, under permit No. 03401023 (PAP-00172521). The PVSC Sewer Connection Permit (No. 03401023) was terminated in February 1999 (PAP-00175006).

The facility also held a NJPDES permit (No. NJ0088374), effective July 1, 1992 through June 30, 1997, for discharge of stormwater to “infiltration/percolation lagoons” (PAP-00170994).

According to a *Request for Information Response Document*, dated July 9, 2004, Givaudan maintained a Stormwater Pollution Prevention Plan and stormwater permit (No. NJ0088315), which required monthly monitoring of stormwater effluent (PAS-00083363); however, no permits related to the discharge of stormwater to the Clifton storm sewer were identified in the available file material. A letter from NJDEP dated May 5, 1999, states the permit was revoked on that date (PAP-00175062). Givaudan ceased manufacturing operations in June 1998 (PAP-00178473).

Additional details regarding these permits are presented in Section 5 above.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Chemical Sewer Investigation*, dated September 20, 1983 (PAS-00001730);
- *Status Report, Remedial Investigation, Dioxin Contamination Non-Process Area*, dated November 15, 1984 (PAP-00183454);
- *Draft TCDD Investigation Report*, dated May 18, 1989 (PAP-00170281);
- *TCDD Investigation Report and Limited Investigation Report*, dated January 1991 (PAP-00170664);
- *Draft TCDD Feasibility Study Report*, dated March 16, 1992, (PAP-00179675);
- *Remedial Investigation Report for Soils*, dated October 1997 (PAP-00182246);
- *Remedial Action Report for On-Site Containment of 2,3,7,8-TCDD-Impacted Soils*, dated October 1999 (PAP-00345755);
- *Preliminary Assessment Report*, dated November 1999 (PAP-00175239);
- *Remedial Action Report for Sewer Decommissioning*, dated February 2000 (PAS-00033747);
- *Remedial Action Work Plan for Soils*, dated April 2000 (PAP-00175624); and,
- *Remedial Action Report for 2,3,7,8-TCDD Excavation and Disposal*, dated September 2000, Revised February 2001 (PAP-00180344).

Sewer

Integrity of Chemical Sewer System

This subsection discusses the integrity of the chemical sewer system as documented in the available file material.

According to a *Chemical Sewer Investigation*, dated September 1983, investigation of the chemical sewer stated that many defects were present within the piping system and structures comprising the chemical sewer and its branches. Defects identified included misaligned and open joints in the piping system (indicating a potential for exfiltration), as well as cracked and broken pipe in many locations. Some of the manhole structures were also found to be in poor condition. The results of the exfiltration hydrostatic test suggested a potential for leakage from the system. The report states that although some leakage could be expected from all piping systems constructed of similar materials utilized in the chemical sewer, the leakage from this particular system was felt to be higher than normal. An inspection of the connections to the chemical sewer and its branches found many locations where exfiltration could occur. Significant deterioration of discharge troughs, traps, and connections were evident, providing locations where direct exfiltration could occur (PAS-00001735). The potential daily total of exfiltration for the entire chemical sewer system was estimated to be 80,400 gallons per day (PAS-00001746). The location where the majority of leakage was occurring was along the

main branch of the chemical sewer and the branch starting at manhole No. 11. These two piping systems were estimated to contribute over 75% of the exfiltration in the system while comprising only 65% of the total length of the system (PAS-00001747).

Explosions in the chemical sewer were reported in 1973, 1980, and twice in 1982 (PAP-00181228-29).

Sewer Sampling Data

According to a letter prepared by NJDEP, dated August 27, 1984, Givaudan planned construction of new chemical sewer lines at the site as soon as an assessment stated the presence or absence of TCDD contamination along the proposed sewer line. All samples showed non-detectable levels of TCDD with the exception of four samples with concentrations ranging from 0.095 ppb to 0.398 ppb (PAP-00183328). According to the letter, these values were below the residential action level of 1 ppb so NJDEP authorized Givaudan to proceed with construction of the chemical sewer line (PAP-00183329).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). 2,4,5-TCP was detected in post-excavation soil samples at concentrations ranging from 62,000 micrograms per kilogram (µg/kg) to 290,000 µg/kg. In addition, high molecular weight PAHs were detected in post-excavation soil samples collected along the sewer lines, along with the following OU2 COCs (PAS-00033862-84):

Range of Concentrations of OU2 COCs Detected in Post-Excavation Soil Samples along the Sewer Lines

COC	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)
Copper	660	53,000
Lead	440	92,000
Mercury	15	130

In addition to the sewer lines, excavation was conducted in areas of subsurface features identified during sewer decommissioning activities such as cesspools and tanks (PAS-00033781-82). In the area of the former cesspools, lead was detected at a concentration of 19,000 mg/kg and copper was detected at a concentration of 53,000 mg/kg (the sample depth was not reported) (PAS-00033854, 85).

Spent Acid Pit

According to a Givaudan document titled *Recovery of G-11 from Sediment in Sewer Ditch,* dated August 27, 1951, sediment had collected in “the pond.” Individual samples of sediment from various locations in the pond, as well as representative samples of the

whole pond, were collected and found to consist of principally G-11® (HCP) and inorganic matter (e.g., sand, “filtercel,” grit, and calcium salts). Representative samples of the sediment yielded 60% “G-11 Pure” (based on the dry solid content of the sediment). The G-11® content was not uniform over the whole pond. The solids near the west end of the pond were approximately 70% G-11®, while the G-11® content near the middle and east end of the pond was about 50% G-11® (PAP-00183732). The referenced document does not identify the name of the pond; however, according to Givaudan’s November 10, 2016, Supplemental Response to 104(e) Request for Information, documentation states that prior to 1947, waste was discharged onsite into cesspools and pits. Further, a 1951 Givaudan memo discusses the recovery of HCP from the former waste pits, which also supports the facility's practice of discharging and handling its process waste water from HCP on site before the plant connected to the city sewer line on River Road by 1951-52 (PAS-00048078-79).

Stormwater Pond

As discussed in the previous subsection, surface water run-off from the site was discharged to an on-site stormwater pond (PAP-00183367).

According to a *Status Report, Remedial Investigation, TCDD Contamination Non-Process Area*, dated November 15, 1984, in July 1984, a composite of the liquid and a bottom sediment sample were obtained from the stormwater pond for analysis as part of the remedial investigation for TCDD contamination at the site. No TCDD “was present” in the pond sediment sample nor in liquid from the pond itself (PAP-00183454-58). Concentration data were not included in the referenced document.

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, lead (1,500 mg/kg), copper (1,100 mg/kg), and mercury (23 mg/kg) were detected in a sample collected from the stormwater pond, along with high molecular weight PAHs, in 1998/1999 (PAS-00033887-88).

Building Interior

According to an *Administrative Consent Order*, dated March 5, 1987, on July 9, 1983, Givaudan conducted a TCDD sampling program including sweep and wipe sampling of the interiors of buildings on portions of the site where HCP or 2,4,5-TCP were being or had been manufactured. Of the 31 samples analyzed, TCDD was present in detectable concentrations in 20 samples. Of those 20 samples, nine chip samples had TCDD concentrations of less than 1 ppb, four had TCDD concentrations between 1.0 ppb and 7.0 ppb, one chip sample had TCDD present in excess of 7.0 ppb (in Building 54 where TCP was believed to have been manufactured), and six wipe samples had TCDD concentrations of between 1.0 and 7.0 nanograms per square foot (PAS-00001809).

According to a letter prepared by Givaudan, dated March 29, 1996, five wipe samples also were collected from Building 54 for TCDD analysis in 1996. The maximum concentration detected was 373 nanograms per square meter (PAP-00172551-52).

Soil

This subsection is divided into a discussion of TCDD characterization activities at the site, and site characterization activities for all other OU2 COCs.

TCDD Characterization

Givaudan entered into an *Administrative Consent Order* with NJDEP on March 5, 1987; an *Amended Administrative Consent Order TCDD* was signed on February 16, 1988. These consent orders required the investigation and remediation of TCDD contamination in soil (PAS-00001767-73). It is noted that NJDEP originally established a 1.0 ppb action level and 7.0 ppb cleanup goal for TCDD; a site-specific cleanup goal of 20.0 ppb was established in the early 1990s (PAP-00179704). Therefore, the referenced documents summarized below often refer to TCDD concentrations relative to these concentration targets. It appears that subsequently, a remedial action objective of 2.0 ppb for TCDD-impacted soils from zero to 12 feet bgs was established in 1999 (PAP-00180350).

According to the *Administrative Consent Order*, dated March 5, 1987, on June 3, 1983, Givaudan agreed to conduct a sampling program designed to ascertain the presence or absence of TCDD in or on the soils, waters, equipment and/or structures at the site. Givaudan reported to NJDEP that the analyses of 15 out of 22 samples collected stated the presence of TCDD in detectable concentrations. Of those 15 samples, six had concentrations of less than 1.0 ppb, eight had concentrations between 1.0 ppb and 7.0 ppb, and one had a TCDD concentration in excess of 7.0 ppb. All samples whose analysis stated the presence of TCDD in concentrations over 1.0 ppb were collected in the area of the site where HCP had been manufactured (referred to as the "Contaminated Process Area"). No TCDD was detected in samples collected off site (PAS-00001808-10).

According to the 1990 NIOSH Report, Givaudan collected soil samples in the vicinity of the main HCP production building on approximately June 14, 1983. Results from 12 samples had TCDD concentrations ranging from 0.94 ppb to 11 ppb (PAP-00170554).

According to the *Administrative Consent Order*, dated March 5, 1987, on June 18 and 25, 1983, Givaudan conducted TCDD sampling at the site. Of the 41 samples collected, 25 had TCDD contamination in detectable concentrations. Of those 25 samples, 13 had TCDD concentrations less than 1.0 ppb, 11 had TCDD concentrations between 1.0 ppb and 7.0 ppb, and one sample had TCDD present in excess of 7.0 ppb (PAS-00001809).

According to a *Status Report, Remedial Investigation, TCDD Contamination Non-Process Area*, dated November 15, 1984, in July 1984, soil sampling was conducted around the stormwater pond as part of the remedial investigation for TCDD contamination at the site (PAP-00183454-58). TCDD contamination in soils around the stormwater pond existed at a number of locations and to depths of 12 inches bgs (PAP-00183458). TCDD concentrations in excess of 1.0 ppb were encountered at four borings in the vicinity of the stormwater pond. TCDD was present in the surface sample

in two of these borings and to a depth of 12 inches bgs in the other two borings at concentrations ranging up to 16.89 ppb (PAP-00183457).

According to the *Administrative Consent Order*, dated March 5, 1987, during the course of a TCDD sampling program conducted by Givaudan and U.S. EPA through July 30, 1985, a total of 402 samples were analyzed for TCDD. Findings were as follows:

- All samples analyzed as having TCDD contamination in concentrations of 1.0 ppb or more were located in the "Contaminated Process or Contaminated Non-Process Areas."

- Twenty-six samples were collected and analyzed by U.S. EPA in the area surrounding the site, all of which were analyzed as containing no TCDD contamination at concentrations of 1.0 ppb or more.

- Three hundred twenty-nine samples were collected and analyzed by Givaudan outside the buildings located on the site, 255 of which were analyzed as containing no TCDD contamination in concentrations of 1.0 ppb or more, 51 of which were analyzed as having TCDD contamination in concentrations between 1.0 ppb and 7.0 ppb, and 23 of which were analyzed as having TCDD contamination in excess of 7.0 ppb.

- Forty-seven samples were collected and analyzed at various locations inside the buildings located on the site, six of which were analyzed as having TCDD contamination at concentrations of 1 nanogram per square foot or more (none of which were analyzed as having TCDD contamination in concentrations in excess of 7 nanograms per square foot) and 41 of which were analyzed as having no TCDD contamination in concentrations of 1 nanogram per square foot or less (PAS-00001812).

Between 1988 and 1989, field investigations were conducted at the site to delineate the presence and extent of TCDD contamination to partially fulfill the March 1987 *Administrative Consent Order*. The investigation concluded that soils impacted by TCDD were confined to the upper 24 inches of the soil profile (PAS-00106329-30).

According to a *Draft TCDD Feasibility Study Report*, dated March 16, 1992, based on the results of the comprehensive site investigation, two areas of potential concern were identified: the Contaminated Process Area and the Contaminated Non-Process Area. The area consisting primarily of buildings formerly used for the manufacture of chemicals and some immediately-adjacent soils was designated as the Contaminated Process Area, while the Contaminated Non-Process Area was comprised of three distinct sub-areas which were identified as former drum storage locations. It was believed that the residual TCDD contamination present in the soil profile was a result of inadvertent spills and leaks originating from the drums (PAP-00179682). The locations of the Contaminated Process Area and Contaminated Non-Process Area are depicted in **Appendix B-7**. At the Contaminated Process Areas, with the exception of one sample, the vertical extent of TCDD contamination was limited to the upper 18 inches bgs of the

soil profile within the area (PAP-00179699-700). The deepest TCDD contaminated soils found were at 10 to 12 inches bgs at Contaminated Non-Process Areas A and B. The deepest TCDD contaminated soils found were at 12 to 18 inches bgs at Contaminated Non-Process Area C. Sample data collected in 1988 and 1989 for TCDD and as discussed in the report were as follows:

- On May 21-22, 1988, 46 samples collected in the Contaminated Non-Process Area were analyzed for TCDD. Of these 46 samples, 36 samples demonstrated the presence of TCDD at concentrations less than 1.0 ppb, eight samples demonstrated the presence of TCDD concentrations in the range of 1.0 ppb to 7.0 ppb, and two samples had TCDD concentrations greater than 7.0 ppb (PAP-00179696).

- Of 80 samples collected at the Contaminated Non-Process Area on November 19, 1988, 57 samples (71 percent) had TCDD concentrations below 1.0 ppb, 19 samples (24 percent) had TCDD concentrations ranging from 1.0 ppb to less than 7.0 ppb, and four samples (5 percent) had TCDD concentrations in excess of 7.0 ppb (PAP-00179696, 98).

- Of the 65 samples collected on March 18, 1989 at the Contaminated Non-Process Area, 33 samples (51 percent) had TCDD concentrations below 1.0 ppb, 28 samples (43 percent) had TCDD concentrations ranging from 1.0 to less than 7.0 ppb, and 4 samples (6 percent) had TCDD concentrations in excess of 7.0 ppb (PAP-00179698).

- On 18 March 1989, 18 additional soil samples, and three Building 54 samples (located above the chemical sewer line) were collected from the Contaminated Process Area. Of the 16 soil samples analyzed, six samples had TCDD concentrations below 1.0 ppb, 10 samples had TCDD concentrations ranging from 1.0 to 7.0 ppb, and two samples had TCDD concentrations in excess of 7.0 ppb (PAP-00179698).

To summarize the historical data described above, the *Draft TCDD Feasibility Study Report*, dated March 16, 1992, stated that between 1983 and 1990, eight soil samples had been collected at the site with concentrations greater than the site-specific cleanup goal of 20.0 ppb TCDD; concentrations of these eight samples ranged from 22 ppb to a maximum of 200 ppb. Sample depths ranged from zero to 12 inches bgs. The volume of soil containing greater than 20.0 ppb TCDD was calculated to be approximately 12,400 cubic feet (PAP-00179717-18).

According to a *Remedial Action Report for 2,3,7,8-TCDD Excavation and Disposal*, dated September 2000, a remedial action objective for TCDD-impacted soils at the site was the removal of TCDD-impacted soils having concentrations greater than 2.0 ppb in the 0 to 12-foot bgs soil profile (PAP-00180350). Additional sampling for TCDD was conducted in areas identified as past drum storage areas at the site. In addition, areas of suspected TCDD contamination, which were identified during previous site investigations, but could not be sampled due to production operations in the buildings,

were sampled (PAP-00180351). The maximum detected TCDD concentration was 18.79 ppb at five to six feet bgs. In the surface soil interval (zero to two feet, at original grade), TCDD concentrations ranged from 0.012 ppb to 16.2 E ppb (the "E" states the concentration of TCDD exceeds the upper end of the method's calibration curve (PAP-00180358, 81).

The location of the drum storage area is depicted in **Appendix B-8**.

Other OU2 COCs

According to the *Remedial Investigation Report for Soils*, dated October 1997, the remedial investigation was completed in three phases. The initial phase was conducted during the period from February 26, 1996 to March 8, 1996, and consisted of the installation of 88 soil borings. Based on the findings of the initial phase, 10 additional soil borings were installed in the investigation areas during a supplemental investigation implemented in May 1996 to further delineate the horizontal and vertical extent of impacted soil. On October 28, 1996, two soil borings were installed during a Supplemental Soil Investigation conducted to complete the delineation of the perimeter of the site (PAP-00182317). The following are the maximum detected concentrations of COCs in soil, along with the depths at which the maximum detected concentrations were detected and the locations (PAP-00182344):

Maximum Detected Concentrations of COCs in Soil Reported in *Remedial Investigation Report for Soils*, dated October 1997			
COC	**Concentration (mg/kg)**	**Depth**	**Location of Maximum Detected Concentration**
Copper	1,800	10-12 feet bgs	Chemical Sewer
Lead	4,800	10-12 feet bgs	Former Spent Acid Pit
Mercury	35	10-12 feet bgs	Chemical Sewer

High molecular weight PAHs were also detected with maximum concentrations reported in the 10 to 12-foot bgs depth interval at the drum storage area and warehouse (PAP-00182319, 29, 41-47). 2,4,5-TCP was detected at the 10 to 12-foot bgs depth interval at the drum storage area at a concentration of 170,000 µg/kg (PAP-00182342). Noting that maximum detected concentrations were in deep subsurface soil, the following concentrations of OU2 COCs were also reported for surface soil: lead (1,900 mg/kg) and mercury (17 mg/kg) in a sample collected from zero to two feet bgs in the area of the chemical sewer (PAP-00182344).

Remedial Activities

According to a letter prepared by NJDEP, dated December 17, 1991, NJDEP originally determined that a site-specific TCDD soil cleanup level of 20.0 ppb was acceptable for the site (PAP-00170898). According to a letter prepared by Givaudan, dated April 25, 1991, the volume of soil in the Contaminated Process and Contaminated Non-Process areas with TCDD concentrations in excess of 7.0 ppb was estimated to be 900 cubic

yards. The volume of soil in the Contaminated Process and Contaminated Non-Process areas with TCDD concentrations in excess of 20.0 ppb was estimated to be 510 cubic yards (PAP-00170773). According to the *Draft TCDD Feasibility Study Report*, dated March 16, 1992, the areal extent of soils containing TCDD greater than 1.0 ppb was calculated to be approximately 101,700 square feet. The volume of soil containing greater than 1.0 ppb but less than or equal to 20.0 ppb TCDD was calculated to be approximately 7,100 cubic yards. In addition to this volume of soil,128 55-gallon drums of soil removed from north of Building 68 were classified as greater than 1.0 ppb but less than or equal to 20.0 ppb TCDD (PAP-00179717-19).

According to a letter prepared by Givaudan, dated February 27, 1995, in February 1988, TCDD-contaminated soil was excavated to a concentration of 1 ppb, and placed in 128 drums (PAP-00172020). According to the October 1999 Remedial Action Report for On-Site Containment of 2,3,7,8-TCDD-Impacted Soils, the soil from these drums, in addition to soils above 1 u/g/kg TCDD excavated from Work Areas, was placed in the onsite containment cell (PAP-00345774).

According to a *Remedial Action Report for Sewer Decommissioning*, prepared for Givaudan, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line, five underground storage tanks, four cesspools, miscellaneous features such as manholes, catch basins, and 15,600 tons of impacted soils were removed from the site for disposal at off-site disposal facilities. In addition, the stormwater pond was taken out of service (including removal of 135,000 gallons of water) and underlying soils were removed, and 2,558 tons of asphalt from paved areas in the plant were removed and sent offsite for disposal. Soils not suitable for reuse were sent offsite for recycling. Concrete from the demolished buildings and various storage pads were crushed, sampled, and reused onsite as backfill, and for rough grading of the property (PAS-00033755; PAP-00168968-69). This work was conducted as part of an ISRA remediation after the plant was closed (PAP-00180344).

According to a *Documentation of Environmental Indicator Determination*, prepared on behalf of U.S. EPA, dated September 29, 2008, 610 tons of soil containing TCDD above the subsequent NJDEP-approved cleanup level of 2.0 ppb was excavated and incinerated offsite (PAP-00168968; PAP-00180360). Note: This work was conducted as part of an ISRA remediation after the plant was closed. The document states that the selected remedy for soils incorporated the installation of a low-permeability asphalt cover over the majority of the site, construction of warehouses, installation of a fence around the perimeter of the site, and recording of a deed notice to restrict future uses of the property (PAP-00168962). This remedy was approved by NJDEP in a letter dated June 21, 2000, and was subsequently implemented by Givaudan as part of the site redevelopment process. The deed notice for the northern parcel of the site restricted the entire site to non-residential use and was recorded on June 29, 1999. The document goes on to state that the soil containing TCDD at concentrations less than 2.0 ppb was managed in an engineered containment cell near the southern end of the site. Givaudan retained ownership of this southern parcel and placed a deed restriction on this site in 1999 (PAP-00168972).

A figure depicting TCDD-impacted areas is presented in **Appendix B-9**.

On March 12, 2002, NJDEP issued a “no further action” letter for soils containing TCDD, which included the site use restrictions (PAS-00106564-66).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Appendix A
Data Report Tables

Appendix A-1	
Hexachlorophene Production Volume	
Year	**Pounds Produced**
1947	42,000
1948	100,000
1949	500,000
1950	500,000-1,000,000
1951	1,000,000
1952	500,000-1,000,000
1953	1,000,000
1954	1,000,000
1955	1,500,000
1956	1,500,000-2,000,000
1957	1,000,000
1958	500,000
1959	500,000-1,000,000
1960	1,000,000
1961	1,000,000
1962	1,500,000
1963	1,500,000
1964	2,000,000
1965	2,500,000
1966	2,000,000-2,500,000
1967	2,000,000-2,500,000
1968	3,000,000
1969	3,000,000-3,500,000
1970	3,000,000
1971	3,000,000-3,500,000
1972	1,000,000
1973	150,000
1974	200,000
1975	100,000
1976	500,000
1977	500,000
1978	100,000-500,000
1979	100,000-500,000
1980	100,000-500,000
1981	100,000-500,000
1982	100,000
1983	100,000-500,000
1984	17,000

Source: PAP-00170561

Appendix A-2			
TCDD Concentrations Detected in 2,4,5-TCP Feedstock			
Source of 2,4,5-TCP	**Date of Analytical Report**	**Number of 2,4,5-TCP Samples Analyzed**	**Maximum 2,3,7,8-TCDD Concentration Detected (or maximum reporting limit if not detected)**
Hooker Chemical	10/27/1970	3	Non-detect at 50 ppb (<50 ppb)
Hooker Chemical	3/12/1971	2	Non-detect at 10 ppb (<10 ppb)
Hooker Chemical	3/12/1971	2	Non-detect at 1,000 ppb (<1,000 ppb)
"Italian TCP"	8/26/1976	24	83 ppb
ICMESA	9/9/1976	3	14 ppb
ICMESA	11/26/1976	3	14 ppb
Dow	8/1977 to 12/1977	3	3 ppb
Dow	10/1976 to 12/1978	44	Non-detect at 10 ppb (<10 ppb)
Dow	6/24/1983	3	3 ppb
Celamerck	8/1978 to 3/1983	58	Non-detect at 10 ppb (<10 ppb)
Celamerck	8/1978 to 3/1983	6	Non-detect at 5 ppb (<5 ppb)
Celamerck	6/24/1983	8	Non-detect at 1 ppb (<1 ppb)
Linz	3/24/1983	8	Non-detect at 5 ppb (<5 ppb)
Linz	6/24/1983	2	2.9 ppb

Source: PAP-00170564; PAP-00182230; PAP-00183644; PAP-00182230; PAS-00084001; PAP-00185309

Appendix A-3		
TCDD Concentrations in Hexachlorophene		
Date of Analytical Report	**Number of Hexachlorophene Samples Analyzed**	**Range of 2,3,7,8-TCDD Concentrations Detected (or maximum reporting limit if not detected)**
6/8/1970	5	Non-detect at 30 ppb (<30 ppb)
7/7/1970	6	Non-detect at 20 ppb (<20 ppb)
10/27/1970	8	Non-detect at 50 ppb (<50 ppb)
10/27/1970	1	Non-detect at 100 ppb (<100 ppb)
3/12/1971	1	Non-detect at 100 ppb (<100 ppb)
1/1976 to 10/1977	212	193 samples non-detect at 1 ppb (<1ppb) 2 samples non-detect at 2 ppb (<2ppb) 17 samples between 1.5 and 4 ppb
9/9/1976	2	Non-detect at 2 ppb <2 ppb to 5.2 ppb

Source: PAP-00170567; PAP-00182230; PAP-00183549-63; PAP-00182227

Appendix A-4			
Summary of Wastewater Discharge Data			
Date	**Outfall**	**Volume Discharged (in gallons, unless otherwise noted)**	**Source**
1979	Not listed	724,000,000	PAS-00035835
1988 to 1992	001	210,481,000 gallons/year	PAP-00171798
March 1994	001	13,725,000	PAP-00171757
March 1994	003	1,620,580	PAP-00171759
January 1995	001	7,905,000	PAS-00036536
January 1995	002	29, 260	PAS-00036537
January 1995	003	1,912,120	PAS-00036538
January 1995	004	22,750	PAS-00036539
March 1995	001	9, 035,000	PAS-00036655
March 1995	002	37, 290	PAS-00036656
March 1995	003	854,320	PAS-00036657
April 1995	001	7,926, 000	PAS-00036675
April 1995	002	74,290	PAS-00036676
April 1995	003	2,093,510	PAS-00036677
May 1995	001	8,721,000	PAS-00036698
May 1995	002	83,430	PAS-00036699
May 1995	003	1,442,320	PAS-00036700
June 1995	001	9,059,000	PAS-00036719
June 1995	002	118,910	PAS-00036720
June 1995	003	2,002,990	PAS-00036721
July 1995	001	8,089,000	PAS-00036739
July 1995	002	159,650	PAS-00036740
July 1995	003	2,797,530	PAS-00036741
August 1995	001	10,906,000	PAS-00036780
August 1995	002	157,580	PAP-00172205
August 1995	003	2,922,870	PAP-00172206
September 1995	001	9,542,000	PAS-00036800
September 1995	002	119,080	PAP-00172203
September 1995	003	2,436,490	PAP-00172204
October 1995	001	4,598,000	PAP-00172214
October 1995	002	64,960	PAP-00172213
October 1995	003	2,369,950	PAP-00172212
November 1995	001	5,613,000	PAS-00036866
November 1995	002	45,190	PAS-00036867
November 1995	003	1,764,520	PAS-00036868
December 1995	001	4,982,000	PAS-00036886
December 1995	002	77,020	PAS-00036887
December 1995	003	1,456,820	PAS-00036888
January 1996	001	6,514,000	PAS-00036911
January 1996	002	37,820	PAS-00036912
January 1996	003	1,499,510	PAS-00036913
February 1996	001	6,910,000	PAS-00036935

Appendix A-4			
Summary of Wastewater Discharge Data			
Date	**Outfall**	**Volume Discharged (in gallons, unless otherwise noted)**	**Source**
February 1996	002	14,420	PAS-00036936
February 1996	003	539,760	PAS-00036937
March 1996	001	6,449,000	PAS-00036956
March 1996	002	19,430	PAS-00036958
March 1996	003	960,760	PAS-00036960
April 1996	001	6,883,000	PAS-00036975
April 1996	002	21,700	PAS-00036976
April 1996	003	464,290	PAS-00036977
May 1996	001	7,473,000	PAS-00036995
May 1996	002	35,380	PAS-00036996
May 1996	003	576,430	PAS-00036997
June 1996	001	9,163,000	PAS-00037014
June 1996	002	80,450	PAS-00037015
June 1996	003	1,450,880	PAS-00037016
July 1996	001	9,065,000	PAP-00172792
August 1996	001	10,160,000	PAP-00173139
August 1996	002	176,040	PAP-00173140
August 1996	003	2,920,800	PAP-00173141
September 1996	001	8,427,000	PAP-00173136
September 1996	002	138,160	PAP-00173137
September 1996	003	2,501,800	PAP-00173138
October 1996	001	7,172,000	PAP-00173123
October 1996	002	100,970	PAP-00173134
October 1996	003	1,547,640	PAP-00173135
November 1996	001	5,204,000	PAP-00173204
November 1996	002	77,000	PAP-00173583
November 1996	003	1,263,320	PAP-00173584
December 1996	001	4,978,000	PAP-00173265
December 1996	002	52,130	PAP-00173580
December 1996	003	1,057,760	PAP-00173581
January 1997	001	4,943,000	PAP-00173358
January 1997	002	21,770	PAP-00173577
January 1997	003	859,160	PAP-00173578
February 1997	001	4,440,000	PAP-00173445
February 1997	002	33,750	PAP-00173574
February 1997	003	732,650	PAP-00173575
March 1997	001	4,784,000	PAP-00173520
March 1997	002	69,940	PAP-00173571
March 1997	003	747,720	PAP-00173572
April 1997	001	5,818,000	PAP-00173558
April 1997	002	51,480	PAP-00173568
April 1997	003	905,930	PAP-00173569

Appendix A-4			
Summary of Wastewater Discharge Data			
Date	**Outfall**	**Volume Discharged (in gallons, unless otherwise noted)**	**Source**
May 1997	001	6,300,000	PAP-00173621
May 1997	002	54,350	PAP-00173706
May 1997	003	1,256,900	PAP-00173707
June 1997	001	8,242,000	PAP-00173624
June 1997	002	129,630	PAP-00173703
June 1997	003	2,059,100	PAP-00173704
July 1997	001	9,128,000	PAP-00173674
July 1997	002	164,620	PAP-00173700
July 1997	003	2,855,100	PAP-00173701
August 1997	001	7,433,000	PAP-00173693
August 1997	002	190,220	PAP-00173694
August 1997	003	2,258,710	PAP-00173695
September 1997	001	7,587,000	PAP-00173708
October 1997	001	6,985,000	PAP-00173772
November 1997	001	5,764,000	PAP-00173817
December 1997	001	5,275,000	PAP-00173866
January 1998	001	6,362,000	PAP-00173921
March 1998	001	7,115,000	PAP-00173972
March 1998	002	51,220	PAP-00173967
August 1998	001	4,614,000	PAP-00174379
August 1998	002	117,910	PAP-00174381
August 1998	003	2,290,100	PAP-00174383
October 1998	001	529,000	PAP-00174923
October 1998	002	10,600	PAP-00174924
October 1998	003	766,000	PAP-00174925
November 1998	001	0	PAP-00174920
November 1998	002	66,680	PAP-00174921
November 1998	003	1,505,670	PAP-00174922

Appendix A-5				
Peak Stormwater Runoff Rates in 1993				
Stormwater Discharge Point Number and Name	**Stormwater Source Description**	**Ultimate Stormwater Discharge Point**	**Acres Drained**	**Peak Rate of Runoff - 25-Year Storm (gallons per minute)**
1 - NW Corner	Sheet flow into Delawanna Avenue gutter	Third River	0.062	49
2 - Building 9	Building 9 roof drainage into storm sewer in Delawanna Avenue	Third River	0.577	1,776
3 - Guard House	Sheet flow into Delawanna Avenue gutter	Third River	0.213	655
4 - NJDOT Inlet	Stormwater runoff collected via swales and pipes from southeastern portion of site into stormsewer in River Road	Passaic River	6.249	12,701
5 - SW Curb Cut	Sheet flow and gutter flow from southern portion of site and south of Building 95 into River Road gutter	Third River	3.306	8,356
6 - Railroad Curb Cut	Stormwater runoff collected via swales and pipes from southeastern portion of site into stormsewer in River Road	Third River	2.945	5,292
5 + 6 - Curb Cut	Not available	Not available	3.251	10,686

Source: PAP-00178571, 77-80

Note: Storm water runoff rates were calculated after the site was paved in 1983. Prior to that date, the Clifton Site was not paved and storm water infiltrated into the site soils and / or was directed to the on-site storm water pond (PAS-00048098).

Appendix A-6

Mass/Concentration of Copper, Lead, and Mercury in Facility Wastewater

		Copper		Lead		Mercury		
Date	Outfall	Mass* (pounds/day)	Permit Limit* (average pounds/day)	Mass* (pounds/day)	Permit Limit* (average pounds/day)	Mass* (pounds/day)	Permit Limit* (average pounds/day)	Source
1975	N/A	10.5	N/A	3.5	N/A	Not Reported	Not Reported	PAS-00035828
1977	N/A	0.212 mg/L	N/A	0.776 mg/L	N/A	0.0038 mg/L	N/A	PAS-00035829
February 1994	001	Not Reported	Not Reported	0.03715	1.53899	Not Reported	Not Reported	PAP-00171264
March 1994	001	Not Reported	Not Reported	0.03029	1.53899	Not Reported	Not Reported	PAP-00171749
July 1994	001	Not Reported	Not Reported	0.01769	1.53899	Not Reported	Not Reported	PAP-00171872
September 1994	001	0.093 mg/L	N/A	0.011 mg/L	N/A	ND	N/A	PAS-00036812
September 1994	002	0.131 mg/L	N/A	0.023 mg/L	N/A	ND	N/A	PAS-00036813
November 1994	001	0.188 mg/L	0.092 mg/L	Not Reported	Not Reported	0.001 mg/L	0.001 mg/L	PAS-00036507
November 1994	002	0.105 mg/L	0.092 mg/L	0.464 mg/L	0.029 mg/L	ND	0.001 mg/L	PAS-00036508
December 1994	001	Not Reported	Not Reported	<0.02128	1.53899	Not Reported	Not Reported	PAS-00036442
January 1995	001	Not Reported	Not Reported	0.04038	1.53899	Not Reported	Not Reported	PAS-00036523
February 1995	001	Not Reported	Not Reported	<0.02015	1.53899	Not Reported	Not Reported	PAP-00172025
March 1995	001	Not Reported	Not Reported	0.02259	1.53899	Not Reported	Not Reported	PAS-00036643
April 1995	001	Not Reported	Not Reported	0.01915	1.53899	Not Reported	Not Reported	PAS-00036663
May 1995	001	Not Reported	Not Reported	0.05304	1.53899	Not Reported	Not Reported	PAS-00036685
June 1995	001	Not Reported	Not Reported	0.01576	1.53899	Not Reported	Not Reported	PAS-00036706
July 1995	001	Not Reported	Not Reported	0.02275	1.53899	Not Reported	Not Reported	PAS-00036727
August 1995	001	Not Reported	Not Reported	0.03615	1.53899	Not Reported	Not Reported	PAS-00036748
September 1995	001	Not Reported	Not Reported	0.03936	1.53899	Not Reported	Not Reported	PAS-00036788
October 1995	001	Not Reported	Not Reported	0.01771	1.53899	Not Reported	Not Reported	PAS-00036830
November 1995	001	Not Reported	Not Reported	0.02502	1.53899	Not Reported	Not Reported	PAS-00036853
December 1995	001	Not Reported	Not Reported	0.01337	1.53899	Not Reported	Not Reported	PAS-00036874
January 1996	001	Not Reported	Not Reported	0.01693	1.53899	Not Reported	Not Reported	PAP-00172254
February 1996	001	Not Reported	Not Reported	0.03247	1.53899	Not Reported	Not Reported	PAP-00172417
March 1996	001	Not Reported	Not Reported	0.08815	1.53899	Not Reported	Not Reported	PAP-00172462
May 1996	001	Not Reported	Not Reported	0.0211	1.53899	Not Reported	Not Reported	PAP-00172653
June 1996	001	Not Reported	Not Reported	0.03916	1.53899	Not Reported	Not Reported	PAP-00172667
November 1996	001	Not Reported	Not Reported	0.00941	1.53899	Not Reported	Not Reported	PAP-00173212
December 1996	001	Not Reported	Not Reported	0.00604	1.53899	Not Reported	Not Reported	PAP-00173274
February 1997	001	Not Reported	Not Reported	0.01898	1.53899	Not Reported	Not Reported	PAP-00173489
March 1997	001	Not Reported	Not Reported	<0.07506	1.53899	Not Reported	Not Reported	PAP-00173536
June 1997	001	Not Reported	Not Reported	0.01556	1.53899	Not Reported	Not Reported	PAP-00173648
June 1997	002	0.114 mg/L	3.02 mg/L	0.00791 mg/L	0.54 mg/L	0.0002 mg/L	0.08 mg/L	PAP-00173662
September 1997	001	0.0891 mg/L	0.092 mg/L	0.00776	1.53899	<0.00020	0.008 mg/L	PAP-00173719, 21
September 1997	002	0.125 mg/L	3.02 mg/L	0.00421 mg/L	0.54 mg/L	<0.00020	0.08 mg/L	PAP-00173738
October 1997	001	0.117 mg/L	3.02 mg/L	0.00368	1.53899	<0.00020 mg/L	0.08 mg/L	PAP-00173788, 94
October 1997	002	0.363 mg/L	3.02 mg/L	0.0422 mg/L	0.54 mg/L	0.00086 mg/L	0.08 mg/L	PAP-00173811
November 1997	001	0.0906 mg/L	3.02 mg/L	0.01242	1.5899	0.00267 mg/L	0.08 mg/L	PAP-00173834, 36
November 1997	002	0.072 mg/L	3.02 mg/L	0.00332 mg/L	0.54 mg/L	0.00031 mg/L	0.008 mg/L	PAP-00173857
December 1997	001	0.06140 mg/L	3.02 mg/L	0.00584	1.53899	ND	0.008 mg/L	PAS-00038351, 53
December 1997	002	0.0447 mg/L	3.02 mg/L	0.00410 mg/L	0.54 mg/L	Not Reported	Not Reported	PAS-00038375
January 1998	001	0.0606 mg/L	3.02 mg/L	0.02448	1.53899	<0.00020 mg/L	0.08 mg/L	PAP-00173939, 41
January 1998	002	0.0551 mg/L	3.02 mg/L	0.00304 mg/L	0.54 mg/L	Not Reported	Not Reported	PAP-00173965
February 1998	001	0.0607 mg/L	3.02 mg/L	0.00307	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174017, 19
February 1998	002	0.0212 mg/L	3.02 mg/L	0.00532 mg/L	0.54 mg/L	Not Reported	Not Reported	PAP-00174049
March 1998	001	0.0832 mg/L	3.02 mg/L	0.00545	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174071, 73
March 1998	002	0.02630 mg/L	3.02 mg/L	0.00106 mg/L	0.54 mg/L	<0.00020 mg/L	N/A	PAP-00174099
April 1998	001	0.14581 mg/L	3.02 mg/L	0.01082	1.53899	<0.00031 mg/L	0.008 mg/L	PAP-00174117, 19
May 1998	001	0.149 mg/L	3.02 mg/L	0.00865	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174141, 43
May 1998	002	0.043 mg/L	3.02 mg/L	0.00381	0.54 mg/L	<0.0002 mg/L	N/A	PAP-00174170
June 1998	001	0.222 mg/L	3.02 mg/L	0.0357	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174186, 88
June 1998	002	0.0339 mg/L	3.02 mg/L	0.00321 mg/L	0.54 mg/L	<0.00020 mg/L	N/A	PAP-00174189
July 1998	001	0.0808 mg/L	3.02 mg/L	0.00366	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174292, 94
August 1998	001	0.09340 mg/L	N/A	0.005	1.53899	ND	N/A	PAS-00038198, 200
August 1998	002	0.0255 mg/L	3.02 mg/L	0.00225 mg/L	0.54 mg/L	<0.00020 mg/L	N/A	PAS-00038226
October 1998	001	0.21600 mg/L	3.02 mg/L	<0.00127	1.53899	0.00039 mg/L	0.08 mg/L	PAS-00038266, 68
October 1998	002	0.031 mg/L	3.02 mg/L	0.0032 mg/L	0.54 mg/L	<0.00020 mg/L	0.08 mg/L	PAS-00038301
November 1998	001	1.07 mg/L	3.02 mg/L	0.00628	1.53899	0.00024 mg/L	0.08 mg/L	PAS-00038316, 18
November 1998	002	0.0331 mg/L	3.02 mg/L	0.00338 mg/L	0.54 mg/L	<0.00020 mg/L	0.08 mg/L	PAS-00038309

*Data reported in pounds per day unless otherwise noted.

Data reported in mg/L are shaded in blue to distinguish them from those data in pounds/day.

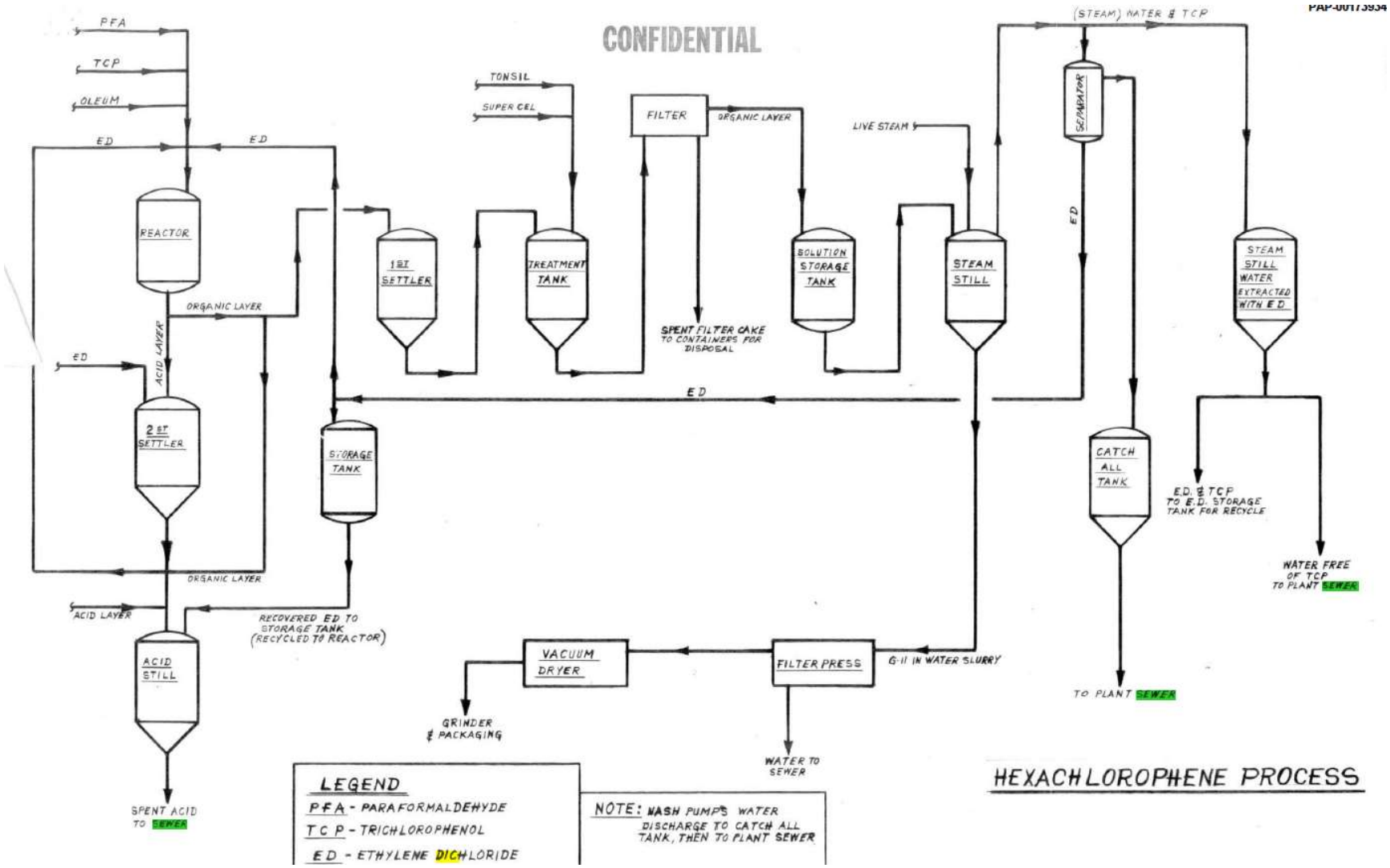
mg/L = milligrams per liter

N/A = Not available

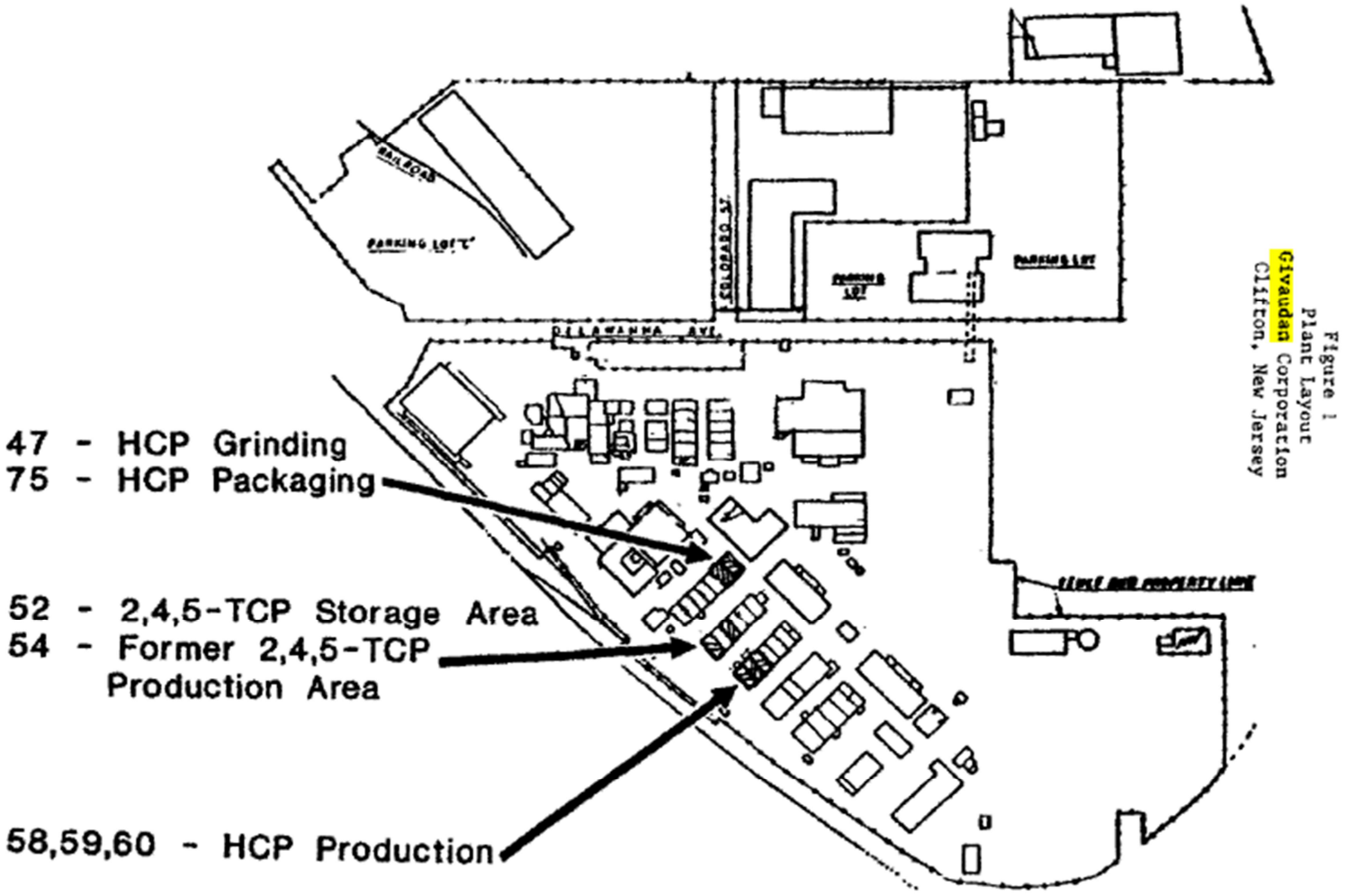
ND = Not detected

Appendix B
Data Report Figures

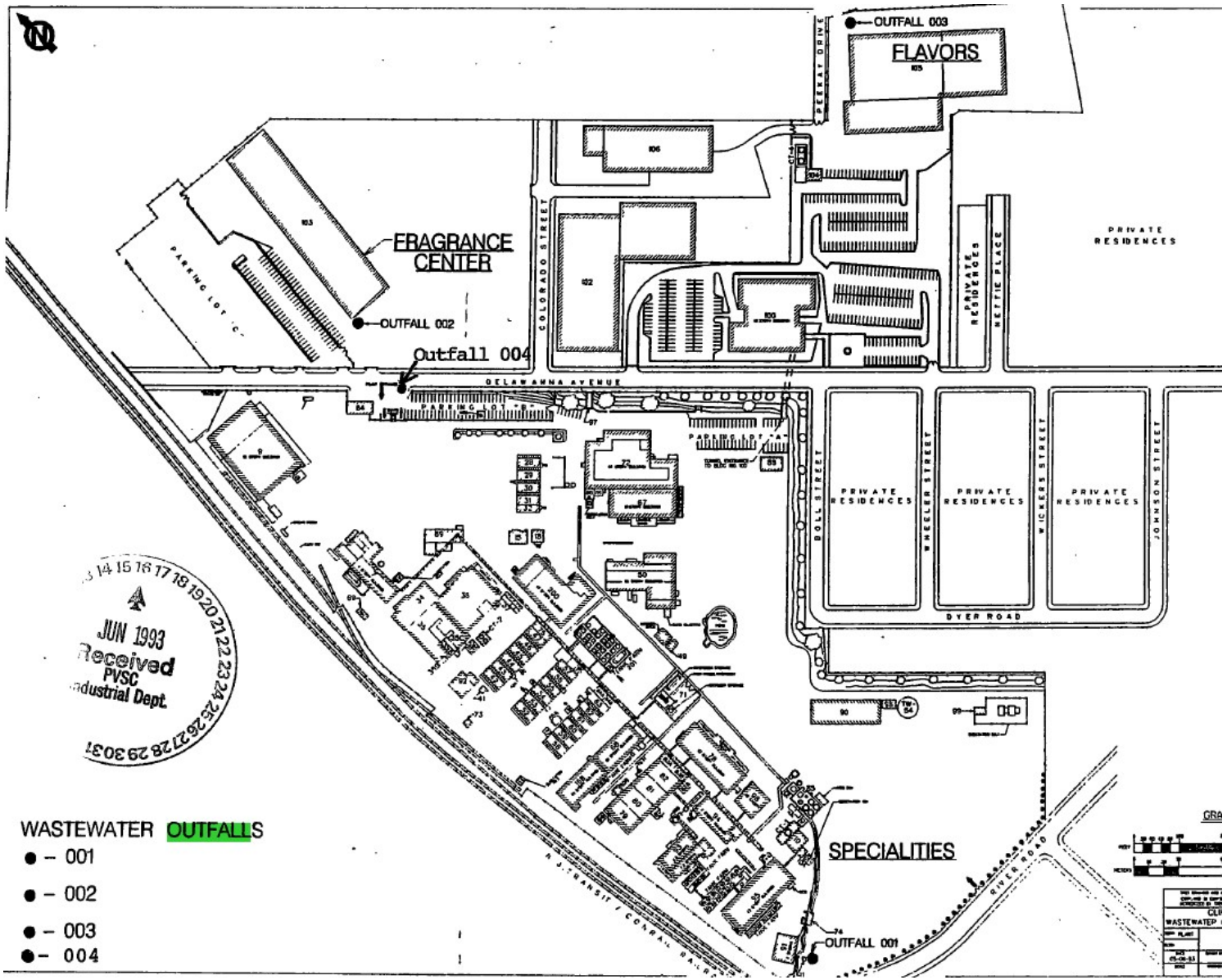
Appendix B-1. Flow diagram outlining the HCP manufacturing process (PAP-00173934).



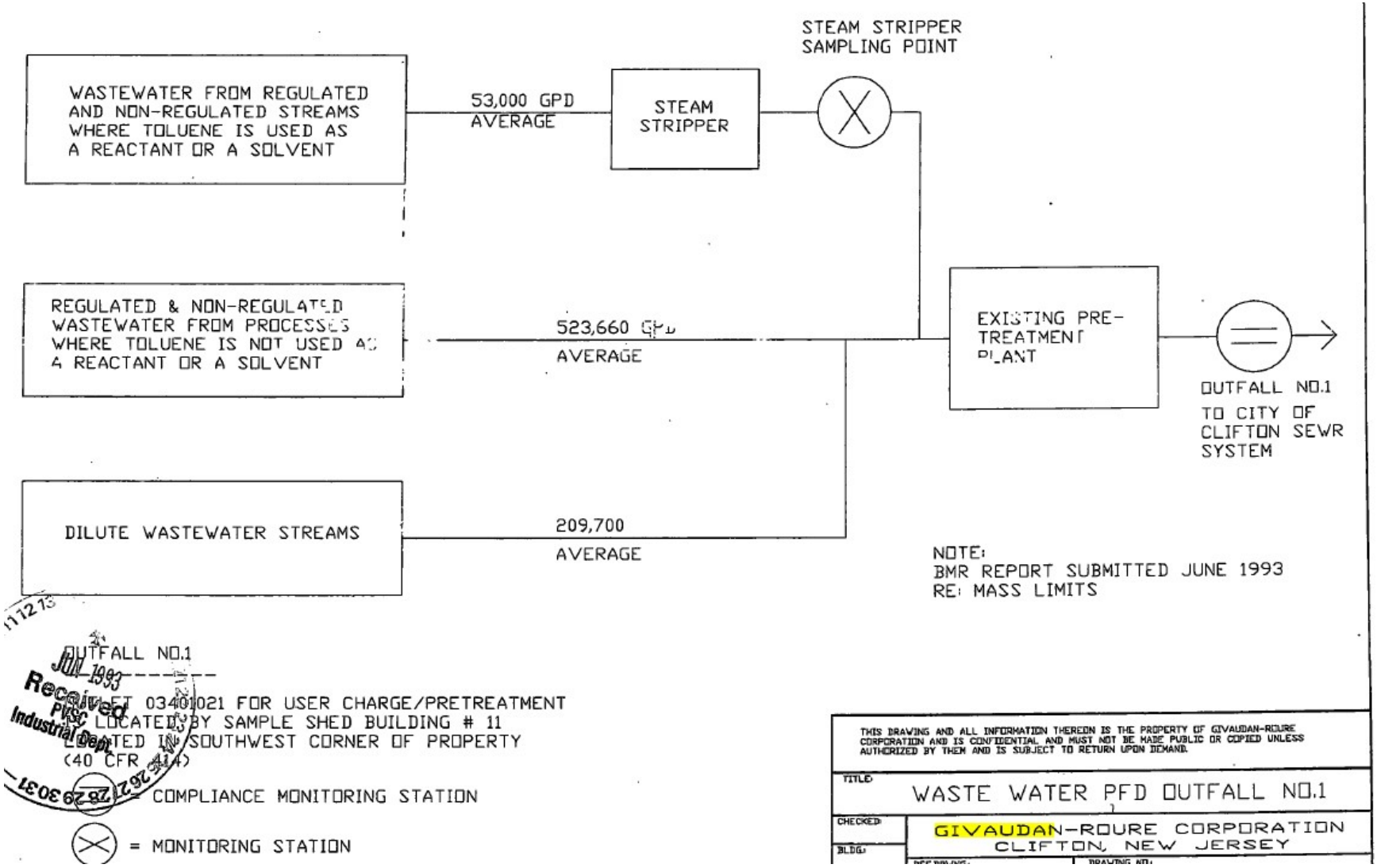
Appendix B-2. HCP and 2,4,5-TCP storage and production areas (PAP-00170572).

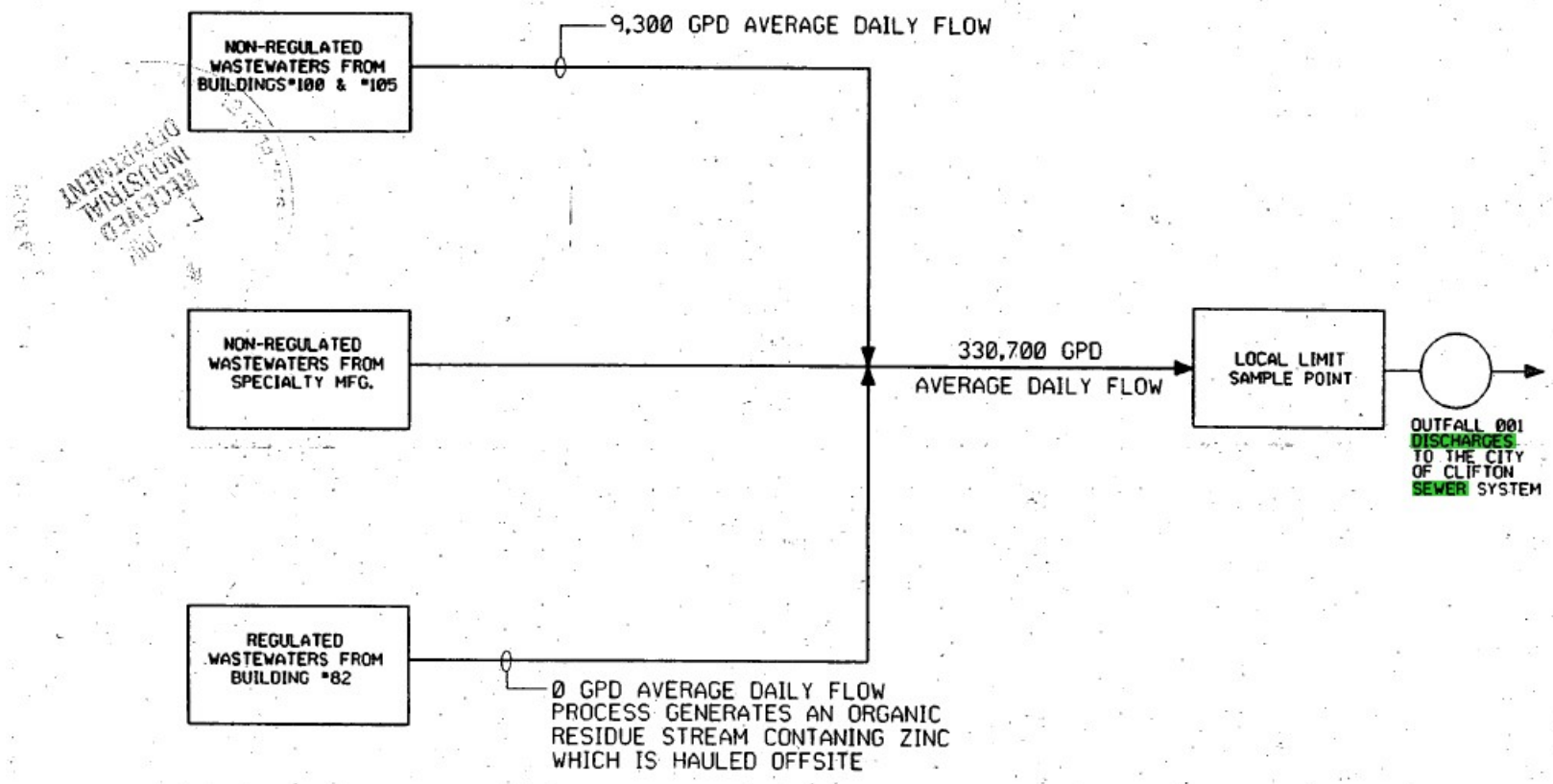


Appendix B-3. Wastewater outfall locations (PAP-00171809).



Appendix B-4. Wastewater flow diagrams for 1993, 1994, and 1995 (PAS-00036328, PAS-00036516-18, PAS-00036534).





OUTLET #1

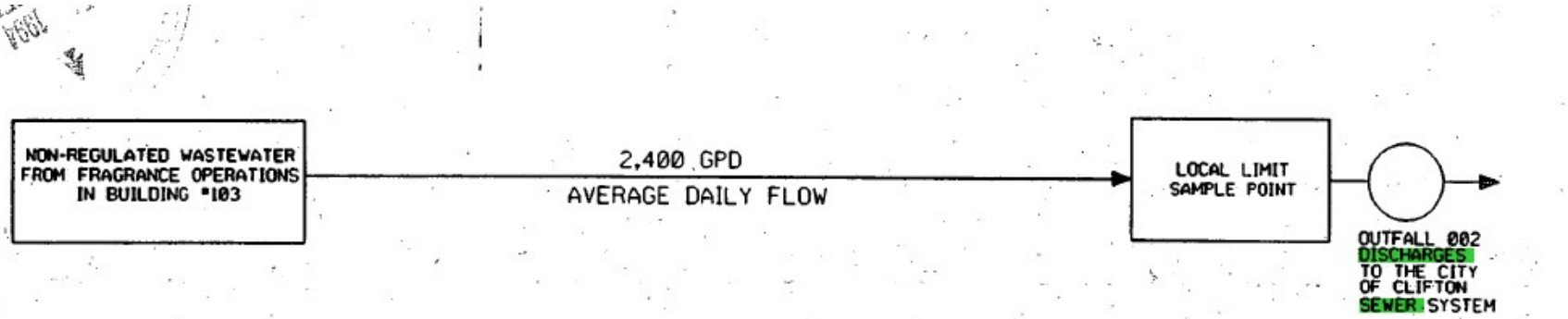
OUTLET 03401021 FOR USER CHARGE AND PRETREATMENT SAMPLE POINT/IS LOCATED BY SAMPLE SHED BUILDING #11 LOCATED IN SOUTHWEST CORNER OF PROPERTY (40 CFR 414)

NOTE: BMR REPORT SUBMITTED DECEMBER, 1994
RE: LOCAL LIMITS ON METALS

◯ = OUTFALL 001

GIVAUDAN-ROURE CORPORATION

UPDATED
FLOW DIAGRAM
OUTFALL 001
DECEMBER 1994



OUTLET #2

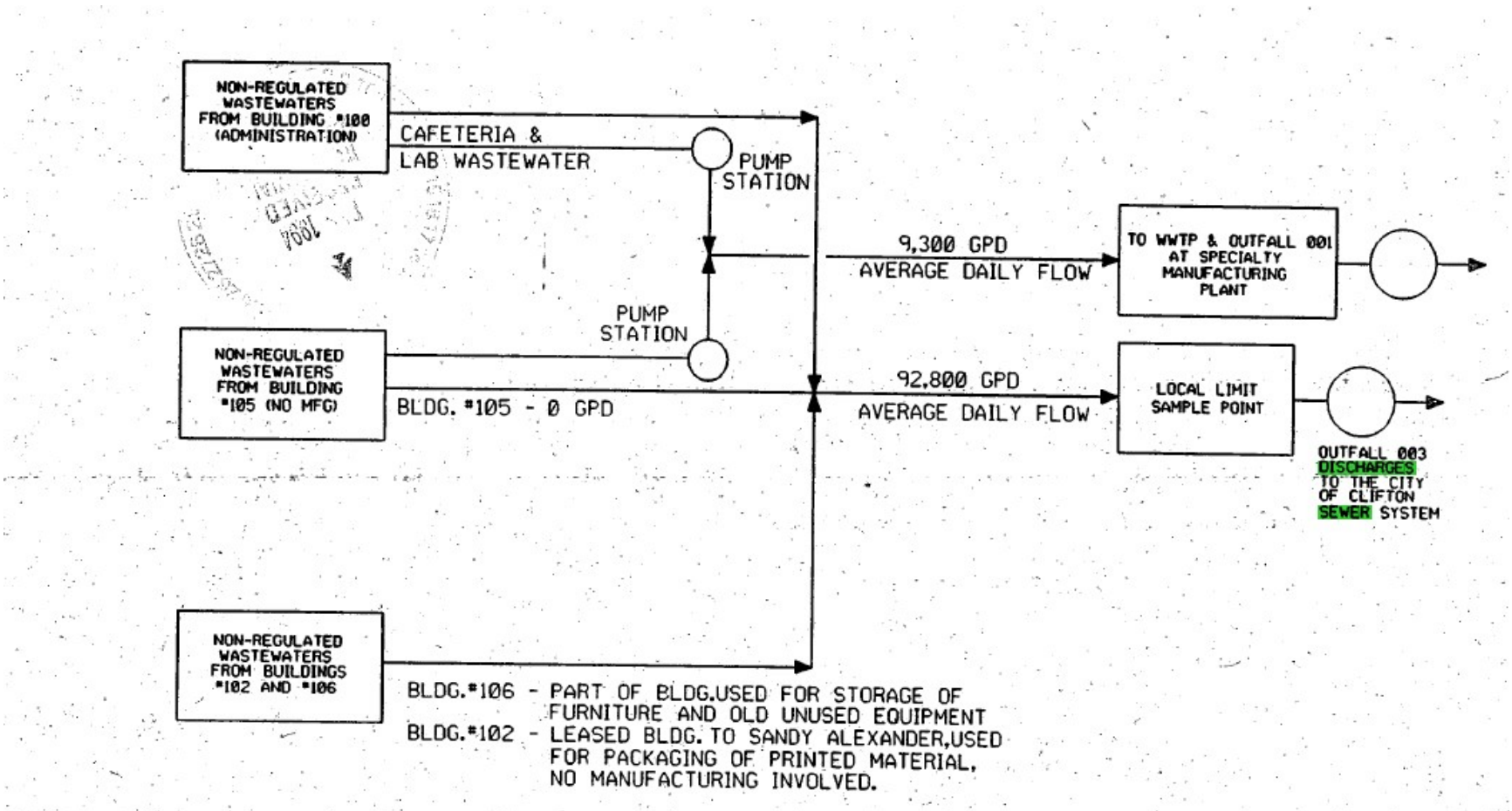
OUTLET 03401022 FOR USER CHARGE AND PRETREATMENT SAMPLE POINT/IS LOCATED IN THE LOCKER ROOM IN BUILDING #103

NOTE: BMR REPORT SUBMITTED DECEMBER, 1994
RE: LOCAL LIMITS ON METALS

◯ = OUTFALL 002

GIVAUDAN-ROURE CORPORATI

UPDATED
FLOW DIAGRAM
OUTFALL 002
DECEMBER 1994



OUTLET #3

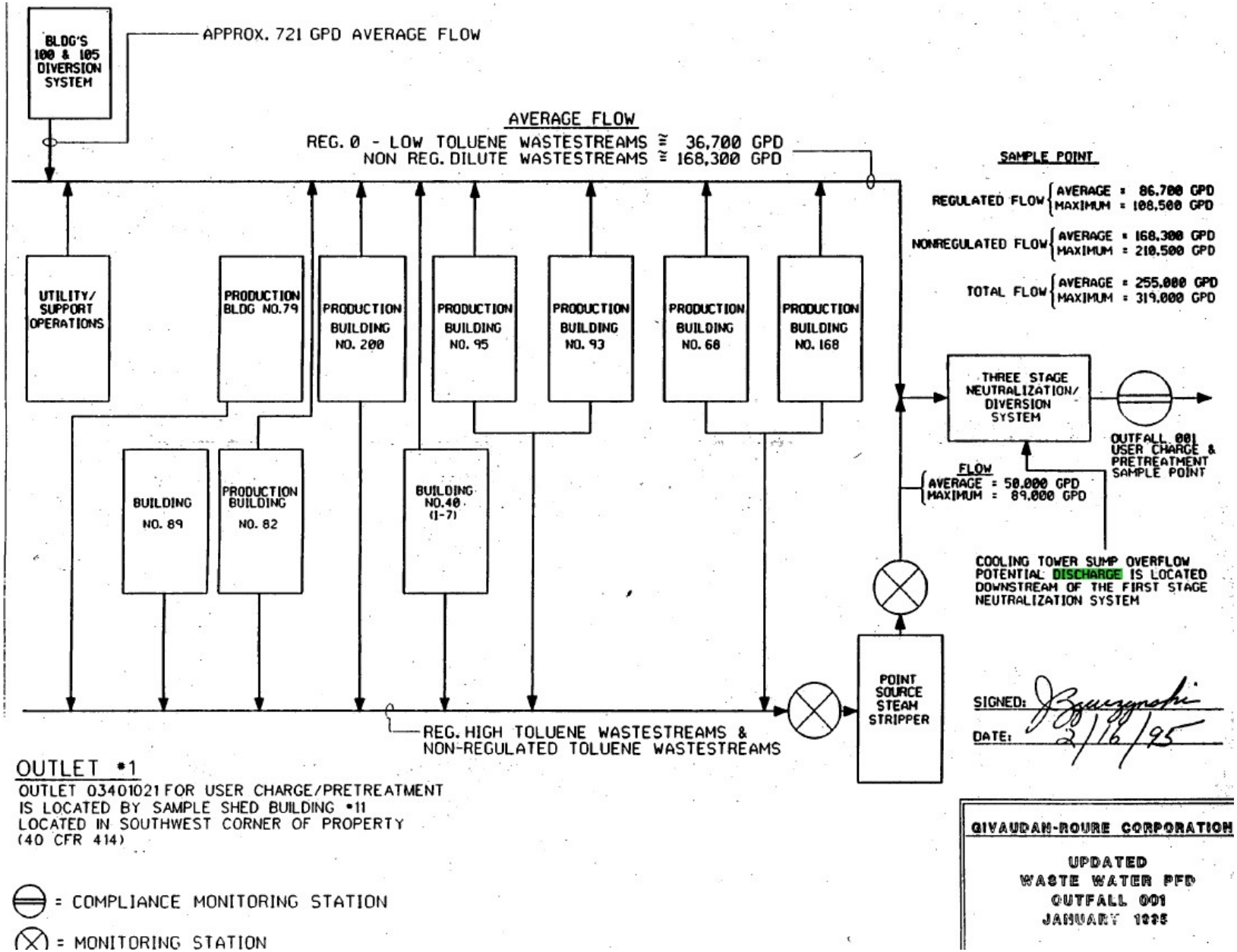
OUTLET 03401023 FOR USER CHARGE AND PRETREATMENT SAMPLE POINT/IS LOCATED IN THE DRIVEWAY OF BUILDING #105 ON PEEKAY DRIVE

NOTE: BMR REPORT SUBMITTED DECEMBER,1994
RE: LOCAL LIMITS ON METALS

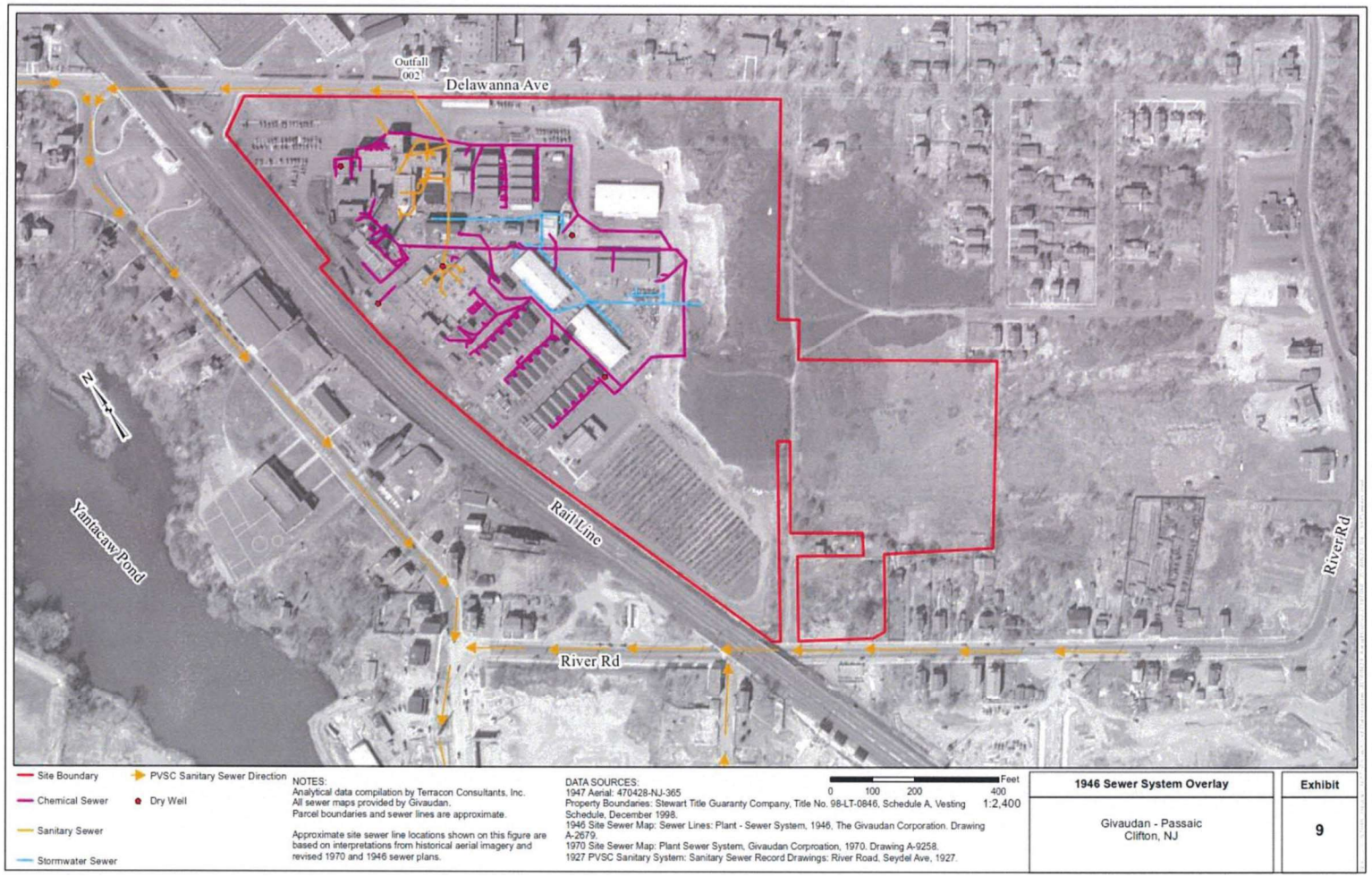
○ = OUTFALL 003

GIVAUDAN-ROURE CORPORATIO

UPDATED
FLOW DIAGRAM
OUTFALL 003
DECEMBER 1994


BLDG'S 100 & 105 DIVERSION SYSTEM
APPROX. 721 GPD AVERAGE FLOW
AVERAGE FLOW
REG. 0 - LOW TOLUENE WASTESTREAMS ≅ 36,700 GPD
NON REG. DILUTE WASTESTREAMS ≅ 168,300 GPD
SAMPLE POINT
REGULATED FLOW AVERAGE = 86,700 GPD MAXIMUM = 108,500 GPD
NONREGULATED FLOW AVERAGE = 168,300 GPD MAXIMUM = 210,500 GPD
TOTAL FLOW AVERAGE = 255,000 GPD MAXIMUM = 319,000 GPD
UTILITY/ SUPPORT OPERATIONS
PRODUCTION BLDG NO.79
PRODUCTION BUILDING NO. 200
PRODUCTION BUILDING NO. 95
PRODUCTION BUILDING NO. 93
PRODUCTION BUILDING NO. 68
PRODUCTION BUILDING NO. 168
BUILDING NO. 89
PRODUCTION BUILDING NO. 82
BUILDING NO.40 (1-7)
THREE STAGE NEUTRALIZATION/ DIVERSION SYSTEM
OUTFALL 001 USER CHARGE & PRETREATMENT SAMPLE POINT
FLOW AVERAGE = 50,000 GPD MAXIMUM = 89,000 GPD
COOLING TOWER SUMP OVERFLOW POTENTIAL DISCHARGE IS LOCATED DOWNSTREAM OF THE FIRST STAGE NEUTRALIZATION SYSTEM
POINT SOURCE STEAM STRIPPER
SIGNED:
DATE: 2/16/95
REG. HIGH TOLUENE WASTESTREAMS & NON-REGULATED TOLUENE WASTESTREAMS
OUTLET *1
OUTLET 03401021 FOR USER CHARGE/PRETREATMENT IS LOCATED BY SAMPLE SHED BUILDING *11 LOCATED IN SOUTHWEST CORNER OF PROPERTY (40 CFR 414)
= COMPLIANCE MONITORING STATION
= MONITORING STATION
GIVAUDAN-ROURE CORPORATION
UPDATED
WASTE WATER PFD
OUTFALL 001
JANUARY 1995

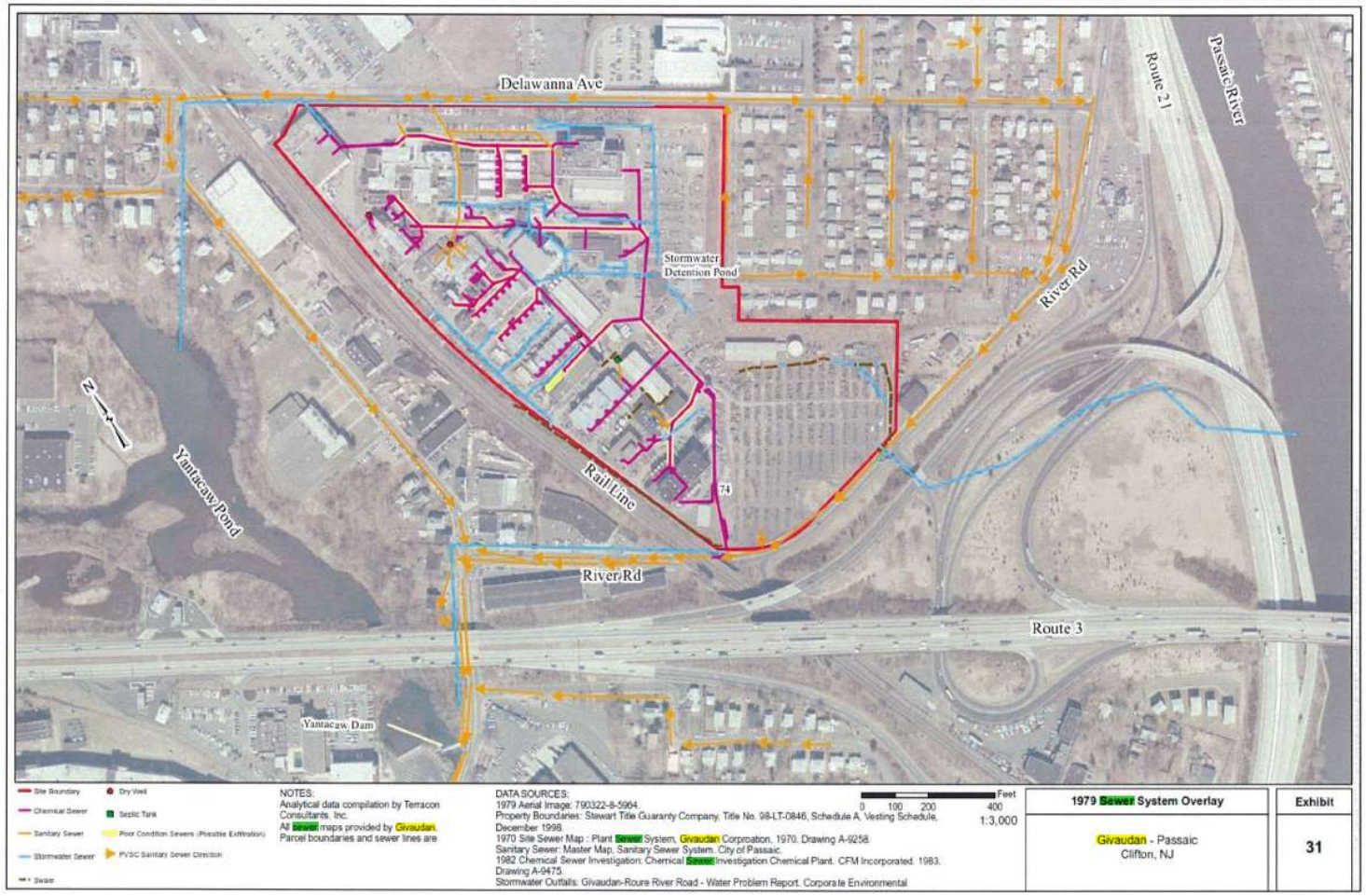
Appendix B-5. Facility sewer system in 1946 and 1979 (PAS-00048106, PAS-00048128).



1946 Sewer System Overlay

- Three primary systems appear active at the site, including:
  - Stormwater (blue) - discharging to the Stormwater Detention Pond
  - Sanitary (gold) – discharging to the City of Clifton Sewer at Outfall 002 on Delawanna Avenue
  - Chemical (purple) – discharging to dry wells throughout the site and to the Spent Acid Pit and the future Wastewater Detention Pond.
- Future aerial photos (see Exhibit 13) indicate the presence of the wastewater treatment building (Building 74). This building provided pre-treatment of process water (chemical system) prior to discharge to the City of Clifton Sewer at Outfall 001 on River Road.
- A series of drawings from 1927, titled "Sanitary Sewer Record Drawing" from the City of Clifton Bureau of Engineering, indicates city sanitary sewer lines were in place near the facility in 1927. As such, it is likely the facility's sanitary sewer system discharged to the City of Clifton system at Outfall 002 prior to 1946.
- A letter dated November 30, 1953 from Givaudan to the County Council, references an August 20, 1946 letter from City of Clifton to Givaudan that indicates the City and Givaudan were in discussions regarding the City's sewer system in 1946; suggesting Givaudan was connected in some capacity to the City sewer at that time.

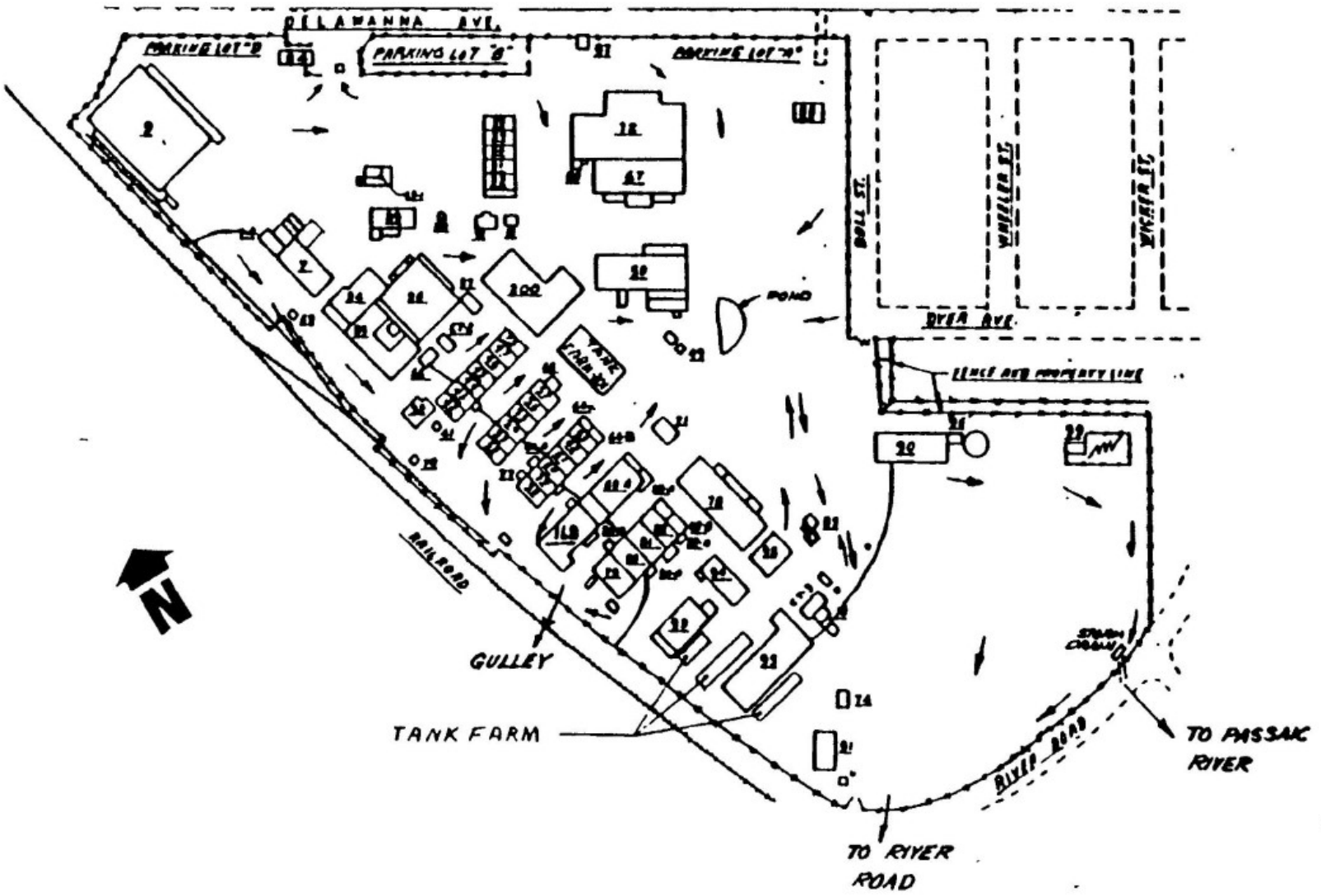
:



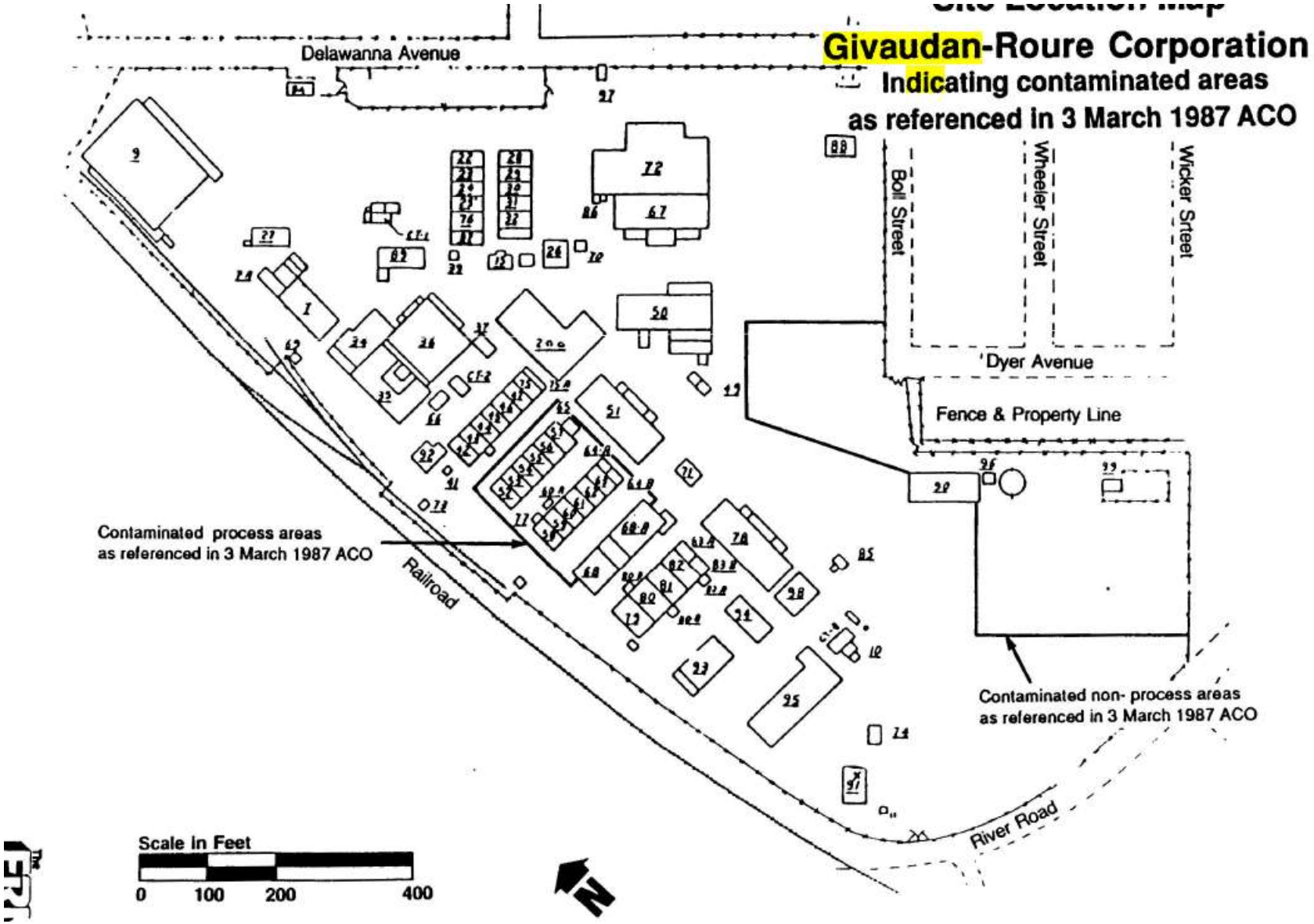
1979 Sewer System Overlay

- Three primary systems appear active at the site, including:
  - Stormwater (blue) - discharging to the Stormwater Detention Pond.
  - Sanitary (gold) – discharging to the City of Clifton Sewer at Outfall 002 on Delawanna Avenue and on-site septic tanks.
  - Chemical (Purple) – discharging to the City of Clifton Sewer at Outfall 001 on River Road.
- Chemical sewer lines with system with yellow highlights represent areas of poor condition lines (e.g., exfiltration areas) identified during a 1980s investigation.
- Brown dashed lines indicate areas of open storm water ditches.
- Chemical sewer system passes through Building 74 prior to leaving the site at River Road. Building 74 was first observed in the 1951 aerial photo.

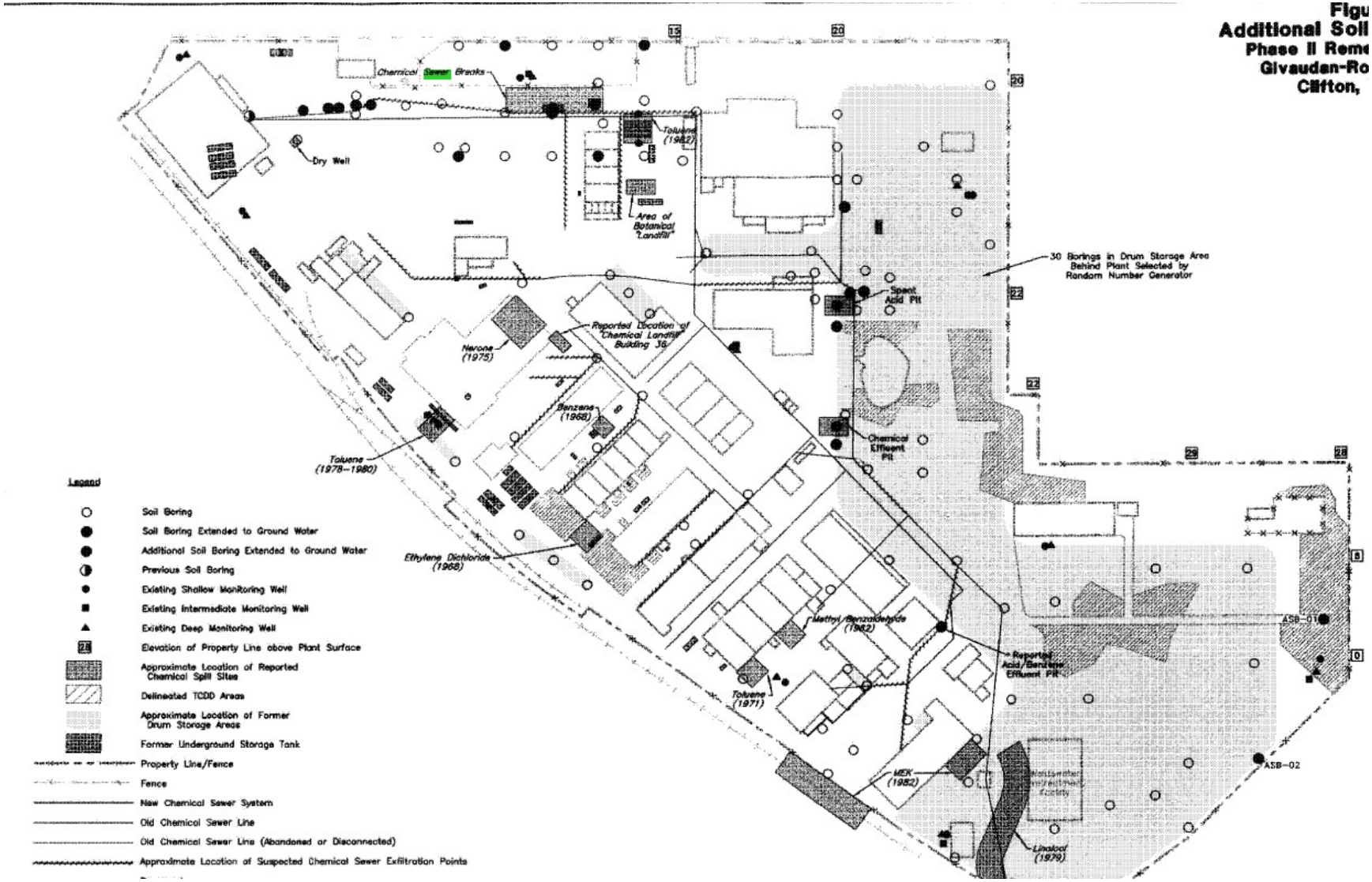
Appendix B-6. Stormwater Drainage Patterns (PAP-00179824).



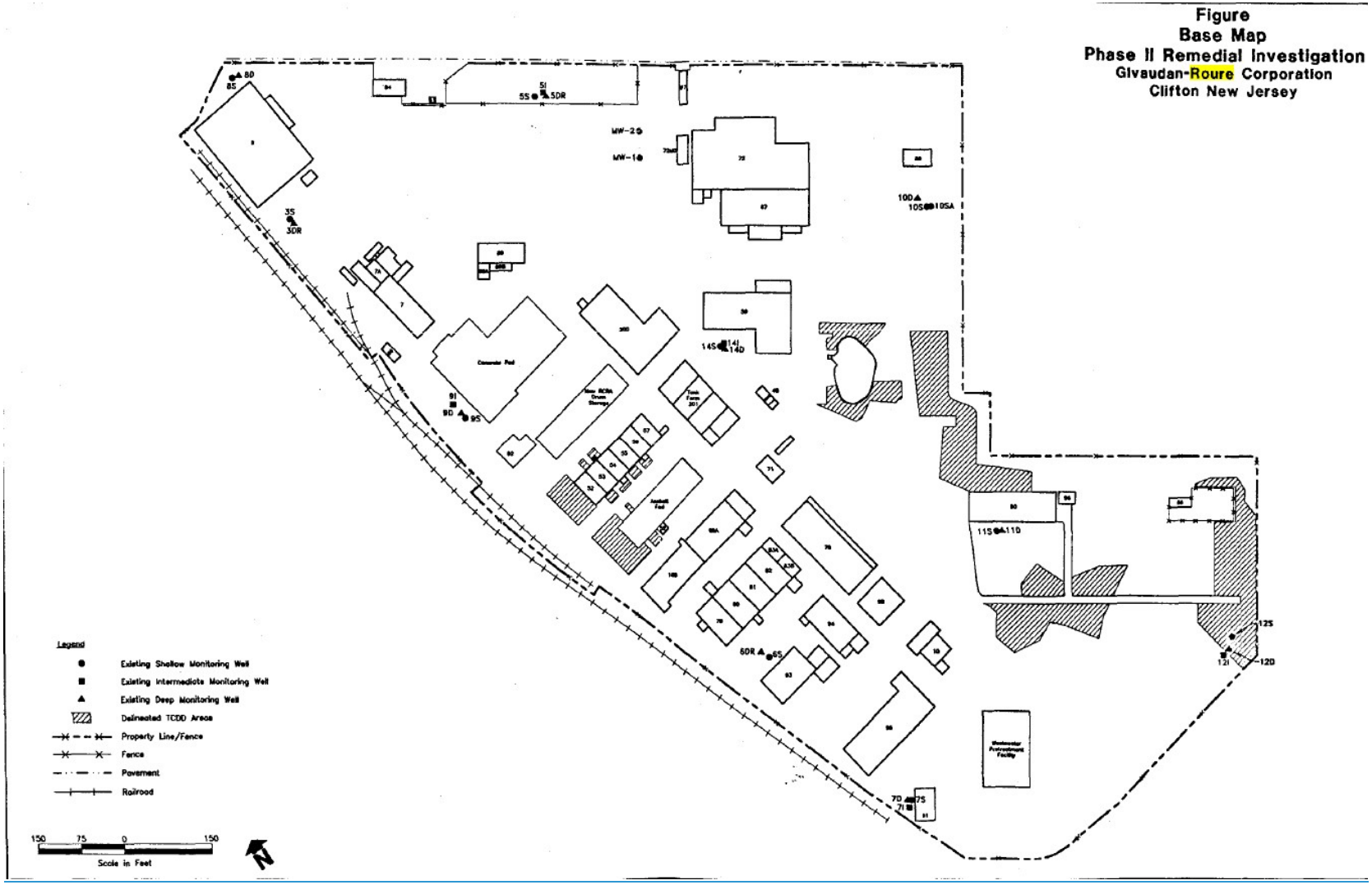
Appendix B-7. Locations of Contaminated Process Area and Contaminated Non-Process Area (PAP-00179697).



Appendix B-8. Location of drum storage area (PAP-00182357).



Appendix B-9. TCDD-impacted areas (PAS-00083406).



Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

GOODRICH CORPORATION

Facility Name, Address and Size: Goodrich Corp./Kalama Chemical, 290 River Drive, Garfield, New Jersey, 07026 (PAS-00123393); approximately 7 acres (PAS-00123393; PAS-00123398). 85 employees, 365 days per year, and 3 shifts per day in 1990 (PAP-00016715) and 1993 (PAP-00206151).

1. **Business Type:** Manufacturing of chemicals used in pharmaceuticals, cosmetics, food packaging, and preservatives, synthetic flavorings, printing inks, dyestuffs, and other products (PAS-00008962).

2. **Time Period of Ownership/Operations**

   Operator: December 1982 to May 1994
   Owner: December 1982 to Present (PAS-00123395-6, 8)

   1982: The Site was sold by Tenneco to Kalama Chemical, Incorporated (Kalama) in an Asset Sales Agreement. Assets identified in the sale included the machinery, equipment, furniture, fixtures, raw materials, work in progress, finished goods, operating supplies, etc. (PAP-00039792-95).

   1986: Partial ownership of Kalama was acquired by BC Sugar Refining Company, a Canadian sugar refining company (PAS-00008962; PAS-00123395).

   1990: BC Sugar acquired complete ownership of Kalama (PAS-00123396). Kalama filed lawsuit against Tenneco Polymers, Inc. (PAP-00046294).

   1991: During Kalama's tenure, operations were reduced in scale, and by 1991, operations were conducted in only one-third of the plant (PAP-00206156).

   1994: BC Sugar sold Kalama Chemical to Freedom Chemical Company (Freedom Chemical) (PAS-00123396). The lawsuit with Tenneco Polymers, Inc. (TPI) was settled, and TPI assumed primary responsibility for compliance with the New Jersey Department of Environmental Protection (NJDEP) Industrial Site Recovery Act (ISRA) regulations in accordance with the revised Administrative Consent Order (PAP-00046294). Operations at Kalama Chemical ceased in May and the manufacturing equipment and chemicals were removed from the facility by August (PAS-00008963; PAS-00123396).

   1998: Freedom Chemical was acquired by and merged into B.F. Goodrich Company. Media sources also note that Kalama, as a subsidiary of Freedom Chemical, was transferred to B.F. Goodrich (PAS-00123396).

3. **Operational History/COC Use and Presence at the Facility**

   According to the *Remedial Investigation Report and Remedial Action Work Plan for the Northern Phenol Area and Dowtherm DNAPL Areas,* dated February 13, 2004, the site was used for chemical manufacturing since 1891. Kalama took ownership in 1982 and

manufactured chemicals used in pharmaceuticals, cosmetics, food packaging and preservatives, synthetic flavorings, printing inks, dyestuffs, and other products (PAS-00008962).

A letter from Kalama to the Passaic Valley Sewerage Commissioners (PVSC), dated June 15, 1988, listed the following chemicals as used or produced at the site:

Salicylic Acid
Methyl Salicylate
Parasepts® (a registered trademark of Kalama for its brand of methyl, ethyl, propyl, and butyl esters of p-hydroxy benzoic acid, also known as Parabens)
Methylene Disalicylic Acid (M.D.A.®)

Raw materials used for production of these products:

Water	Formaldehyde
Phenol	Toluene
Methanol	Sodium hydroxide
Sulfuric acid	Carbon dioxide
Propanol	Ethanol
Butanol	Pottassium Hydroxide

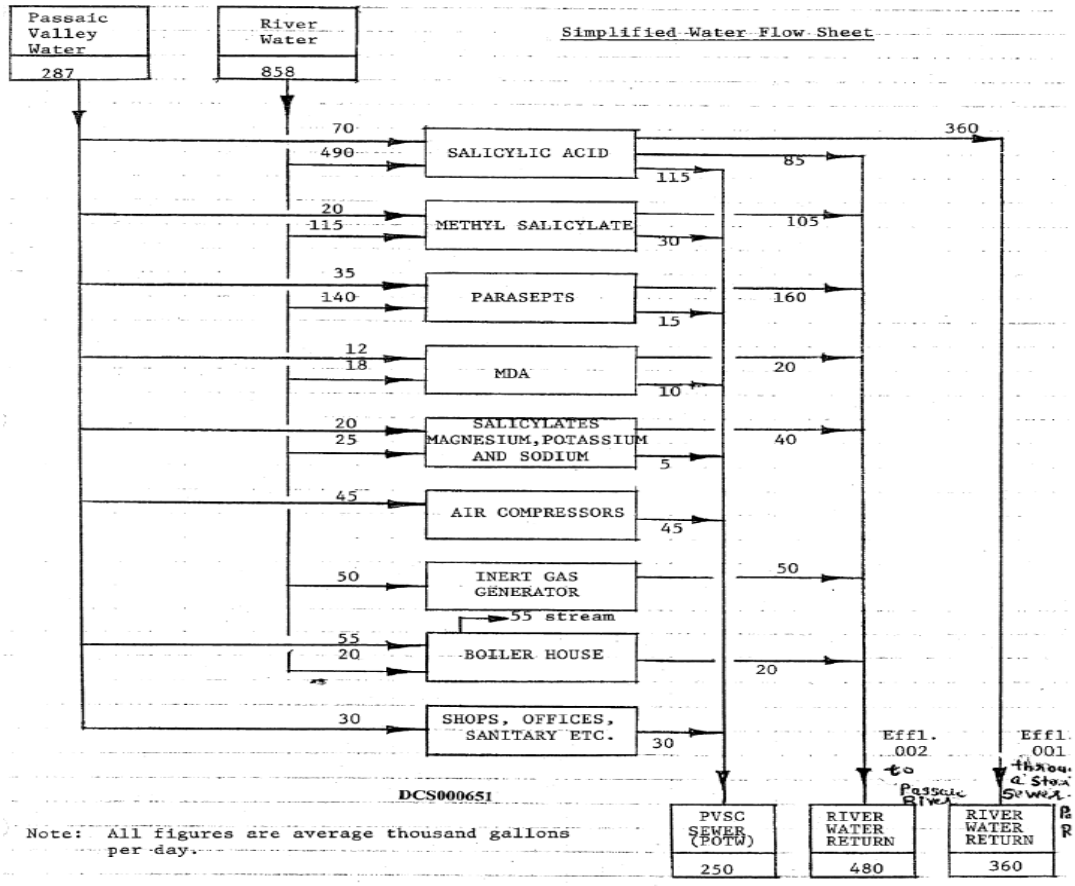
(PAP-00206172-73; PAP-00433761)

According to the *ECRA Investigation Report and Proposed Remedial Action Workplan, Volume I of IV*, dated December 1993 (ECRA Investigation Report), Kalama stopped synthesizing benzoic acid and benzaldehyde in early 1984, a little over a year after it acquired the property (PAP-00041526).

A schematic of the water flow at the facility for each process was provided in a 1989 fact sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey (Permit No. NJ0000124). Two outfalls to the Passaic River and one outlet to the PVSC sewer were identified (PAP-00206141). A report titled *Environmental Assessments, Draft Report for B.C. Sugar*, dated September 3, 1991 (1991 EA) stated that all process waste was discharged to the PVSC under permit number 09404292 (PAP-00433578).

Goodrich Corporation

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report



(PAP-00206141)

As discussed in the ECRA Investigation Report, the site consists of two properties; the manufacturing facility (6.4 acres) and the former employee parking area (0.5 acres) located across River Drive and along the Passaic River. The site is surrounded by mixed residential, commercial and industrial properties on the north, south and east. The Passaic River borders the site on the west, approximately 100 feet from the former manufacturing operations (PAP-00041522-23).

The 1991 EA identified areas of potential environmental concern resulting from on-site operations and hazardous materials handling practices (PAP-00433546). It also discussed buildings where the following operations were identified:

- Building 1: boiler room, housing oil-fired steam boilers, compressors and other ancillary power-generation equipment, six transformers located between Building 1 and Building 33 were each labeled with a sticker stating that the PCB content of the transformer was <50 parts per million (ppm).

- Building 7: formerly a copper shop where sheet metal was fabricated; used for maintenance and equipment storage at that time.

- Building 11: reportedly used for naphthalene distillation but appeared to be idle at the time. The *Revised Remedial Action Work Plan*, dated March 31, 1995 (1995 RAWP) stated this building was inactive since 1965 (PAP-00041642).

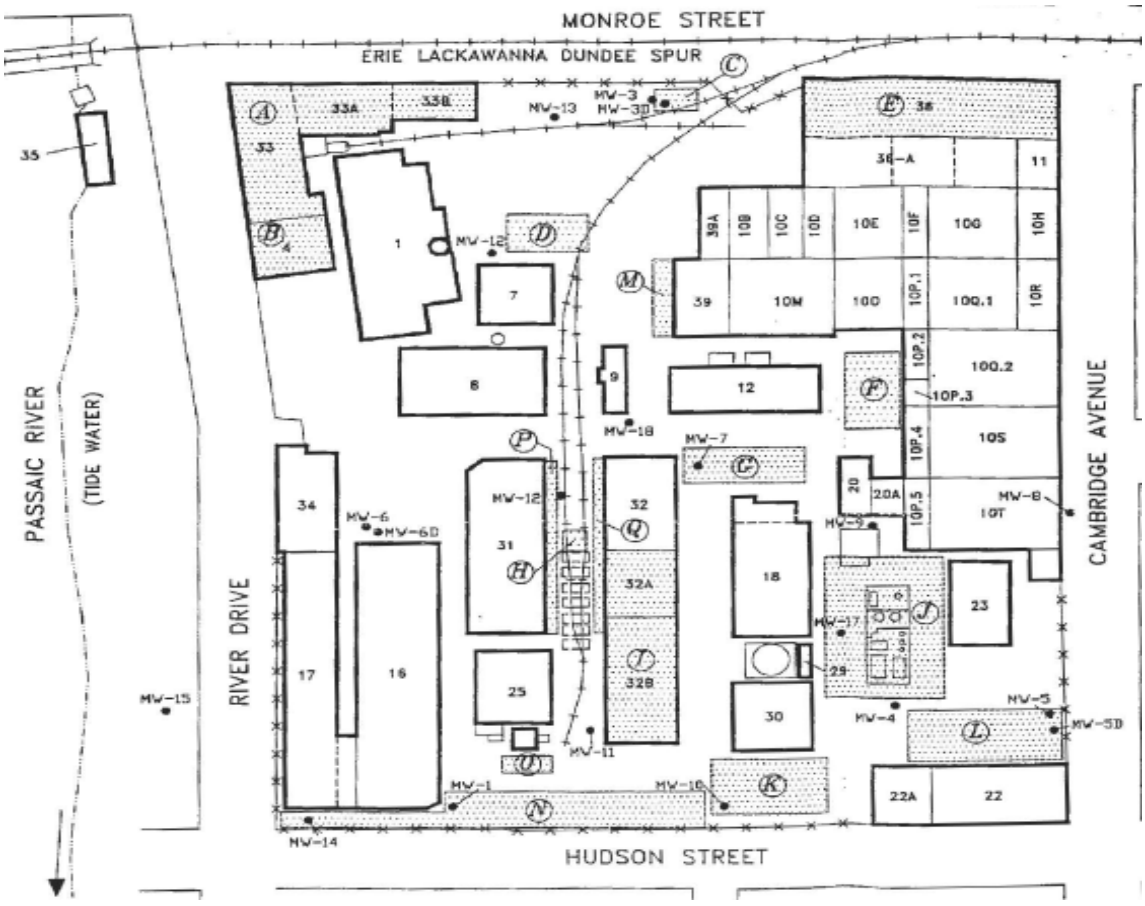
- Building 12: a transformer labelled with a sticker stating that the unit contained <50 ppm PCB was outside Building 12 on a concrete pad.

- Building 16: previously rented by Glare Industries, which was described as having manufactured urinal blocks (Note: As noted below, other documentation establishes that Glare Industries only packaged urinal blocks (PAP-00433528-9)).

- Building 17: leased to Chemo Dynamics Inc. and contained laboratories.

- Building 35: pump house located on the banks of the Passaic River; a transformer was observed and appeared to have a label indicating that the PCB content of the unit was <50 ppm.

- Building 36: three transformers located on the second floor; appeared to be labeled as containing <50 ppm of PCB. (PAP-00433546-57)



(PAP-00433612)

According to the 1993 ECRA Investigation Report, approximately 38 buildings once existed on the site, half of which were used for manufacturing operations by Kalama (PAP-00041525). The 1995 RAWP stated most manufacturing equipment and all production-related chemicals were removed from the site between May and August 1994. Ten buildings (2, 3, 8, 10-A, 10-N, 37, 38, 39, and 39A) had been dismantled over the years (PAP-00041636).

After Kalama took ownership of the site in 1982, portions of the site were operated by other companies.

- A November 25, 1985, registration form for the City of Garfield Bureau of Fire Protection identified "Bldg. 16 (Glair) AMK Manufacturing" as operating an industrial packaging plant for urinal blocks at the Garfield facility owned by Kalama (PAP-00433528), while the 1991 EA stated a "Glare Industries" had previously rented Building 16 for the manufacturing of urinal blocks (PAP-00433552).

- Hart Chemical Co. was identified at the facility site in a December 15, 1988, Garfield Fire Department Application for Certificate of Inspection and an October 4, 1989, New Jersey Bureau of Fire Safety verification/update request. The 1989 document noted Hart Chemical was not open for business (PAP-00433766).

- A February 11, 1991, Addendum to the Lease Agreement dated December 22, 1988, between Landlord Kalama Chemical, Inc. and Tenant, Chemo Dynamics, Inc. stated Chemo Dynamics, Inc. leased the area immediately behind their laboratories in Building 17 (1,600 square feet). Chemo Dynamics performed custom synthesis in small batches (1-25 kilograms) for the pharmaceutical and food industries (PAP-00433552). An additional Addendum dated August 10, 1992, stated Chemo Dynamics, Inc. also leased 729 square feet east of their pilot plant in Building 17 (PAP-00433536, 38).

4. Identified COCs

- PCBs (, used detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

PCBs

The 1991 EA identified several transformers at the site and each was noted to be labeled as containing less than 50 ppb PCBs (PAP-00433546-57).

Two areas containing transformers were identified as areas of environmental concern (AECs) in the 1995 RAWP (PAP-00041652). According to the *Comprehensive Remedial Action Work Plan Addendum*, dated March 14, 2008 (Comprehensive RAWP), PCBs were not detected in site soil at AEC-23 (Transformers at Building 1), but were detected in soil samples collected from AEC-24 (Transformer at Building 12) at a maximum of 2.2 milligrams/kilogram (mg/kg) for Aroclor-1260. This sample (B-44-01

DUPE) was collected from a depth of 0.3-0.8 feet, and two of eight delineation samples collected later from a depth of 0.3-0.8 feet and 1.5-2.0 feet to confirm the findings detected PCBs up to 0.22 mg/kg (PAP-00046359-60).

The *Remedial Investigation and Remedial Actions Report, Building 17 & Former Sewer Lines*, dated February 26, 2003, (2003 RI/RAR) identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Fill was discovered within the foundation walls of the building and was analyzed for PCBs as part of the waste disposal characterization. PCBs were detected at 15.8 mg/kg in one soil sample, but additional delineation samples did not detect PCBs. An area of 19 feet by 27 feet was excavated to a depth of 4 feet around the sample location (PAP-00044391-92). Building 17 was located in the southwestern corner of the site as shown on the figure above.

PAHs

The Comprehensive RAWP identified AECs 1, 3, 6, 10, and 11 as formerly containing fuel oil underground storage tanks (USTs). The USTs were excavated between 1987 and 1990. Only the soil at AEC-11 showed PAH-impacted soil. Sample S-2, collected from a depth of 2 to 4 feet, had a maximum concentration of benzo(b)fluoranthene of 5.69 ppm (see Section 7 for all PAH concentrations at S-2) (PAP-00046310, 16, 18, 20-21, 31-33).

As discussed in the 1993 ECRA Investigation Report, PAHs were detected in 50 of 69 soil samples analyzed for PAHs. The total PAH concentrations ranged from an estimated 0.018 ppm in Sample B-43-A to approximately 101 ppm in Sample B-52-A, collected just south of former fuel oil UST A-4 (PAP-00041235).

According to the data reported in the 1995 RAWP, PAHs were detected at most AECs when soil samples were analyzed for these parameters (PAP-00041858-86). The highest concentrations were detected at AEC-11 (Former No. 2 Fuel Oil USTs), AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39), and AEC-21 (Drum Storage Area Buildings 16 and 17). The maximum concentrations of PAHs were detected from soil sample AEC-15-1C at AEC-15 (see concentrations in the discussion of Historic Fill and in Section 7, Response Actions) (PAP-00042265).

The *Revised Remedial Action Work Plan Addendum*, dated February 29, 1996 (RAWP Addendum) stated that fill material, including sand, gravel, brick and rock fragments, cinders, and ash, had been noted at the site and extending off site. The RAWP Addendum investigated soil boring B-52-A, detecting concentrations of benzo(a)pyrene up to 42 ppm, and attributed the elevated PAH concentrations to the presence of fill (PAP-00042178-79). The Comprehensive RAWP attributed PAHs at several AECs (e.g., AEC-14 and AEC-15) to the fill material at the site since PAHs would not have been used at the facility (PAP-00046341, 44).

The 2003 RI/RAR found elevated PAHs detected in mud from a concrete basin (AEC-32A) north of Building 17 (i.e., 6.1 ppm of benzo(a)anthracene; 4.45 ppm of benzo(b)fluoranthene; 3.04 ppm of benzo(k)fluoranthene; and 4.42 ppm of benzo(a)pyrene). It was stated that this basin drained sinks in the laboratory, but did not connect to a sewer and instead had vents to allow for evaporation (PAP-00044389, 91).

Copper

The 1991 EA identified Building 7 as a former copper shop where sheet metal was fabricated, but it is unclear when this building was used for this purpose (PAP-00433547). A 1989 fact sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey (Permit No. NJ0000124) noted that the limitation on copper was removed because the facility informed NJDEP that they did not use copper (PAP-00206137, 44).

A NJDEP Hazardous Waste Generator Annual Report lists hazardous wastes shipped offsite in the year 1989, including 18 pounds of Waste Poison B solids identified as P029 (copper cyanide) among others (PAP-00433733).

According to the 1990 PVSC Application for a Sewer Connection Permit, Effluent 003 is the Kalama designation for outlet 09404292-21040-0091, which contained industrial waste discharged to the PVSC. This permit application also noted copper was detected at 9 mg/L in the waste water effluent (PAP-00016718, 21). A previous PVSC Application for a Sewer Connection Permit from 1986 stated copper was detected at 2.3 mg/L (PAP-00206124).

An undated NJDEP application for permit to discharge to a domestic treatment works stated the process waste (effluent 003) had copper at 1.0 mg/L (PAP-00433687). Copper was detected in surface soil (Sample B-47-Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at a maximum concentration of 550 ppm (PAP-00041872). Copper was also detected in filter cake material at 223 ppm located between crushed white rock found in a 40-foot-long concrete trough at Building 17 (AEC-32C, Concrete Trough). The soil sample collected beneath the trough detected copper at 52.4 ppm. The concrete trough was excavated in 2002, including an area of 12.5 feet by 60 feet and 5 feet deep and consisting of 210 tons of soil (PAP-00044395-97, 455).

Lead

Although lead was not reported to be included in the operations at the site, a sample of Methylsalicylate Still Bottoms collected April 10, 1991, was analyzed by Toxicity Characteristic Leaching Procedure and resulted in lead concentration of 0.132 mg/L (PAP-00433740).

A NJDEP Hazardous Waste Generator Annual Report lists hazardous wastes shipped offsite in the year 1989, including 107 pounds of hazardous waste solids identified as D008 (lead) among others (PAP-00433733).

Pretreatment monitoring reports for discharges to the PVSC included results for lead in composite samples collected during three months in 1991 as reported below. The monitoring reports stated that metals were not used at the facility (PAP-00433622; PAP-00433632; PAP-00433642).

Effluent Monitoring of Lead		
Month in 1991	**Result (µg/L)**	**Average Flow (GPD)**
July	150	251,000
October	140	271,000
November	120	129,000

(PAP-00433625; PAP-00433635; PAP-00433645)

Results for a sample of "PV 003 Effluent – Pretreatment (composite)" collected March 2, 1993, had lead (0.0020 mg/L) (PAP-00433666-67). According to the 1990 PVSC Application for a Sewer Connection Permit, Effluent 003 is the Kalama designation for outlet 09404292-21040-0091, which contained industrial waste. This permit application also noted that lead was not expected to be present in the waste water (PAP-00016718, 21).

An undated NJDEP application for permit to discharge to a domestic treatment works stated the process waste (effluent 003) had lead at 0.09 mg/L (PAP-00433687).

Analytical results for outfalls to the Passaic River were reported in an undated EPA form 3510 2C (Rev. 2-85). Lead (15 µg/L) was detected in Outfall 002 (PAP-00433658). The long-term average value for lead in the intake water was listed as 16 µg/L (PAP-00433658).

According to the 2003 RI/RAR, lead was detected in filter cake material at 594 ppm found at AEC-32C (Concrete Trough) in Building 17. Soil beneath the trough contained lead at 43.6 ppm (PAP-00044395-97, 455). After the trough was excavated in 2002, the loading dock between Building 16 and Building 17 was investigated. Fill material consisting of crushed rock, brick, wood chips, and glass was found beneath the loading dock. The fill was 1 foot thick, while the native soil beneath consisted of a fine sandy silt. A sample from the fill material contained 42,000 ppm lead, while the native soil beneath this location detected lead at 35.9 ppm. Approximately 166 tons of soil were excavated from this area in 2002 (PAP-00044397-99, 457).

The 2008 Comprehensive RAWP stated that lead was detected up to 820 ppm in AEC-15, but the lead was attributed to historic fill because it was never used in any of the manufacturing processes at the site (PAP-00046343-44). Lead was also detected up to 2,830 ppm in crushed concrete in the basement of former Building 33-B. The concrete was generated during demolition activities. The text stated that the lead contamination in the crushed concrete would be addressed by the site wide institutional and engineering controls that will be implemented for the historic fill material (PAP-00046395-96).

Mercury

A NJDEP Hazardous Waste Generator Annual Report lists hazardous wastes shipped offsite in the year 1989, including 107 pounds of hazardous waste solids identified as D009 (mercury) among others (PAP-00433733).

An undated NJDEP application for permit to discharge to a domestic treatment works stated the process waste (effluent 003) had mercury at <0.0005 milligrams/liter (mg/L) (PAP-00433687).

Analytical results for outfalls to the Passaic River were reported in an undated EPA form 3510 2C (Rev. 2-85). Mercury was detected at 0.2 µg/L in Outfall 002 (PAP-00433658).

Mercury was detected in subsurface soil (depth of 4 to 4.5 feet, Sample B-53 Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at a maximum concentration of 18.6 ppm (PAP-00041873). Mercury was also detected at a concentration of 15.5 ppm from the soil along the sewer line (depth of 2.5 to 3 feet, Sample SL-17-1) at AEC-33 (Building 17 Sewer Line). Approximately 110 tons of soil were excavated from the sewer line and disposed off-site (PAP-00046380-1).

According to the 2003 RI/RAR, mercury was also detected in filter cake material at 100 ppm located between crushed white rock found in a 40-foot-long concrete trough at Building 17 (AEC-32C, Concrete Trough). The soil sample collected beneath the trough detected mercury at 0.58 ppm. An area of 12.5 feet by 60 feet and 5 feet deep was excavated around the concrete trough in 2002, and included 216 tons of soil (PAP-00044395-97, 455).

Historic Fill

The Allocation Team has determined that the majority of the facility site is not located on regional historic fill as designated by the NJDEP.[1]

However, NJDEP-designated regional historic fill is present at the northwest corner of the site under Monroe Street. Site investigations found man-made materials (crushed stone, brick and sandstone fragments, cinders ash,) characteristic of historic fill in the subsurface throughout the facility and offsite at depths up to 10 feet below ground surface (bgs) (PAP-00041645, PAP-00042178). In addition, the 1996 RAWP Addendum attributed elevated concentrations of PAHs and lead at the former Salicylic Acid/Salicylate Production Buildings located at the northeast portion of the site to the presence of fill (PAP-00042177-80). The 2008 Comprehensive RAWP attributed elevated concentrations of PAHs at AECs 14, 15, 21, 26, 30, 31, and 34 to “historic fill” (PAP-00046341, 44, 58, 62, 67-8, 70, 82).

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 42 (NJDEP map identifying locations of recognized historic fill).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing historic fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of historic fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00041872-3; PAP-00042265).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	42,000 mg/kg
Copper	550 mg/kg
Mercury	18.6 mg/kg
Benzo(a)anthracene	41.0 mg/kg
Benzo(a)pyrene	42.0 mg/kg
Benzo(b)fluoranthene	38.0 mg/kg
Benzo(k)fluoranthene	13.0 mg/kg
Dibenzo(a,h)anthracene	5.5 mg/kg
Indeno(1,2,3-cd)pyrene	33.0 mg/kg

5. COC Pathways

Sanitary/Combined Sewer

A letter from Kalama to the PVSC, dated December 21, 1982, stated that the Garfield, New Jersey, facility had been acquired by Kalama as of December 9, 1982, and waste water was discharged to the PVSC Treatment Works under Sewer Connection Permit No. 0940722, which had been issued to the previous owner Tenneco Chemicals, Inc. on January 23, 1981, and expired January 26, 1986. The letter also stated that the flow rate, analysis, and flow characteristics of wastewater effluent remained the same even though the ownership had changed (PAP-00208804). A list of the waste water flow rates from each department at the facility to the "PV Sewer" was dated May 1981, and identified the total flow to the sewer at that time as 85.48 million gallons per year (PAP-00433614, 20).

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[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of historic fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area historic fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The 1991 EA stated that all process waste was discharged to the PVSC under permit number 09404292 (PAP-00433578). This PVSC Sewer Connection Permit was effective May 27, 1986, and expired May 27, 1991. Effluent limitations were defined for two outlets, 09404291-21040-0091 (discharge point No. 3) and 09404292-21040-0091 (discharge points No. 1 and 2), including a daily maximum total for lead of 690 µg/L and a maximum monthly average of 320 µg/L to be reported semiannually (PAP-00016682, 86-89, 90-92).

An undated NJDEP Application for Permit to discharge to a domestic treatment works identified outlets 001 (Sanitary Building No. 17), 002 (Sanitary Building No. 34), and 003 (process wastes, boiler house, air compressors, shops, offices, sanitary, etc.) to the PVSC. Outlet 003 had a pH neutralization listed for its treatment. In addition, this outlet was stated to have copper at 1.0 mg/L, lead at 0.09 mg/L, and mercury at less than 0.0005 mg/L. PAHs were listed as not detected (PAP-00433684, 87-88).

As of March 14, 1986, daily flow at outlet 09404291 was reported as 315,000 gallons (PAP-00206123). The Baseline Monitoring Report submitted under the OCPSF (Organic Chemicals, Plastics and Synthetic Fibers) Category (40 CFR 414 and 416), dated June 15, 1988, listed the total waste water from the facility as an average flow rate of 335,000 GPD (for OCPSF-regulated wastewater, 270,000 GPD) and a maximum flow rate of 380,000 GPD (for OCPSF-regulated wastewater, 310,000 GPD). (PAP-00206174). Information on Compliance with OCPSF Category stated the annual volume of wastewater from the facility was 119,435,000 gallons, while the daily average was 327,000 gallons in 1989 (PAP-00433668, 73). In 1990, pretreatment standards for discharge to the PVSC treatment plant were a daily maximum of 690 ppb and a monthly average of 320 ppb for lead. Kalama's total waste water flow was listed as 275,000 gallons per day (GPD), while flow from Kalama's OCPSF operations was 265,000 GPD (PAP-00016701-2). In 1993, pretreatment standards for lead discharge were the same as in 1990. Kalama's total waste water flow to the PVSC treatment plant was listed as 327,000 GPD, while flow from Kalama's regulated waste water flow was 322,000 GPD (PAP-00433676-77).

According to a PVSC Application for a Sewer Connection Permit, dated May 5, 1986, 113,607,000 gallons of process waste water and approximately 1,440,000 gallons of sanitary service water went to the combined sewer from January 1985 through December 1985 (PAP-00206120-21, 29).

According to a PVSC Application for a Sewer Connection Permit, dated November 27, 1990, 80,699,000 gallons of process waste water and approximately 1,440,000 gallons of sanitary service water went to the combined sewer from October 1989 through September 1990 (PAP-00016715-17).

The flow rates through outlet No. 09404290-21040-0091 during three months in 1991 were reported in Pretreatment Monitoring Reports for the PVSC.

Total Flow		
Month in 1991	**Maximum (GPD)**	**Average Flow (GPD)**
July	318,000	251,000
October	361,000	271,000
November	191,000	129,000

(PAP-00433621; PAP-00433631; PAP-00433641)

Results for a sample of "PV 003 Effluent – Pretreatment (composite)" collected March 2, 1993, had lead (0.0020 mg/L) but PAHs were not detected (PAP-00433666-67). According to the 1990 PVSC Application for a Sewer Connection Permit, Effluent 003 is the Kalama designation for outlet 09404292-21040-0091, which contained industrial waste. This permit application also noted that lead was not expected to be present in the waste water, but copper was detected at 9.0 mg/L (PAP-00016718, 20, 21).

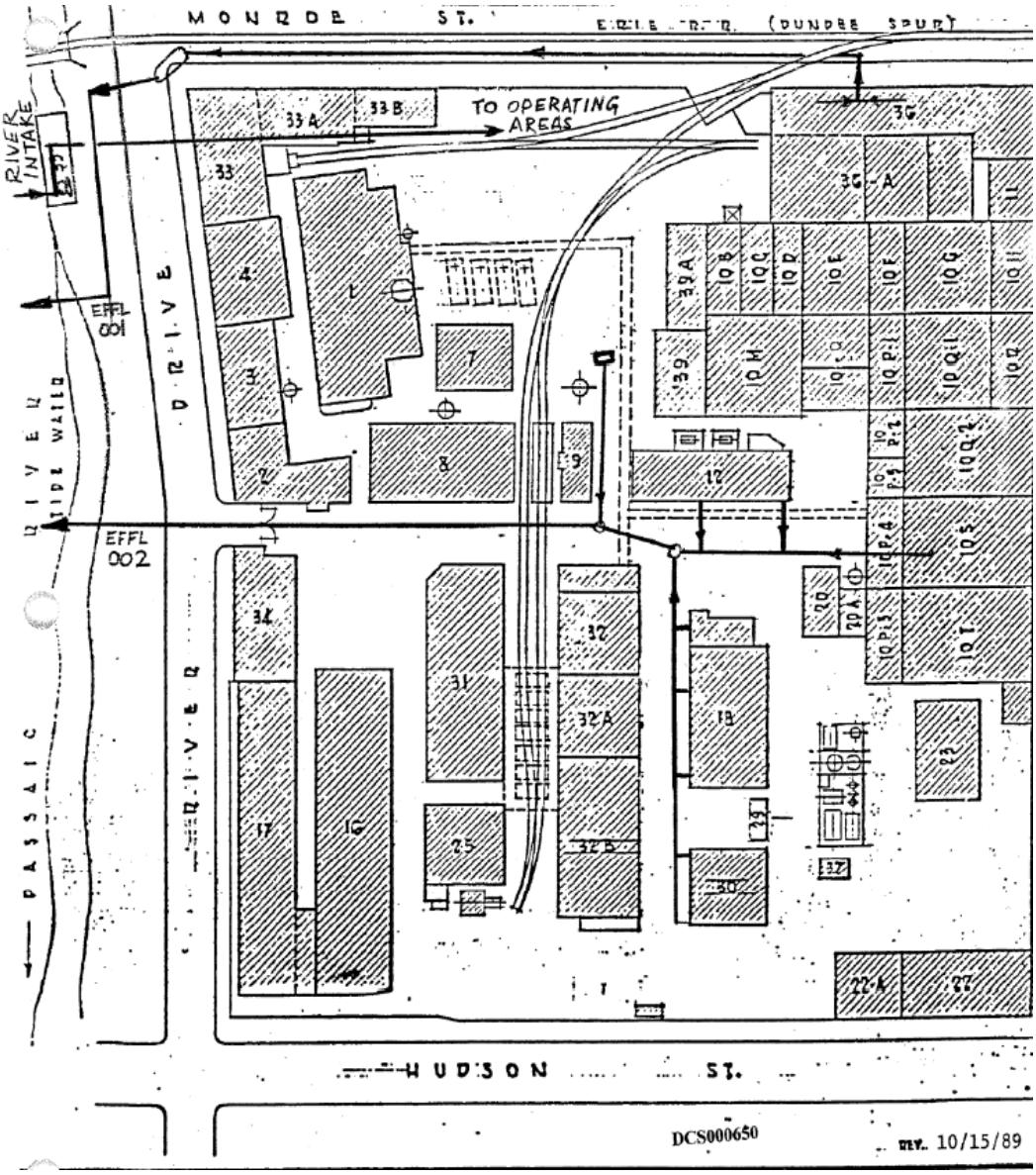
An Industrial User Charge/Pretreatment Inspection Report stated an annual inspection was performed March 25, 1993. Meter readings for average daily water use were reported as 700,000 GPD of river water and 150,000 GPD of waste water. The report also stated contaminated storm water was treated and then discharged to the sewer, while uncontaminated water was discharged to the river (PAP-00206151, 53, 55).

According to the 1993 ECRA Investigation Report, the process waste water lines connected to the PVSC trunk line beneath River Drive (PAP-00041523).

Direct Release

According to the 1991 EA, Kalama had two separate outfalls that discharged to the Passaic River. Outfall 001 was for non-contact cooling water, which was pumped from the river, screened, used once and returned without treatment to the river. Outfall 002 was similar to 001, but included storm water and boiler blowdown (PAP-00433579).

A fact sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey (Permit No. NJ0000124) listed approximately 360,000 GPD of non-contact cooling water from the Salicylic Acid plant as discharged through a storm sewer to Outfall 001. Approximately 480,000 GPD of storm water and non-contact cooling water from the Salicylic Acid derivatives were discharged through Outfall 002. The following site map showing the outfall locations was dated October 15, 1989 (PAP-00206137, 40).



(PAP-00206140)

According to two PVSC Applications for a Sewer Connection Permit, dated May 5, 1986, and November 27, 1990, 340,078,600 gallons and 404,358,000 gallons, respectively, of cooling water were discharged to the Passaic River from January to December 1985 and October 1989 through September 1990, respectively (PAP-00206119-20; PAP-00016715-16).

An Industrial User Charge/Pretreatment Inspection Report stated an annual inspection was performed March 25, 1993. Meter readings for average daily water use were reported as 700,000 GPD of river water and 150,000 GPD of waste water. The report also stated contaminated storm water was treated and then discharged to the sewer, while uncontaminated water was discharged to the river (PAP-00206151, 53, 55)

Analytical results for each outfall were reported in an undated EPA form 3510 2C (Rev. 2-85). Concentrations of PAHs, PCBs, total lead, total copper, and total mercury were not detected in Outfall 001 (PAP-00433647-55), while total lead (15 µg/L) and total mercury (0.2 µg/L) were detected in Outfall 002 (PAP-00433658). The long-term average value for lead in the intake water was listed as 16 µg/L (PAP-00433649, 58).

6. Regulatory History/Enforcement Actions

Inspections

An Industrial User Charge/Pretreatment Inspection Report stated an annual inspection was performed March 25, 1993. Meter readings for average daily water use were reported as 700,000 GPD of river water and 150,000 GPD of waste water. The report also stated contaminated storm water was treated and then discharged to the sewer, while uncontaminated water was discharged to the river (PAP-00206151, 53, 55).

An Application for Certificate of Inspection by the Garfield Fire Department stated Hart Chemical Co. at the 290 River Drive location was inspected by the New Jersey Bureau of Fire Safety on December 15, 1988 (PAP-00433530-31).

A Right to Know Compliance inspection was conducted by the New Jersey Department of Health on September 14, 1992. The violations noted were all due to failure to label containers (PAP-00433862-65).

Violations

Violations were noted for Hart Chemical Co. at the facility based on a December 15, 1988, inspection by the New Jersey Bureau of Fire Safety. The violations included permits needed for the flammable and corrosive areas, and a diked area for the manufacturing area (PAP-00433532).

The PVSC sent a notice of violation on May 2, 1991, for non-COCs (chloroform and toluene) but these were noted by the facility to be sampling error and subsequent results showed compliance (PAP-00208805). Another PVSC notice of violation for permit 0949429 based on a non-COC (methylene chloride) was dated April 13, 1994 (PAP-00208813).

Permits

A letter from Kalama to the PVSC, dated December 21, 1982, stated that the Garfield, New Jersey, facility had been acquired by Kalama as of December 9, 1982, and discharged water under Sewer Connection Permit No. 0940722, which had been issued to Tenneco Chemicals, Inc. on January 23, 1981, and expired January 26, 1986 (PAP-00208804).

PVSC Sewer Connection Permit No. 09404292 was effective May 27, 1986, and expired May 27, 1991. Effluent limitations were defined for two outlets, 09404291-21040-0091 (discharge point No. 3) and 09404292-21040-0091 (discharge points No. 1 and 2), including a daily maximum for total lead of 690 µg/L and a maximum monthly average of 320 µg/L to be reported semiannually (PAP-00016682, 86-89, 90-92).

A letter to the PVSC from Kalama dated April 6, 1990, documented standard limits for discharge to the PVSC treatment plant. The total wastewater flow was 275,000 gallons per day, while flow from Kalama's OCPSF operations was 265,000 GPD. The limits for total lead were a daily maximum of 690 ppb (combined waste water formula application 665 ppb) and a monthly average of 320 ppb (combined waste water formula application 309 ppb) (PAP-00016700-02).

A letter from the NJDEP to Kalama, dated January 29, 1993, served as a final notice of termination of the New Jersey Pollutant Discharge Elimination System/Significant Indirect User (NJPDES/SIU) Permit (No. NJ0000124) to discharge pollutants into a delegated local agency's wastewater treatment plant, because the criteria for individual NJPDES/SIU permits did not apply to the facility (PAP-00016712).

NJDEP Permit No. NJ0000124 allowed discharge to the Passaic River, and was effective January 1, 1985, and expired December 31, 1989. According to the *Environmental Site Assessment, Phase I Property Transfer Report*, dated May 1994, Kalama submitted a renewal application to NJDEP, but it was still under review by NJDEP (PAP-00433807). Effluent limitations included copper (1.0 mg/L), but monitoring was only stated to be necessary if a corrosion inhibitor containing copper was used (PAP-00206157-58).

A 1989 fact sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey (Permit No. NJ0000124) identified the two outfalls to the Passaic River. Limitations for non-COCs were specified and it was noted that the limitation on copper was removed because the facility informed NJDEP that they did not use copper (PAP-00206137, 44).

7. Response Actions

Characterization Activities

Numerous site characterization activities have taken place at the facility. The most significant reports include:

- *Environmental Assessments, Draft Report for B.C. Sugar*, dated September 3, 1991, prepared by Dames & Moore (PAP-00433539).
- *ECRA Investigation Report and Proposed Remedial Action Workplan, Volume I of IV*, dated December 1993 (ECRA Investigation Report), prepared by Geraghty & Miller, Inc. (PAP-00041187).
- *Environmental Site Assessment, Phase I Property Transfer Report*, dated May 1994, prepared by IT Corporation (PAP-00433767).
- *Revised Remedial Action Work Plan*, dated March 31, 1995 (PAP-00041624)

- *Revised Remedial Action Work Plan Addendum*, dated February 29, 1996, by SECOR International Inc. (PAP-00042155).
- *Remedial Investigation and Remedial Actions Report, Building 17 Former Sewer Lines*, dated February 26, 2003 (RI/RAR), by Sovereign Consulting Inc. (PAP-00044380).
- *Remedial Investigation Report and Remedial Action Work Plan for the Northern Phenol Area and Dowtherm DNAPL Areas,* dated February 13, 2004 (PAS-00008946).
- *Comprehensive Remedial Action Work Plan Addendum*, dated March 14, 2008, prepared by Sovereign Consulting Inc. (PAP-00046273).

Soil

Soil sampling was performed from 1986 through 1993 and summarized in the 1995 RAWP. The 1995 RAWP identified 28 AECs that generally included former locations of USTs (e.g., AECs 1, 3, 6, 10, and 11 contained fuel oil USTs), drum and scrap metal storage areas (AECs 19, 20, 21), production areas (AECs 14, 15, 16, 17), transformers (AECs 23, 24), and loading/unloading areas (AECs 24 through 28) (PAP-00041648-52).

According to the 1995 RAWP, PCBs were detected in site soil at AEC-24 (Transformer at Building 12) at a maximum of 2.2 mg/kg for Aroclor-1260 (PAP-00041882). In addition, according to the 2003 RI/RAR, PCBs were detected at 15.8 pm in one sample collected from the fill within the foundation walls of Building 17, but additional delineation samples did not detect PCBs (PAP-00044392-93).

The 1995 RAWP stated metal COCs were detected in soil at AEC-14, AEC-15, and AEC-18 as listed in the table below. Highest levels of metals contamination in soil were noted at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39). The 1996 RAWP Addendum attributed the lead concentration at AEC-15 to the presence of fill at the site (PAP-00042180).

Metal COCs Detected in Soil				
AEC	**Description**	**Copper**	**Lead**	**Mercury**
AEC-14	Benzoic Acid/ Benzaldehyde Production Area	7.8 mg/kg	(3.4 U)	(0.11 U)
AEC-15	Salicylic Acid/ Salicylate Production Buildings 10/36/39	550 mg/kg	820 mg/kg	18.6 mg/kg
AEC-18	Sewer Lines	190 mg/kg	446 mg/kg	0.68 mg/kg

U: Not detected
(PAP-00041871-73, 76)

PAHs were detected at most AECs, but concentrations were generally low, with the highest concentrations detected at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39). The 1996 RAWP Addendum attributed these concentrations to the presence of fill at the site (PAP-00042179). The maximum concentrations of PAHs were detected as follows:

Maximum PAHs Detected in Soil Samples			
PAHs (ppm)	**S-2 at AEC-11**	**B-52-A at AEC-15**	**AEC-15-1C**
Anthracene	0.85	1.3	13.0
Benzo(a)anthracene	3.0	12.0	41.0
Benzo(a)pyrene	2.4	10.0	42.0
Benzo(b)fluoranthene	5.69	13.0	38.0
Benzo(ghi)perylene	0.96	3.0	43.0
Benzo(k)fluoranthene	NR	2.5	13.0
Chyrsene	4.0	12.0	45.0
Dibenzo(a,h)anthracene	NR	1.0	5.5
Fluoranthene	4.1	14.0	41.0
Fluorene	0.66 U	NR	1.8
Indeno(1,2,3-cd)pyrene	0.95	2.9	33.0
Naphthalene	2.8	0.12 J	0.27 J
Phenanthrene	3.4	4.6	39.0
Pyrene	6.91	20	260

NR: not reported J: estimated concentration U: not detected
(PAP-00041870, 72; PAP-00042265)

The 2003 RI/RAR identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Elevated PAHs were detected in mud from a concrete basin (AEC-32A) north of Building 17 (i.e., 6.1 ppm of benzo(a)anthracene; 4.45 ppm of benzo(b)fluoranthene; 3.04 ppm of benzo(k)fluoranthene; and 4.42 ppm of benzo(a)pyrene). It was stated that this basin drained sinks in the laboratory, but did not connect to a sewer and instead had vents to allow for evaporation (PAP-00044389-91).

Sewer

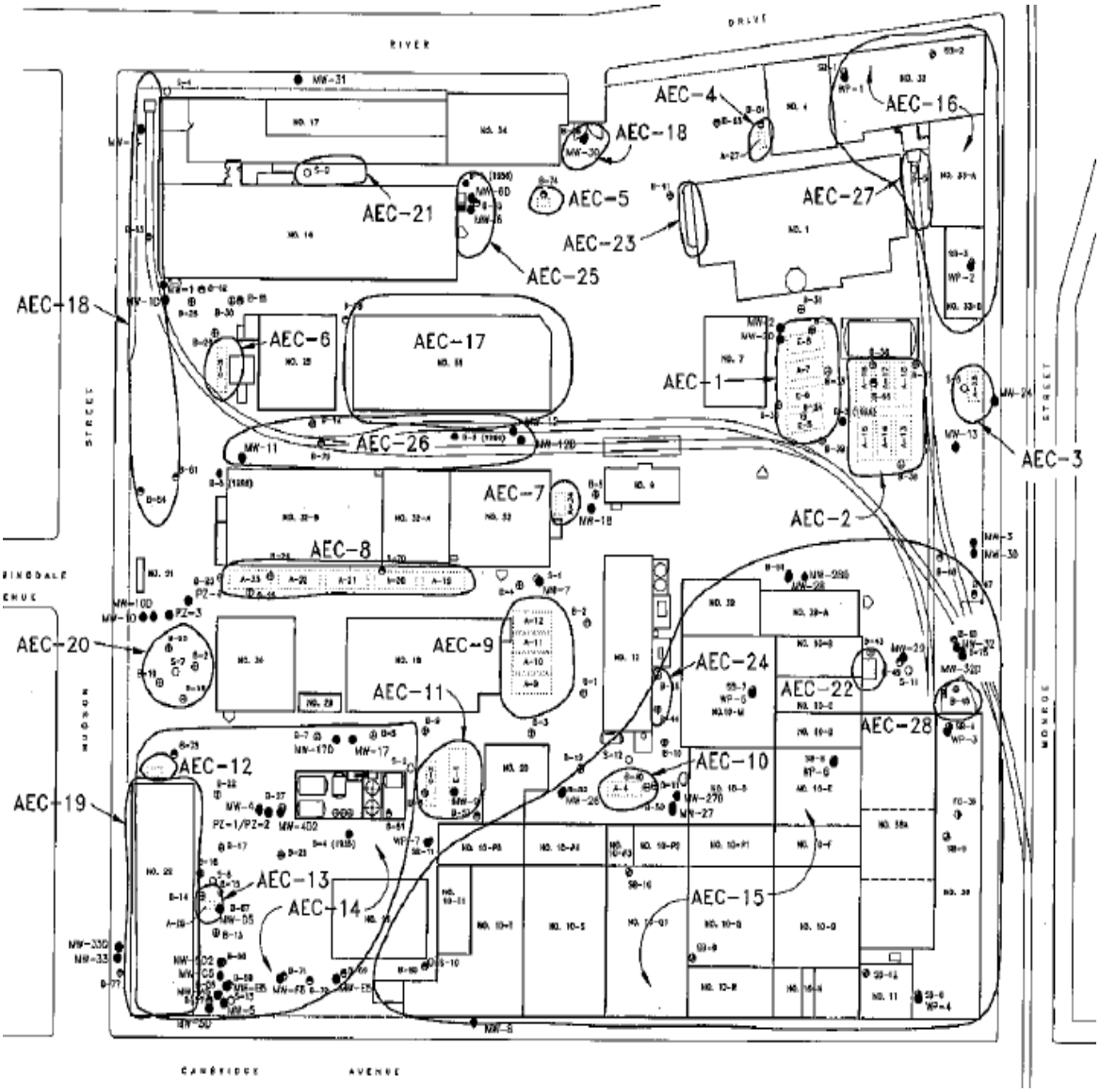
In the 1995 RAWP, AEC-18 was identified as the western portion of the sewer line that ran along Hudson Street to south, as well as the sewer outfall 002 near the main gate (PAP-00041651). Metals and PAHs were detected in soil samples collected along the sewer lines at maximum concentrations of 190 ppm copper (Sample B-55-Fill), 446 ppm lead (Sample B-54-Fill), and 0.68 ppm mercury (Sample B-54-Fill) (PAP-00041876).

The sewer lines from Building 17 (AEC-33), Building 32 (AEC-34), and Hudson Street (AEC-35) were removed in 2002. Maximum concentrations of metals in soil beneath the Building 17 line were 92.9 ppm copper, 132 ppm lead, and 15.5 ppm mercury. Soil samples collected at the Building 32 and Hudson Street sewer lines were not analyzed for metals, but PAH concentrations detected at Building 32 were attributed to fill material at the site. Approximately 110 tons, 756 tons, and 1,312 tons of soil were removed with each sewer line, respectively (PAP-00016753-56; PAP-00044401, 03-04, 13, 59).

Remedial Activities

The 1993 ECRA Investigation Report discussed five phases of ECRA-related investigations from 1986 to 1993 and the removal of 27 underground storage tanks during September 1987 to February 1990. In addition, an Administrative Consent Order (ACO) was executed between Kalama and NJDEP in December 1988 (PAP-00041518, 28-32).

The 1995 RAWP identified 28 AECs that generally included former locations of USTs (e.g., AECs 1, 3, 6, 10, and 11 contained fuel oil USTs), drum and scrap metal storage areas (AECs 19, 20, 21), production areas (AECs 14, 15, 16, 17), transformers (AECs 23, 24), and loading/unloading areas (AECs 24 through 28) (PAP-00041648-52).



(PAP-00041795; note north is to the right in this figure)

The 2003 RI/RAR identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Fill was discovered within the foundation walls of the building and was analyzed for PCBs as part of the waste disposal characterization. PCBs were detected at 15.8 ppm in one soil sample, but additional delineation samples did not detect PCBs. An area of 19 feet by 27 feet was excavated to depth of 4 feet around the sample location (PAP-00044391-92).

This investigation also excavated a concrete trough with elevated metals concentrations located at Building 17, including an area of 12.5 feet by 60 feet and 5 feet deep and consisting of 216 tons of soil (PAP-00044395-97). After the trough was excavated in 2002, the loading dock between Building 16 and Building 17 was investigated. Fill material consisting of crushed rock, brick, wood chips, and glass was found beneath the loading dock. The fill was 1 foot thick, while the native soil beneath consisted of a fine sandy silt. A sample from the fill material contained 42,000 ppm lead, while the native soil beneath this location detected lead at 35.9 ppm. Approximately 166 tons of soil were removed from this area in 2002 (PAP-00044397-99, 457).

The sewer lines from Building 17 (AEC-33), Building 32 (AEC-34) and Hudson Street (AEC-35) were removed in 2002. Maximum concentrations of metals in soil beneath the Building 17 sewer line were 92.9 ppm copper, 132 ppm lead, and 15.5 ppm mercury. The soil along the Building 17 sewer line consisted of crushed stone/slag fill material underlain by sand, silt, and silty sands. Approximately 110 tons, 756 tons, and 1,312 tons of soil were removed with each sewer line, respectively (PAP-00044401, 04, 13).

The 2008 Comprehensive RAWP stated no further action (NFA) was approved by NJDEP for the following AECs in a letter dated September 6, 1995: AEC-1 through 8, 10, 16, 22, 23, 25, 27, and 28. It was also stated that AEC-31 received NFA approval on June 18, 2002, and AEC-32A, 32B, 32C, 32D, 33, 34, and 35 were approved for NFA by NJDEP on October 21, 2003 (PAP-00323694-702, 708, 729, 737-739, 741-742, 749-766).

A letter from NJDEP dated December 30, 2008 approved NFA for the following AECs: 9, 12, 13, 15, 17, 18, 19, 20, 21, 26, and 32A. The letter stated a site-wide cap engineering control was required due to the presence of contaminated historic fill at the site (PAP-00324631).

8. Summary of Asserted Defenses

Goodrich asserts that to the extent it is claimed that PAHs from released petroleum products impacted the River, such discharges are excluded from CERCLA by the petroleum exclusion at 42 USC 9601(14). To the extent it is claimed that PAHs impacted the River, Respondent also intends to assert a transport and fate defense.

Newell Brands Inc. (f/k/a Newell Rubbermaid Inc.)

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

NEWELL BRANDS INC. (f/k/a Newell Rubbermaid Inc.)

Facility Name, Address and Size: Goody Products, Inc. (formerly known as H. Goodman & Sons, Inc.) 969 Newark Turnpike, Kearny, New Jersey 07032.[1] Approximately 10.3 Acres (PAP-00104322). In a Pollutant Discharge form dated December 1975, the plant reported 300 employees. In a July 24, 1991, Sewer Connection Application, the plant reported 300 full-time employees with two shifts per day (PAP-00103450; PAP-00105520). A Community Right To Know Survey for 1991 completed by Goody Products, Inc. reported 320 employees (PAS-00002034).

1. **Business Type:** Manufacturer of nickel-plated hair care accessories (PAP-00104322).

2. **Time Period of Ownership/Operations**

Operator: ~1968 to May 13, 1994 (PAP-00103485; PAP-00104911; PAP-00104832; PAP-00105268; PAS-00001863)
Owner: Jeryl Industries, Inc., from pre-1969 to at least 1996 (PAS-00001835; PAS-00002050)

H. Goodman & Sons, Inc. leased the Site from Jeryl Industries, Inc. on May 26, 1966 (PAP-00350468; PAS-00002050-89). On January 2, 1976, H. Goodman & Sons, Inc. filed a Restated Certificate of Incorporation (PAS-00002091-98). The corporate name was changed to Goody Products, Inc. on May 22, 1980, according to a Certificate of Amendment of Certificate of Incorporation of H. Goodman & Sons, Inc. (PAS-00002099-104). Note: A 1996 Assignment and Assumption of Lease stated the name was changed to Goody Products, Inc. on June 2, 1982 (PAP-00350469). Goody Products became a wholly owned subsidiary of Newell Company by a stock purchase of August 2, 1993 (PAP-00350690; PAS-00001867). According to the 1997 Response to Request for Information completed by Newell Company, Goody Products operated at the facility for approximately 25 years from approximately 1968 to 1994. Operations at the site ceased in May 1994 (PAP-00104911; PAP-00104832; PAP-00105268; PAS-00001863).

On June 15, 2018, the stock of Goody Products, Inc. was transferred from Newell Brands Inc. (f/k/a Newell Rubbermaid Inc., f/k/a Newell Co.), through a series of internal contributions, ultimately to its wholly owned indirect subsidiary Sunbeam Diversified Holdings LLC, a Florida limited liability company. On August 31, 2018, Newell Brands Inc. assumed the liability of Goody Products, Inc., if any, in connection with the Diamond Alkali Superfund Site arising from alleged discharges from the past operation of the Facility by Goody Products, Inc. (PAP-00718033; PAP-00718036). On that same day, Newell Brands Inc. then caused the sale of the stock of Goody Products, Inc. from Sunbeam Diversified Holdings LLC to GP Midco, L.L.C., a Delaware limited liability company that is unrelated to Newell Brands Inc. (PAP-00717943, 54-57). Newell

[1] The property where the Goody Products, Inc. facility was located was commonly known as 969 Newark Turnpike. Google Maps currently lists the property's address as 969 Newark-Jersey City Turnpike.

Brands Inc. further agreed to indemnify Goody Products, Inc. for that assumed liability (PAP-00717954-57, PAP-00718033-4, PAP-00718036).[2]

3. Operational History/COC Use and Presence at the Facility

According to the 1997 Response to Request for Information completed by Newell Company, the products manufactured at the facility were hair barrettes, and other metal hair accessories such as pins. Base metals such as steel, stainless steel, and aluminum were purchased and processed to make the final products. These base metals contained variable amounts of aluminum, iron, and chromium. The manufacturing processes to make the final products included stamping and forming to obtain semi-finished metal parts which were heat-treated and annealed. This process utilized oils. Metal parts were also subjected to burnishing or polishing. Scale removal involved acid and caustic water mixtures. Certain products underwent dry process metallizing with aluminum. Electroplating of nickel onto steel from an acid solution of nickel ions was also conducted. Some zinc plating from cyanide solutions may also have taken place. Lacquer coating of metal parts that utilized thinners containing ethylbenzene, toluene, and xylene also occurred. Hazardous wastes were generated as a result of the manufacturing processes (PAP-00103473; PAS-00001864).

Goody Products operated under NJPDES discharge permit No. NJ0029505, which granted the company permission to discharge to Dead Horse Creek. The permit was issued June 2, 1984, and effective August 1, 1984, and had an expiration date of July 31, 1989 (PAP-00350677; PAS-00001878). Contaminants to be monitored under this permit included lead and copper, with daily discharges of each not to exceed 0.1 mg/L; and oil and grease, with daily discharge not to exceed 20 mg/L (PAS-00001891). Note: PAHs may be present in oils.

According to the 1983 Public Notice for the issuance of draft NJPDES permit No. NJ0029505, there were two existing surface water discharge outfalls at the Goody Products facility. Discharge 001 was industrial process wastewater generated from various metal finishing operations that would receive treatment consisting of equalization, neutralization, flocculation, clarification, and filtration. Discharge 002 was sanitary wastewater which received treatment consisting of primary settling, aeration, secondary settling, and chlorination (PAP-00105420; PAP-00105440-41).

A Discharge Monitoring Report from July 1989 stated that a new Industrial Process Waste Water Treatment Plant was installed in July (PAP-00446234-37). In August 1989, it was reported that Goody Products was adjusting and debugging the new treatment system. The old treatment system, which was being used for neutralization of alkaline cleaners, appears to be the source of unexpected nickel, cadmium and lead residues, thereby contributing to exceedances (PAP-00446296).

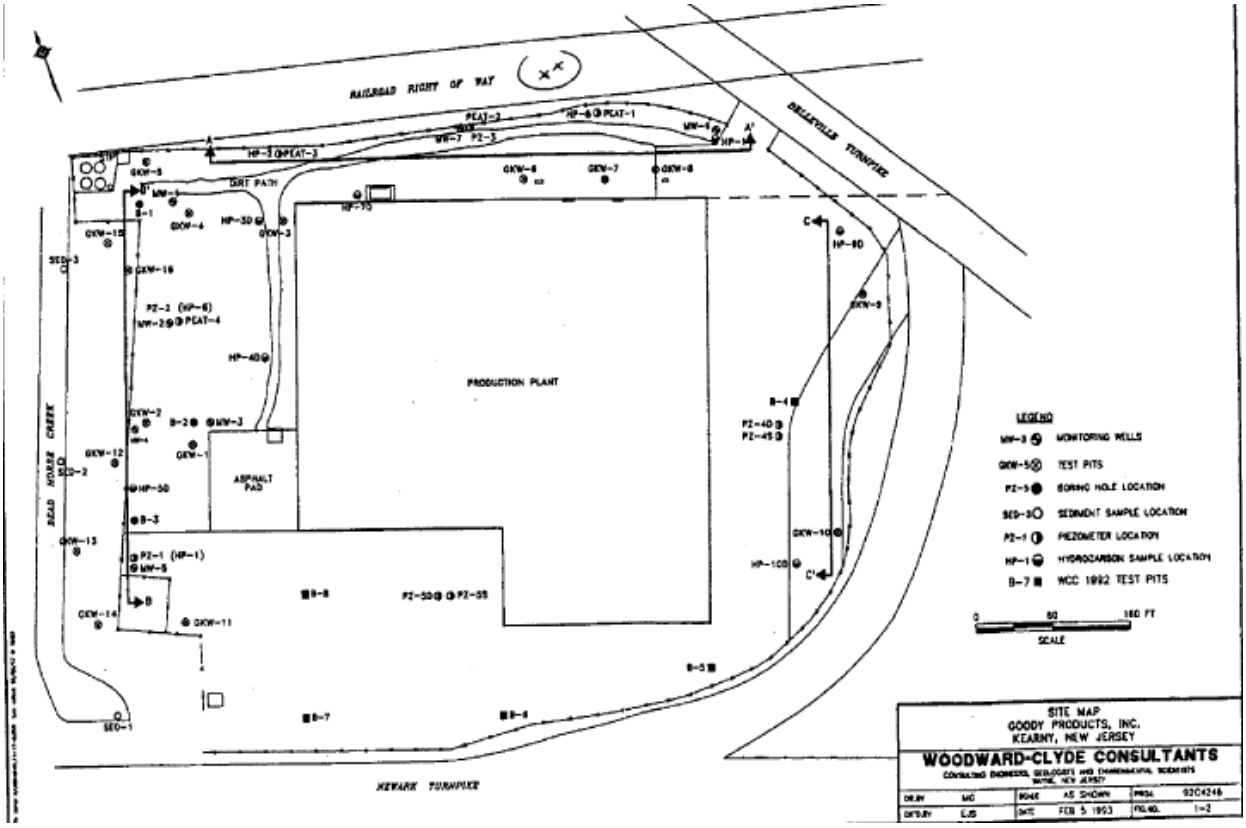
[2] This Report was revised to include documents received on June 15, 2020. The additional documents did not change Newell Brands Inc.'s previous certification

A Community Right-to-Know Survey for 1991 completed by Goody Products states that Goody Products' nature of business included manufacturing, assembly, and warehousing of hair care accessories (PAS-00002034).

The 1991 Survey shows areas where chemicals were stored. This included: The tool room; boiler room; plating room; maintenance department; warehouse; metalizing-stripping room; waste treatment area; waste storage area; and, outside sanitary sewer treatment plant. Chemicals listed included among others, waste oils, acetone, acetylene, naphtha solvent, kerosene, hydrogen peroxide, hydrochloric acid, ferrous sulfate, sodium hydroxide, sulfuric acid, sodium bisulfite, sodium hypochlorite, nickel plugs and nickel compounds, 2-butoxyethanol, and ammonia (PAS-00002035-43).

A map included with the June 1993 report *Results of Field Investigation and Review of Remedial Options* (included below) prepared by Woodward-Clyde Consultants for Goody Products shows the location of the production plant in relation to Dead Horse Creek to the west. According to the map at the end of this section the sanitary wastewater treatment plant was located in the northwestern corner of the facility (PAS-00001945; PAS-00001959).

Newell Company stated in the 1997 *Response to Request for Information* that there was no further discharge by Goody Products personnel from the treated sanitary wastewater outfall (002A) after the property was vacated in October 1994. No flow reports were filed with the New Jersey Department of Environmental Protection (NJDEP) until August 1996 (PAS-00001863; PAS-00001876-77). In 1994 and 1995, all hazardous waste generated at Goody Products was disposed of at off-site facilities (PAS-00001911-26; PAS-00001930-43). Hazardous wastes disposed of in 1994 included filter cake from metals treatment of wastewater, and rinse and wash water from electroplating (PAS-00001911-26). Note: It was stated in the *Response to Request for Information* that the site was vacated in October 1994 and confirmed in a waste report that manufacturing operations ceased May 13, 1994 (PAS-00001929). The last shipments of hazardous waste from the facility were on August 14, 1995 (PAS-00001930-43).



4. Identified COCs

- PAHs (potentially used and detected
- Copper (used)
- Lead (used)
- Mercury (released)

PAHs

Newell stated in the 1997 Response to EPA Request for Information that PAHs may be present in heating fuel oil, lubricating oils, and heat quench oil (PAS-00001864). Fuel Oil No. 4 was stored in a 10,000-gallon underground storage tank (UST) located in the northern portion of the Goody site. The tank was removed in February 1990 (PAP-00105060; PAP-00350612).

Following the excavation, confirmation samples were collected from the sidewalls. Five base-neutral compounds (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene) were detected in the deeper sample obtained from the southern sidewall (PAP-00105061). The total concentration of the PAHs was 7.34 mg/kg, which is below the cleanup guideline of 10 mg/kg (PAP-00350625). A 1990 Report on UST Removal found that soil remediation was not necessary following UST removal because elevated petroleum hydrocarbon concentrations were attributable to historic fill (PAP-00350612-13). A October 1994

Preliminary Remedial Investigation Workplan concluded the presence of PAHs was attributable to historical urban fill materials placed at the site in conjunction with site development, and no further action was proposed with regard to the 10,000 gal. UST (PAP-00105061). Soil, surface water, and groundwater sampling on the site and within Dead Horse Creek has detected several PAHs (PAS-00002018-19; PAS-00002021-22; PAS-00002024-25; PAP-00104829-97; PAP-00104783-801).

Copper

According to the May 1972 Waste Effluent Survey conducted for Passaic Valley Sewerage Commissioners, some materials used at the facility contained metals and metal alloys (brass and white metal) (PAP-00350464). Brass contains copper (PAP-00350483). The white metal may have contained copper (PAP-00350467; PAP-00103466; PAP-00350478-508; PAP-00350509-10). The type of white metal used by the facility and its chemical composition is not known. The 1972 Waste Effluent Survey reported a concentration of copper of 1,675 micrograms per liter (µg/L) in the facility's industrial wastewater (PAP-00350467).

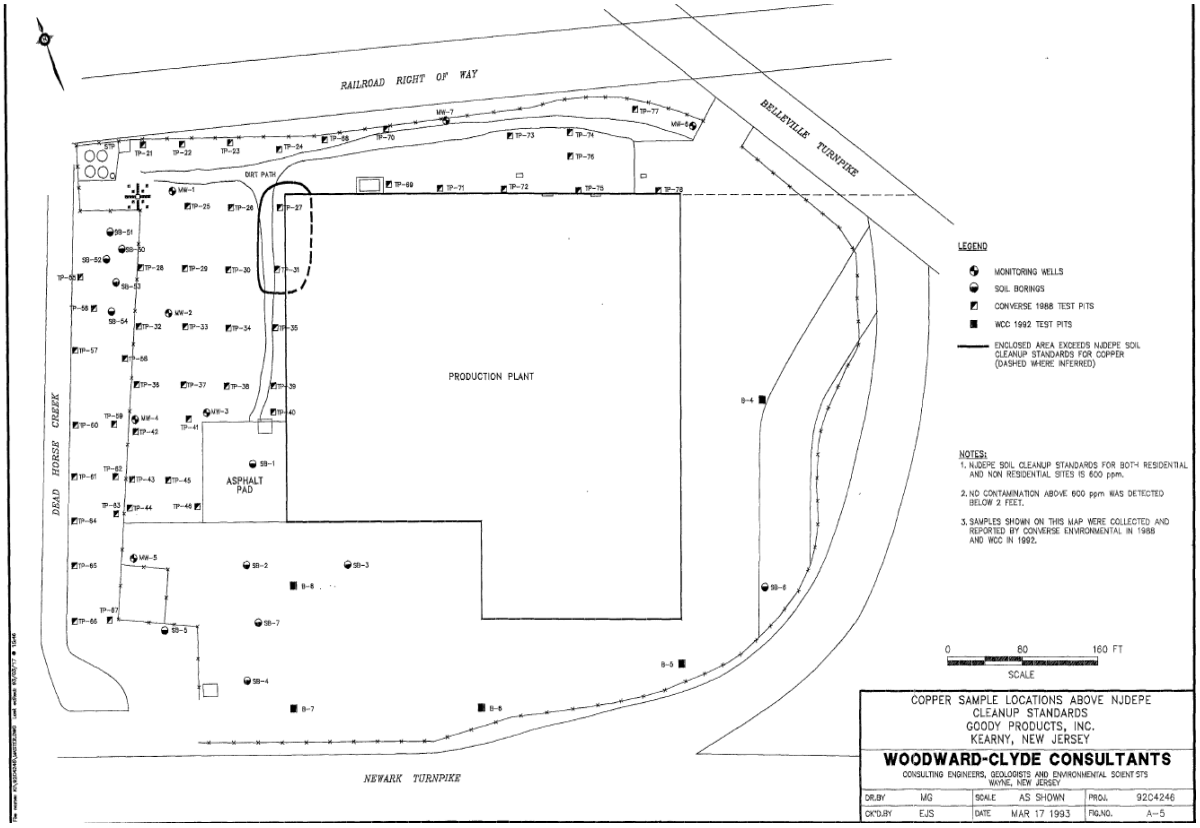
According to a NJDEP memorandum dated February 11, 1976, field samples collected on three different occasions in June 1975 and in September 1975 from two-inch discharge hoses emanating from the rear of H. Goodman & Sons, Inc., premises and discharging to the ground revealed excessive heavy metals parameters (PAP-00105499). The concentration of copper in these samples ranged from 105 µg/L to 430 µg/L (PAP-00105511-13). In addition, the samples collected on June 5 and 12, 1975 had low pH readings of 2.7 and 2.3, respectively (PAP-00105511-12). It appears that as of 1983, the Facility was no longer using brass or white metal (PAP-00105322).
In the 1997 Response to EPA's Request for Information, Newell stated that it received, utilized, manufactured, discharged, released, stored or disposed of materials containing copper at the Goody Products facility included (PAS-00001863-64).

According to a December 17, 1976 Regarding Aeration Studies, the Facility's industrial wastewater discharges contained copper (PAP-00104750; PAP-00104753).

A 1979 treatability study of facility wastewater noted pretreatment levels of copper of 0.19 mg/l; and post treatment levels of copper of 0.03 mg/l (PAP-00105365 According to the NJPDES permit application materials from 1991, copper was known to be present in the facility's discharge (PAP-00103466).

Soil, surface water, and groundwater sampling on the site and within Dead Horse Creek has detected copper (PAS-00001965-69; PAS-00001973-76 PAS-00001994-96; PAP-00104185-88;; PAP-00104829-97; PAP-00104783-801;).

The June 1993 Results of Field Investigation and Review of Remedial Options prepared by Woodward-Clyde Consultants for Goody Products included maps delineating the locations of the contaminants which exceeded New Jersey Department of Environmental Protection and Energy (NJDEPE) residential and non-residential soil cleanup standards. The following map shows the area where copper exceeded cleanup standards:



(PAP-00103569)

Discharge Monitoring Reports for Industrial Process Wastewater discharges (Discharge 001) from 1984 through 1994 reported numerous detections for copper (PAP-00446408-735).

Lead

According to the May 1972 Waste Effluent Survey, white metal was used at the facility (PAP-00350464). The white metal may have contained lead (PAP-00350478-508). The type of white metal used by the facility and its chemical composition is not known. It appears that as of 1983, the facility was no longer using brass or white metal (PAP-00105322). Lead was not reported in the chemical testing results recorded in the 1975 New Jersey Department of Health Stream or Wastewater Analysis (PAP-00105511-13).

A 1979 treatability study of facility waste water noted pretreatment levels of lead of 6.40 mg/l; and post treatment levels of lead of 0.40 mg/l (PAP-00105365). In other instances, such as in 1983 and 1991, lead was not detected in facility wastewater discharges (PAP-00105310). According to the NJPDES permit application materials from 1991, lead was suspected to be absent from the facility's discharges (PAP-00103466).

In the 1997 Response to EPA's Request for Information, Newell stated that it received, utilized, manufactured, discharged, released, stored or disposed of materials containing lead at the Goody Products facility (PAS-00001863-64).

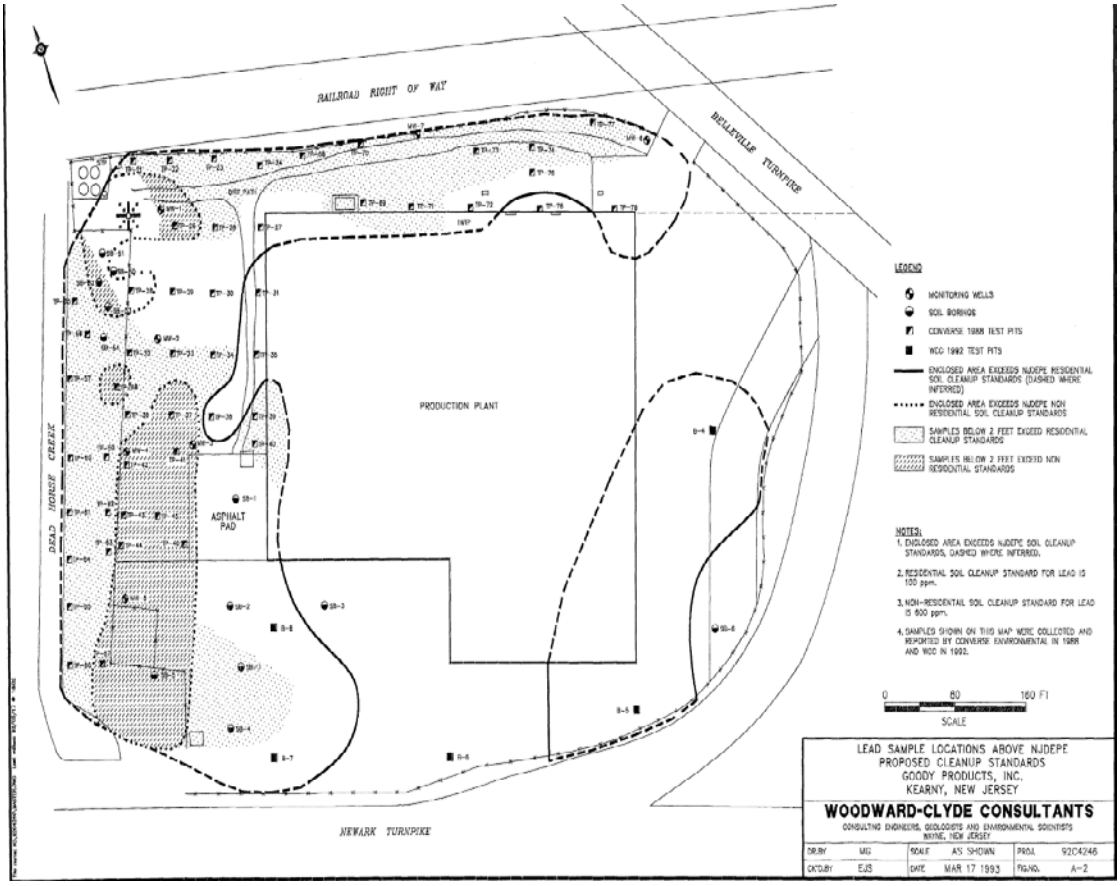
Newell Brands Inc. (f/k/a Newell Rubbermaid Inc.)
Diamond Alkali OU2 Allocation
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Facility Data Report

Discharge Monitoring Reports for Industrial Process Wastewater discharges (Discharge 001) from 1984 through 1994 reported numerous detections for lead (PAP-00446408-735).

Soil, surface water, and groundwater sampling on the site and within Dead Horse Creek has detected lead, (PAS-00001965-79; PAS-00001994-96; PAS-00002009; PAS-00002016-17; PAS-00002023; PAP-00104156; PAP-00104185-98; PAP-00104829-97; PAP-00104783-801).

In 2002, NJDEP accepted information provided by Killam that lead in groundwater is associated with historic fill. Based on the presence of lead in groundwater in both process and non-process areas of the property, and on the fact that lead is a common constituent of fill materials, NJDEP accepted that the lead in groundwater is associated with the historic fill on the property and required no further delineation for lead in groundwater (PAP-00105242).

The following map from the June 1993 Results of Field Investigation and Review of Remedial Options shows areas where lead exceeded cleanup standards:



(PAP-00103563)

Mercury

Mercury was not reported in the chemical testing results recorded in the 1975 New Jersey Department of Health Stream or Wastewater Analysis (PAP-00105511-13) or in a 1979 wastewater treatability analysis (PAP-00105365). A 1979 NPDES Permit Application Form states that mercury was not present in wastewater (PAP-00105310). According to the NJPDES permit application materials from 1991, mercury was suspected to be absent (PAP-00103466).

Soil, surface water, and groundwater sampling on the site and within Dead Horse Creek detected mercury, (PAS-00001994-96; PAP-00104166; PAP-00104173; PAP-00104175; PAP-00104829-97; PAP-00104783-801).

In 2002, NJDEP Bureau of Groundwater Pollution Assessment (BGWPA) accepted Newell's conclusions that the mercury in the surface water did not originate from the facility (PAP-00105250). According to a 2003 memo from the BGWPA, mercury was not identified above the standard in the shallow wells proximate to Dead Horse Creek or in any other shallow wells at the site. Therefore, the BGWPA concluded that mercury in Dead Horse Creek probably originated from an off-site source (PAP-00105243).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[3]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[4] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[5] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[6]

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[3] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).

[4] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[5] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[6] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	13,572 mg/kg
Copper	2,550 mg/kg
Mercury	11.2 mg/kg
Benzo(a)anthracene	49 mg/kg
Benzo(a)pyrene	48 mg/kg
Benzo(b)fluoranthene	63 mg/kg
Benzo(k)fluoranthene	24 mg/kg
Dibenzo(a,h)anthracene	8.6 mg/kg
Indeno(1,2,3-cd)pyrene	31 mg/kg

Available documentation and information suggests the soil samples were taken from areas containing historic fill materials. According to the Report of Environmental Record Check and Review prepared by S&S Environmental Sciences, Inc. for Jeryl Industries, Inc., dated May 24, 1994, the site was previously undeveloped marshland, which was reclaimed for construction before 1968 with fill material (PAP-00103480). The entirety of the site is located on historic fill material starting from the surface and going to a depth of 9.5 feet below grade (PAP-00105254-255). Investigation by Killam in connection with the Industrial Site Recovery Act (ISRA) process confirmed the presence of fill material throughout the property (PAP-00104915). During sampling at the facility, the presence of fill material was noted at all interior and exterior sample locations (PAP-00104918, 41).

Documentation and information also suggests sediment samples included historic fill material. According to Hatch Mott MacDonald, Jeryl Industries created the current surface water feature (i.e., Dead Horse Creek) as part of the property's development in the late 1960s. The linear, channelized water body currently present at the property was believed to have been created both through the removal of indigenous soil material and emplacing fill materials from an off-site source to form the bedding of the channel (PAP-00104787).

There is no indication from a review of provided documents that facility operations disturbed contamination located in historic fill.

Further, according to S&S Environmental Sciences, Inc.. report, \ the background sampling and testing conducted at the site since 1988 stated that the fill materials used at the site also contain some of the pollutants (metals and organics) also used and/or discharged by Goody Products. However, due to S&S Environmental Science's conclusion that long-term use of hazardous substances and generation of hazardous wastes by Goody Products during its operation, combined with periodic on-site disposal and/or spills of hazardous substances/wastes, it was their opinion that the operations of Goody Products have had significant adverse environmental impact on the property soils and groundwater (PAP-00103476; PAP-00103485). Notably, the S&S report was

prepared while a suit was pending between Jeryl Industries, Inc. and Goody Products, and the report's author was later designated in the suit as an expert for Jeryl Industries, Inc. (PAP-00402669; PAP-00402673).

5. COC Pathways

Sanitary Sewage

Goody Products operated a sanitary sewage treatment plant at the northwestern corner of the facility. The plant included four below-grade cylindrical tanks and a control building. Effluent discharge was to Dead Horse Creek, located immediately adjacent, and to the west, of the plant (PAP-00103326; PAP-00104611).

Available references include information on the sanitary sewage treatment plant at the site, but do not include specific information regarding COCs that may have entered the system or been discharged through it. Correspondence from May 4, 1970, provided a response to a March 31, 1970, surveillance report concerning an incident where the chlorine contact tank was overflowing due to the receiving stream (Dead Horse Creek) being blocked, raising the level of the creek and backing up onto Plant property (PAP-00351060-61). NJDEP Discharge Surveillance Reports dated October 18, 1979 similarly described the chlorine contact tank as being flooded by receiving stream backup (PAP-00351068).

A Plant Diagram and Flow Sequence included with a NJDEP Plant Inspection and Status Report Form dated August 23, 1983 shows the sanitary wastewater to flow to the treatment plant and then to Dead Horse Creek (PAP-00105320-22).

An application for EPA permit to discharge wastewater, dated January 26, 1989, listed the average flow through outfall 002 as 9,000 gallons per day (PAP-00717921, 24).[7]

Correspondence dated November 13, 1989, described the sewage treatment plant as a compact, activated sludge return, package unit. It was designed to handle 100,000 gallons per day. The normal processing is 15,000 gallons per day. Sludge generated at the contact aerator is return-pumped back to a primary settling tank for recycling. Sludge is not routinely removed from the system and it had been several years since anything had been removed from any tank (PAP-00446792; PAP-00446953). It was stated that Goody Products does not produce sludge on a daily basis and they pump out the system only when maintenance dictates so. In September 1989, the entire system was completely pumped out to perform maintenance work (PAP-00446793; PAP-00446954). In April 1989, a sample of the slurry was taken from the bottom of the primary settling tank for analysis (PAP-00446792). The reported results included copper at 2.45 mg/L, lead at 0.6 mg/L, and oil and grease at 528 mg/L (PAP-00446797-98).

[7] This Report was revised to include documents received on June 15, 2020. The additional documents did not change Newell Brands Inc.'s previous certification.

Correspondence dated May 29, 1990, reported that Goody Products had no sludge wasting capabilities built into their treatment systems. They did not have thickening tanks, dewatering equipment, incinerator, or removal pumps. If they desired to waste or remove sludge, they would call a commercial vacuum to suction directly from their digester (PAP-00447846-47).

Numerous Domestic Wastewater Sludge Reports reported copper and lead and in some cases mercury. The domestic sludge waste was disposed of by off-site incineration (PAP-00446844; PAP-00448131; PAP-00447543-45, 641, 841).

Industrial Wastewater

The volume of industrial wastewater discharged through outfall 001 to Dead Horse Creek was an average of 25,000 gallons per day with a maximum of 40,000 gallons per day, according to an application for EPA permit to discharge wastewater, dated January 26, 1989. The wastewater was discharged five days per week and twelve months per year (PAP-00717922, 24). This application also reported concentrations for the industrial effluent of 0.1 mg/L copper and 0.1 mg/L lead. PAHs were not detected in the one industrial effluent sample collected (PAP-00717925-33).[8]

In addition to other non-COC pollutants, the industrial wastewater from discharge Outfall 001 has been reported to contain copper and lead (PAP-00350678; PAP-00446368-76).

A memo from the NJDEP dated February 9, 1988, reported that before the installation of the computerized industrial treatment system about four years prior, untreated industrial waste water was discharged to the ground. The computerized treatment system reportedly had never worked as planned and excessive nickel above Permit limits was being discharged at that time. NJDEP noted that the treatment system may need in house design changes (PAP-00105285). NJDEP also noted that Goody Products would need a Discharge to Groundwater Permit for past and present use. A minimum of four monitoring wells would be required, one upgradiant and three downgradiant. If the groundwater monitoring results were acceptable, Goody Products may not have been required to renew the Groundwater Permit after five years (PAP-00105285-86).

The following results for Industrial Process Wastewater discharges (Discharge 001) at Goody Products, Inc. were reported on monthly Discharge Monitoring Reports and/or in the May 1990 New Jersey Pollution Discharge Elimination System Discharge to Groundwater Permit Application:

Monthly Discharge Monitoring Reports					
Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
September 1984	78 mg/L	0.04 mg/L	0.1 mg/L	No analysis reported	PAP-00446411-12

[8] This Report was revised to include documents received on June 15, 2020. The additional documents did not change Newell Brands Inc.'s previous certification.

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Monthly Discharge Monitoring Reports					
Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
October 1984	15 mg/L	0.04 mg/L	0.1 mg/L	No analysis reported	PAP-00446418-19
November 1984	21 mg/L	0.3 mg/L	0.4 mg/L	No analysis reported	PAP-00446424-25, 29-30
December 1984	22 mg/L	0.01 mg/L	0.05 mg/L	No analysis reported	PAP-00446433-34
January 1985	12 mg/L	0.06 mg/L	0.02 mg/L	No analysis reported	PAP-00446437-38
February 1985	16 mg/L	Not detected	0.9 mg/L	No analysis reported	PAP-00446441-42
March 1985	23 mg/L	0.05 mg/L	0.05 mg/L	No analysis reported	PAP-00446446-47
April 1985	32 mg/L	0.02 mg/L	0.1 mg/L	No analysis reported	PAP-00446449-50
May 1985	39 mg/L	0.08 mg/L	0.09 mg/L	No analysis reported	PAP-00446453-54
June 1985	31.5 mg/L	0.07 mg/L	0.08 mg/L	No analysis reported	PAP-00446457-58
July 1985	24 mg/L	0.08 mg/L	0.15 mg/L	No analysis reported	PAP-00446461-62
August 1985	7.1 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446465-66
September 1985	7.4 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446469-70
October 1985	3.9 mg/L	0.009 mg/L	0.004 mg/L	No analysis reported	PAP-00446474-75
November 1985	10.5 mg/L	0.04 mg/L	Not detected	No analysis reported	PAP-00446478-79
December 1985	16 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446483-84
January 1986	18.3 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446487-88
February 1986	8.0 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446491-92
March 1986	3.1 mg/L	Not detected	Not detected	No analysis reported	PAP-00446495-96
April 1986	7.0 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446499-500
May 1986	8.2 mg/L	0.05 mg/L	Not detected	No analysis reported	PAP-00446745-47; PAP-00446503-04
June 1986	4.2 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446740-42; PAP-00446507-08
July 1986	5.6 mg/L	Not detected	Not detected	No analysis reported	PAP-00446736-38; PAP-00446511-12
August 1986	126 mg/L	0.25 mg/L	Not detected	No analysis reported	PAP-00446515-16
September 1986	10.3 mg/L	0.08 mg/L	Not detected	No analysis reported	PAP-00446751-53; PAP-00446519-20

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Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
October 1986	23 mg/L	0.08 mg/L	Not detected	No analysis reported	PAP-00446523-24
November 1986	31 mg/L	0.06 mg/L	Not detected	No analysis reported	PAP-00446527-28
December 1986	39 mg/L	0.05 mg/L	Not detected	No analysis reported	PAP-00446531-32
January 1987	48 mg/L	0.03 mg/L	Not detected	No analysis reported	PAP-00446535-36
February 1987	4.5 mg/L	Not detected	0.05 mg/L	No analysis reported	PAP-00446539-40
March 1987	18 mg/L	0.08 mg/L	0.05 mg/L	No analysis reported	PAP-00446543-44
April 1987	8.4 mg/L	Not detected	0.10 mg/L	No analysis reported	PAP-00446547-48
May 1987	8.6 mg/L	Not detected	0.04 mg/L	No analysis reported	PAP-00446551-52
June 1987	16.4 mg/L	0.05 mg/L	0.08 mg/L	No analysis reported	PAP-00446555, 57
July 1987	12 mg/L	0.10 mg/L	0.08 mg/L	No analysis reported	PAP-00446559
August 1987	18.0 mg/L	0.06 mg/L	0.05 mg/L	No analysis reported	PAP-00446563-64
September 1987	8.4 mg/L	0.08 mg/L	0.05 mg/L	No analysis reported	PAP-00446567-68
October 1987	1.2 mg/L	0.08 mg/L	0.10 mg/L	No analysis reported	PAP-00446571-72
November 1987	1.9 mg/L	0.05 mg/L	0.02 mg/L	Not detected	PAP-00446575-81
December 1987	6.8 mg/L	0.08 mg/L	Not detected	Not detected	PAP-00446584-91
January 1988	4.0 mg/L	0.08 mg/L	0.05 mg/L	Not detected	PAP-00446399-407; PAP-00446592-93
February 1988	12.6 mg/L	0.10 mg/L	0.06 mg/L	Not detected	PAP-00446390-98; PAP-00446596-604
March 1988	14.8 mg/L	Not detected	Not detected	Not detected	PAP-00446377-86; PAP-00446605-14
April 1988	14.5 mg/L	0.06 mg/L	0.12 mg/L	Not detected	PAP-00446368-76; PAP-00446615-23
May 1988	12.9 mg/L	0.05 mg/L	0.06 mg/L	Not detected	PAP-00446359-67; PAP-00446624-32
June 1988	9.7 mg/L	0.09 mg/L	0.01 mg/L	Not detected	PAP-00446350-58; PAP-00446633-41
July 1988	0.10 mg/L	0.10 mg/L	0.10 mg/L	Not detected	PAP-00446341-49; PAP-00446642-50
August 1988	3.8 mg/L	Not detected	Not detected	Not detected	PAP-00446325-40; PAP-00446651-58
September 1988	0.1 mg/L	0.3 mg/L	0.10 mg/L	Not detected	PAP-00446316-24; PAP-00446659-66

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Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
October 1988	0.1 mg/L	0.1 mg/L	0.1 mg/L	Not detected	PAP-00446307-15; PAP-00446667-75
November 1988	8.4 mg/L	0.12 mg/L	0.09 mg/L	No analysis reported	PAP-00446303-05; PAP-00446676-81
December 1988	10.0 mg/L	0.03 mg/L	Not detected	No analysis reported	PAP-00446299-301; PAP-00446682-87
January 1989	2.0 mg/L	0.06 mg/L	0.07 mg/L	No analysis reported	PAP-00446688-89
February 1989	3.2 mg/L	0.06 mg/L	0.09 mg/L	No analysis reported	PAP-00446692-93
March 1989	3.8 mg/L	0.03 mg/L	0.05 mg/L	No analysis reported	PAP-00446696-97
April 1989	4.8 mg/L	0.08 mg/L	0.09 mg/L	No analysis reported	PAP-00446700-01
May 1989	9.6 mg/L	0.04 mg/L	Not detected	No analysis reported	PAP-00446704-05
June 1989	4.8 mg/L	0.24 mg/L	0.09 mg/L	No analysis reported	PAP-00446708-09
July 1989	13.0 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446234-37; PAP-00446712-13
August 1989	7.2 mg/L	0.02 mg/L	0.18 mg/L	No analysis reported	PAP-00446292-95; PAP-00446716-17
September 1989	140 mg/L	Not detected	Not detected	No analysis reported	PAP-00446229-33; PAP-00446719-20
October 1989	1.6 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446724-25
November 1989	4.8 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446728-29
December 1989	16 mg/L	0.03 mg/L	Not detected	No analysis reported	PAP-00446732-33
January 1990	10.0 mg/L	0.02 mg/L	0.06 mg/L	No analysis reported	PAP-00446227-28
February 1990	14.0 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446261-63
March 1990	21 mg/L	0.05 mg/L	0.07 mg/L	No analysis reported	PAP-00446250-52
May 1990	13.0 mg/L	Not detected	Not detected	No analysis reported	PAP-00446050-53; PAP-00446246-48
June 1990	3.2 mg/L	Not detected	0.03 mg/L	No analysis reported	PAP-00446221-23
October 1990	3.4 mg/L	0.04 mg/L	0.17 mg/L	No analysis reported	PAP-00446217-19
January 1991	13.0 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446242-44
February 1991	Not detected	0.15 mg/L	Not detected	No analysis reported	PAP-00446213-15; PAP-00446238-39
October 1991	4.2 mg/L	0.005 mg/L	Not detected	No analysis reported	PAP-00446209-11

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Monthly Discharge Monitoring Reports					
Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
February 1992	18 mg/L	0.02 mg/L	0.1 mg/L	No analysis reported	PAP-00446205-07
June 1992	4.8 mg/L	Not detected	Not detected	Not detected	PAP-00446191-204
July 1992	10 mg/L	0.02 mg/L	0.03 mg/L	No analysis reported	PAP-00446185-87
August 1992	9.2 mg/L	Not detected	0.03 mg/L	No analysis reported	PAP-00446178-82
September 1992	17 mg/L	Not detected	Not detected	No analysis reported	PAP-00446172-74
November 1992	0.8 mg/L	Not detected	0.01 mg/L	Not detected	PAP-00446279-91
December 1992	4.4 mg/L	0.03 mg/L	0.07 mg/L	No analysis reported	PAP-00446168-70
January 1993	8.0 mg/L	0.01 mg/L	0.03 mg/L	Not detected	PAP-00446154-67
February 1993	9.2 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446141-53
March 1993	4.0 mg/L	0.03 mg/L	0.02 mg/L	No analysis reported	PAP-00446135-40
May 1993	16.0 mg/L	0.03 mg/L	0.05 mg/L	No analysis reported	PAP-00446129-134
June 1993	8.0 mg/L	Not detected	Not detected	Not detected	PAP-00446115-128; PAP-00446274-77
July 1993	8.0 mg/L	Not detected	Not detected	Not detected	PAP-00446098-114
August 1993	7.8 mg/L	Not detected	0.02 mg/L	No analysis reported	PAP-00446046-48
September 1993	5.6 mg/L	0.10 mg/L	Not detected	No analysis reported	PAP-00446043-45
January 1994	11 mg/L	0.02 mg/L	0.01 mg/L	Not detected	PAP-00446027-6040
February 1994	18 mg/L	Not detected	Not detected	Not detected [Note: The semi-volatile analysis was performed with a 50x dilution resulting in raised detection limits (PAP-00446026).	PAP-00446009-6026; PAP-00446068-82
March 1994	8.4 mg/L	0.01 mg/L	0.02 mg/L	Not detected	PAP-00445994-6008; PAP-00446083-97
April 1994	18.0 mg/L	Not detected	0.02 mg/L	Not detected	PAP-00445978-93
May 1994	4.0 mg/L	Not detected	Not detected	Not detected	PAP-00445963-77

Note: Reported results which appear to exceed the permit limitations are highlighted grey.

A NJDEP letter to Goody Products dated September 27, 1989, discussing the results of an August 9, 1988, Compliance Evaluation Inspection stated that the Goody Products facility received an "Unacceptable" rating due to several deficiencies which included Discharge Monitoring Report violations for August 1988 through June 1989, the final effluent pipe at discharge 002 (sanitary wastewater) being inaccessible due to high weeds, and that a portion of the wastewater from the effluent pit for discharge 001 (industrial wastewater) discharges to ground and surface waters of the State. This deficiency had been cited in previous directive letters and it was stated again that Goody Products must apply for a Discharge to Groundwater Permit (PAP-00105282-84).

Numerous Industrial Process Wastewater Sludge Reports reported detections of copper, lead, and mercury (PAP-00446809; PAP-00447493-95; PAP-00447587, 762, 772, 786, 799, 960; PAP-00448032; PAP-00448065; PAP-00448076; PAP-00448115). Numerous other Industrial Process Wastewater Sludge Reports reported detections of just copper and lead (PAP-00446832; PAP-00446831; PAP-00446845; PAP-00447677, 678, 730, 744, 806, 814, 822; PAP-00448018; PAP-00448037; PAP-00448045; PAP-00448053; PAP-00448090, 97; PAP-00448105; PAP-00448139). These sludge wastes were disposed of as hazardous waste off-site (PAP-00447447-58).

A January 1993 NJDEP monitoring report stated that on December 11, 1992, both the sanitary and industrial wastewater treatment systems were out of service due to flooding in the area. Both systems were restored by December 21, 1992 (PAP-00105280-81).

Release

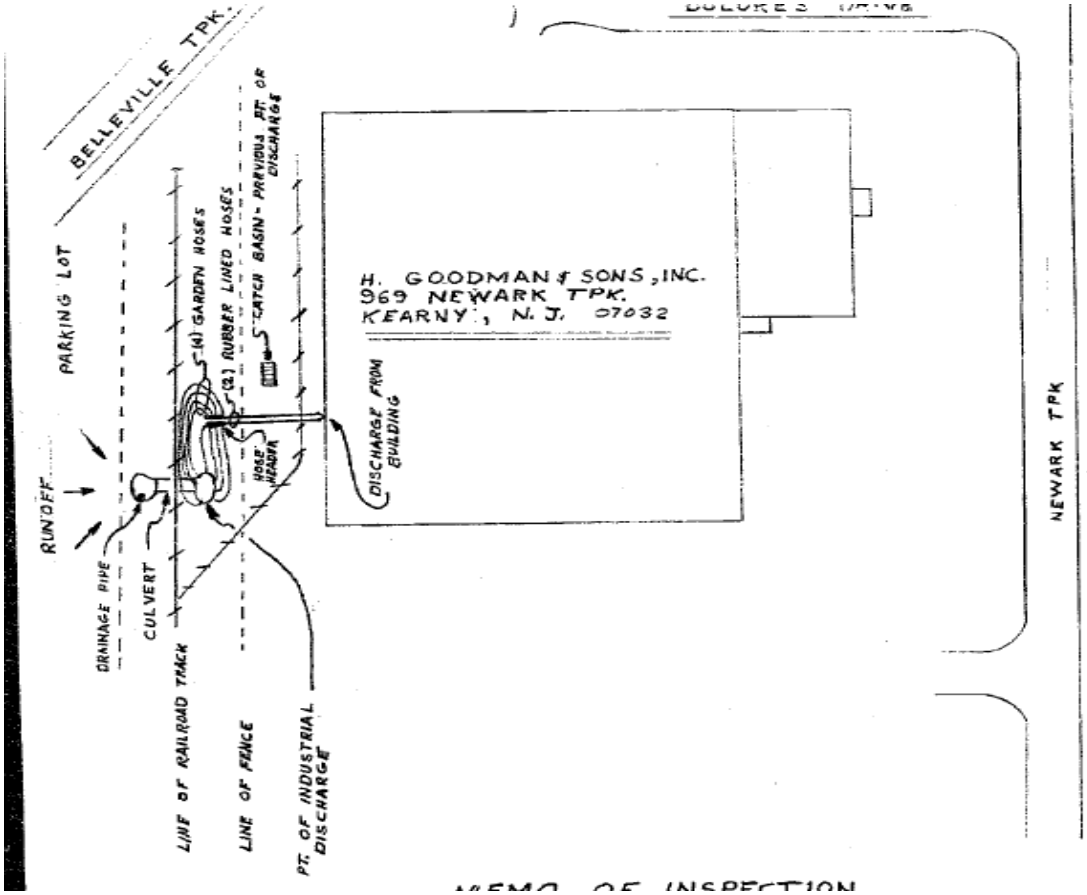
According to a NJDEP memorandum dated October 21, 1975, after a September 18 1975 inspection by the NJDEP it was noted that there were no provisions in place for containment or treatment of the industrial wastewaters at the point of discharge. Two discharge hoses were used for the conveyance of collected plating room floor drain wastewaters out of the plant. The untreated industrial wastewaters were being allowed to discharge onto plant grounds. According to a representative of H. Goodman & Sons, Inc., this had been the procedure followed by the facility for a number of years. It was noted that the hoses were evident in a 1974 inspection, but it was suggested at that time that the hoses were not in use (PAP-00105514).

An October 18, 1979, NJDEP Discharge Surveillance Report included a Plant Diagram and Flow Sequence for the Plating and Etching operation showing the batch tanks rinse waste would flow to floor drains, then to sump pit, then pumped to ground surface behind plant property (PAP-00351067).

A Plant Diagram and Flow Sequence included with a NJDEP Plant Inspection and Status Report Form dated August 23, 1983, shows the acid rinse sump, burnishing sump, and caustic rack strip sump all draining directly into Dead Horse Creek (PAP-00105320-22). The NJDEP Plant Inspection and Status Report Form dated August 23, 1983 states that the Goody facility was waiting for the industrial wastewater treatment system to be installed (PAP-00105320-21).

Starting in September 1984, the industrial waste effluent from the electroplating and burnishing operations were treated at the facility's industrial wastewater treatment plant and discharged to Dead Horse Creek at Outfall 001, located near the northwest corner of the Facility building. A concrete block tank (discharge pit) was constructed in the facility's west yard to act as a collection point so that the IWTP effluent could be pumped to Dead Horse Creek (PAP-00104321-22; PAP-00105318; PAP-00105373).

According to a NJDEP memorandum dated November 3, 1978, an investigation was conducted on October 6, 1978, by the NJDEP to verify the direction of the treated sewage treatment plant discharge from the H. Goodman & Sons, Inc. facility. According to the November 1978 memorandum (PAP-00105486) and a separate memo dated October 6, 1978 (PAP-00105489), NJDEP found that the discharge flowed through a 12" reinforced concrete pipe under the Newark Turnpike, through a wetland area, entering a 60" culvert which then emptied into a drainage ditch between the railroad line and the U.S. Post Office, through another 60" culvert flowing under the Post Office property, through a second wetland area, then flowing through an underground drainage canal along an abandoned transformer building, out of the drainage canal, flowing under the Erie Lackawanna Railroad track, then finally entering the tide pump well and being discharged to the waters of the Passaic River (PAP-00105486; PAP-00105489).



(PAP-00105491)

The NJDEP inspected the Facility in May 1971 and observed that the "ditch" (i.e. Dead Horse Creek) was blocked and the blockage caused the wastewater to back up and flood the Facility (PAP-00103321). Goody believed that the construction of the U.S. Post Office had blocked the flow of Dead Horse Creek causing wastewater to back up on the Facility property (PAP-00104747).Observations of dye testing at the Facility have shown that industrial wastewater discharges prior to 184 on the norther side of the building did not flow to Dead Horse Creek (PAP-00105515).

NJDEP Discharge Surveillance Reports dated August 27, 1987, and March 10, 1988, gave unsatisfactory ratings to several categories due to flooding and the lack of drainage and flow under Newark Turnpike (PAP-00105293-95).

NJDEP performed a dye study to verify the drainage of Dead Horse Creek in 1980. According to NJDEP, a dye tablet dropped at the mouth of the sewage treatment plant effluent discharge pipe remained in Dead Horse Creek on the facility side of Newark Turnpike and was not transported through the 12-inch RCP culvert under the Newark Turnpike (PAP-00105480). It was stated that there is only a flow when there is severe flooding on the Goody side of the road (PAP-00105480).

A March 24, 1988, evaluation of the system by Converse Environmental East for Goody Products found surface water drainage problems that may be caused by one or more of the following: an earth berm across the creek, a fully or partially blocked culvert under the Newark Turnpike adjacent to and south of the site, and a non-operating pump station at Dead Horse Creek's discharge into the Passaic River. The evaluation noted that the earthen berm across the creek "has been breached, to some degree." It was also noted the existing 12 to 15-inch culvert under the Newark Turnpike was scheduled to be replaced by a larger 24-inch culvert within the next two weeks from the report date. The pump was noted as being inoperable for about two months (PAP-00104611-12). There is no record of the culvert ever being replaced.

Converse Environmental East surveyed surface water elevations in Dead Horse Creek on March 23, 1989. Surface water elevation at the time of the survey was above normal stage due to precipitation that had occurred several days before the survey. The survey points were located near the culvert at the Newark Turnpike and near the Sanitary Treatment Plant in the northwest portion of the site. The surface water elevation at both locations was 2.49 feet. It was observed that the creek was ponding due to damming effects at the culvert orifice (PAP-00104344-45).

Culverts located under Newark Turnpike and the Passaic were frequently clogged resulting in elevated water levels in Cedar Marsh and flooding on surrounding properties (PAP-00104728-29).

The Pumping Station (also referred to as the Cedar Creek Pumping Station, the Hudson County Pumping Station or the HCMC Pumping Station, Tide Well) was funded and built by the NJ State Mosquito Control Commission between 1953 and before 1962 to provide drainage for the Cedar Creek Marsh. A major storm in 1962 caused severe damage of the mosquito control installations. The Pumping Station was having chronic problems since the 1960's and HCMC eventually stopped fixing it. As of at least 1991, the

Pumping Station was inoperable (PAP-00104661). A 1991 report also noted that water flowed from Cedar Marsh through a culvert (when it was not clogged) and then out to the Passaic River during low water levels in the Passaic River through a gravity outlet (Id.). No mention of the gravity outlet has been seen in other documents.

According to the May 1996 Remedial Investigation Report / Remedial Action Workplan for Goody Products, Inc., Dead Horse Creek analytical results from samples collected on March 22, 1996 from 0.0 – 0.5 feet from the base of the stream contained max concentrations of PAHs in sample 03226-78 including benzo(a)anthracene (4,800 mg/kg), Benzo(b)fluoranthene (6,200 mg/kg), Benzo(k)fluoranthene (2,400 mg/kg), Benzo(a)pyrene (4,600 mg/kg), indeno(1,2,3 cd)pyrene (3,000 mg/kg), copper (382 mg/kg), lead (780 mg/kg) and mercury (2.10 mg/kg) (PAP-00104964; 5040).

Sample ID	032296-76	032296-77	032296-78	032296-79	032296-80	032296-81	032296-82	032296-83	032296-84	032296-85	NJDEP Residential Direct Soil Cleanup Criteria	NJDEP Impact to Groundwater Soil Cleanup Criteria
Sample Depth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Laboratory ID Number	44260	44261	44262	44263	44264	44265	44266	44267	44268	44269		
PAH Compounds (mg/kg)												
Naphthalene	0.400	ND	ND	ND	0.550	ND	0.730	0.870	1.200	ND	230	100
Acenaphthylene	0.950	ND	ND	ND	0.170	0.310	0.250	ND	0.300	ND	NCC	NCC
Acenaphthene	1.500	2.600	3.500	1.200	0.990	1.000	1.200	1.800	1.400	1.600	3400	100
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2300	100
Phenanthrene	2.900	3.300	6.900	2.700	2.400	2.200	2.500	3.700	2.100	2.700	NCC	NCC
Anthracene	1.200	0.800	1.600	0.420	0.560	0.510	0.630	0.470	0.370	0.450	10000	100
Fluoranthene	9.300	5.200	12.000	3.000	2.400	2.100	2.400	2.300	1.700	3.100	2300	100
Pyrene	7.900	4.200	9.100	2.700	2.400	2.000	2.400	2.300	1.600	3.100	1700	100
Benzo(a)anthracene	4.100	1.600	4.800	1.100	0.780	0.570	0.680	0.780	0.700	1.200	0.9	500
Chrysene	4.500	1.900	4.700	1.500	0.900	0.870	0.920	0.830	0.480	1.300	9	500
Benzo(b)fluoranthene	5.300	2.300	6.200	1.520	1.300	0.920	1.200	0.790	0.710	1.100	0.9	50
Benzo(k)fluoranthene	2.000	ND	2.400	ND	ND	ND	ND	ND	ND	ND	0.9	500
Benzo(a)pyrene	3.600	1.900	4.600	1.400	0.700	0.590	0.720	0.520	0.620	0.710	0.66	100
Indeno(1,2,3 cd)pyrene	2.700	1.300	3.000	0.780	0.620	0.630	0.750	0.470	0.450	0.730	0.9	500
Dibenz(a,h)anthracene	0.550	ND	ND	ND	ND	0.230	0.220	ND	ND	ND	0.66	100
Benzo(g,h,i)perylene	2.400	1.300	3.100	0.900	0.720	0.670	0.700	0.460	0.500	0.640	NCC	NCC
Total PAH	49.300	26.400	61.900	17.200	14.490	12.600	15.330	15.290	12.140	16.630	NCC	NCC
PP Metals (mg/kg)												
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	NCC
Arsenic	12.2	10.1	12.1	10.6	12.4	10.3	11.6	11.6	15.5	9.2	20	NCC
Beryllium	0.59	0.51	0.55	0.38	0.34	0.26	0.36	0.41	0.27	0.39	1	NCC
Cadmium	42.0	314.0	275.0	302.00	304.0	450.0	378.00	529.0	364.00	823.00	1	NCC
Chromium	1910.0	1280.0	1930.0	1140.0	1750.0	1900.0	2120.0	2040.0	1820.0	1290.0	500	NCC
Copper	285.0	318.0	382.0	281.0	250.0	258.0	227.0	321.0	244.0	510.0	600	NCC
Lead	396.0	396.0	780.0	408.0	448.0	312.0	304.0	606.0	264.0	563.0	600	NCC
Mercury	1.60	0.82	2.10	1.30	1.60	1.40	0.98	1.20	0.81	1.60	14	NCC

(PAP-00105040)

6. Regulatory History/Enforcement Actions

Violations and Enforcement Actions

In November 1975, the NJDEP issued an order to H. Goodman & Sons, Inc. to cease the discharge of all polluting materials (PAP-00105499; PAP-00105516-17).

In a letter received on December 1, 1975, the NJDEP issued a Notice of Violation and Offer of Settlement to H. Goodman & Sons, Inc. for the discharges of industrial waste allowing the flow of polluting materials into the waters of Dead Horse Creek, a tributary to the Passaic River. The discharges were noted in inspections conducted on June 5, 1975, June 12, 1975, and September 18, 1975 by NJDEP and included excessive heavy metal parameters (PAP-00105499; PAP-00105518-19). Note: The specific metals which exceeded permit levels were not specified.

On July 17, 1978, the U.S. EPA issued a Findings of Violation and Order to Show Cause to H. Goodman & Sons, Inc., for violating the Clean Water Act by discharging pollutants without a National Pollutant Discharge Elimination System (NPDES) permit (PAP-00103534-43). Note: The specific pollutants which exceeded permit levels were not specified.

A NJDEP Discharge Surveillance Report for an inspection conducted on June 5, 1979 noted a major deficiency as 6,000 gallons per day of an unspecified liquid were discharging into Dead Horse Creek. The majority of the evaluation parameters were noted to be “flooded.” This included the grounds and buildings, the settling units, aeration (contact), effluent (residual), contact tank, and final effluent appearance (PAP-00105481-83). Note: The Surveillance Report did not specify which outfall discharged the 6,000 gallons.

According to a NJDEP letter to Goody Products dated September 26, 1983, the Goody Products facility earned an “acceptable” rating after a Compliance Monitoring Inspection conducted on September 15, 1983 (PAP-00105425).

According to a December 13, 1985, NJDEP Discharge Surveillance Report, two discharges observed exceeded permit limitations for pH, cyanide, nickel and total suspended solids (PAP-00105297).

According to November 24, 1987, correspondence, a Compliance Evaluation Inspection was conducted by NJDEP on August 27, 1987, and September 8, 1987. The Goody Products facility received a rating of “Unacceptable” due to several deficiencies. These deficiencies included that the bypass of the effluent filter and filter press at Industrial Treatment, discharge 001, due to pump failure had not been reported as required by NJPDES Permit No. NJ0029505, and the final effluent contained visible solids (PAP-00447020-21). Deficiencies at the Sewage Treatment, discharge 002, included the fact that the sanitary wastewater treatment plant was flooded, so that representative effluent samples could not be obtained; and the primary settling units, contact aeration tanks, secondary settling units, sludge holding, and chlorine contact tanks were flooded in violation of N.J.A.C. 7:9-1.39(a) (PAP-00447021). Soil samples taken from the surface of the ground surrounding the industrial waste discharge pit were taken on September 8, 1987. Exceedances included lead at 210 ppm (PAP-00447021-22, 27). Copper was detected at 82 ppm (PAP-00447027). Goody Products responded to the NJDEP on January 18, 1988 (PAP-00447047-51).

A NJDEP letter to Goody Products dated September 27, 1989, discussing the results of an August 9, 1988, Compliance Evaluation Inspection stated that a Notice of Violation was issued for Discharge Monitoring Report violations for August 1988 through June 1989. These violations included copper on three occasions. Another deficiency listed was that a portion of the wastewater from the effluent pit for DSN 001 discharges to ground and surface waters of the State. It was stated that Goody Products must apply for a Discharge to Groundwater Permit. Goody Products was required to submit a written report concerning specific details of remedial measures to be instituted, as well as an implementation timetable within 30 days (PAP-00105282-84; PAP-00447388-91). According to the November 22, 1989, Administrative Order and a Notice of Civil Administrative Penalty Assessment issued by NJDEP to Goody Products, in September 1988 and June 1989 copper was detected at Outfall 001 at 0.30 mg/L and 0.24 mg/L, respectively (PAP-00350677-88).

A Compliance Evaluation Inspection was conducted on September 19, 1991, by NJDEP. The Goody Products facility received a rating of “Unacceptable” because a review of the Discharge Monitoring Reports revealed that permit effluent limitations were exceeded at discharges 001 and 002. These violations included a February 1991 discharge of copper 0.15 mg/L (PAP-00447037-38).

A September 29, 1993, Administrative Consent Order Affidavit included a Summary of Enforcement Actions for Violation of Environmental Laws or Regulations which discussed 11 violations which occurred from December 1975 through August 1993. Violations included effluent limitation exceedances, alleged discharges to ground surface, and unpermitted discharges (PAP-00350695-98). Note: The pollutants which exceeded effluent limitations were not specified in the source document.

According to the May 1994 *Report of Environmental Record Check and Review*, on November 22, 1989, the NJDEPE issued an Administrative Order and a Notice of Civil Administrative Penalty Assessment to Goody Products. The penalty was for violations which occurred in 1988, 1989, and 1990. The parameters for which the permit limits were violated included copper amongst others. In September 1988 and June 1989 copper was detected at Outfall 001 at 0.30 mg/L and 0.24 mg/L, respectively. NJDEP determined that a penalty of $859,500 should be assessed (PAP-00350677-88). The penalty was settled on May 28, 1991 for $1.1 million (PAP-00402685-88). In addition, S&S Environmental Sciences, Inc. noted that based on information supplied by Goody Products on its ISRA Site Evaluation Submission, other NJPDES effluent violations occurred after 1990 and as late as August 25, 1993 (PAP-00103482-83).

In 1996, a Remedial Action Work Plan dated May 1996 was submitted to NJDEP for approval as part of the November 1993 Remediation Agreement. NJDEP stated in a letter to Newell that further delineation of the groundwater was needed, but the soil remediation plan could be conditionally approved as a Partial Remedial Action Work Plan. The approved cleanup plan was to remove the soil hot spots, collect post-excavation samples and place capping on the property (PAS-00002044). The four areas of concern (AOC) were the wastewater discharge pit and the area south of the wastewater discharge pit (AOC 1) which contained lead above 600 ppm; the west yard which includes the hazardous waste storage area, central west yard, and former waste

discharge pipe (AOC 2) which included copper and lead as contaminants of concern; the north yard which includes the heating system condensate slowdown pipe discharge area, the burnishing room pipes/hoses discharge area, and compressor blowdown pipe discharge area (AOC 3); and Dead Horse Creek (AOC 4). It was noted that the vertical delineation of the metal contamination in several areas had to be completed (PAS-00002044-46). The PAH levels in soil samples associated with the former UST location were above the impact to groundwater criteria; however, it was noted that there were no monitoring wells installed in this area. Therefore, it was requested that Goody Products submit a proposal to investigate the impact of the PAH contamination on the groundwater (PAS-00002048).

Permits

Goody Products operated under NJPDES discharge permit No. NJ0029505, which granted the company permission to discharge to Dead Horse Creek. The permit was issued June 2, 1984 and effective August 1, 1984 and had an expiration date of July 31, 1989 (PAP-00350677; PAP-00447426; PAS-00001878). Contaminants to be monitored under this permit included lead and copper which daily discharges were not to exceed 0.1 mg/L and oil and grease which daily discharge was not to exceed 20 mg/L (PAP-00446410; PAP-00447439; PAS-00001891). Note: PAHs may be present in oils.

According to the 1983 Public Notice for the issuance of draft NJPDES permit No. NJ0029505, there were two existing surface water discharge outfalls at the Goody Products facility. Discharge 001 was industrial process wastewater generated from various metal finishing operations that would receive treatment consisting of equalization, neutralization, flocculation, clarification, and filtration. Discharge 002 was sanitary wastewater which received treatment consisting of primary settling, aeration, secondary settling, and chlorination (PAP-00105420; PAP-0010540-41).

7. Response Actions

The following characterization activities have taken place at the facility:

- October 1994 Preliminary Remedial Investigation Workplan (PAP-00105052)
- August 1995 Industrial Site Recovery Act Site Investigation Report/Revised Remedial Investigation Workplan Addendum (PAP-00446881)
- May 1996 *Remedial Investigation Report/Remedial Action Workplan and Groundwater Evaluation Report* (PAP-00104898)
- October 1997 Industrial Site Recovery Act Remedial Action Report (PAP-00425794)

According to the June 1993 *Results of Field Investigation and Review of Remedial Options*, an environmental site investigation was conducted at the Goody Products facility by Converse Environmental East in May, June, and September, 1988 in response to a letter from the NJDEPE dated November 24, 1987. Phase I included soil sampling conducted by Converse Environmental East from 54 test pits excavated mainly in the western portion of the site to characterize the extent of contamination. Phase II, which was conducted in September 1988, included additional soil sampling to further delineate

the horizontal and vertical extent of contamination identified in Phase I as well as the installation and sampling of seven overburden monitoring wells, finished below the peat layer (PAP-00104155; PAS-00001964).

The Phase I soil sample results which exceeded the NJDEPE Proposed Cleanup Standards Residential Surface Soil for copper (600 milligram/kilogram [mg/kg]) and lead (100 mg/kg) ranged as follows:

- Copper: 757.1 mg/kg in sample TP-27, collected at a depth of 0 to 0.5 feet on June 3, 1988 to 1,121 mg/kg in sample TP-31, collected at a depth of 0 to 0.5 feet on June 3, 1988 (PAP-00104185-88; PAS-00001966-69)

- Lead: 101.3 mg/kg in sample TP-44 collected at a depth of 0 to 0.5 feet on June 6, 1988 to 13,572 mg/kg in sample TP-48, collected at a depth of 0 to 0.5 feet on June 8, 1988 (PAP-00104185-88; PAS-00001966-69)

The Phase II soil sample results which exceeded the NJDEPE Proposed Cleanup Standards Residential Surface Soil for lead (100 mg/kg) ranged as follows:

- Lead: 100.8 mg/kg in sample TP-71D collected at a depth of 4 to 4.5 feet on September 30, 1988 to 3,459 mg/kg in sample SB-5D collected at a depth of 3 to 3.5 feet on September 22, 1988 (PAP-00104189-91; PAS-00001970-72)

The specific locations of the samples discussed above could not be determined from the available references as the sample location map was not legible.

According to the June 1993 *Results of Field Investigation and Review of Remedial Options*, the highest levels of metals occurred in samples collected near the waste water treatment plant (WWTP) Discharge Pit, the yard area northwest of the hazardous waste storage area, and adjacent to the north side of the building (PAS-00001965). The concentrations of lead and copper exceeded both residential and non-residential cleanup standards. See Phase I and Phase II results above for the specific concentrations. No contaminants of concern were detected in any of the groundwater samples collected in 1988 (PAS-00001981-82).

According to the June 1993 *Results of Field Investigation and Review of Remedial Options*, a preliminary round of groundwater sampling in the seven existing wells was started on October 26 and October 27, 1992, to confirm the previous groundwater sampling results (PAS-00001984). In general, the total metals concentrations were above the previous results (PAS-00001992). One groundwater monitoring well (MW-7) contained lead (145 µg/L) above the proposed standard of 10 µg/L (PAS-00001994).

Five shallow piezometers were also sampled for metals to evaluate the effects of the metal contamination in the fill on the shallow groundwater (PAS-00001984-86). Lead was above the NJDEPE proposed cleanup standard (10 µg/L) in the five samples with concentrations ranging from 49 µg/L in PZ-3 to 2,030 µg/L in PZ-5S. Mercury was detected above the 2 µg/L standard in four samples with concentrations of 116 µg/L in PZ-1, 7.9 µg/L in PZ-2, 66.4 µg/L in PZ-4S, and 3.2 µg/L in PZ-5S (PAS-00001995-96).

It was noted by Woodward-Clyde Consultants in the June 1993 *Results of Field Investigation and Review of Remedial Options* that the metal contamination detected in the piezometer samples may be the result of the high turbidity of the samples. Woodward-Clyde Consultants recommended that monitoring wells be installed and both filtered and unfiltered groundwater samples should be sampled after the wells have been properly developed (PAS-00001997). Note that the available references did not provide conclusive information regarding groundwater flow patterns at the site or specific information regarding the potential connection of groundwater to the Dead Horse Creek or to other potential pathways connected to the Passaic River.

On November 9 and 10, 1992, 16 test pits were excavated and sampled. Each test pit was excavated to the groundwater table, or refusal, with the depths ranging from 1.67 to 4.5 feet. Soil samples were collected from the six-inch interval which appeared to be most contaminated (PAS-00001989). The specific locations of the samples discussed above are shown on a Site Map included with the report (PAS-00001959). Six PAHs exceeded the proposed cleanup standards in multiple samples. These PAHs were also detected in several other samples at levels below the cleanup standards.

The PAHs detected included benzo(a)anthracene (concentrations ranging from 201 J µg/kg to 7,206 µg/kg in 14 samples), chrysene (concentrations ranging from 256 J µg/kg to 5,421 µg/kg in 14 samples), benzo(k)fluoranthene (concentrations ranging from 51 J µg/kg to 4,655 µg/kg in 15 samples), benzo(a)pyrene (concentrations ranging from 82 J µg/kg to 6,861 µg/kg in 14 samples), indeno(1,2,3-cd)pyrene (concentrations ranging from 111 J µg/kg to 2,350 µg/kg in six samples), and benzo(g,h,i)perylene (concentrations ranging from 222 J µg/kg to 2,098 µg/kg in nine samples). In addition, dibenzo(a,h)anthracene was detected below cleanup standards in three samples at concentrations ranging from 308 J µg/kg to 610 µg/kg. The sample locations with the highest concentrations were located in the western portion of the site. As for metals, two samples (GKW-4 and GKW-5 located in the northwest corner of the site) had lead concentrations at 6.98 parts per million (ppm) and 7.25 ppm which exceeded the toxicity characteristic leaching procedure (TCLP) regulatory limit of 5 ppm (PAS-00001959, 2009, 2012, 2016).

Creek bed sediment samples were collected on November 16, 1992, at three locations in Dead Horse Creek to evaluate potential contamination to the creek. The sample locations were at the south end of Dead Horse Creek (SED1), the middle (SED2, and the north end (SED3) near the Goody Sewer Treatment Plant (PAS-00001959). The samples were collected at depths ranging from 0.5 feet to 3 feet (PAS-00001959, 1991, 2025). Woodward-Clyde Consultants reported that no PAHs exceeded the proposed NJDEPE subsurface soil cleanup standards (PAS-00002024). However, according to the sampling results, chrysene in one sediment sample (SED2) had an estimated concentration of 675 J µg/kg, exceeding the proposed cleanup standard of 660 µg/kg (PAS-00002025). Additional PAHs detected in the SED2 sediment sample included acenaphthene (338 J µg/kg), phenanthrene (981 J µg/kg), fluoranthene (552 J µg/kg), pyrene (1,342 µg/kg), benzo(a)anthracene (634 J µg/kg), benzo(b)fluoranthene (585 J µg/kg), benzo(k)fluoranthene (579 J µg/kg), and benzo(a)pyrene (487 J µg/kg). The sediment sample SED1 also had the following PAHs detected below cleanup standards: acenaphthene (52 J µg/kg), phenanthrene (102 J µg/kg), fluoranthene (166 J µg/kg),

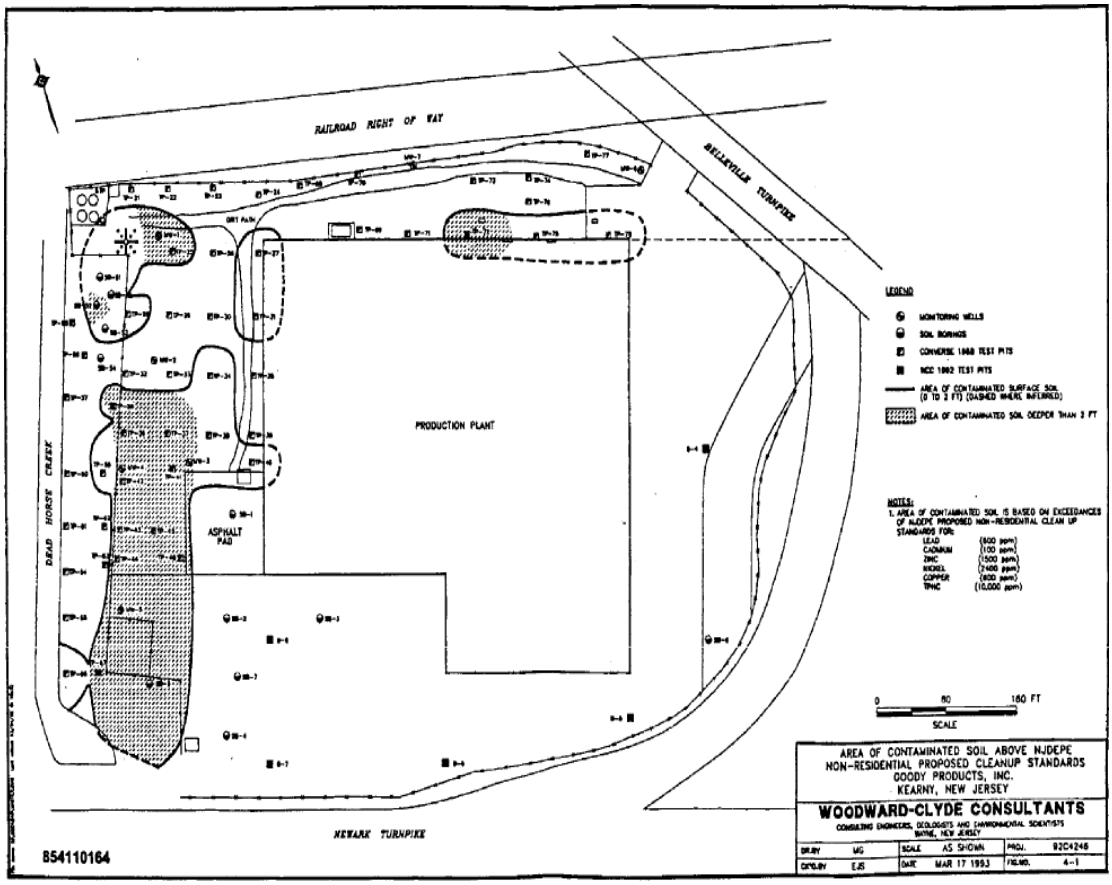
pyrene (286 J µg/kg). Likewise, the SED3 sediment sample had the following PAHs detected below cleanup standards: naphthalene (547 J µg/kg), anthracene (540 J µg/kg) and pyrene (496 J µg/kg) (PAS-00002025).

Subsurface soil samples were also collected from eight borings in the peat layer located throughout the site to determine whether the peat had absorbed contamination from the overlying soil and/or groundwater (PAS-00001990). These samples were analyzed for volatile organics and base neutral compounds. The results of the peat samples were consistent with the overlying fill according to Woodward-Clyde Consultants. Contaminants of concern were below NJDEPE proposed subsurface soil cleanup standards with the exception of naphthalene. The concentration of naphthalene (198 ppm) in one sample PEAT-3 collected from boring MP-2 at a depth of 12 to 14 feet below ground surface near the northwest corner of the plant building exceeded the NJDEPE 100 ppm standard. The PAHs detected include chrysene (PEAT-2, PEAT-3, and PEAT-4) in concentrations up to 1,176 parts per billion (ppb), benzo(a)pyrene (PEAT-2, PEAT-3, and PEAT-4) up to 1,170 ppb, and benzo(k)fluoroanthene (PEAT-3 AND PEAT-4) up to 22,229 ppb (PAS-00002018, 21). Note: Many of the reported results were flagged “J” indicating the result was detected below the method detection limit and is considered an estimated value.

Background samples were also collected in 1992 at locations along the eastern and southern portions of the site. These samples also had detections of PAHs (four of five samples) and metals (five of five samples) both above and below cleanup standards. The concentrations ranged as follows: 2-methylnaphthalene (40 J µg/kg), acenaphthylene (71 J µg/kg to 118 J µg/kg), acenaphthene (43 J µg/kg to 390 J µg/kg), fluorene (41 J µg/kg to 405 µg/kg), phenanthrene (443 µg/kg to 3,574 µg/kg), anthracene (121 J µg/kg to 1,065 µg/kg), fluoranthene (734 µg/kg to 5,285 µg/kg), pyrene (573 µg/kg to 4,630 µg/kg), benzo(a)anthracene (293 J µg/kg to 2,782 µg/kg), chrysene (319 J µg/kg to 2,596 µg/kg), benzo(b)fluoranthene (480 µg/kg to 2,948 µg/kg), benzo(k)fluoranthene (660 µg/kg to 2,060 µg/kg), benzo(a)pyrene (329 J µg/kg to 2,672 µg/kg), indeno(1,2,3-cd)pyrene (198 J µg/kg to 211 J µg/kg), dibenzo(a,h)anthracene (93 J µg/kg to 467 µg/kg), benzo(g,h,i)perylene (110 J µg/kg to 788 µg/kg), copper (39.6 mg/kg to 101mg/kg), lead (48.3 mg/kg to 377 mg/kg), and mercury (0.28 mg/kg to 3.7 mg/kg) (PAS-00001959, 2022-23).

Regarding the 1992 field investigation, Woodward-Clyde Consultants concluded in the June 1993 *Results of Field Investigation and Review of Remedial Options* that there did not appear to be any migration of contamination from soil to groundwater at the site. According to Woodward-Clyde Consultants, the shallow groundwater quality seemed consistent with soil contaminants found in the man-placed fill (PAS-00002028).

The following map from the *Results of Field Investigation and Review of Remedial Options* delineates the areas of contaminated soil above the NJDEPE non-residential proposed cleanup standards:



(PAS-00002026)

According to a May 1996 *Remedial Investigation Report/Remedial Action Workplan and Groundwater Evaluation Report* prepared by Killam Associates for Newell Company remedial investigation activities were implemented at the facility in November 1995 through March 1996 inside the manufacturing building and in exterior areas to delineate the vertical and horizontal extent of PAHs and certain priority pollutant metals (PAP-00104917).

According to the August 1995 Industrial Site Recovery Act Site Investigation Report/Revised Remedial Investigation Workplan Addendum for the Goody Products, Inc. Site, Goody initiated compliance with the ISRA due to its acquisition by Newell Company by providing the NJDEP with a Remediation Agreement in November of 1993. A Proposed Cleanup Plan was submitted along with the Remediation Agreement. The Cleanup Plan included an overview of previous environmental investigations and costs associated with potential site capping activities. Goody submitted a General Information Submission in December of 1993 and a Site Evaluation Submission (SES) in January of 1994. A report entitled Results of Field Investigation dated October 1993 was provided under separate cover along with the SES. Representatives of the NJDEP conducted a site inspection on March 30, 1994 and issued a Report of Inspection on April 20, 1994. The Report of Inspection noted a number of deficiencies and identified actions required on the part of the responsible party (PAP-00446887).

The purpose of the Site Investigation Report/Revised Remedial Investigation Workplan was to summarize the site investigation activities performed in June-August of 1995 and to set forth remedial investigation activities for those areas of concern identified through implementation of the site investigation activities (PAP-00446890). One area of concern was an underground storage tank (UST) that was formerly located at the northern portion of the Goody site, adjacent to the north wall of the building. The tank had a capacity of 10,000 gallons and was reported to have contained No. 4 fuel oil. Following the removal of the UST, confirmation samples were collected and five PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene) were detected above corresponding NJDEP Cleanup Criteria in the deeper sample obtained from the southern sidewall. These results were initially attributable to historical urban fill materials placed at the site in conjunction with site development. As such, no further action was proposed with regard to the former UST. The NJDEP reviewed the May 1990 UST report included in the July 1994 Preliminary RIW and issued comments regarding same. The NJDEP required that Goody collect additional soil samples to identify the presence/absence of contaminants at the north side of the former excavation area and at the former fill pipe area as well as to delineate the presence of base-neutral compounds detected in the confirmation sample collected from the south side of the former excavation (PAP-00446891-92).

Analytical results from this additional sampling revealed the presence of seven PAH compounds above respective NJDEP Cleanup Criteria in sample UST-W1. Benzo(a)anthracene was detected at 19 ppm, chrysene at 19 ppm, benzo(b)fluoranthene at 20 ppm, benzo(k)fluoranthene at 8.4 ppm, benzo(a)pyrene at 16 ppm, indeno(1,2,3-cd)pyrene at 12 ppm and dibenz(a,h)anthracene at 2.7 ppm. In addition, samples were collected from two test pits installed west and east of a previous sample which had PAH detections in excess of NJDEP Cleanup Criteria. Benzo(a)pyrene was detected at 0.73 ppm and indeno(1,2,3-cd)pyrene at 1.4 ppm. The report concluded that based on analytical results from the April 1995 sampling round, additional sampling was warranted to delineate the presence of PAH compounds detected in these samples (PAP-00446895).

According to the August 1995 Industrial Site Recovery Act Site Investigation Report/Revised Remedial Investigation Workplan Addendum the March 1995 SI/RIW Addendum identified four areas of potential environmental concern at the site. The four areas of potential environmental concern identified were as follows: interior process areas, pipe discharge areas, the sanitary treatment plant, and two stained areas adjacent to air conditioner units. The identification of these areas necessitated the performance of site investigation activities and a sampling program to identify the presence/ absence of contaminants. In addition, review of previous environmental investigations stated that two previously identified areas of environmental concern (i.e., sediment at Dead Horse Creek and sample locations for which the minimum detection limit was noted to exceed the current NJDEP Cleanup Criteria) required acquisition of samples to identify current conditions (PAP-00446898).

Sample results at areas of environmental concern which included COCs of the OU2 Project site included the portion of the North Yard located between the two former openings in the northern exterior wall of the Burnishing Room and the northern fence line. In general, analytical results at this location revealed varying concentrations of PAH compounds and priority pollutant metals in all samples. Copper was detected at 962 ppm and 2,550 ppm; lead at 861 ppm and 2,320 ppm; benzo(a)anthracene at 1.7 ppm, 1.8 ppm, and 1.9 ppm; benzo(b)fluoranthene at 1.4 ppm, 2.7 ppm, 3.1 ppm, and 3.4 ppm; benzo(k)fluoranthene at 1.0 ppm, 1.1 ppm, and 1.2 ppm; and benzo(a)pyrene at 0.95, 1.5 ppm, 1.9 ppm and 1.9 ppm (PAP-00446905-06). Another area of environmental concern which included COCs of the OU2 Project site were the Heating System - Blowdown/Condensate pipes. Samples collected in this area had detections which included benzo(b)fluoranthene at 0.93 ppm and 1.1 ppm, benzo(a)pyrene at 0.76 ppm, and copper at 1,290 ppm (PAP-00446909-10).

Three sediment samples were collected June 30, 1995, from the eastern bank of Dead Horse Creek. One sample was obtained upstream of industrial and sanitary system discharge points (STR-15), one sample was obtained near the southern limit of the stream (STR-17) and the remaining sample was obtained at a representative mid-point area (STR-16). The sample locations were biased toward natural accumulation points along Dead Horse Creek. The former industrial wastewater discharge pipe was not located; therefore, no sample was obtained from the discharge point (PAP-00446914).

PAH compounds and lead were detected in the three sediment samples. Sample STR-15 had detections of benzo(a)anthracene at 2.8 ppm, benzo(b)fluoranthene at 3.8 ppm, benzo(k)fluoranthene at 1.4 ppm, benzo(a)pyrene at 2.7 ppm, indeno(1,2,3-cd)pyrene at 0.97 ppm, and lead at 228 ppm. Sample STR-16 had detections of benzo(a)anthracene at 1.4 ppm, benzo(b)fluoranthene at 2.3 ppm, benzo(a)pyrene at 1.6 ppm, and lead at 169 ppm. Sample STR-17 had detections of benzo(a)anthracene at 1.2 ppm, benzo(b)fluoranthene at 2.7 ppm, benzo(k)fluoranthene at 0.94 ppm, benzo(a)pyrene at 1.3 ppm, and lead at 547 ppm (PAP-00446915-16).

Since historical information states that fill material was placed at the site in conjunction with site development activities, it was proposed to evaluate conditions at non-process areas of the site to determine the presence/ absence of fill at these areas and to ascertain the environmental quality of same. Based on historical information and observations rendered during site reconnaissance, no process operations and/or storage has been conducted at the eastern portion of the site, east of the loading dock area. As such, it was proposed to install nine soil borings and collect one sample from the fill layer and one sample from the peat layer at this area to establish background conditions. The NJDEP approved the proposed actions in its June 1995 response letter (PAP-00446918).

A variety of fill materials including brick fragments, metal pieces, asphalt pieces, wood pieces was noted with regard to the fill layer during soil boring installation activities. Six of the nine samples collected from the fill material exhibited concentrations of PAHs in excess of NJDEP Cleanup Criteria (BG-2, BG-4A, BG-5, BG-7A, BG-8A and BG-9). Sample BG-2 contained benzo(b)fluoranthene at 1.1 ppm and benzo(a)pyrene at 0.84 ppm. Five PAHs were detected in each of samples BG-4A, BG-5, and BG-7A:

benzo(a)anthracene at 3 ppm, 4.3 ppm and 2.8 ppm respectively; benzo(b)fluoranthene at 3.4 ppm, 4.5 ppm, 3.4 ppm respectively; benzo(k)fluoranthene at 1.2 ppm, 1.8 ppm, and 1.4 ppm respectively; benzo(a)pyrene at 2. 7 ppm, 3.4 ppm, and 2.6 ppm respectively; and indeno(1,2,3-cd)pyrene at 1.3 ppm, 1.7 ppm and 1.3 ppm respectively. Samples BG-SA and BG-9 each contained three PAHs: benzo(a)anthracene at 1.2 ppm and 1.3 ppm respectively; benzo(b)fluoranthene at 1.5 ppm in both samples; and benzo(a)pyrene at 1.2 ppm and 1.1 ppm respectively. In addition, one of the three samples collected from the peat layer also exhibited PAHs in excess of NJDEP Cleanup Criteria. Sample BG-8B contained benzo(a)anthracene at 4.6 ppm, benzo(b)fluoranthene at 4.8 ppm, benzo(k)fluoranthene at 1.9 ppm, benzo(a)pyrene at 4 ppm and indeno(1,2,3-cd)pyrene at 2.3 ppm (PAP-00446919-20).

None of the samples from the fill layer exhibited concentrations of metals in excess of NJDEP Cleanup Criteria. However, numerous metals were detected, in varying concentrations, in these samples. [Note: The source document does not provide these concentrations.] Mercury was detected in one of the samples collected from the peat layer in excess of NJDEP Cleanup Criteria. Sample BG-8B contained mercury at 23.8 ppm (PAP-00446920).

The report determined that based on analytical results, one or more PAHs exist at concentrations in excess of corresponding NJDEP Cleanup Criteria in the samples collected from the fill layer at the non-process area of the site. Furthermore, it appears that PAHs and certain priority pollutant metals are also present in a sample from the peat layer at the non-process area of the site. As the contaminants detected in these samples were not the result of process operations, no remedial investigation activities were proposed at this time for these locations (PAP-00446920).

Based on the results of the site investigation activities, additional actions were determined to be warranted to delineate the presence of contaminants detected at elevated concentrations in samples collected during site investigation activities. Remedial investigation activities for the site were proposed (PAP-00446922-38).

Analytical results from samples collected in March 1996 reveal the presence of one or more PAH compounds above corresponding NJDEP Cleanup Criteria in eight of the 10 Dead Horse Creek sediment samples. Specifically, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene were detected in excess of NJDEP Cleanup Criteria in two or more samples. Lead was detected in all samples but was in excess of its NJDEP Cleanup Criteria of 600 ppm in three samples with a maximum concentration of 996 ppm. Copper was detected in all samples with a maximum concentration of 510 ppm and mercury was detected in all samples with a maximum concentration of 2.10 ppm. The remaining priority pollutant metals were either not detected or were detected in concentrations below corresponding NJDEP Cleanup Criteria The maximum concentrations detected for the PAHs were as follows: acenaphthene (3.5 ppm), acenaphthylene (0.95 ppm), anthracene (1.6 ppm), naphthalene (1.2 ppm), phenanthrene (6.9 ppm), benzo(a)anthracene (4.1 ppm), benzo(a)pyrene (4.6 ppm), benzo(b)fluoranthene (6.2 ppm), benzo(g,h,i)perylene (3.1 ppm), benzo(k)fluoranthene (2.4 ppm), chrysene (4.7 ppm), dibenzo(a,h)anthracene (0.55 ppm), fluoranthene (12 ppm), indeno(1,2,3-

cd)pyrene (3.0 ppm), and pyrene (9.1 ppm) (PAP-00104964-65, 5040). Note: The locations of these samples within the Dead Horse Creek streambed were not provided in the source document.

A remedial strategy for soil and sediment was approved by NJDEP in a letter dated September 4, 1996, which included “hot spot” excavation, sediment removal, placement of an environmental cap, and imposition of a site-wide Declaration of Environmental Restriction. The “hot spot” excavation for soil was performed from September 1996 through September 1997 (PAP-00104770).

According to the October 1997 Industrial Site Recovery Act Remedial Action Report, Soil, investigative efforts performed in conjunction with, and prior to, this ISRA compliance effort revealed the presence of historic fill throughout the subject site including areas beneath the site building. The primary contaminants which have been identified in the historic fill material at this site include heavy metals and PAHs. The investigative efforts also identified areas of environmental concern (AECs) at the site unrelated to the historic fill material. Analytical results from samples collected at some of these identified the presence of contaminants in soil unlikely to be related to historic fill. Therefore, further evaluation of these areas was performed to delineate contaminants unrelated to historic fill. Analytical results from samples collected at the remaining AECs revealed the presence of contaminants which could be attributed to either the historic fill material or process operations. In addition, analytical results from a few areas revealed contaminants related to fill material and did not reveal the presence of contaminants related to process operations. The report states that therefore, investigative efforts confirmed that contaminants at concentrations in excess of NJDEP Cleanup Criteria were related to historic fill material (PAP-00425805).

Investigative efforts also identified the presence of a limited number of contaminants (i.e., certain priority pollutant metals and PAH compounds) in samples from the stream sediments. Based on information gained through soil sampling efforts, the presence of contaminants in stream sediments is attributable to fill material and overland storm water flow and, to some degree, contaminants may be attributable to process operations (PAP-00425805). However, a site survey determined that the western portion of Dead Horse Creek is situated beyond the property limits of the Goody site. Therefore, the remedial activities for sediments in Dead Horse Creek would commence upon execution of an access agreement with the adjacent property owner (PAP-00425807).

To verify the success of the remedial efforts (i.e. “hot spot” excavation), confirmation samples were collected from the majority of the site AECs. However, confirmation samples were not collected in those instances where excavations were advanced to “clean” samples (PAP-00425845).

A summary of analytical results for the Burnishing Room Pipes/Hoses Discharge Area listed the following concentrations:

Remedial Action Report Samples		
COC	**Concentration Ranges**	**Depth of Max**
Benzo(a)anthracene	0.350 mg/kg – 6.000 mg/kg	3.0-3.5 ft.
Benzo(a)pyrene	0.340 mg/kg – 4.800 mg/kg	3.0-3.5 ft.
Benzo(b)fluoranthene	0.470 mg/kg – 6.700 mg/kg	3.0-3.5 ft.
Benzo(g,h,i)perylene	0.270 mg/kg – 1.800 mg/kg	3.0-3.5 ft.
Benzo(k)fluoranthene	0.200 mg/kg – 2.600 mg/kg	3.0-3.5 ft.
Dibenzo(a,h)anthracene	0.068 mg/kg – 0.630 mg/kg	3.0-3.5 ft.
lndeno(1,2,3-cd)pyrene	0.240 mg/kg – 2.200 mg/kg	3.0-3.5 ft.
Copper	27.6 mg/kg – 213 mg/kg	3.0-3.5 ft.
Lead	37 mg/kg – 352 mg/kg	3.0-3.5 ft.
Mercury	0.08 mg/kg – 6.3 mg/kg	0.0-0.5 ft.

(PAP-00425856-57)

A summary of analytical results for the KTP-1/TP-27 Area listed concentrations of copper ranging from 32.6 mg/kg to 331 mg/kg (PAP-00425863). The KTP-1 area was located approximately 15 feet southwest of the northwest corner of the Goody building (PAP-00425821).

A summary of analytical results for the TP-31 Area listed concentrations of copper ranging from 56.3 mg/kg to 498 mg/kg (PAP-00425864). The TP-31 area was located in the west yard (PAP-00425797).

A summary of analytical results for the SB-5 Area listed concentrations of lead ranging from 200 mg/kg to 353 mg/kg (PAP-00425868). The SB-5 area was located in the west yard (PAP-00425798).

A summary of analytical results for the TP-67 Area listed concentrations of lead ranging from 208 mg/kg to 323 mg/kg (PAP-00425869). The TP-67 area was located in the west yard (PAP-00425798).

A summary of analytical results for the Central West Yard - PHC Impacted Area and Former Hazardous Waste Storage Area listed the following concentrations:

Remedial Action Report Samples		
COC	**Concentration Ranges**	**Depth of Max**
Benzo(a)anthracene	0.920 mg/kg – 5.600 mg/kg	2.5-3.0 ft.
Benzo(a)pyrene	1.000 mg/kg – 6.200 mg/kg	2.5-3.0 ft.
Benzo(b)fluoranthene	1.400 mg/kg – 7.700 mg/kg	2.5-3.0 ft.
Benzo(g,h,i)perylene	0.340 mg/kg – 2.900 mg/kg	2.5-3.0 ft.
Benzo(k)fluoranthene	0.480 mg/kg – 2.800 mg/kg	2.5-3.0 ft.
Dibenzo(a,h)anthracene	0.110 mg/kg – 0.780 mg/kg	2.5-3.0 ft.
lndeno(1,2,3-cd)pyrene	0.370 mg/kg – 3.000 mg/kg	2.5-3.0 ft.

(PAP-00425867)

Sediment removal activities in Dead Horse Creek were conducted in 1999. Visual observations during the sediment removal effort noted the presence-of fill material during the sediment removal activities. Hatch Mott MacDonald collected post-remedial sediment samples from the base of the Dead Horse Creek and analytical results from the sampling revealed the presence of metals in excess of nonresidential soil remediation standards in place at that time. However, a comparison of the March 1996 and February 1999 sampling events revealed a dramatic decrease in the concentrations of contaminants detected in samples from stream sediment. Killam Associates concluded that the sediment removal undertaken at Dead Horse Creek substantially reduced the overall contaminants present in the stream corridor (PAP-00104787).

According to a May 2001 *Surface Water and Groundwater Evaluation Summary Report* prepared by Killam Associates for Newell Company, an investigation was conducted by Killam Associates in 2000-2001 to evaluate the Site surface water and groundwater (PAP-00104829-35). Five surface water samples were collected from Dead Horse Creek on September 20, 2000, to assess the potential for impacts from the presence of the Historic Fill and/or contaminants in soil. The samples were collected from representative locations upstream, midstream and downstream and were located approximately 100 feet apart. Lead and mercury were detected in surface water samples at concentrations in excess of the corresponding NJDEP Surface Water Quality Criteria of 5 µg/L and 0.144 µg/L, respectively. Lead was detected at the following concentrations: 13.6 µg/L in sample DownStream-1, 10.4 µg/L in sample DownStream-2, 16.3 µg/L in MidStream-3, 15.7 µg/L in sample Upstream-4, and 15.4 in UpStream-5. Mercury was detected at 0.25 µg/L in sample DownStream-1, 0.16 µg/L in DownStream-2, and 0.15 µg/L in MidStream-3. In addition, eighteen groundwater wells were sampled. Lead was detected in excess of the NJDEP Groundwater Quality Standard (GWQS) (10 µg/L) in groundwater samples from three shallow wells and one deeper well (PAP-00104829-97).

During 2007 and 2009, a follow-on Remedial Investigation was conducted in order to further delineate remaining areas of concern at the Site in preparation for the assignment of a Classification Exception Area for groundwater and site-wide Deed Notice to address Historic Fill. According to a Remedial Investigation Report dated July 2009 prepared by Hatch Mott MacDonald for Goody Products, the investigation included additional soil delineation and sampling in the area of the WWTP Discharge Pit (AOC 1), additional soil investigation in the area of the Compressor Blowdown Pipe/Test Pit TP-75 Area (AOC 3E) and the installation of six monitoring wells and performance of groundwater sampling to investigate groundwater conditions at the Site (PAP-00104765-73). The majority of the investigation involved hexavalent chromium, arsenic, ethylbenzene, total xylenes, and nickel. However, elevated concentrations of metals above the NJDEP GWQS which included lead were also detected at the western portion of the Site. Lead was detected at concentrations of 170 µg/L (MW-10S), 55 µg/L (MW-13), and 10 µg/L (MW-15); exceeding the GWQS of 5 µg/L (PAP-00104783-801 Note that the available references did not provide conclusive information regarding groundwater flow patterns at the site or specific information regarding the potential connection of groundwater to the Dead Horse Creek or to other potential pathways connected to the Passaic River.

On February 28, 2012, a Deed Notice was issued for the property at 969 Newark Turnpike (this site) because soil contamination remained in certain areas of the property which contains contaminants in concentrations that do not allow for the unrestricted use of the property. Due to the presence and concentration of these contaminants resulting from Historic Fill, restrictions regarding the use of the property, and the placement of capping over the ground as an engineering control were instituted. The restriction against subsurface intrusion included the entire 9.55-acres of the property (PAP-00104217-56). According to an April 2012 NJDEP Remedial Action Permit Application – Soil, the contaminants and the concentrations which required the Deed Notice included the metals copper (1,320 mg/kg, depth of 0 to 0.5 feet) and lead (1,780 mg/kg, depth of 2.0 to 2.5 feet); and PAHs benzo(a)anthracene (19 mg/kg, depth of 4.5 to 5.0 feet), chrysene, (19 mg/kg, depth of 4.5 to 5.0 feet), benzo(b)fluoranthene (20 mg/kg, depth of 4.5 to 5.0 feet), benzo(k)fluoranthene (8.4 mg/kg, depth of 4.5 to 5.0 feet), benzo(a)pyrene (16 mg/kg, depth of 4.5 to 5.0 feet), indeno(1,2,3-cd)pyrene (12 mg/kg, depth of 4.5 to 5.0 feet), and dibenzo(a,h)anthracene (2.7 mg/kg, depth of 4.5 to 5.0 feet) (PAP-00104212-4).

On April 25, 2012, NJDEP issued Remedial Action Soil Permit No. RAP120002 requiring Goody Products to conduct monitoring, maintenance and evaluation for compliance and effectiveness of the remedial action, and the associated institutional and engineering controls (PAP-00104269-76). In addition, on April 26, 2012, NJDEP issued a Conditional No Further Action Letter stating that as long as each subsequent owner, lessee, and operator of the Site complied with the conditions of the Remedial Action Soil Permit then no further remedial action would be required (PAP-00104419-21). The remediation that was covered by this Conditional No Further Action Letter did not address the remediation of hazardous substances that may exist in building interiors or equipment; including, but not limited to, lead. As a result, any risks to human health presented by any building interior or equipment remained (PAP-00104421).

In a letter dated April 25, 2015, NJDEP established a Classification Exception Area/Well Restriction Area for lead and other metals contamination in the groundwater above the NJDEP GWQS at the Goody Products Site, which may limit the groundwater use at the Site. The maximum concentration of lead detected at the site was 2,070 µg/L (PAP-00104257-62; PAP-00104483-500).

On March 13, 2018, a Soil Remedial Action Permit Modification (RAP170001) was issued by NJDEP. RAP170001 superseded RAP130001, which presumably superseded RAP120002. The permit modification requires the permittee to conduct monitoring, maintenance and evaluation for compliance and effectiveness of the remedial action and its associated institutional control. The permit modification established requirements necessary for demonstrating that the remedial action and control continue to be protective of public health, safety and the environment (PAP-00104518-19).

8. Summary of Asserted Defenses

Neither Newell nor Goody Products, Inc. ("Goody") is a "covered person" (i.e., a responsible party) under CERCLA Section 107(a), 42 U.S.C. § 9607(a), with respect to the Diamond Alkali Superfund Site, including because Newell and Goody (a) do not, and never did, own or operate any portion of the Site; (b) did not arrange for the disposal of any hazardous substances at the Site (including because neither discharged any hazardous substances from the Facility to the Lower Passaic River); and (c) did not transport any hazardous substances to the Site.

Some or all of Goody's releases of hazardous substances to the Lower Passaic River, if any, were "federally permitted releases" within CERCLA Section 107(j), 42 U.S.C. § 9607(j), and resulting response costs or damages, if any, may not be recovered under CERCLA.

Pursuant to CERCLA Section 107(b), 42 U.S.C. § 9607(b), Newell and Goody are not liable for the releases or threatened releases of hazardous substances from the Facility, if any, because such releases or threatened releases were caused solely by: an act of God; an act of war; or the acts or omissions of persons or entities other than Newell or Goody, for whom Newell and Goody are not responsible.

Each release or threat of release of hazardous substances, if any, and any costs or damages resulting there from was caused solely by the negligence, acts or omissions of third-parties over whom Newell and Goody had no control and no duty to control, including without limitation: (a) the State of New Jersey and its agencies, instrumentalities and officials, including, without limitation, Trustees for tidelands; and (b) the United States and its agencies, instrumentalities and officials.

Neither Newell nor Goody is a successor to any person or entity that owned or operated any portion of the Facility property.

L3 Harris Technologies, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

L3 HARRIS TECHNOLOGIES, INC. F/K/A HARRIS CORPORATION

Facility Name, Address and Size: The facility has historically comprised three contiguous areas owned and operated during different periods. The buildings comprising the facility carried the following street addresses: 100 Kingsland Road (now 77 River Road), Clifton, New Jersey; 500 Washington, 390 Washington, 417 River Road, 483 River Road, and 491/493 River Road, Nutley, New Jersey; 492 River Road, Nutley, New Jersey. At its largest, the area of the facility was approximately 149 acres; currently it consists of 26 acres. The facility was owned and operated under different names over time, including, International Telephone & Telegraph Corporation; ITT Avionics; ITT Defense Communications; ITT Industries, Inc.; ITT Corporation; ITT Avionics Div.; ITT Defense; ITT Aerospace Communications Division; Federal Telephone & Radio Corp.; Exelis, Inc. Information on the number of employees and shifts per day was not identified in the available file material.

1. **Business Type:** Defense communications, research and development, defense contractor, telephone/telegraph equipment (PAP-00204915; PAP-00199552)

2. **Time Period of Ownership/Operations**

   The facility has historically comprised three contiguous areas:

   - Kingsland Road Area [100 Kingsland Road (now 77 River Road), Clifton, New Jersey];
   - Washington Avenue Area (500 Washington, 390 Washington, 417 River Road, 483 River Road, and 491/493 River Road, Nutley, New Jersey); and,
   - River Road Area (492 River Road, Nutley, New Jersey).

   Each area has been owned and operated during different, but overlapping periods.

   Operator: 1946 to present (the operations and size of the facility have varied over time, as further described below).

   Owner: 1941 to present (the size of the facility has varied over time, as further described below).

   1941: ITT purchased the Washington Avenue Area in 1941 (PAP-00205092).

   1946: ITT purchased the Kingsland Road Area in 1946 (PAP-00199552).

   1952: ITT purchased the River Road Area in 1952 (PAP-00202991).

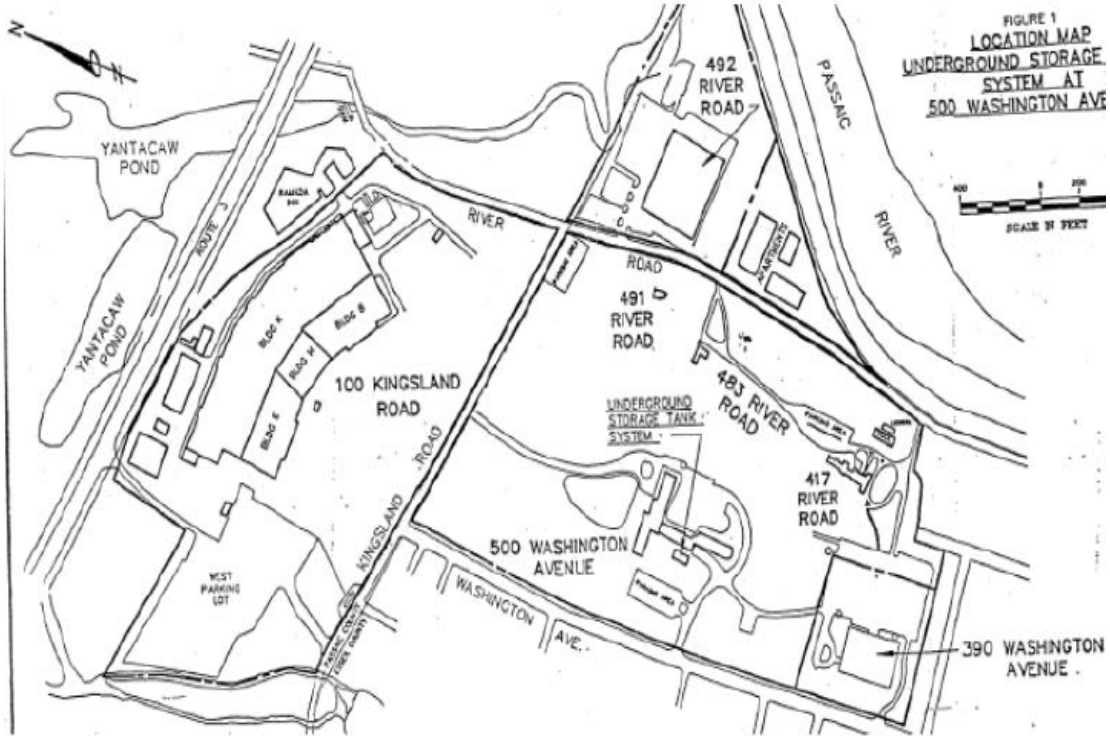
   1993: Operations at the Washington Avenue Area and River Road Area ceased in 1993 (PAP-00203242-43).

1996: ITT Industries, Inc. sold the Kingsland Road Area in 1996 to Related Retail Corporation and then leased-back the area. After transfer of the title and execution of the lease, ITT Avionics Division continued to operate on-site (PAP-00199552; PAP-00204976).

1998: ITT Industries purchased the Kingsland Road Area back from Related Retail Corporation, excluding 10 acres (i.e., the western portion of the property), in 1998 (PAP-00199552).

2001: The Kingsland Road Area was subdivided into Block 83.01, Lot 1.01 and Block 83.01, Lot 1.02 in 2001. Lot 1.02 was sold for redevelopment. The address of the remaining 26 acres was changed from 100 Kingsland Road to 77 River Road (PAP-00204976; PAP-00199552).

The facility layout circa 1990 is depicted below (PAP-00202318):



3. Operational History/COC Use and Presence at the Facility

Kingsland Road Area

According to a *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, historical operations at the Kingsland Road Area included the manufacture of television and radio tubes, telephones, radios, and printed circuit boards (PAP-00199552).

Facility operations included metal finishing and electroplating which were historically performed in an area of the facility directly east of the chemical storage room. These operations included solvent degreasing, acid etching, pickling, aqueous alkaline cleaning, plating, and electroplating (i.e., via plating baths consisting of cadmium, chromium, copper, lead, molybdenum, nickel, silver, tin, and zinc). Process baths were reportedly located throughout the area on elevated gratings. Process rinse water was discharged to concrete troughs, which drained to an industrial wastewater pretreatment system (PAP-00199563). The pretreatment system was located in the subbasement of the main building. Pretreatment consisted of chrome reduction (i.e., hexavalent to trivalent), metal hydroxide precipitation, and neutralization (PAP-00199806).

Pretreated process wastewater was discharged to the municipal sanitary sewer operated by the Passaic Valley Sewerage Commission (PVSC) pursuant to a permit between 1982 and 1990 (PAP-00199536; PAS-00111061-62). Sewer discharge monitoring was automatically performed at this location (PAP-00199559). During the period that the pre-treatment process was in operation, pretreated discharges were monitored for metals (including copper and lead), among other parameters (PAP-00203244). The pretreatment system began operation in 1982 and was discontinued in 1990 because of the termination of process operations generating industrial wastewater (PAP-00199559). The *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, states that sanitary waste was discharged to the PVSC system beginning in 1946 (PAP-00199536). On July 6, 1990, the facility certified to PVSC that all uses of cadmium, nickel, silver, zinc, copper and lead had been discontinued for manufacturing purposes (PAP-00203260). Review of a *Community Right to Know Survey for 1995* states no OU2 contaminants of concern (COCs) were present as part of the facility's chemical inventory in 1995 (PAP-00199675-722). A *Community Right to Know Survey for 2000* also identified no OU2 COCs in the facility's chemical inventory (PAS-00110830-57).

As reported in the *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, in 2012 the property was being utilized for assembly, laboratory, testing, and office activities. Assembly operations included ancillary drilling, soldering, and wiring of units, some painting, printing, degreasing, machining, and grinding. The facility also performed some associated laboratory and product testing (PAP-00199554).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, ITT operations at the Washington Avenue Area consisted primarily of research and development activities in support of manufacturing and assembly of electronic components and equipment for defense and intelligence applications. This included prototype designs and model construction in an electronic laboratory setting. Model construction involved soldering, printing, degreasing, drilling, machining, grinding, and testing of the products. Degreasing operations involved small spot degreasers in laboratory areas (PAP-00205011).

According to a *Community Right to Know Survey for 1992*, lead was present at the facility. According to a *1992 Hazardous Waste Report*, "tin/lead solder dross bars for recycling" were generated by the facility and properly drummed and sent of off-site to an EPA-licensed disposal facility, Halpern and Company, Inc. (PAP-00205075; PAP-00205039).

It is noted that a former dry well near the 500 Washington Avenue area may have received plating or acid wastes (PAP-00205108).

As reported in the *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, in 1993, the facility was inactive. Buildings remaining at the facility were 500 Washington Avenue, 390 Washington Avenue, the cafeteria/clubhouse at 417 River Road, the carpenter shop at 483 River Road, and the Admiral's house at 493 River Road. Only the building at 390 Washington Avenue was being used, serving as a temporary outplacement services office. All other buildings were closed (PAP-00205011).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, ITT operations at the River Road Area consisted of testing and assembling communications equipment used for satellite defense applications. Most of the facility housed small offices and electronics laboratories, with some rooms devoted to assembly of equipment. Manufacturing consisted mainly of assembly operations which included drilling, soldering and wiring of the units. Assembly involved manual, table-top operations, including soldering, printing, small scale plating, degreasing, acid/alkali cleaning, drilling, machining, grinding, assembling and testing of products. It is reported that "on occasion," ITT conducted small-scale plating operations at the facility in one small laboratory at the east end of the building (PAP-00199237).

According to a *Community Right to Know Survey for 1992,* no OU2 COCs were specifically listed as being present as part of the facility's chemical inventory in 1992 (PAP-00199251-268).

According to the *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, process rinse waters from the plating laboratory were disposed off-site as hazardous waste (PAP-00199237); however, a former plating rinse water dry well was also identified on the east side of the building. In addition, a former non-contact cooling water dry well was located on the east side of the building, and a former machine shop sink discharge point to a dry well was identified on the north side of the building (PAP-00199279, 287).

It is noted that according to the *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, prior to the purchase of the River Road Area, the eastern portion of that property was reportedly landfilled with municipal refuse immediately prior to construction of the facility. There were no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure; however, drilling revealed fill material to include coal, ash, glass, china, leather, rubber, cast iron and steel (PAP-

00199213). NJDEP concurred that Historic Fill occupied a "much larger" area of the site than previously thought in a letter dated August 31, 1994 (PAP-00202981-83).

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (detected)

PCBs

Kingsland Road Area

According to a *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012, during visual inspection of transformers and switchgear conducted at the Kingsland Road Area in May 1996, three transformers were identified as having stains on concrete pads adjacent to the transformers as follows: 1) staining was observed on a transformer pad located on the south side of the boiler house (100 Kingsland Road (now 77 River Road) ; 2) staining was observed on an interior concrete floor in a subbasement adjacent to electrical systems; and, 3) staining was observed on the concrete transformer pad located on the north side of the main building. Concrete chip samples were collected at the stained areas and analyzed for polychlorinated biphenyls (PCBs) (PAP-00199564; PAS-00111066). The maximum detected concentration of total PCBs in concrete chips was 6.24 milligrams per kilogram (mg/kg) in 1997 (PAP-00200025). PCBs were detected in two soil samples collected below the concrete. The maximum detected concentration of total PCBs detected in soil below the concrete was 0.054 mg/kg in 1997 (PAP-00200026).

PAHs

Kingsland Road Area

Six underground storage tanks (USTs), identified as UST systems El through E6, were closed and removed from the northern side of the Kingsland Road Area, north of the former boiler house between July 12, 1990, and October 25, 1990. UST systems El through E4 were 22,000 gallons in capacity and were used for the storage of No. 6 fuel oil. UST systems E5 and E6 were 2,000 and 6,000 gallons in capacity, respectively, and were used for the storage of No. 4 fuel oil. Four post-excavation subsurface soil samples were analyzed for PAHs. Detected concentrations of PAHs (in mg/kg) were as follows (PAP-00199883):

Semi-Volatile Organic Compounds:												
Fluoranthene	<0.71	NA	NA	0.29	NA	<0.78	0.35	NA	NA	NA	NA	0.11
Pyrene	<0.71	NA	NA	0.76	NA	<0.78	0.72	NA	NA	NA	NA	0.24
Bis (2-Ethylhexyl) phthalate	<0.71	NA	NA	0.39	NA	<0.78	5.60	NA	NA	NA	NA	1.40
Chrysene	<0.71	NA	NA	3.90	NA	<0.78	0.40	NA	NA	NA	NA	0.12
Benzo (A) anthracene	<0.71	NA	NA	0.37	NA	<0.78	0.38	NA	NA	NA	NA	0.11
Benzo (B) fluoranthene	<0.71	NA	NA	0.31	NA	<0.78	0.36	NA	NA	NA	NA	<0.72
Benzo (K) fluoranthene	<0.71	NA	NA	0.11	NA	<0.78	0.087	NA	NA	NA	NA	<0.72
Benzo (A) pyrene	<0.71	NA	NA	0.20	NA	<0.78	0.25	NA	NA	NA	NA	0.13
Indeno (1,2,3-C,D) pyrene	<0.71	NA	NA	0.14	NA	<0.78	0.15	NA	NA	NA	NA	<0.72
Benzo (G,H,I) perylene	<0.71	NA	NA	0.11	NA	<0.78	0.18	NA	NA	NA	NA	0.20
Phenanthrene	<0.71	NA	NA	<0.74	NA	<0.78	0.25	NA	NA	NA	NA	1.50
Acenaphthene	<0.71	NA	NA	<0.74	NA	<0.78	<0.74	NA	NA	NA	NA	0.37
Fluorene	<0.71	NA	NA	<0.74	NA	<0.78	<0.74	NA	NA	NA	NA	0.66

According to the June 2012 Preliminary Assessment and Site Investigation Report, no further action was required for the soils in this area, since all parameters were below NJDEP's Impact to Groundwater Soil Cleanup Criteria and NJDEP's Residential Direct Contact Soil Cleanup Criteria (PAP-00199805).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue area was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). High and low molecular weight PAHs were detected in subsurface soil associated with the dry well at a depth of three to four feet (PAP-00205108, 136). Detected concentrations of PAHs (in µg/kg) were as follows (PAP-00205136):

fluorene	390 J
phenanthrene	2,200
anthracene	560
fluouranthene	2,400
pyrene	1,900
benzo(a)anthracene	1,200
chrysene	1,200
benzo(b,k)fluouranthene	1800 L
benzo(a)pyrene	1,100
indeno(1,2,3-cd)pyrene	710
dibenz(a,h)anthracene	390 J
benzo(g,h,i)perylene	610

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, between October 31, 1990 and November 2, 1990, a 20,000-gallon UST system used to store No. 2 fuel oil was evacuated of its contents, excavated and removed in accordance with a New Jersey Department of Environmental Protection (NJDEP)-approved UST closure plan. Post-excavation samples were collected and high and low molecular weight PAHs were detected (PAP-00199288, 315). Detected concentrations of PAHs (in mg/kg) were as follows (PAP- 00199315):

phenathrene	.32	.077
anthracene	.08	ND
fluouranthene	.37	.11
pyrene	.29	.08
bis(2 ethylhexyl)phthalate	.12	.18
chrysene	.16	.044
benzo(a)anthracene	.16	.049
benzo(b)fluouranthene	.19	.054
benzo(k)fluouranthene	.089	ND
benzo(a)pyrene	.15	.042
indeno(1,2,3-cd)pyrene	.08	ND
benzo(g,h,i)perylene	.073	ND

The NJDEP certified by letter dated July 13, 1992, that ITT Corporation had properly complied with the requirements regarding the 20,000 gallon UST and no additional corrective actions were necessary (PAP-00199231, 288).

Copper

Kingsland Road Area

According to Pretreatment Monitoring Reports, copper was detected in wastewater discharges as follows. The pre-treatment standard under the PVSC permit for copper was 3.36 mg/L (PAP-00203271). :

- Between January and June 1987, copper was detected in facility wastewater at concentrations ranging between 0.34 milligrams per liter (mg/L) and 2.44 mg/L (PAP-00203228-39).

- Between July and December 1987, copper was detected in facility wastewater at concentrations ranging between 0.34 mg/L and 5.0 mg/L (PAP-00203271-86). According to the associated monitoring report, “A single analysis exceeded the permit requirement [for copper] due to solids in the sample. Upon preservation of the sample, copper was released. Additional analyses were performed and are attached to show compliance with pre-treatment standards” (PAP-00203272).

- In January through June 1988, copper was detected in facility wastewater at a maximum concentration of 1.28 mg/L. In July through December 1988, copper was detected in facility wastewater at a maximum concentration of 1.03 mg/L (PAP-00426083).

- In January through June 1989, copper was detected in facility wastewater at a maximum concentration of 4.07 mg/L (PAP-00426124). The three-day average was 1.81 mg/L (PAP-00426145). In July through December 1989, copper was detected in facility wastewater at a maximum concentration of 1.20 mg/L (PAP-00426152).

- Copper was detected in facility wastewater at a maximum concentration of 0.765 mg/L between January and June 1990 (PAP-00203246).

- In November 1994, copper was detected at outfalls 003 and 005 at maximum concentrations of 1 mg/L and 0.15 mg/L, respectively (PAP-00426311).

- In December 1996, copper was detected at outfall 003 at a concentration of 70 µg/L (PAP-00426318).

- In October 1997, copper was detected at outfall 003 at a maximum concentration of 80 µg/L (PAP-00426522).

- Copper was detected in facility wastewater in January 1998 at a concentration of 0.4 mg/L (PAP-00203321). In February 1998, copper was detected at outfall 003 at a concentration of 0.1 mg/L (PAP-00427182). In April 1998 it was detected at a concentration of 0.6 mg/L (PAP-00427339). In May 1998, it was listed at a concentration of 0.07 mg/L (PAP-00427432). In June 1998, it was listed at a concentration of 0.05 mg/L (PAP-00427528). In July 1998, it was listed at a concentration of 0.09 mg/L (PAP-00427598). In August 1998, it was listed at a concentration of 0.06 mg/L (PAP-00427667).

- The maximum detection of copper reported in the monitoring reports from January to May 1999 was 0.13 mg/L for both outfalls 003 and 005 (PAP-00722746-64). This was noted to exceed the threshold value for copper of 0.092 mg/L, but not the monthly average limit of 3.02 mg/L (PAP-00722287-9, 386-7, 768, 772).[1]

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue facility was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). Copper was detected in subsurface soil at concentrations of 52.1 mg/kg at a depth of three to four feet (PAP-00205137).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building was released via a pipe directly to a subsurface dry well in the ground on the north side of the building (PAP-00199292, 89). In addition, a former dry well for plating rinse water was located at the northeast corner of the building (PAP-00199293). Finally, a former dry well for non-contact cooling water was located at the northeast corner of the building (PAP-00199289). It is noted that according to a *Remedial Action Report*, dated February

[1] This Report was revised to include documents received on July 13, 2020. The additional documents did not change L3 Harris Technologies' previous certification.

1997, facility personnel stated that the non-contact cooling water dry well did not receive industrial waste, but rather was a discharge point for storm water (roof drains) (PAP-00203004). All of these dry wells, except the machine shop sink discharge point, were located in historic fill, as confirmed by NJDEP (PAP-00202983).

It is noted that initially, the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility, prior to ITT's ownership of the property. It is reported that there are no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure, but that on-site drilling has revealed fill material to include coal, ash, glass, china, leather, rubber, cast iron, and steel (PAP-00199213). Later, additional evidence provided to NJDEP showed that the fill that predated ITT's ownership extended to almost the entire River Road Area. NJDEP itself concurred with the conclusion that fill "extends throughout the site…" in a letter dated August 31, 1994 (PAP-00202983). Metals detected in this area were attributed to former landfill activities (PAP-00199291). The NJDEP concurred that this area was historic fill (PAP-00202983).

Maximum concentrations of copper detected in 1991 and 1993 at the above-listed areas were as follows (PAP-00199290-293, 312, 316):

Maximum Copper Concentrations by Area of Concern (mg/kg)				
	Machine Shop Sink Discharge	**Dry Well for Non-Contact Cooling Water**	**Dry Well for Plating Rinse Water**	**Municipal Landfill**
Copper	2,380 (at 0.5 to one foot)	360 (at one to three feet)	360 (at one to three feet)	865 (at zero to two feet)

Lead

Kingsland Road Area

According to Pretreatment Monitoring Reports, lead was reported in conformance with the PVSC lead permit limit of 0.69 mg/L in wastewater discharges as follows:

- Between January and June 1987, lead was reported in facility wastewater at concentrations ranging between 0.04 mg/L and 0.16 mg/L (PAP-00203228-39).
- Between July and December 1987, lead was reported in facility wastewater at concentrations ranging between 0.03 mg/L and 0.14 mg/L (PAP-00203271-86).
- In January through June 1988, lead was detected in facility wastewater at a maximum concentration of 0.13 mg/L. In July through December 1988, lead was detected in facility wastewater at a maximum concentration of 0.03 mg/L (PAP-00426083).

- In January through June 1989, lead was detected in facility wastewater at a maximum concentration of 0.237 mg/L (PAP-00426124). In July through December 1989, lead was detected in facility wastewater at a maximum concentration of 0.139 mg/L (PAP-00426152).

- Lead was reported in facility wastewater at a maximum concentration of 0.0283 mg/L between January and June 1990 (PAP-00203246).

- In 1991, the cooling water was listed as having a lead concentration of 0.0216 (PAP-00426050).

- In November 1994, lead was detected at outfalls 003 and 005 at maximum concentrations of 0.087 mg/L and 0.015 mg/L, respectively (PAP-00426311).

- In December 1996, lead was detected at outfalls 003 and 005 at concentrations of 18.1 µg/L and 20.5 µg/L (PAP-00426318, 19).

- In October 1997, lead was detected at outfall 005 at a maximum concentration of 163 µg/L (PAP-00426579). It was detected at outfall 003 at a maximum concentration of 8.4 µg/L (PAP-00426669).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue area was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). Lead was detected in subsurface soil at concentrations of 57.6 mg/kg at a depth of three to four feet (PAP-00205137).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building was released via a pipe directly to a subsurface dry well in the ground on the north side of the building (PAP-00199292). In addition, a former subsurface dry well for plating rinse water was located at the northeast corner of the building (PAP-00199293). Finally, a former subsurface dry well for non-contact cooling water was located at the northeast corner of the building (PAP-00199289). It is noted that according to a *Remedial Action Report*, dated February 1997, facility personnel stated that the non-contact cooling water dry well did not receive industrial waste, but rather was a discharge point for storm water (roof drains) (PAP-00203004). All of these areas, except the machine shop sink discharge, were located within the historic fill placed on the property prior to ITT's ownership, as confirmed by letter from NJDEP (PAP-00202983).

It is noted that initially, the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility, prior to ITT's ownership of the property. It is reported that there are no records regarding the

period of landfill activity, the types of waste disposed, or the manner of landfill closure, but that on-site drilling has revealed fill material to include coal, ash, glass, china, leather, rubber, cast iron, and steel (PAP-00199213). Later, additional evidence provided to NJDEP showed that the fill that predated ITT's ownership extended to almost the entire River Road Area. NJDEP itself concurred with the conclusion that fill "extends throughout the site…" in a letter dated August 31, 1994 (PAP-00202983). Metals detected in this area were attributed to former landfill activities (PAP-00199291). The NJDEP concurred that this area was historic fill (PAP-00202983).

Maximum subsurface detected concentrations of lead detected in 1991 and 1993 at the above-listed areas were as follows (PAP-00199290-293, 312, 316-317):

Maximum Lead Concentrations by Area of Concern (mg/kg)				
	Machine Shop Sink Discharge	**Dry Well for Non-Contact Cooling Water**	**Dry Well for Plating Rinse Water**	**Municipal Landfill**
Lead	1,400 (at two to four feet)	2,470 (at one to three feet)	2,470 (at one to three feet)	1,710 (at zero to two feet)

Mercury

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue facility was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). Mercury was detected in a subsurface soil sample at a concentration of 0.83 mg/kg at a depth of three to four feet (PAP-00205137).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building (492 River Road) was released via a pipe directly to a subsurface dry well on the north side of the building (PAP-00199292). In addition, a former dry well for plating rinse water was located at the northeast corner of the building (PAP-00199293, 89). Finally, a former dry well for non-contact cooling water was located at the northeast corner of the building (PAP-00199289). It is noted that according to a *Remedial Action Report*, dated February 1997, facility personnel stated that the non-contact cooling water dry well did not receive industrial waste, but rather was a discharge point for storm water (roof drains) (PAP-00203004).

It is noted that initially, the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility, prior to ITT's ownership of the property. It is reported that there are no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure, but that on-site drilling has revealed fill material to include coal, ash, glass, china,

leather, rubber, cast iron, and steel (PAP-00199213). Later, additional evidence provided to NJDEP showed that the fill that predated ITT's ownership extended to almost the entire River Road Area. NJDEP itself concurred with the conclusion that fill "extends throughout the site…" in a letter dated August 31, 1994 (PAP-00202983). Metals detected in this area were attributed to former landfill activities (PAP-00199291). The NJDEP concurred that this area was historic fill (PAP-00202983).

Maximum concentrations of mercury detected in 1991 and 1993 (with the concentration at the machine shop sink discharge location being detected at 0.5 to one feet) at the above-listed areas were as follows (PAP-00199290-293, 312, 316-317):

Maximum Mercury Concentrations by Area of Concern (mg/kg)				
	Machine Shop Sink Discharge	Dry Well for Non-Contact Cooling Water	Dry Well for Plating Rinse Water	Municipal Landfill
Mercury	2.1	Not Detected	Not Detected	Not Detected

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[2]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[3] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[4] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[5]

[2] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[3] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[4] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[5] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, fill was encountered at the River Road Area. Boring log descriptions of the fill included ash, glass, china, leather, rubber, cast iron, steel and coal. The thickness of the fill ranged from approximately three feet to approximately 12 feet (PAP-00199283). The report goes on to state that the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility and predated ITT's ownership. It is reported that there are no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure (PAP-00199213), but metals detected in soil in this area were attributed to former landfill activities (PAP-00199291). In 1994, based on additional evidence provided by NJDEP, NJDEP concurred that historic fill "extends throughout the site [River Road Area]" (PAP-00202983).

The levels of copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00199312, 316-317).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,470 mg/kg
Copper	865 mg/kg
Mercury	2.1 mg/kg

5. COC Pathways

Prior to 1998, the Third River, a tributary of the Passaic River, bordered part of the Kingsland Road Area to the west, and flowed around to the facility to the west, north and east. To the north, the facility was bordered by State Highway Route 3. This tributary discharges to the Passaic River approximately one-quarter mile east of the facility (PAP-00199799).

Sanitary Sewer

Each area of the facility had its own PVSC sanitary sewer permit:

- The Kingsland Road Area held PVSC Sewer Connection Permit (03401703) (PAP-00203263). A copy of the permit was not identified in the available file material.
- The Washington Avenue Area held PVSC Sewer Connection Permit (24401713) (PAP-00205012, 32).
- The River Road area held PSVC Sewer Connection Permit (24403740) (PAP-00199240).

Additional details are discussed below by facility area.

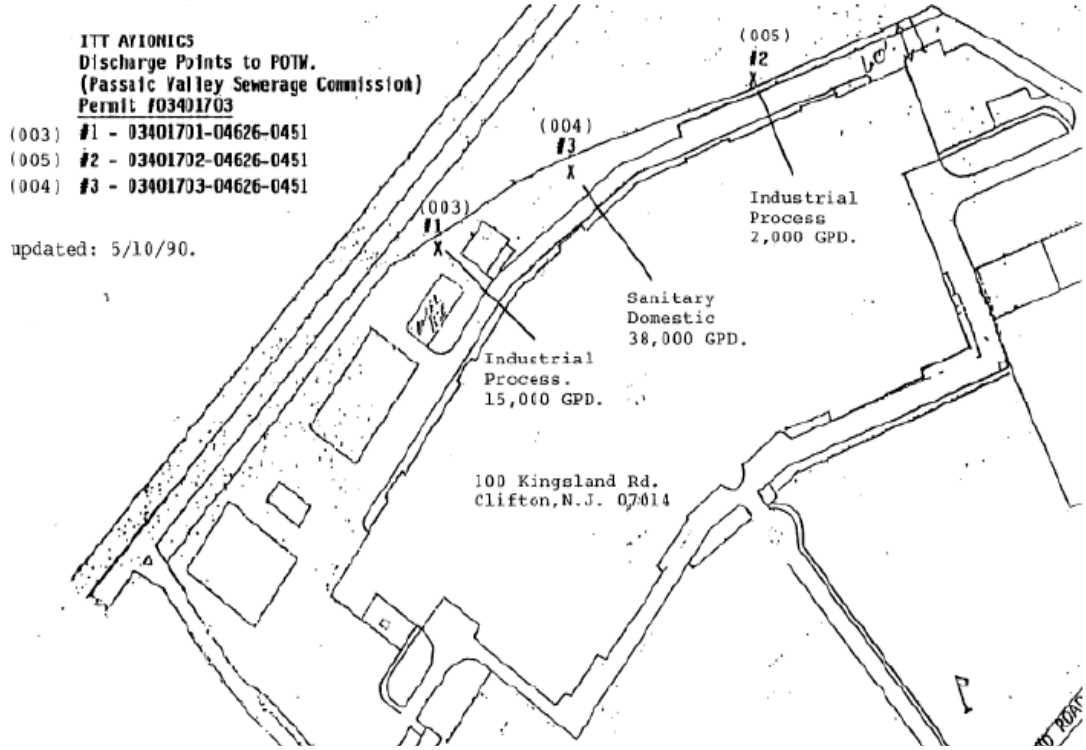
Kingsland Road Area

Sanitary wastewater, along with industrial process wastewater that was pretreated in an on-site wastewater treatment system, was discharged to the PVSC system between 1982 and 1990 pursuant to the PVSC permit. Discharge was monitored for copper and lead, among other parameters (PAP-00203244). The *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, states that sanitary waste was discharged to the PVSC system beginning in 1946 (PAP-00199536). As documented in 1990, discharges from the Kingsland Road Area to the PVSC system were via three outfalls. Industrial process wastewater was discharged to outfall 003 and outfall 005. Sanitary waste was discharged to outfall 004 (PAP-00203263). Discharge through outlets 003 and 005 appears to have been permitted through 2001 (PAP-00722300, 85-87).[6]

For the period of January through June 1988, a maximum flow volume of 140,950 gallons per day was reported for outfall 005 (PAP-00426063). For the period of July through December 1988, a maximum flow volume of 160,729 gallons per day was reported for outfall 005 (PAP-00426083). For the period of January through June 1989, a maximum flow volume of 163,658 gallons per day was reported for outfall 005 (PAP-00426124). For the period of July through December 1989, a maximum flow volume of 111,000 gallons per day was reported for outfall 005 (PAP-00426152). In 1990, process wastewater was discharged at a rate of 15,000 gallons per day out of outfall 003 and 2,000 gallons per day out of outfall 005. Sanitary waste was discharged out of outfall 004 at a discharge rate of 38,000 gallons per day (PAP-00203263).

A figure depicting the locations of the outfalls is below (PAP-00203263):

[6] This Report was revised to include documents received on July 13, 2020. The additional documents did not change L3 Harris Technologies' previous certification.



According to a *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, facility operations historically included metal finishing and electroplating (i.e., via plating baths consisting of cadmium, chromium, copper, lead, molybdenum, nickel, silver, tin, and zinc). Between 1982 and 1990, process baths were reportedly located throughout the area on elevated gratings. Process rinse water was discharged to concrete troughs which drained to an industrial wastewater pretreatment system (PAP-00199563). The pretreatment system was located in the subbasement of the main building. Pretreatment consisted of chrome reduction (i.e., hexavalent to trivalent), and metal hydroxide precipitation and neutralization (PAP-00199806). Process operations generating industrial wastewater ceased in 1990 (PAP-00199806).

From April 1 through June 30, 1991, the flow volume at outfall 003 was listed as 902,080 gallons and the flow volume at outfall 005 was listed as 265,450 gallons (PAP-00426044, 46). For June 1992, the flow volume at outfall 003 was listed as 14,734 gallons and the flow volume at outfall 005 was listed as 4,385 gallons (PAP-00426194). In October 1997, the flow volume at outfall 003 was listed as 23,698 gallons per day (PAP-00426674). In February 1998, the flow volume at outfall 003 was listed as 26,626.52 gallons per day and at outfall 005 was listed as 2,753.8 gallons per day (PAP-00427182, 84). In March 1998, the flow volume at outfall 003 was listed as 589,305 gallons and at outfall 005 was listed as 113,882 gallons (PAP-00427258, 60). In April 1998, the flow volume at outfall 003 was listed as 371,143 gallons and at outfall 005 was listed as 143,181 gallons (PAP-00427327, 29). In May 1998, the flow volume at outfall 003 was listed as 200,978 gallons and at outfall 005 was listed as 168,095 gallons (PAP-00427419, 21). In June 1998, the flow volume at outfall 003 was listed as 526,948 gallons and at outfall 005 was listed as 395,707 gallons (PAP-00427521, 23). In July

1998, the flow volume at outfall 003 was listed as 270,906 gallons and at outfall 005 was listed as 932,774 gallons (PAP-00427593, 95). In August 1998, the flow volume at outfall 003 was listed as 17,658 gallons per day and at outfall 005 was listed as 16,092 gallons per day (PAP-00427667, 68). In December 1998, the flow volume at outfall 003 was listed as 32,845 gallons per day and at outfall 005 was listed as 4,434 gallons per day (PAP-00428078, 80).

Additional monitoring reports from January to May 1999 provided data for discharges through outfalls 003 and 005. The maximum flow through outlet 003 during this time period was reported as 29,052.1 gallons per day, and the maximum flow through outfall 005 was reported as 4,500.1 gallons per day (PAP-00722758, 60).[7]

According to the *Remedial Action Report*, dated September 1997, the pretreatment system continued to operate as a neutralization system in the event the pH of other industrial wastewater generated throughout the facility was outside of discharge limits (PAP-00199975).

The *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, states that at that time of the report, all industrial process wastes were containerized and staged on-site prior to off-site disposal (PAP-00199536).

Washington Avenue Area

According to the *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, sanitary wastewater was discharged to the PVSC system beginning as early as 1981 via a PVSC Sewer Connection Permit (24401713) (PAP-00204993, 5032). No discharge monitoring was required under this permit, which included discharge of sanitary waste only via three outfalls (PAP-00205015-18). ITT informed PVSC that operations and discharges had ceased on November 3, 1993 (PAP-00203242).

River Road Area

According to the *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, sanitary wastewater was discharged to the PVSC system beginning as early as 1991 to at least 1996 via one outfall (PAP-00199207, 240, 242). ITT was not required to monitor this discharge for OU2 COCs (PAP-00199242). On July 13, 1992, ITT certified that they did not have any discharges from the River Road Area (PAP-00426189).

Non-Contact Cooling Water and Stormwater Discharges

Kingsland Road Area and Washington Avenue Area

The Kingsland Road Area had a New Jersey Pollutant Discharge Elimination System (NJPDES) permit (NJ0020214) for discharge to the Third River and Passaic River at least as early as 1983 (PAP-00026354; PAP-00203103). According to a *Site Evaluation*

[7] This Report was revised to include documents received on July 13, 2020. The additional documents did not change L3 Harris Technologies' previous certification.

Submission and Cleanup Plan Report, dated July 1993, the Washington Avenue Area was also covered under this NJDPES permit (PAP-00204991). It is noted that ITT was not required to monitor discharges for OU2 COCs under this permit (PAP-00203109-11).

Discharges included stormwater and non-contact cooling water (PAP-00026354; PAP-00203103). Discharges were via outfall 001 (which discharged to the Third River) and outfalls 002 and 003 (which discharged to the Passaic River) (PAP-00204991, 5007).

According to a modification to the NJPDES permit, approved by NJDEP on October 31, 2001, ITT requested to eliminate discharge 001 and to monitor the discharge of non-contact cooling water out of outfalls 002 and 003 (PAP-00203113). The outfalls 002 and 003 referenced in the modification request discharged to the Third River, not the Passaic River (PAP-203119-121). On January 14, 2003, ITT requested that their NJPDES permit be revoked, as it had ceased non-contact cooling water discharges, and installed a closed loop recirculation system (PAP-00203162).

The *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, states that stormwater catch basins were observed throughout the exterior of the site during an October 2011 site reconnaissance. The report states that stormwater followed sheet flow across paved areas of the site and was collected in stormwater catch basins that ultimately discharge to the Third River located north and east of the site. ITT filed a "No Exposure Certification" and did not require permit authorization for its stormwater due to the existence of a condition of no exposure. No exterior hazardous material storage areas were observed during the October 2011 site reconnaissance. As stated above, the report states that historically the facility held a NJPDES Permit for the discharge of stormwater and non-contact cooling water to the Third River (PAP-00199568; PAP-00203173).

River Road Area

The River Road Area also had a NJPDES permit (NJ0020435) for stormwater discharges to the Third River and Passaic River (PAP-00199205, 216; PAP-00203149). The permit was issued on August 22, 1985, and discharges were described as "thermal surface water" discharges (PAP-00203157, 59). Information on volume of discharges was not identified. The permit was terminated on June 21, 1996 (PAP-00203157). A copy of the permit was not identified in the available file material. According to a July 7, 1980 NJDEP letter, the permittee shall discharge so as not to violate Water Quality Standards for tributaries to the Third River Classified as TW-2 waters pursuant to N.J.A.C.7:9-4.6(e) including: floating, suspended, colloidal, and settleable solids, color; Petroleum Hydrocarbons and other oils and grease, pH (between 6.5 and 8.5), and temperature (PAP-00203151-52).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

NJDEP inspected the Kingsland Road Area on February 17, 1988, and gave the facility a rating of 'acceptable' for their NJPDES compliance (PAP-00203144).

Violations/Enforcement Actions

No violations or enforcement actions associated with OU2 COCs were identified in the available file material.

Settlements

It is noted that ITT entered into a Natural Resources Damages settlement with NJDEP in 2007 that provided ITT with a release and covenant not to sue for natural resource damages under the state Spill Act and federal CERCLA in return for conducting a storm water and park restoration project (PAP-000204429-49). NJDEP in responding to comments to the proposed settlement stated that the settlement was intended to apply to all areas both on-site and off-site, as based on their review of the environmental documentation, there had been no releases from the Facility off-site, and the only impact to natural resources from Facility operations was to on-site groundwater (PAP-00204430; PAP-00204909).

Permits

Each area of the site had its own PVSC permit:

- The Kingsland Road Area held PVSC Sewer Connection Permit (03401703) (PAP-00203263).
- The Washington Avenue Area held PVSC Sewer Connection Permit (24401713) (PAP-00205032).
- The River Road area held PSVC Sewer Connection Permit (24403740) (PAP-00199240).

The terms of each permit are described in the "Sanitary/Storm Sewer" subsection above. The Kingsland Road Area and Washington Avenue Area had a NJPDES permit (NJ0020214) for discharge to the Third River and Passaic River at least as early as 1983. Discharges included stormwater and non-contact cooling water (PAP-00026354; PAP-00203103; PAP-00204991). Discharges were via outfall 001 (which discharged to the Third River) and outfalls 002 and 003 (which discharged to the Passaic River) (PAP-00204991, 5007). On January 14, 2003, ITT requested that their NJPDES permit be revoked, as it had ceased non-contact cooling water discharges, and installed a closed loop recirculation system (PAP-00203162).

The River Road Area also had a NJPDES permit (NJ0020435) for stormwater discharges to the Third River and Passaic River at least as early as 1985 (PAP-00199205, 216; PAP-00203149). The permit was terminated on June 21, 1996 (PAP-00203157).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993 (PAP-00204989) (Washington Avenue Area);
- *Site Evaluation Submission and Remedial Action Plan*, dated October 1993 (PAP-00199203) (River Road Area);
- *Remedial Action Report*, dated February 27, 1995 (PAP-00200046, 48) (River Road Area);
- *Remedial Investigation Report and Remedial Action Work Plan*, dated August 8, 1996 (PAP-00199792) (Kingsland Road Area);
- *Remedial Action Report*, dated February 1997 (PAP-00202986) (River Road Area);
- *Remedial Action Report*, dated September 1997 (PAP-00199971) (Kingsland Road Area);
- *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012 (PAP-00199530) (Kingsland Road Area);
- *Site Investigation Report*, dated October 29, 2012 (PAP-00203487) (Kingsland Road Area);
- *Baseline Ecological Evaluation, ITT Avionics Division*, dated July 1, 2004 (PAP-00204912) (Facility-wide).

Soil

Kingsland Road Area

According to a *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012, during visual inspection of transformers and switchgear conducted at the Kingsland Road Area in May 1996, three transformers were identified as having stains on concrete pads adjacent to the transformers. Concrete chip samples were collected at the stained areas and analyzed for PCBs (PAP-00199564). The maximum detected concentration of total PCBs in concrete chips was 6.24 mg/kg in 1997 (PAP-00200025). The maximum detected concentration of total PCBs in soil below the concrete was 0.054 mg/kg in 1997 (PAP-00200026).

In addition, in 2005, concrete chip samples and wipe samples were collected from the surface of the concrete upon which interior building transformers were historically staged (PAP-00199564). Total PCBs were detected at a maximum concentration of 1,890 µg/kg in concrete chip samples from an interior floor (PAP-00199591). It is reported that

all concrete core bottom sample and soil sample data were reported as non-detected for PCBs (PAP-00199585; PAP-00203490). According to a *Site Investigation Report*, dated October 29, 2012, based on these results, no further investigation was recommended for soil in proximity to the building transformer areas (PAP-00203490).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue facility was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). High and low molecular weight PAHs were identified in soil associated with the dry well (PAP-00205108, 136). Mercury, copper, and lead were detected at concentrations of 0.83 mg/kg, 52.1 mg/kg, and 57.6 mg/kg, respectively, at a depth of three to four feet (PAP-00205137).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building was released via a pipe directly to a subsurface dry well on the north side of the building (PAP-00199292, 89). In addition, a former dry well for plating rinse water was located at the northeast corner of the building (PAP-00199293). Finally, a former dry well for non-contact cooling water was located at the northeast corner of the building (PAP-00199289). It is noted that according to a *Remedial Action Report*, dated February 1997, facility personnel stated that the non-contact cooling water dry well did not receive industrial waste, but rather was a discharge point for storm water (roof drains), further corroboration that the metals detections in the dry well were related to the recognized historic fill. (PAP-00203004).

It is noted that initially, the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility, prior to ITT's ownership of the property. It is reported that there are no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure, but that on-site drilling has revealed fill material to include coal, ash, glass, china, leather, rubber, cast iron, and steel (PAP-00199213). Later, additional evidence provided to NJDEP showed that the fill that predated ITT's ownership extended to almost the entire River Road Area. NJDEP itself concurred with the conclusion that fill "extends throughout the site…" in a letter dated August 31, 1994 (PAP-00202983). Metals detected in this area were attributed to former landfill activities (PAP-00199291). The NJDEP concurred that this area was historic fill (PAP-00202983).

Maximum detected concentrations of mercury, copper, and lead detected in 1991 and 1993 at of the above-listed areas were as follows (PAP-00199290-293, 312, 316-317):

Maximum Metals Concentrations by Area of Concern (mg/kg)				
COC	**Machine Shop Sink Discharge**	**Dry Well for Non-Contact Cooling Water**	**Dry Well for Plating Rinse Water**	**Municipal Landfill**
Mercury	2.1 (at 0.5 to one foot)	Not Detected	Not Detected	Not Detected
Copper	2,380 (at 0.5 to one foot)	360 (at one to three feet)	360 (at one to three feet)	865 (at zero to two feet)
Lead	1,400 (at two to four feet)	2,470 (at one to three feet)	2,470 (at one to three feet)	1,710 (at zero to two feet)

Remedial Activities

In 1989, ITT initiated an investigation of environmental conditions at the site as part of a corporate-wide environmental assessment of all ITT properties (PAP-00203472; 77). ITT participated in New Jersey's Voluntary Cleanup Program and entered into three Memoranda of Agreement with NJDEP for the investigation and remediation of the three separate areas of the site in 1993 (PAP-00203454-69).

Kingsland Road Area

According to a *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012, six USTs, identified as UST systems El through E6, were closed and removed from the northern side of the Kingsland Road Area site, north of the former boiler house between July 12, 1990, and October 25, 1990. UST systems El through E4 were 22,000 gallons in capacity and were used for the storage of No. 6 fuel oil. UST systems E5 and E6 were 2,000 and 6,000 gallons in capacity, respectively, and were used for the storage of No. 4 fuel oil. Four post-excavation soil samples were analyzed for PAHs, and according to the report, no further action was required (PAP-00199804-05, PAP-00199883).
Beginning in 1985, PCB-containing transformers were retro-filled and retested until concentrations were below 50 parts per million (ppm) and PCB-impacted concrete was removed from the facility in 2005 (PAP-00199564; PAP-00203490).

The Kingsland Road Area received an "Unrestricted Use (Soils Only) No Further Action Letter and Covenant Not to Sue" for soil from NJDEP on June 2, 1998. This designation did not include PCB contamination at the building transformer pads because the investigation was ongoing (PAP-00199578-79; PAP-00026342-43). The *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012, states that this "no further action" designation applied to the above-referenced USTs as well (PAP-00199558). It is reported that a "no further action" letter was not issued for the transformer pads because the investigation was ongoing (PAP-00199572).

Additional sampling work was performed in 2005 (PAP-00203490). A New Jersey Licensed Site Remediation Professional determined that no further remedial action was required for the transformer pads on November 19, 2012 and issued a Response Action Outcome (PAP-00026345-53).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue facility was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). Affected subsurface soils were removed in 1993 and confirmation samples were collected (PAP-00200077-80; PAP-00199293).

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a 20,000-gallon heating oil UST and a 3,000-gallon heating oil UST located at the 500 Washington Avenue facility were identified by ITT's environmental consultant as an area of potential concern because of the age of the tanks. The USTs were removed under NJDEP oversight in 1990. Post-excavation soil samples were collected (PAP-00205103). According to the report, although there was one sample that exceeded the NJDEP action limit for total base neutral compounds. "the sample depths and the sound condition of the tank system suggest that the elevated contaminant levels may be attributed to historical conditions (i.e. construction fill material) unrelated to the UST system operation." (PAP-00202323).

In addition, an *Underground Storage Tank Closure Plan Implementation Summary Report* was prepared for ITT in March 1993. This closure plan addressed the decommissioning of two USTs at 390 Washington Avenue and one UST at 417 River Road. The USTs at 390 Washington Avenue were a 10,000-gallon No. 4 fuel oil tank and a 10,000-gallon No. 2 fuel oil tank. The UST at 417 River Road was a 3,000-gallon No. 2 fuel oil tank. The USTs were removed under NJDEP oversight and post-excavation samples were collected (PAP-00205094-95). The two tanks at 390 Washington Avenue were intact with no signs of leaking (PAP-00205106-08). Similarly, the UST at 417 River Road did not show signs of leaking (PAP-00205105). NJDEP issued a "no further action" designation for the Washington Avenue Area on July 31, 1995 (PAP-00204398; PAP-00204388).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, between October 31, 1990 and November 2, 1990, a 20,000-gallon UST system used to store No. 2 fuel oil was evacuated of its contents, excavated and removed in accordance with an NJDEP-approved UST closure plan. Post-excavation samples were collected. High and low molecular weight PAHs were detected. The report states that based on the analytical results and a no further action letter received from NJDEP, no further action was proposed (PAP-00199288, 315). On July 13, 1992, NJDEP issued a letter stating that no additional corrective action related to the USTs at the River Road Area was needed (PAP-00199231).

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building was released via a pipe directly to a subsurface dry well in the ground on the north side of the building (PAP-00199292). Subsurface soil sampling in the area of the machine shop sink surface discharge identified copper and lead (PAP-00199279, 292). The machine shop sink dry

well and associated subsurface soils were excavated and disposed of off-site (PAP-00199293). NJDEP stated that this area should be restricted to non-residential use based on a single sampling result that exceeded the residential direct contact soil cleanup criteria for lead (PAP-00203066, PAP-00202984).

According to a *Remedial Action Report*, dated February 1997, in 1995, ITT excavated soil containing lead from the area of the municipal landfill, which included the former plating, rinse water dry well and the non-contact cooling dry well. Approximately 5.4 (3.6 + 0.6 + 1.2) cubic yards of soil was removed (PAP-00203019, 22-23). Lead remained in subsurface soil following the excavations at a concentration as high as 598 ppm (PAP-00203029). According to the report, this area also included the former dry well for plating rinse water, and the non-contact cooling water dry well and lead detected in these areas was attributed to historic fill (PAP-00203036).

NJDEP issued a "no further action" designation for all areas of the River Road Area on November 18, 1997. A "Declaration of Environmental Restriction" was required for the municipal landfill area because of exceedances of zinc, which is not a COC (PAP-00204414, PAP-00203100). The deed notice was terminated on July 15, 2015 (PAP-00382267).

8. Summary of Asserted Defenses

ITT believes that its operations at the Facility did not result in a discharge or release of COCs to the Third River or the Passaic River, or to OU 2. However, to the extent an allocation to ITT is based on discharges to the PVSC or stormwater discharges, these discharges of copper and lead to the PVSC were permitted discharges conducted in compliance with federal and state permit conditions, and thus are exempt under CERCLA. In addition, PAHs contained in petroleum products that came from tanks or associated piping in subsurface soils are subject to the petroleum exclusion under CERCLA…. [A]lthough ITT asserts that it is not liable for the conditions in the LPR [Lower Passaic River], if it is determined to have any liability, ITT has already contributed more than its fair share to response costs…. ITT cannot be liable for or be required to pay for a release that arises out of conduct lawfully undertaken in compliance with permits or other approvals issued by relevant government agencies, including the States and/or the United States and/or in compliance with applicable laws, regulations, rules, orders, ordinances, directives and common law ('applicable Environmental Laws'). It is constitutionally impermissible to impose retroactive liability for acts that were previously authorized or condoned by law including applicable Environmental Laws. At all relevant times, ITT complied with all applicable Environmental Laws, regulations, industry standards and ordinances, and otherwise conducted itself reasonably, prudently, in good faith and with due care. ITT exercised due care with respect to hazardous substances, if any, that may have been handled at the Facility, took precautions against foreseeable acts or omissions of others and the consequences that could reasonably result from such acts or omissions, and because any release or threat of release of any hazardous substances, if any, and costs arising therefrom were caused solely by the negligence, acts or omissions of third parties over whom ITT had no control.

Hartz Consumer Group, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

Hartz Consumer Group, Inc.

Facility Name, Address and Size: The Hartz Mountain Corporation Site, owned by the Hartz Consumer Group Inc./Hartz Mountain Corporation (Hartz); 600/700 Frank E. Rodgers Boulevard (formerly South 4th Street), Harrison, New Jersey; 10.3 acres (PAP-00216527); 550 employees, 1 shift per day, 5 days per week (PAS-00002440). Another source says 770 employees, up to 3 shifts per day in some areas, 251 days per year (PAS-00002444).

1. **Business Type:** Pet products and supplies (PAS-00002440)

2. **Time Period of Ownership/Operations**

Operator: Hartz Mountain Corporation 1971 to 1996
Owner: Sternco-Dominion Real Estate Corporation December 11, 1970 to September 15, 1999

1895: Hyatt Roller Bearing Facility operated independently at the property before being acquired by General Motors (GM) (PAS-00124165; PAS-00125353). Hyatt Roller Bearing Company operating on-site from 1897 and was acquired by GM in 1918 (PAP-00005292), but other sources identify Reuther Bros Foundry and other industrial uses prior to 1918 (PAS-00002123).

1918: General Motors-Hyatt Roller Bearing Facility was the previous site owner and operator (PAS-00002123). GM began operations providing roller bearings, and the manufacturing process included machining, heat treating, bearing assembly and fabrication, and recovery of machining fluid and scrap. Waste materials generated included hydraulic, lubricating, and soluble oils, scrap metal shavings/chips, off-specification products, and sludge from grinding solutions (PAP-00005292). Operations at this property were phased out between 1966 and 1968 (PAP-00005292).

1970: Hartz operated the site from 1971 until 1993, when operations ceased. Other sources state that Sternco Dominion Real Estate Corp. purchased the property on December 11, 1970 and leased it to Sternco Industries, Inc. on August 19, 1971. The lease expired in 1991 and the tenancy continued month to month until the property was vacated in 1995 (PAP-00211208; PAP-00005292-93). However, correspondence regarding the property purchase were addressed from Hartz Mountain Products Corp. (PAP-00211220-21).

1973: Sternco Industries, Inc. merged with Hartz Mountain Pet Foods, Inc. on May 31, 1973, and the name was changed to Hartz Mountain Corporation (PAP-00165391; PAP-00211207-8).

1995: Property vacant after transfer of warehouse operations (PAP-00216533).

1999: The site was sold to FER Boulevard Realty Corp. in 1999 (PAP-00005354; PAP-00216533; PAS-00002123).

2000: Hartz was jointly purchased by the company's management and an investment group named J.W. Childs (PAP-00165391).

2004: Hartz was acquired by Sumitomo Corporation of America in September 2004 (PAP-00165391; PAS-00125317).

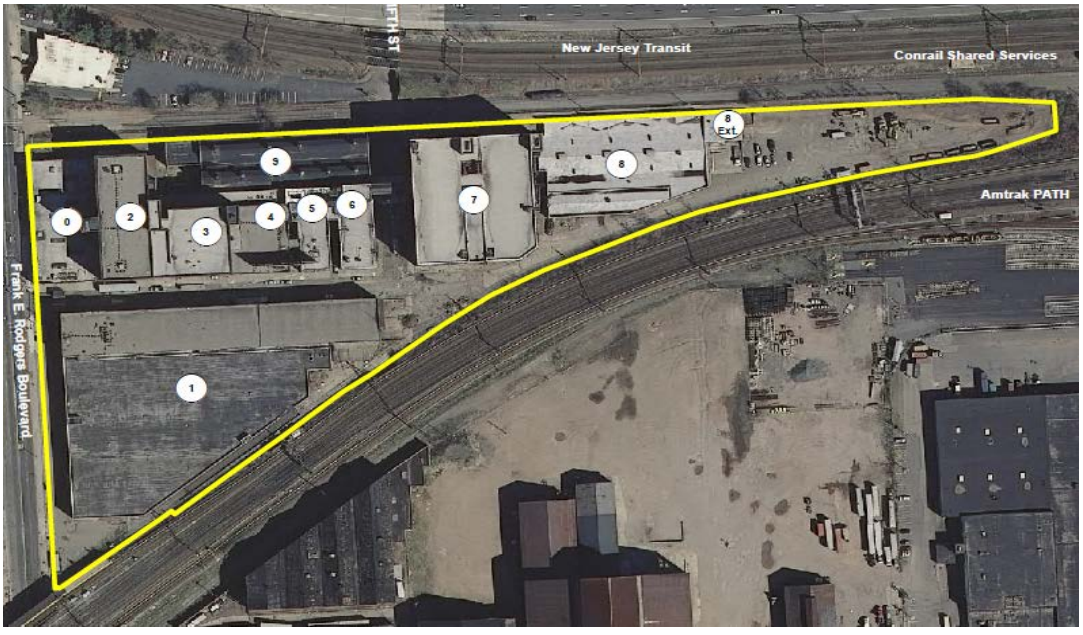
2011: Property taken by Harrison Redevelopment Agency (HRA) via eminent domain in June 2011 (PAP-00006537; PAP-00216533).

2012: All buildings demolished under ownership of HRA (PAP-00216533).

2015: Title transferred from HRA to Heller Urban Renewal, LLC (Heller) (PAP-00216533).

3. Operational History/COC Use and Presence at the Facility

Buildings 0 through 9 were present at the site during operations by Hartz. Buildings 0 through 9 were constructed between 1910 and 1954, during ownership/operations by GM (PAP-00210588). The property is bound to the north, south, and east by active railroad easements (Conrail and Amtrak), and bound to the west by the former South 4th Street (now Frank E. Rodgers Boulevard). Approximately 90 percent of the property was impervious surfaces. Two large building complexes were separated by a central roadway (Middlesex Street). Building 1 was located south of Middlesex Street, was approximately 80,000 square feet, and contained offices, warehouses, plant utilities (heating plant, fire cistern, pumping station), and a rooftop parking deck. Buildings 0 and 2 through 9 were located north of Middlesex Street, and contained assembly, lab, and office areas. The buildings to the north totaled approximately 190,000 square feet (PAS-00121274; PAS-00123454). A map of the building locations is presented below (PAP-00216586):



When the property was purchased by Hartz, the buildings were in a state of disrepair as the facility had not been used for years (PAP-00211059, 65-67). The pit furnaces left by GM in Building 9 were removed by Hartz in 1971 (PAP-00211061-62, 209). Two 30,000 gallon fuel oil aboveground storage tanks (ASTs) located east of Building 8 were moved to the east end of Building 1 (PAP-00211208-09).

Hartz Consumer Group operations consisted of the following:

- Packaging of fish food, charcoal, and aquarium gravel on the third floor of Building 7, from 1971 to 1982 (PAP-00210605);
- Blister packaging on the third floor of Building 7 from the early 1970s to 1982 (PAP-00210605);
- Aquarium operations (steel/glass) at Buildings 3 and 4 at grade level from the early to late 1970s (PAP-00210605);
- Aquarium operations (all-glass) at Buildings 3 and 4 at grade level from the late 1970s to early 1990s (PAP-00210605);
- Display rack assembly, including powder painting and vapor degreasing in the basement of Building 0, from 1972 to the early 1990s (PAP-00210605);
- Shipping at Buildings 1 and 8, from the early 1970s to 1995 (PAP-00210605)
- "Carpet Magic" machine maintenance and repair on the first floor of Buildings 3 and 4 from the late 1970s to early 1990s (PAP-00210605);
- Research and Development (R&D) Laboratories at Buildings 4, 5, and 6 from 1975 to 1995 (PAP-00210605); and
- Warehousing throughout the facility from the early 1970s to 1995 or 1996 (PAP-00210605).

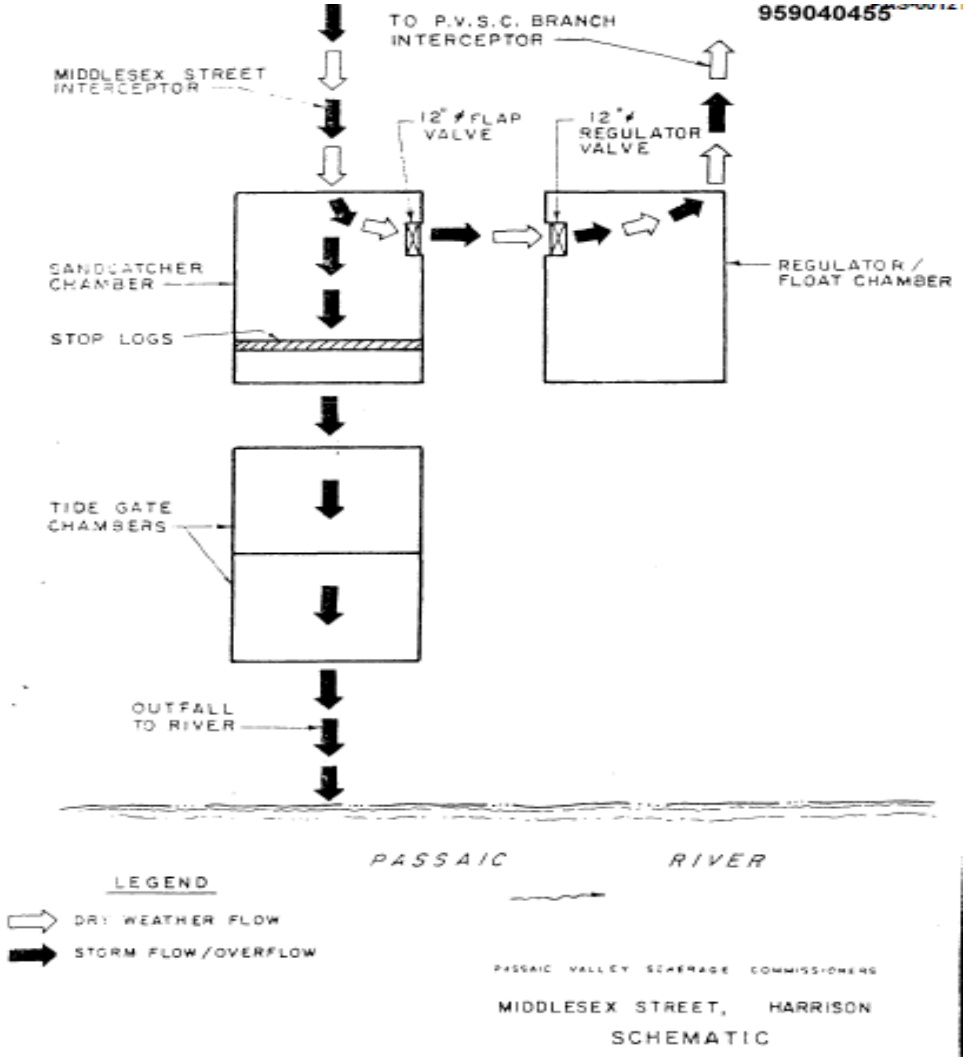
During production of stainless steel aquariums in Buildings 3 and 4, tar was heated in a tank and wax was added until the mixture was in a flowing state. This occurred on the first floor of the buildings (PAP-00211114). A tank on the second floor of the building was used to store tar and gravity fed the tar to the first floor (PAP-00211114-15). Residual tar from the day was left in the tank and re-heated the next day for use (PAP-00211115). Tar was purchased in corrugated-wrapped 50 pounds logs, stored on pallets (PAP-00211118). The tar AST on the second floor was a 3,000 gallon AST, but was removed in 1989 (PAP-00211210).

Small quantities of COC-containing compounds (copper, mercury, and lead) were used and stored in small bottles at the R&D laboratories in Buildings 4, 5 and 6 (PAP-00210638). The R&D laboratory only used and/or stored very small quantities of chemicals and used only gram amounts or less for any experiments. Materials were poured down the laboratory sink, which was connected to the sewer system. The daily flow of water discharged by the Hartz facility was 13,000 gallons per day (PAS-00048703). Other sources state that waste materials from the laboratory were not poured down the sink drains, but were instead collected and placed in lab packs for off-site disposal (PAP-00210638).

Equipment used to manufacture pet food was washed down at the end of the work day using hot water and the rinse water was discharged to the sewer (PAP-00211108). Dry waste was placed in compactors in Building 7 (PAP-00211112). Stainless steel scrap was collected in drums and taken by scavengers (sometimes Hartz was paid, other times they had to pay, depending on the scrap metal market) (PAP-00211124).

Hartz did not use several areas of the site where COCs were found, including the subsurface tunnels and the chip pit (PAP-00210606). Equipment left by GM but not used by Hartz included a kerosene tank at Building 8, three rectangular steel tanks in a subsurface processing room, and two hot water tanks in the Building 5 pump room (PAP-00211209).

A schematic of the Middlesex Street combined sewer system is presented below (PAS-00121700):



4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (used. detected)

PCBs

Except for transformers owned by others, there were no operations or processes used by Hartz that used or contained PCBs. GM used PCBs in their manufacturing process as high temperature hydraulic fluid (PAP-00210552).

GM purchased approximately 250,000 lbs of Pydraul F-9 (48 to 53% PCBs) from Monsanto (PAP-00210580, 89). GM also purchased approximately 25,000 lbs of Pydraul A-200 (99% PCBs) hydraulic fluids from Monsanto (PAP-00210589). Other sources specify 249,250 lbs of Pydraul F-9 and 26,610 lbs of Pydraul A-200 from Monsanto between 1958 and 1963, with the Pydraul F09 consisting of 48% Aroclor 1248 and the Pydraul A-200 consisting of 66% Aroclor 1248 and 33% Aroclor 1242 (PAP-00005297-98).
Transformers located at the property and owned by Public Service Electric and Gas (PSE&G) did not contain PCBs (PAS-00048701).

PCBs contained in transformers and capacitors owned by Hartz were properly disposed of in 1990 and 1995 (PAP-00210649).

See Section 7, Characterization Activities, for environmental media sampling and detection information for PCBs.

PAHs

Tar used in aquarium assembly operations during the early to late 1970s likely contained PAHs. Tar was originally formulated on-site, but later arrived on-site as asphalt (PAP-00211114-16).

The list of chemicals used by the R&D laboratory contained a substance called coal tar solution topical, which contains PAHs, but the release of these solutions to the laboratory sink, if it occurred, would not be an amount that would be measurable once diluted in the sewer (PAP-00210551-52).

Copper

Copper-containing chemicals used in the R&D laboratory included hampene 14.5% copper, hampene 7.5% copper, and cupric sulfate, which are all water soluble substances (PAP-00210552-53).

See Section 7, Characterization Activities, for environmental media sampling and detection information for copper.

Lead

Lead-containing compounds would have been received in small bottles or jars. Residual laboratory chemicals were placed in lab packs and sent off-site for disposal in accordance with applicable waste management (PAP-00210638).

Lead IV oxide was listed as a R&D laboratory chemical; because this compound is insoluble it would not be poured down the laboratory sink if appropriate laboratory practices were followed (PAP-00210553).

See Section 7, Characterization Activities, for environmental media sampling and detection information for lead.

Mercury

Colloidal mercury was listed as a chemical used in the R&D laboratory (PAP-00210552).

See Section 7, Characterization Activities, for environmental media sampling and detection information for mercury.

Historic Fill

The Allocation Team has determined that the property is not located on regional Historic Fill as designated by the NJDEP.[1]

However, historic fill, including brick, cinders, weathered concrete, discarded metal pieces, and other indications of historic fill were identified in soil borings advanced across the property (PAP-00216377).

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill state that

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	6,400 mg/kg
Copper	4,100 mg/kg
Mercury	3.2 mg/kg
Benzo(a)anthracene	0.57 mg/kg
Benzo(a)pyrene	0.82 mg/kg
Benzo(b)fluoranthene	1.2 mg/kg
Benzo(k)fluoranthene	0.33 mg/kg
Dibenzo(a,h)anthracene	0.14 mg/kg
Indeno(1,2,3-cd)pyrene	0.57 mg/kg

The *Remedial Action Workplan for Heller Redevelopment Parcel/Hub at Harrison Station, Former Hartz Mountain Corporation Site*, dated June 2018, includes several cross-section figures that depict the presence of fill, ranging in thickness from 2 to 10 feet (PAP-00216606-13).

5. COC Pathways

Sanitary and Storm Sewer

During 1974, the facility received 3,285,515.2 gallons of water; no well water or river water was used by the facility (PAS-00002441). Water was purchased from the Harrison Water Department (PAS-00002445). All the water used was discharged to the sanitary sewer and a sample of the discharge water was collected over a 10-hour period on February 4, 1976 (PAS-00002441-42). No specifics regarding COCs were provided in available references and it is unknown if the sample was analyzed for COCs.

Cooling water was discharged directly to the sewer system as of May 24, 1988, and a closed, non-contact cooling water system was installed in January 1989 (PAP-00165392; PAP-00210498). The non-contact cooling water system was in operation as of April 1989 (PAP-00210499).

Documented wastewater discharge volumes are as follows:

- According to a *Waste Effluent Survey* dated June 27, 1972, 11,290,000 gallons of wastewater were discharged to the sanitary sewer in 1971 (PAP-00210437-38; PAS-00125321).

- According to a *Waste Effluent Survey* dated November 24, 1975, 328,551.52 gallons of wastewater were discharged to the sanitary sewer in 1974 (PAP-00210445-46).

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the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

- According to a *Waste Effluent Survey* dated March 30, 1976, 3,285,515.2 gallons of wastewater were discharged to the sanitary sewer in 1974 (PAP-00210447-48; PAS-00002441-42).

- According to an Application for a Sewer Connection Permit to the Passaic Valley, 9,664,160 gallons of wastewater were discharged to the sanitary sewer in 1985, of which 3,865,400 gallons were from sanitary service only and 5,798,760 gallons were cooling water (PAS-00002445). Sample results of the waste water taken at three outlets on June 18, 1986 include lead from <0.1 to 0.3 ppb, mercury at <0.002 ppb, and pesticides at <1 ppb (PAS-00002450-53).

- According to a letter dated June 2, 1995 and a follow-up letter dated June 27 1995, a request was made to PVSC for approval to discharge 34,000 gallons of pre-treated water to the combined sewer system. The water was generated during sediment removal from the on-site sewers (approximately 25,000 gallons) and dewatering of an on-site tunnel (approximately 15,000 gallons). Sample results state that post-treatment concentrations were as follows: copper <25 micrograms per liter (µg/L), lead <3.0 µg/L, mercury <0.20 µg/L, total PCBs 0.55 µg/L (PAP-00008294; PAP-00008323-25). According to a letter dated July 18, 1995, 20,000 gallons were approved by PVSC and was discharged to the combined sewer system on July 3, 1995. The July letter also requested approval to discharge 10,000 gallons of water to the combined sewer system from an on-site tunnel (PAP-00008334).

- According to a letter dated November 9, 1995, a request was made to PVSC to discharge 7,000 to 10,000 gallons of pre-treated monitoring well development water to the combined sewer system (PAP-00008358).

Direct Release

According to the *Lower Passaic River Study Area PRP Data Extraction Form - Hartz Mountain Corp./Sternco Industries, Inc. and the Maxus Energy Corporations and Tierra Solutions, Inc.'s Third-Party Complaint "B",* PVSC reports state that during rainfall or wet weather, a portion of the combined flow in the Middlesex Street combined sewer outfall (CSO) entered the interceptor, with the balance of the combined flow being discharged via the outfall pipe to the Passaic River (PAP-00165392; PAS-00125327).

Spills

A PVSC *Stream Contamination Report Violation Elimination* report, dated October 5, 1981, states on September 29, 1981, a leak was discovered in the No. 2 oil storage tank during a boiler start up. Approximately 500 gallons of No. 2 oil was released before the valve was shut off. Hartz contacted the Coast Guard and NJDEP immediately and retained Moran-Crowley Service to clean up the spill. Water from the storm outlet was collected and pumped into a tank truck to prevent discharge to the river and booms were placed around the outlet and downstream. The Coast Guard and NJDEP were checking daily on the cleanup and the river inspector stated that PVSC involvement would not be needed (PAS-00002462-63). It should be noted that the address on the PVSC *Stream*

Contamination Report Violation Elimination report, dated October 5, 1981 is 1000 First Street, which is not the location of the Hartz facility. Hartz states they never owned nor operated at the 1000 First Street property, and therefore is not responsible for this spill (PAP-00210639-40; PAS-00048701). Hartz Harrison Limited Partnership was the owner of the 1000 First Street property, after purchasing this property from Otis Elevator Company in December 1980. Hartz Harrison Limited Partnership was an affiliate of Hartz Mountain Industries, Inc. (HMI), a real estate development and management company (PAP-00210640). It should be noted that Hartz and HMI were sister companies (privately owned but separately managed) for a period of time until 2000, when Hartz was sold to a third party (PAP-00210640).

6. Regulatory History/Enforcement Actions

Inspections

NJDEP conducted a preliminary ISRA inspection on June 30, 1993. Staining of the concrete around the transformers was observed (PAP-00007551).

Violations

There is no information regarding violations in the available file material.

Permits

According to the *Lower Passaic River Study Area PRP Data Extraction Form - Hartz Mountain Corp./Sternco Industries, Inc.,* Hartz did not have a PVSC-issued wastewater discharge permit prior to or as of 1985 (PAS-00125322). There are no citations or available underlying documents to support these statements. A letter from Hartz to PVSC dated March 12, 1986, states that an application for a sewer connection permit was submitted (PAP-00210461). However, the permit was not located in the available file materials.

According to the *NJDEP ECRA Initial Notice Site Evaluation Submission (SES)*, dated March 29, 1993, Hartz did not have a NJPDES permit. Hartz did have permits from the New Jersey Bureau of Air Pollution Control for stack discharge from the Hudson Regional Health Commission for air and hazardous waste generation (PAP-00007282).

NJDEP issued a soil remedial action permit to Hartz Mountain Corp. effective March 11, 2020, requiring the permittee to conduct monitoring, maintenance and evaluation for compliance and effectiveness of the remedial action and its associated institutional control, as specified in a deed notice dated February 21, 2019 (PAP-00466312-67). The deed notice restricts land use and specifies the placement of engineering controls on an 1,800 square-foot area on Block 133 Lot 1.03 and a 2,950 square-foot area on Block 133 Lot 1.02 to protect the public from contact with PCB-contaminated soils. The area is developed with commercial and residential buildings, road, sidewalks, parking, and landscaping (PAP-00466358).[5]

[5] This Report was revised to include documents received on May 15, 2020. The additional documents did not change Hartz's previous certification.

Another deed notice, dated April 20, 2020, requires the owner to obtain another solid remediation permit, and restricts the land use of a 4,500 square-foot area within Block 133 Lot 1.02, near the Port Authority Trans-Hudson Northeast Station House (formerly AOC-10) due to the presence of PCBs (PAP-00466273-304, 6).[5]

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Phase I Site Assessment Letter Report*, dated August 30, 1990 (PAP-00007110);
- *Report on UST Closure Plan Implementation for Hartz Mountain Corporation, Vol 1*, dated July 24, 1991 (PAP-00007133);
- *Discharge Investigation and Corrective Action Report for Hartz Mountain Corporation*, dated November 5, 1991 (PAP-00007188);
- *ECRA Sampling Plan, Hartz Mountain Corporation*, dated May 1993 (PAS-00123448);
- *Remedial Investigation Report and Remedial Investigation Workplan*, dated June 1994 (PAS-00123582);
- *Phase II Remedial Investigation Report, Hartz Mountain Corporation*, dated April 1995 (PAP-00008035);
- *Phase III Remedial Investigation Report, Hartz Mountain Corporation, Vol I and II*, dated June 1996 (PAS-00104756; PAP-00008784);
- *Phase IV Remedial Investigation Report, Hartz Mountain Corporation, Vol I and II*, dated December 1997 (PAP-00005048; PAP-00005248);
- *Phase IV Remedial Investigation Report, Hartz Mountain Corporation*, dated December 1997 (PAS-00121518);
- *Remedial Action Workplan for Heller Redevelopment Parcel/Hub at Harrison Station, Former Hartz Mountain Corporation Site*, dated June 2018 (PAP-00216518);
- *Phase V Remedial Investigation Report, Vol I of I*, dated March 2000 (PAP-00005373);
- *Self-Implementing Cleanup & Disposal Plan, Former Hartz Mountain Facility*, dated May 2011 (PAP-00006176);
- *LNAPL Interim Remedial Measures Report, Former Hartz Mountain Corp.*, dated December 2012 (PAP-00006301)
- *Remedial Investigation Report/Remedial Action Report, PCB Soil Remediation (AOC-21), Former Hartz Mountain Facility*, dated January 2016 (PAP-00006417);
- *Supplemental Remedial Action Workplan, Chip Pit (AOC-8), Former Hartz Mountain Facility*, dated May 2016 (PAP-00006533)
- *Memorandum, AOC-8 Former Chip Pit Investigation/Remediation Summary*, dated June 26, 2015 (PAP-00006666);
- *Supplemental Remedial Action Report, Chip Pit Soil Remediation (AOC-8), Former Hartz Mountain Corporation Facility*, dated December 2016 (PAP-00006751); and,

- *AOC-18 Remedial Investigation Report, Former Hartz Mountain Corporation Site*, dated April 2017 (PAP-00006866).

Sewer

Six stormwater catch basins were assessed, sampled, and cleaned during the Phase I RI and two more stormwater catch basins were assessed, sampled, and cleaned during the Phase III RI (PAS-00104758). The maximum PCB result was from CB-7, at 110 ppm. Other catch basin sample results ranged from 27.4 ppm to 98 ppm. Only CB-4 was sampled for SVOCs, but no SVOCs were detected above regulatory values (PAS-00104759). [Note: concentrations of SVOCs were not identified in the cited document]. Copper results ranged from 6.1 ppm to 1,200 ppm; lead ranged from <11 ppm to 2,400 ppm; and mercury ranged from <0.10 ppm to 2.9 ppm (PAS-00104761). Another source states that sediment samples collected from the combined sewer system had PCB concentrations as high as 78 parts per million (ppm) (PAP-00006623).

Soil

Several investigations were conducted at the property, including five phases of remedial investigation. Both concrete and soil sampling was conducted. Based on data collected during several remedial investigations, concrete samples contained total PCB concentrations as high as 6,800 ppm (PAP-00006195; PAP-00006609). PCB concentrations in soil were as high as 816 ppm (PAP-00006618). Sediment from within the subsurface tunnels had PCB concentrations as high as 1,900 ppm (PAP-00006624).

According to the *Remedial Investigation Report/Remedial Action Report, PCB Soil Remediation (AOC-21), Former Hartz Mountain Facility*, dated January 2016, 47 soil borings were installed within the footprint of Building 3 following demolition, and PCBs exceed 10 ppm at eight locations, with a maximum concentration of 120 ppm. 37 soil borings were installed within the footprint of Building 4 following demolition, and PCBs exceed 10 ppm at three locations, with a maximum concentration of 53 ppm. 121 soil borings were installed within the footprint of Building 9 following demolition, and PCBs exceed 10 ppm at 45 locations, with a maximum concentration of 280 ppm (PAP-00006427-28).

According to the *Memorandum, AOC-8 Former Chip Pit Investigation/Remediation Summary*, dated June 26, 2015, soil sampling occurred at test pits and at soil borings for AOC-8 (Former Chip Pit), and six of the 11 samples had PCB concentrations above 10 milligrams per kilogram (mg/kg), with a maximum concentration of 42.79 mg/kg (PAP-00006671, 87).

Remedial Activities

Three steel gasoline underground storage tanks (USTs) of unknown age were removed in April 1991 and granted closure approval by the NJDEP (C-91-0517). The tanks had capacities of 550 gallons, 1,000 gallons, and 5,000 gallons, and all contained water with sludge. Approximately 200 cubic yards of soil were removed during the UST removals (PAP-00007128-29; PAP-00007136-37, 39-40).

Two USTs south of Building 8 were removed prior to the ISRA investigation under Case Number 91-04-09-1745 (approval of UST closure granted by NJDEP in letter dated April 30, 1992) (PAP-00216533). A 550-gallon UST for a steam boiler behind Building 7 was removed in 1991 (PAP-00211209-10).

Three 6,200-gallon quench oil ASTs, three 6,200-gallon machine oil ASTs, two 30,000-gallon fuel oil ASTs, and one 6,200-gallon machine oil AST, previously located to the east of Building 8, were removed by 1993. NJDEP issued a No Further Action Determination on November 11, 1996 (PAP-00216374).

During the initial site inspection in 1993, NJDEP identified staining on an active transformer pad that was located in a courtyard north of Building 3. The transformers were determined to be owned by PSE&G, and the pad, transformer, and surrounding building walls were stained, though PSE&G had no records of a spill. A chip sample of concrete collected from a stained area on the transformer pad, along the flow path to an adjacent storm water drain, detected PCBs. The stormwater drain was dye tested, and the results showed the storm water drain was connected to the storm sewer system located within Fourth Street. Steam cleaning the transformer pad to remove mobile residue and chip sampling from the cleaned transformer pad were conducted in 1994. The transformers were removed by PSE&G in 2001 (PAP-00216375).

During the initial site inspection in 1993, NJDEP identified subsurface tunnels beneath Buildings 4 and 9. Sediment in the tunnels was sampled in 1994 and contained PCBs. In 1996, materials from Tunnels A through F were removed and the tunnels were visually inspected; all were in good condition, with the exception of Tunnel D, which had a crack in the floor. The tunnels were removed during building demolition in 2012 (PAP-00216375).

A 1,000 gallon kerosene UST was located beneath the foundation of the eastern portion of Building 8 and this UST was abandoned in place per the January 2, 1995 UST Closure Report, using low-density concrete. NJDEP issued a No Further Action Determination on November 11, 1996. This UST was later removed following demolition of the buildings (PAP-00216374).

A 2,000 gallon diesel UST located beneath the basement floor of Building 2, used as a fuel source for a backup generator, was proposed for closure in place during 1996, after the backup generator was taken out of service. A UST Closure Application was submitted on May 2, 1996 and approved by NJDEP on May 31, 1996. This UST was later removed following demolition of the buildings (PAP-00008505-16; PAP-00216374).

In 1997 a riveted steel 8,000 to 9,000 gallon UST was identified beneath Building 9. The UST contained approximately 40 tons of sand and 3,000 gallons of residual oily liquid. Based on the piping configuration, the UST appeared to be a process flow-through tank. The UST was emptied and cleaned. Three soil samples were collected beneath the UST's centerline and TPHs and PCBs were detected. The UST was filled with cement to grade, and abandoned in place. In 2012, the process UST was excavated and removed as part of the demolition activities. A sample of the concrete from within the UST had PCB concentrations below applicable standards, so the concrete was crushed and reused on site. The UST shell was disposed offsite as PCB-containing material

(>50 ppm). Following removal of the building foundations and process UST, PCB-and petroleum-contaminated soils were excavated to a depth of 30 feet bgs (PAP-00216376).

Six stormwater catch basins were assessed, sampled, and cleaned during the Phase I RI and two more stormwater catch basins were assessed, sampled, and cleaned during the Phase III RI. Integrity testing was conducted at all catch basins, with the exceptions of CB-1, CB-3, and CB-4. Most of sediments removed were from CB-2 (PAS-00104758). Catch basin CSS-2 was excavated and backfilled and was then no longer functional (PAS-00104760). Approximately 80 tons of PCB contaminated sediment and other debris were removed from the stormwater catch basins/combined sewer (PAS-00121267).

According to the *Self-Implementing Cleanup & Disposal Plan, Former Hartz Mountain Facility*, dated May 2011, concrete impacted by PCBs was washed with PCB cleaning solution until wipe results showed PCB concentrations below 10 µg/cm^2 (PAP-00006181). This document also states that soil investigations determined that PCB concentrations in soils beneath Buildings 3, 4, and 9 exceeded 10 ppm, to a depth of 12 feet below grade beneath Buildings 3 and 4, and between 28 and 30 feet below grade beneath Building 9 (PAP-00006185). Following PCB cleaning, all buildings were demolished in 2012 for future site redevelopment (PAP-00216533).

According to the *Memorandum, AOC-8 Former Chip Pit Investigation/Remediation Summary*, dated June 26, 2015, excavation with offsite disposal was conducted at AOC-8 (Former Chip Pit) to remediate soil with PCB concentrations above 50 ppm. At the catch basin CB-CSS2 area, excavation with offsite disposal was conducted to remove the catch basin feature and PCB impacts above 10 ppm (PAP-00006672). According to the *Supplemental Remedial Action Workplan, Chip Pit (AOC-8), Former Hartz Mountain Facility*, dated May 2016, 2,000 tons of PCB-contaminated soil were removed from the Chip Pit area (AOC-8) in 2015, but PCB concentrations above 10 mg/kg remained in some areas (PAP-00006539).

According to the *Remedial Investigation Report/Remedial Action Report, PCB Soil Remediation (AOC-21), Former Hartz Mountain Facility*, dated January 2016, all soil and concrete with PCB concentrations greater than 10 ppm was removed and disposed offsite during building demolition, while soils and concrete with PCB concentrations less than 10 ppm were used for re-grading and placed under an on-site cap with a deed notice filed in perpetuity (PAP-00006422). Approximately 19,000 tons of material with PCB concentrations between 10 and 50 ppm and approximately 29,000 tons of material with PCB concentrations greater than 50 ppm were removed and disposed of offsite (PAP-00006435). During soil excavation activities, dewatering occurred, which include the removal of 10,559,339 gallons of water, which was treated for total suspended solids, PCBs, and volatiles, prior to discharge to the sewer, under a PVSC permit (the permit was referenced to be in Appendix E of the cited document, but this appendix was not included in the file materials) (PAP-00006432).

According to the *Supplemental Remedial Action Report, Chip Pit Soil Remediation (AOC-8), Former Hartz Mountain Corporation Facility*, dated December 2016, "hot spot" excavation occurred on July 5, 2016 to remove PCB concentrations greater than 50 ppm to a depth of 10 feet below ground surface (bgs) at AOC-8. July 6-13, 2016, "warm spot" excavation occurred to remove PCB concentrations greater than 10 ppm, but less than 50 ppm at AOC-8. Approximately 245 tons of "hot spot" soil and approximately 2,100 tons of "warm spot" soil were removed. Approximately 30 tons of concrete removed from the subsurface adjacent to AOC-8 was analyzed and disposed of offsite (PAP-00006760-62).

According to a NJDEP Confirmed Discharge Notification Form submitted on October 4, 2017, a 3,000-gallon UST was uncovered during site redevelopment, near the southwest corner of former Building 7. The UST was registered and removed on August 17, 2017. Soil samples were collected and PCBs exceed 10 mg/kg. Delineation occurred between October 2017 and February 2018 and PCBs greater than 10 mg/kg were excavated (PAP-00006990-92; PAP-00216377).

According to a PCB Impacted Soil and Liquids Disposal Summary, dated May 7, 2020, a total of 36,095 tons of soil with >50 ppm PCBs and 27,707 tons of soil with <50ppm PCBs were disposed of from the site between 1995 and 2018 (PAP-00466272).[6]

8. Summary of Asserted Defenses

Hartz and its consultants and remediation contractors are "response action contractors" protected under §119(a) of CERCLA. They are thus protected from liability in connection with any incidental discharges or releases during its remediation of (GM-Hyatt's) contamination in cleaning up the Harrison Site. This is consistent with the law of the Third Circuit (See U.S. v. CMDG Realty Co., 96 F.3d 706 (3d Cir. 1996) (requiring a showing that contractor negligence exacerbated contamination before a remediation contractor would be subject to "operator" liability). Hartz also claims "innocent landowner" status, having done the appropriate level of due diligence when it acquired the site in 1970. See 42 U.S.C. §9601(35). Remediation of petroleum hydrocarbons may also be covered by the CERCLA "petroleum exclusion" See 42 U.S.C. §9601(14).

[6] This Report was revised to include documents received on May 15, 2020. The additional documents did not change The Hartz Mountain Corporation's previous certification.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

HEXCEL CORPORATION

Facility Name, Address and Size: Hexcel Corporation (Hexcel), 205 Main Street, Lodi, New Jersey. The site is an approximately two-acre parcel (PAS-00002498). According to an *Application for a Sewer Connection Permit*, dated July 9, 1985, Hexcel had 39 full-time employees that worked one shift per day, 260 days per year (PAP-00326658, 68).

1. **Business Type:** Manufacturer of specialty chemicals and industrial cleaning compounds (PAS-00091294; PAS-00091237).

2. **Time Period of Ownership/Operations**

Operator:	Hexcel Corporation (1973-1986)
	Fine Organics, Inc. (1944-1973)
Owner:	Hexcel Corporation (1973-1986) and (1998-2017)

According to an Environmental Cleanup Responsibility Act (ECRA) General Information Submission from January 7, 1986, Hexcel Industrial Chemicals Group, a subdivision of Hexcel Corporation, had been operating at the site, but the property was in the process of being sold to FOA Corporation of Wyckoff, New Jersey. Hexcel Corporation of San Francisco, California, was identified as the owner of the property prior to the sale, which was anticipated to be finalized on January 29, 1986. The form states that Hexcel operated at the site starting in 1973 when it merged with Fine Organics, Inc. Fine Organics, Inc. manufactured specialty chemicals and had owned and operated the site since 1944. United Piece Dye Works operated at the site manufacturing dyestuffs for the textile industry from the early 1900s to 1944 (PAS-00091293-95).

A letter dated April 5, 1991, from Fine Organics Corporation states they purchased the facility from Hexcel Corporation on April 1, 1986, suggesting that FOA Corporation had changed their name to Fine Organics Corporation (PAS-00089207).

A Remedial Action Work Plan (RAWP) Addendum, dated November 1999 states the facility had been sold to Fine Organics Corporation in 1985, who operated at the facility until September 1998. Once Fine Organics Corporation was removed from the site, Hexcel demolished the buildings to improve accessibility for remediation of the site. The RAWP Addendum identified Hexcel Corporation as the owner of the site at that time (PAS-00002491, 96).

According to a Remediation Agreement between Hexcel and the New Jersey Department of Environmental Protection (NJDEP), signed in April 1997, Hexcel would purchase the property from Fine Organics Corporation. Hexcel agreed to remediate the site under the NJDEP Industrial Site Recovery Act (ISRA) (PAP-00047398-405).

3. **Operational History/COC Use and Presence at the Facility**

According to a 1986 Inspection Report by NJDEP, Hexcel manufactured, blended, and packaged industrial cleaning compounds. They also produced certain resins, but the report stated this was expected to be phased out by January 30, 1986. The Inspection

Report also stated that different chemical manufacturing operations have occupied the site for more than 80 years (PAS-00091237).

The *Application for ECRA Review, Initial Notice, Site Evaluation Submission*, dated January 14, 1986 (the 1986 SES), stated manufacturing of industrial cleaning compounds occurred in Buildings Nos. 1, 11, and 12 and under the canopy east of Building No. 1. Raw materials were blended in 17 mixing tanks that ranged in size from 50 to 7,500 gallons. The blending process did not produce hazardous wastes as by-products. However, any off-spec product or finished product not marketed was disposed as hazardous waste if appropriate. Wastewater (from wash-outs and cooling water) was discharged to the Passaic Valley Sewerage Commission (PVSC) system under permit and monitored by a 24-hour sampling device. The yard adjacent to the Saddle River was paved in 1963 and used as an outside drum storage area for raw, work-in-process, and waste materials, according to the 1986 SES. Spill containment curbs were installed in the drum storage area along Saddle Brook in 1980 and 1981. The portion east of Building No. 2 has been used for outside storage of finished industrial maintenance chemicals (PAP-00326360, 63, 65-67, 70).

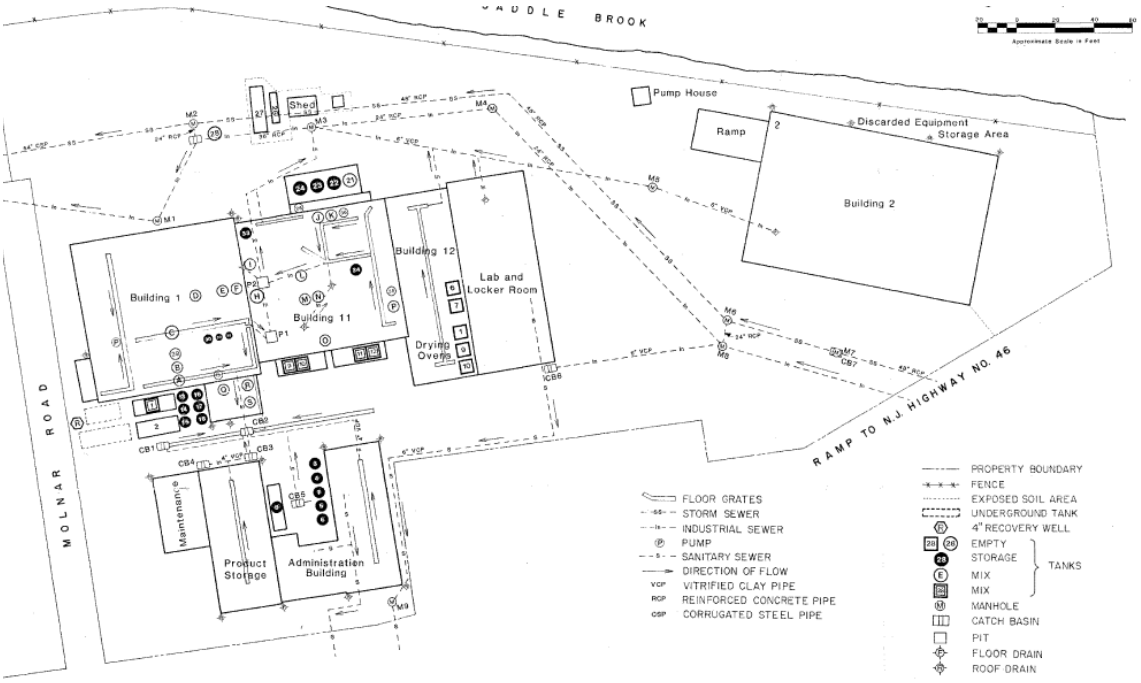
As reported in the Investigation of Fuel Oil Leak for Hexcel, Lodi, New Jersey, dated June 1984, investigation at the site began in 1984 in response to leaking fuel oil underground storage tanks (USTs). Fuel oil was found to be in the soil and gravel surrounding the USTs from depths of 0.5 to 8 feet below ground surface (ft bgs) and at least 10 feet away from the USTs (PAS-00091704, 16). It was suspected that two USTs had been leaking fuel oil for years. During the subsequent investigation, analysis of an oil sample collected from a nearby existing recovery well detected polychlorinated biphenyls (PCBs) at 43 parts per million (ppm) (PAS-00091430, 39). Lead was also detected at low levels (96 and 130 ppm) in soil samples from the site, but according to the report on the Investigation of Fuel Oil Leak for Hexcel, lead had never been used or stored onsite (PAS-00091426, 36-37).

It was stated in the *Summary Report of Preliminary Environmental Sampling*, dated October 14, 1987, that PCBs were not used as part of the ongoing operations of the facility (PAS-00091023, 52). However, according to the *Presentation of the ECRA Sampling Results for Hexcel Corporation*, dated December 1988, PCBs had been used in the heat exchange system of Building No. 1, which was not in operation at that time (PAS-00090284). Investigation of the decommissioned heating oil system, overhead wooden flooring in the boiler room, and subsurface concrete pits beneath the boilers detected PCBs up to 5,500 milligrams per kilogram (mg/kg). PCBs were also found in oil in the industrial sewer system, specifically catch basin CB8 and manhole M1 (PAS-00091037-38).

A list of Manufacturing Equipment from 1969 includes a reactor with a hot Therminol® heating system (PAP-00326349). Therminol® would have contained PCBs.

In 1987, Environ Corporation inspected the storm drain and industrial sewer systems at the Hexcel facility and traced their outfall points. As documented in the letter report from Environ Corporation to NJDEP, dated March 25, 1987, two major drain systems crossed the facility property, shown on the drainage system figure below. The storm drain ran

parallel and directly west of the industrial sewer line, which was part of the PVSC system. The storm drain entered the property near manhole M7, then flowed south to manholes M6 and M2. After exiting the property, the storm drain pipe was traced to an outfall into Saddle Brook approximately 900 feet south of the facility and immediately south of the Hendrix wastewater pumping station. A second drain pipe entered the property near manhole M8, but then joined with the storm drain at this manhole because the path to the southwest (likely to manhole M4) was almost completely clogged with sediment. The industrial sewer line behind the property ran from manhole M4 to manhole M3, a catch basin, and then manhole M1. Several smaller sewer drains from the facility were observed at manhole M3. The industrial sewer discharged to the south across Molnar Road and to the Hendrix pump station, where water was discharged into a wet well and then combined with other sanitary sewer lines before it was pumped into the PVSC system. It was also noted that the connection between M2 of the storm sewer and the catch basin of the industrial sewer was blocked, so the systems were not interconnected at this point (PAP-00326356-58).



(PAS-00326352)

Additional investigation of the industrial sewer system on April 14, 1987, found that process wastewater was flowing upstream from manhole M4 to M8, possibly due to high inflow to the sewer system or blockage downstream. A dye test conducted on that day confirmed that water in the industrial sewer was flowing from manhole M4 to manhole M8 at which point it entered the storm drainage system. This reversal of flow had been observed on only one occasion throughout the period of sewer inspection and testing during 1987, and was stated to be a short-term condition that occurred during periods of high inflow into the sewer system (PAS-00091047).

As discussed in the *Preliminary Feasibility Study Report for Alternate Discharge to the PVSC*, dated March 16, 1992, pretreatment of seepage water from the basement was initiated when PCBs were discovered at the site in 1985. The report presumed that prior to 1985, the water had been discharged directly to the PVSC industrial sewer without treatment. Pretreatment consisted of diatomaceous earth and granular activated carbon filtration with batch testing for PCBs. Water was discharged to the PVSC after sample results did not detect PCBs. In 1989, complete removal of PCBs became more difficult, so seepage water was sent off-site to the Chambers Works DuPont facility in Deepwater, New Jersey. However, DuPont discontinued acceptance of the seepage water in August 1989 due to the presence of PCBs at unacceptable levels. Treatment of the seepage water was added to the site remediation activities in September 1990. A batch chemical treatment with carbon filtration was used, and the water was discharged in accordance with the terms of the PVSC discharge permit. An average total of 200 gallons of basement seepage water were discharged per day in 1991 (PAS-00088621).

4. Identified COCs

- PCBs (released/used)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

Site investigations have been performed since 1984, when leaking fuel oil USTs were noted at the site (PAS-00091706). The reports summarized below state PCB contamination was found in soil surrounding the former boiler room and along the industrial sewer line. The PCBs appear to be related to the oil used in the boiler room (PAS-00091037-40).

The following table summarizes the maximum PCB concentrations detected in site media and river sediment from the adjacent Saddle River:

Maximum PCB Concentrations in Site Media (mg/kg)				
PCBs	**Aroclor-1242**	**Reference**	**Aroclor-1248**	**Reference**
Soil	4,500	PAP-00325568	26,000	PAS-00002559
Oil	9,970	PAS-00091032	10,940	PAS-00091041
Sewer Sediment			240	PAS-00091037
Saddle River Sediment	Not detected	PAS-00086066	0.42	PAS-00086066

A *Review of Prior Sampling Programs at HEXCEL'S Lodi Facility*, dated January 10, 1986, identified ten Areas of Concern (AOCs), two of which were contaminated with PCBs (i.e., AOCs A and B) (PAS-00091335-36). According to the *Summary Report of Preliminary Environmental Sampling at the Fine Organics Corporation Facility, Lodi, NJ*, dated October 14, 1987, the level of PCB contamination ranged from 4 to 11.6 ppm in soil samples collected from the vicinity of the USTs (AOC A), while the pit in Building No.

1 (AOC B) had PCB concentrations up to 9,970 mg/kg (Aroclor-1242) in the oil floating on water. PCB analyses of the water inside the pit were non-detect (<10 ug/L) and 0.8 mg/kg, while the PCB concentration for the "wall scraping" from the pit was 62 mg/kg (PAS-00091030).

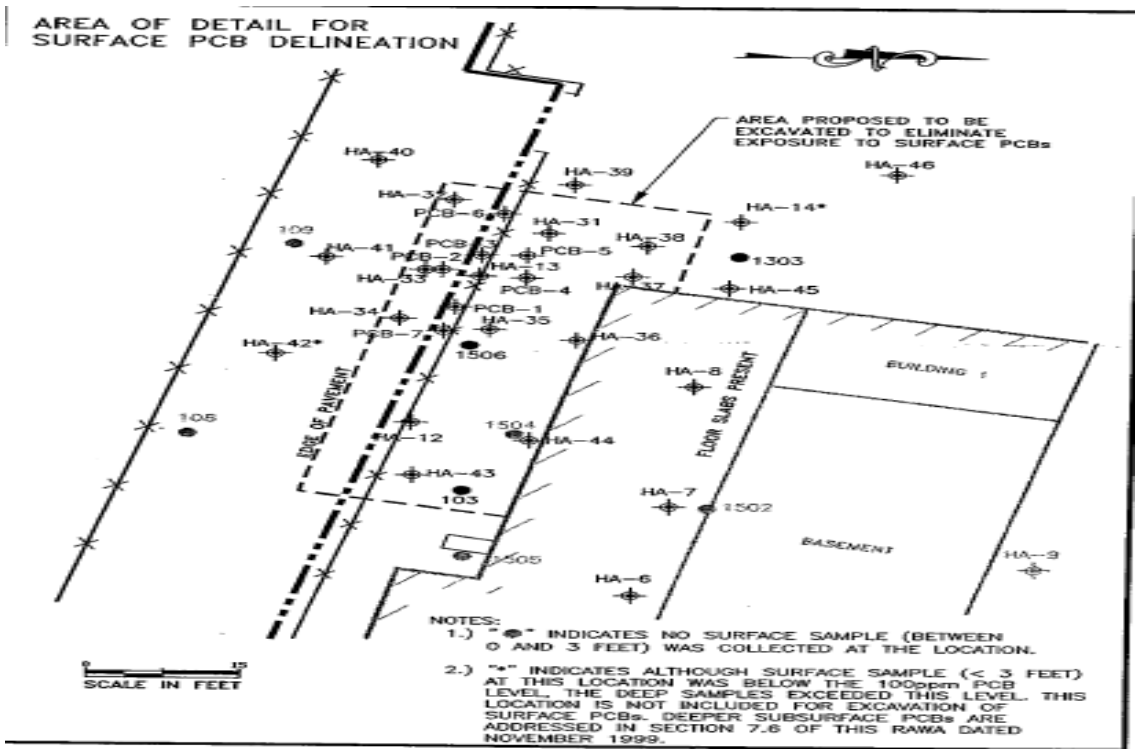
Further investigation of the facility in 1987 determined that oil was in sandy soil (with soil PCB concentrations up to 150 ppm) beneath the boiler room in Building 1. PCB concentrations in soil generally decreased with depth to the clay layer below. A sample of the oil floating on groundwater in a boring installed in the boiler room detected PCBs at 10,940 mg/kg (PAS-00091039-40). Oil was also found to be accumulating in Manhole M1 and stormwater catch basin CB8 of the industrial sewer at the rear of the property. PCBs were detected in sediment samples along the main line of the industrial sewer system on the facility property, ranging from 10 mg/kg to 240 mg/kg, with generally increasing concentrations toward the Hendrix pump station sewer system (PAS-00091036-38).

According to a report titled *Characterization of Oil Samples – Hexcel Project 536A*, dated February 12, 1987, three oil samples were collected from the site and analyzed for PCBs, metals, volatile organic compounds (VOCs), and infrared spectra to determine if they were derived from the same source. The analyte list was determined based on preliminary information that suggested the oil could be Mobiltherm oil, which was produced for heat transfer operations and could also include reclaimed mixtures of oil products from various manufacturers. Mobiltherm oil is reported to handle high temperatures (550°F) where normal, petroleum oils decompose (PAS-00091111). The oil sample collected from the floor drain in the concrete pit from Building No. 1 had the highest PCB content (maximum of 1,350 ppm), and the sample from the manhole M1, which is part of the PVSC industrial sewer located outside Building No. 1, had slightly lower PCB content (900 ppm). The sample collected from the recovery well had the lowest PCB content (60 ppm) (PAS-00091116). The letter from Environ Corporation to NJDEP documenting these analyses stated that the oil in manhole M1 appears to be chemically different than the oil from the other two locations. Oil in the manhole was being removed weekly by bailing and was estimated to accumulate 10 to 15 gallons per month (PAS-00091104).

According to the *Summary Report of Preliminary Environmental Sampling at the Fine Organics Corporation,* dated October 14, 1987, characterization of sediment in the industrial sewer line closer to and including the Hendrix pump station detected PCBs, but a potential additional offsite source was also identified. The PCB detected in the sediment sample from the manhole on the Napp Chemical Co. property was Aroclor-1260, while Aroclors-1242 and -1248 were detected in the samples at the Hexcel facility. Sediment sampling at the Hendrix Pump Station outfalls reported 7,660 mg/kg PCBs (Aroclor-1242) from the industrial sewer system and 1420 mg/kg PCBs (Aroclor-1242) from the sanitary sewer. The sediment samples collected from Saddle Brook at the outfall from the storm drain system detected PCBs at 0.3 and 2.4 mg/kg (Aroclor-1242) (PAS-00091041-42).

Three abandoned USTs were removed on June 19 and 20, 1991, according to the *Underground Storage Tank Closure Assessment Report*, dated August 27, 1991 (PAS-00089015). A 500-gallon gasoline tank was located north of Building 6 and two fuel oil tanks (4,000-gallon and 2,000-gallon) were located east of Building 1 and adjacent to the boiler room (PAS-00089015). Upon removal, the tanks were noted to be corroded with holes. Soil samples collected from the walls of both excavations detected PCBs (Aroclor-1242 at 0.024, 0.048, and 0.187 mg/kg). The soil sample collected from the bottom of the gasoline UST excavation detected Aroclor-1242 at 2.357 mg/kg. In addition, a water sample collected from the pit of the fuel oil UST excavation detected Aroclor-1242 at 48 micrograms/liter (µg/L) (PAS-00089019-23).

The 1999 RAWP Addendum categorized the PCB contamination in site soil into two areas: the elevated levels of PCBs on the ground surface in the vicinity of the former boiler room and PCBs primarily associated with dense non-aqueous phase liquid (DNAPL) at depth and detected in the upper overburden soil samples. The 1999 RAWP Addendum proposed to excavate the surface soil to a depth of 2 ft bgs and from Molnar Road to the edge of the former boiler room, as shown in the figure below. A 2-Phase Extraction remediation process was proposed for the DNAPL, so the 1999 RAWP Addendum stated the PCBs detections at depth would be reassessed after this process was implemented (PAS-00002506-07).

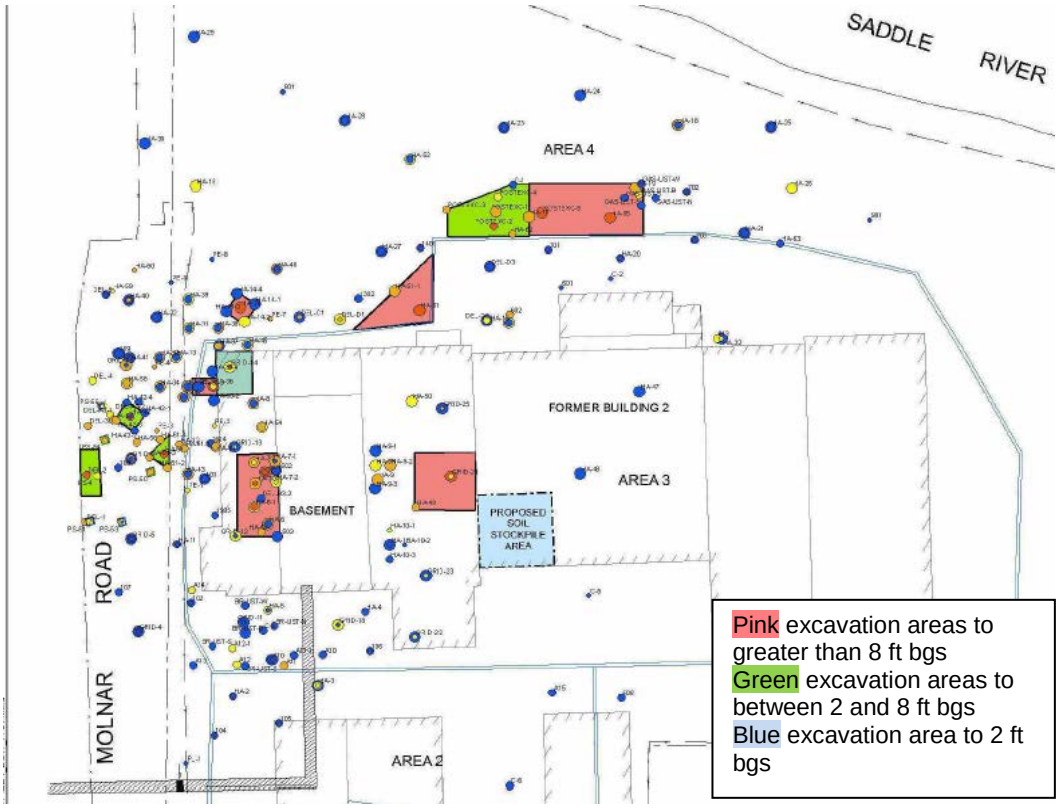


(PAS-00002606)

The 1999 RAWP Addendum also stated that the industrial sewer line was reported to be filled with sediments with elevated levels of PCBs. The sewer line was a 24-inch reinforced concrete pipe that ran from the vicinity of the existing warehouse to the

Hendrix pump station (PAS-00002508). According to a *Status Report*, dated May 10, 2005, the entire length of the industrial sewer on the Hexcel property from manhole M-8 to manhole M-1 was removed in 2003. At the same time, a hot-spot excavation at HA-17 was performed to remove the 1,800 ppm detection of PCBs. Approximately 400 tons of contaminated soil were removed during these excavations; however, soil with concentrations up to 300 mg/kg Aroclor-1242 were left in place near HA-17 (PAP-00325152, 61).

The *Self-Implementing PCB Cleanup and Disposal Plan*, dated June 20, 2008 (the Cleanup Plan), discussed the two areas of suspected PCB impacts, including the area associated with the former boiler room and the area associated with the former industrial sewer. The Cleanup Plan proposed to excavate several additional areas due to PCB contamination. These excavations would address detections of PCBs over 100 ppm. The deeper excavations were stated to extend only to the top of the confining clay layer because it would protect the lower formation from residual contamination in the confining layer. According to Table 1 of the Cleanup Plan, the maximum detection of PCBs was 13,000 ppm (Aroclor-1248) at HA-7, located under the former boiler room (see area adjacent to the basement in the figure below) (PAP-00325538, 40, 72, 86).



(PAP-00325586)

According to the *Remedial Investigation Report and RAWP Addendum*, dated January 28, 2011 (the 2011 RIR), excavation of soil approximately 10 feet by 5 feet by 1-foot deep around sample Surf-7 was performed to remove surficial PCB contamination in order to facilitate the installation of a utility pole (PAP-00324823). Investigation of the storm sewer detected only Aroclor-1260 in one sample of eight samples collected at a concentration of 0.77 mg/kg (PAP-00324827, 977).

The *Soil Remedial Investigation Report/Remedial Action Report*, dated August 25, 2015 (the 2015 RIR/RAR) documented the excavations performed at the site. The following soils were removed from 2010 to 2015:

Excavations Performed in 2010-2011			
Excavation	**Area (square feet)**	**Depth (ft bgs)**	**Volume (cubic yards)**
L2	225	2	17
L3	140	17	40
L4	320	16	200
L5	420	13.5	160
L6	800	14-15	487
L7	400	11	163
L8	480	8.5-10	250
SURF-7	40	1	
SURF-13	25	1	
SURF-20	100	1	
REM-1	150	4	
REM-5	730	13	

(PAP-00047433-37)

PAHs

A report of soil data for the site was undated and did not include the title of the report but provided soil sampling results from the 1980s through 1992. This report stated PAHs were detected at low levels in several soil samples (see discussion for Historic Fill below) (PAS-00088282, 319).

The *Summary of Historical Soil Data*, dated July 1997, concluded that base neutral organics are not of concern for the site. The *Summary of Historical Soil Data*, dated July 1997 did not provide all of the data, but specified the concentrations that exceeded the soil cleanup criteria in the 46 soil samples collected at the site. Benzo(a)anthracene was the only PAH that exceeded the criteria and was detected at 1.4 mg/kg (PAS-00087498, 516).

The 2015 RIR/RAR stated that naphthalene was detected in two post-excavation samples for the industrial sewer at 13 mg/kg and 37 mg/kg. These sample locations were excavated in 2011 (PAP-00047449-50).

Metals - Copper, Lead and Mercury

As documented in the *Summary of Historical Soil Data*, dated July 1997, mercury was detected at 236 mg/kg in site soil (PAS-00087516).

According to the *Presentation of the ECRA Sampling Results for Hexcel Corporation*, dated December 1988, copper was detected in three soil samples at concentrations of 8 to 96 mg/kg (PAS-00090408-411).

A Narrative Report of Interpretation on Results for Hexcel Facility, dated July 18, 1985, identified lead detected at the site. Lead was detected in sample C-1 (96 ppm) at a depth of 24 to 30 inches and at C-5 (130 ppm) at 18 to 24 inches. This report states that lead was never used or stored onsite (PAS-00091426, 36-37).

According to the *Presentation of the ECRA Sampling Results for Hexcel Corporation*, dated December 1988, lead was detected in soil samples from across the site at concentrations of 3 to 72 mg/kg (PAS-00090393-411).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1] However, the 2011 RIR states that the metals contamination in site groundwater may be due to the presence of Historic Fill (PAP-00324817).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #31 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes in New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00087498, 516; PAS-00088282, 319-20; PAS-00090408-411; PAS-00091426).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	290 mg/kg
Copper	123 mg/kg
Mercury	236 mg/kg
Benzo(a)anthracene	1.4 mg/kg
Benzo(a)pyrene	0.25930 J mg/kg
Benzo(b)fluoranthene	0.13949 J mg/kg
Benzo(k)fluoranthene	0.25307 J mg/kg
Dibenzo(a,h)anthracene	0.13161 mg/kg
Indeno(1,2,3-cd)pyrene	0.08747 mg/kg

The PAHs and metals results were provided in a document without a title page prepared by Killam. The document summarized the data collected at the site in the 1980s and early 1990s (PAS-00088172).

5. COC Pathways

Sanitary Sewer

According to the 1986 SES, cooling water and wastewater from washing out the blending tanks were discharged to the PVSC under permit and monitored by a 24-hour sampling device (PAP-00326370). The amount of wastewater discharged to the PVSC in 1978 was an estimated 135,600 gallons per day for continuous operations six days a week, according to an Industrial Sewer Connection Application, dated May 30, 1978 (PAP-00326713-14). An application for a Sewer Connection Permit, dated July 9, 1985, stated that Hexcel discharged 130,000 gallons of process water and 4,552,982 gallons of cooling water to the sanitary/combined sewer system from third quarter 1984 to second quarter 1985. The daily flow through outlet 17402370 was an estimated 19,550 gallons (PAP-00326659, 62, 68).

As discussed in the *Preliminary Feasibility Study Report for Alternate Discharge to the PVSC*, dated March 16, 1992, pretreatment (diatomaceous earth and granular activated carbon filtration) of seepage water from the basement was initiated when PCBs were discovered at the site in 1985. The report presumed that prior to 1985, the water had been discharged directly to the PVSC industrial sewer without treatment (PAS-00088621).

A letter report from Environ Corporation to the PVSC, dated March 14, 1988 describes the remedial actions taken at the site to address the PCBs and oil in the industrial sewer. Oil was observed floating on the water in the last manhole on the property, and oil absorbent pillows were installed in the manhole and a catch basin on the industrial sewer system to remove any floating oil. The letter stated the manhole and catch basin were acting as an oil trap to prevent the release of oil downstream through the sewer

system to the pump station. Monthly monitoring of the sewer system began in October 1987, and samples from the farthest downstream manhole detected PCBs one time at 0.072 ppm in the first six months of monitoring. PCBs were also detected at the Hendrix pump station at 0.006 ppm during the same month that PCBs were detected in the sewer (PAS-00090938-39).

Additional monthly monitoring detected PCBs at concentrations up to 1.2 milligrams/liter (mg/L) in the manhole; PCBs were only detected one time (650 µg/L) at the Hendrix pump station from June to October, 1988 and August to October, 1990 (PAS-00090901; PAS-00089431). The sample from the manhole with the highest PCB concentration was collected in October 1990 and was stated to be slightly higher than levels detected in previous samples due to active construction activities that were part of the overall site remediation. The samples collected at the wet well of the Hendricks pump station stated no detectable levels of PCBs in the industrial sewer inlet pipe to the pump station during this time (PAS-00089431). Monthly monitoring continued through 1991 (PAS-00088902).

The letter from Environ Corporation to NJDEP regarding the Characterization of Oil Samples – Hexcel Project 536A, dated February 12, 1987 stated that the oil in manhole M1 was being removed weekly by bailing and was estimated to accumulate 10 to 15 gallons per month (PAS-00091104).

The letter from Environ Corporation to the PVSC, dated March 14, 1988 also stated a small amount of oil was accumulating with water in a below-ground pit in Building No. 1. These accumulating liquids were previously pumped into a dual-stage diatomaceous earth/granulated activated carbon treatment system for removal of oils and any aqueous phase PCBs, with the effluent discharged through the PVSC permitted sewer outfall into the industrial sewer system (PAS-00090938-39). As discussed in the *Preliminary Feasibility Study Report for Alternate Discharge to the PVSC*, dated March 16, 1992, the basement seepage water was treated this way until 1989, when complete removal of PCBs became more difficult. It was shipped offsite briefly before being treated onsite again using batch chemical treatment with carbon filtration in 1990 and discharged at an average rate of 200 gallons per day in 1991 (PAS-00088621).

According to the letter from Hexcel to the PVSC, dated May 20, 1994, all discharges to the PVSC ceased as of November 30, 1992. The basement seepage water was then treated and shipped offsite for disposal. Due to Hexcel's filing for bankruptcy, the basement seepage water was not treated (PAS-00087885-86).

A letter report to the NJDEP regarding the Hexcel site, dated July 17, 1995, stated that a new sewer line for a groundwater treatment system was installed in 1995 (PAS-00087777). According to a *Status Report*, dated May 10, 2005, the entire length of the industrial sewer on the Hexcel property from manhole M-8 to manhole M-1 was removed in 2003 (PAP-00325152).

Storm Sewer

As discussed in the March 25, 1987, letter report by Environ Corporation to the NJDEP, the storm drain entered the property at the northeast corner of the property near manhole M7, then flowed south to manholes M6 and M2. After exiting the property, the storm drain pipe was traced to an outfall into Saddle Brook approximately 900 feet south of the facility and immediately south of the Hendrix wastewater pumping station (PAP-00326356-57).

The 2003 Report on Sediment and Surface Water Sampling Program stated that samples from the storm sewer outfall area delineated previous PCB contamination characterized in October 1997 (PAS-00086066). The maximum detected PCB concentration was 1.3 mg/kg (Aroclor-1242) collected from sediment location directly downstream from the outfall (PAS-00086092). Historical sediment sample results from 1997 are provided in Table D-4 (Historical Sediment Quality Data) of the report and state PCBs were detected in Saddle River sediment up to 300 mg/kg; note the range of the other sediment samples was non-detect to 2.7 mg/L (PAS-00086124).

The Status Report, dated May 10, 2005, stated that surface water and sediments in the Saddle River adjacent to the site were minimally impacted by the potential migration of compounds of concern from the site (PAP-00325153). According to the 2011 RIR, NJDEP approved that no further investigation was required for the storm sewer outfall in a letter from July 2010 (PAP-00324827). Soil samples collected along the storm sewer on the property detected only Aroclor-1260 in one sample of eight samples collected at a concentration of 0.77 mg/kg (PAP-00324827, 977).

Direct Release

The Review of June and August 1985 Sampling Programs discusses the surface water flow across the site to the Saddle River. At the north of the site, stormwater from the parking lot flows into storm sewers and not the Saddle River. Stormwater can discharge to the river behind Building No. 2 (PAS-00091276).

The 2003 Report on Sediment and Surface Water Sampling Program concluded that surface water quality in the Saddle River adjacent to the site has not been adversely impacted by the potential migration of compounds of concern from the site. PCBs were not detected in any of the surface water samples collected. In addition, the report concluded that there was no significant migration of PCBs offsite based on the non-detection of Aroclor-1242, the primary PCB Aroclor of concern, and the one detection of Aroclor-1248 at a relatively low concentration (0.42 mg/kg) in the 14 sediment samples collected (PAS-00086066, 69, 91).

Spills

As discussed above in Section 3, investigation at the site began in 1984 in response to leaking fuel oil USTs. Fuel oil was found to be in the soil and gravel surrounding the USTs (PAS-00091716). It was suspected that two USTs had been leaking fuel oil for years (PAS-00091430).

6. Regulatory History/Enforcement Actions

When Hexcel sold its Lodi business and property to FOA Corporation in 1986, the facility was assigned ECRA case No. 86009. Due to this transaction, an Administrative Consent Order was signed in March 26, 1986 to move the facility through the NJDEP ECRA process (PAS-00091243). According to the *Remedial Investigation Report*, dated May 2016, investigation and remediation activities were conducted under NJDEP Site Remediation Program case manager oversight until the spring of 2010, when the case oversight was transferred to the Office of Brownfields. In February 2012, Hexcel opted into the Licensed Site Remediation Professional (LSRP) program to oversee and review documents related to remediation at the site. Christopher Schmitt (LSRP IDNo. 586933) is the LSRP for the site (PAP-00047694).

Inspections

Inspections performed by NJDEP on August 15 and September 2, 1986 as part of the ECRA process identified deficiencies, including an uncertain drainage network (interior floor drains, roof drains, storm, domestic and industrial sewer) and unknown composition of the lubricating oil and the age of the transformer (PAS-00091237-38).

Violations

Two violations were noted in the ECRA application. One is stated to be related to failure to submit information to local agencies, while the other is a notice that spills and leaking drums were observed close to the east bank of the Saddle River during a state inspection in the September of 1984. Both violations were stated to be resolved (PAS-00091296-97). The document does not state these violations involved OU2 COCs.

Permits

PVSC permit No. 17402370 was effective January 26, 1981 and expired January 26, 1986. The permit allowed discharge to the PVSC through outfall 17402370-37430-01l71 (PAP-00326695, 99; PAS-00091296).

PVSC permit No. 17402372 was effective January 21, 1986 and expired January 21, 1991. The permit allowed discharge to the PVSC through outfall 17402371-37430-0171 (industrial waste outlets 1 through 4) and 17402372-37430-0171 (sanitary waste outlets 5 and 6) (PAP-00326679, 83-84).

Fine Organics Corporation Sewer Connection Permit No. 17405042 was effective on May 27, 1991. It included discharge and monitoring requirements for pretreated groundwater and basement seepage resulting from Hexcel Corporation's operation of a groundwater pretreatment system. The Hexcel portion of the sewer connection permit expired on November 30, 1991 (PAS-00088620).

New Jersey Pollutant Discharge Elimination System (NJPDES) Permit No. NJ0081507 was effective November 11, 1992 and expired August 31, 1997. The permit was for discharges to the PVSC and to surface water (PAP-00047893).

PVSC permit No. 17407540 was effective May 16, 1996 and expired May 16, 2001. The permit allowed discharge from outlet number 17407540-37430-0171 with monthly monitoring for PCBs and metals, including lead, copper, and mercury (PAP-00047871-77).

The NJPDES Permit No. NJ0145378 from was effective January 1, 2004 and expired December 31, 2008 (PAP-00047855, 58).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Investigation of Fuel Oil Leak for Hexcel (June 27, 1984) (PAS-00091704)
- Narrative Report of Interpretation on Results for Hexcel Facility (July 18, 1985) (PAS-00091417)
- Review of Prior Sampling Programs at Hexcel's Lodi Facility (January 10, 1986) (PAS-00091332)
- June and August 1985 Sampling Programs (January 13, 1986) (PAS-00091270)
- Administrative Consent Order (March 26, 1986) (PAS-00091241-48)
- Characterization of Oil Samples (February 12, 1987) (PAS-00091110)
- Summary Report of Preliminary Environmental Sampling at the Fine Organics Corporation (October 14, 1987) (PAS-00091023)
- Presentation of the ECRA Sampling Results for Hexcel Corporation (December 1988) (PAS-00090232; PAS-00090378)
- Underground Storage Tank Closure Assessment Report (August 27, 1991) (PAS-00089012)
- Summary of Historical Soil Data (July 1997) (PAS-00087494)
- Summary of Historical Groundwater Data (July 1997) (PAS-00087475)
- Remedial Action Work Plan Addendum (November 1999) (PAS-00002490)
- Report on Sediment and Surface Water Sampling Program (October 8, 2003) (PAS-00086055)
- Self-Implementing PCB Cleanup and Disposal Plan (June 20, 2008) (PAP-00325528)
- Remedial Investigation Report and Remedial Action Work Plan Addendum (January 28, 2011) (PAP-00324786)
- Soil Remedial Investigation Report and Remedial Action Report (August 25, 2015) (PAP-00047406-407)

Soil

As discussed in the 2008 Cleanup Plan, the two areas of suspected PCB impacts are the area associated with the former boiler room and the area associated with the former industrial sewer. The 2008 Cleanup Plan proposed to excavate several areas due to PCB contamination in soil over 100 ppm. According to Table 1 (Soil PCB Data) of the

2008 Cleanup Plan, the maximum detection of PCBs was 13,000 ppm (Aroclor-1248) at HA-7, located under the former boiler room (PAP-00325538, 72, 86).

Sewer

During an investigation of the facility's industrial sewer system in December 1986, oil was observed to be floating on the water surface in manhole M1, which is located to the rear of Building No. 1. Oil was not observed in the other manholes and structures on the industrial sewer. Manual bailing removed approximately 75 gallons of oil during the investigation and 30 gallons several weeks after (PAS-00091033-34). The concentration of PCBs (Aroclor-1248) in sediments from the industrial sewer ranged from 10 mg/kg to 240 mg/kg, with generally increasing concentrations toward the Hendrix pump station sewer system (PAS-00091037-38).

According to a *Status Report*, dated May 10, 2005, the entire length of the industrial sewer on the Hexcel property from manhole M-8 to manhole M-1 was removed in 2003. At the same time, a hot-spot excavation at HA-17 was performed to remove the 1,800 ppm detection of PCBs. Approximately 400 tons of contaminated soil were removed during these excavations; however, soil with concentrations up to 300 mg/kg Aroclor-1242 were left in place near HA-17 (PAP-00325152, 61).

Sediment

Surface water and sediment of the Saddle River were characterized in the *Report on Sediment and Surface Water Sampling Program*, dated October 8, 2003. This report documented surface water and soil samples collected from the Saddle River adjacent to the site, as well as samples from a storm sewer outfall located approximately 750 feet south and downstream of the site (PAS-00086056). According to this report, PCBs were not detected in any of the surface water samples collected adjacent to the site. Aroclor-1242, the primary PCB Aroclor of concern, was not detected in any of the 14 sediment samples collected along the site. However, Aroclor-1248 was detected in one sediment sample at 0.42 mg/kg. Aroclor-1254 was detected at 0.49 mg/kg adjacent to the facility (PAS-00086063, 65, 91). Samples from the storm sewer outfall area delineated previous PCB contamination characterized in October 1997 (PAS-00086066). The maximum detected PCB concentration was 1.3 mg/kg (Aroclor-1242) collected from sediment located directly downstream from the outfall (PAS-00086092). Historical sediment sample results from 1997 are provided in Table D-4 (Historical Sediment Quality Data) and report PCB concentrations detected in Saddle River sediment ranged from non-detect to 2.7 mg/kg with the exception of a maximum detection of 300 mg/kg (PAS-00086124).

According to the 2011 RIR, NJDEP approved that no further investigation for the Saddle River and stormwater outfall was required at that time in a letter from July 2010. Although the NJDEP did not require any further investigation of the Saddle River, the July 2010 letter required that Hexcel propose a remediation for contaminated groundwater to ensure that no groundwater discharges enter the Saddle River at concentrations that exceed the Surface Water Quality Standards (SWQS) (PAP-00324826).

Remedial Actions

The *Investigation of Fuel Oil Leak for Hexcel, Lodi, New Jersey*, dated June 27, 1984, describes soil sampling for an oil leak from a UST. The investigation found visible oil in nine of 12 soil borings (PAS-00091712). Saddle Brook River is located 150 to 200 feet to the west of the UST (PAS-00091715). The report concluded that the oil is present in sand and gravel layers from 0.5 to 8 ft bgs, and that vertical movement of the oil is limited by a sandy silt layer, which has not been contaminated by the fuel oil (PAS-00091716).

According to a *Narrative Report of Interpretation on Results for Hexcel Facility*, dated July 18, 1985, lead and PCBs were detected at the site. Lead was detected in sample C-1 (96 ppm) at a depth of 24 to 30 inches and at C-5 (130 ppm) at 18 to 24 inches. This report states that lead was never used or stored onsite (PAS-00091423, 26, 36-37).

The *Review of June and August 1985 Sampling Programs*, dated January 13, 1986, discussed differences between the summer sampling results and reported additional sampling performed in December 1985. Discussion of the PCBs detected in the recovery well stated heat transfer oils that may have contained PCBs were used prior to 1981 in the boiler room adjacent to the oil recovery well (PAS-00091273). Additional sampling of a concrete-lined pit located within Building No. 1 was performed to confirm that the contamination was present. This area was actively used at that time for organic chemical formulation. Previous sampling had detected PCBs in wall wipe samples (62 ppm) and in the water at the base (173 ppm). A sample was collected from the oil floating on water in the drain, and PCBs were detected at 8,070 to 9,970 ppm. A sample of the water did not detect PCBs (PAS-00091282-83). It was noted that the pit was periodically pumped to the industrial sewer to remove accumulated seepage or spillage within the building (PAS-00091286).

Hexcel and NJDEP signed an Administrative Consent Order on March 26, 1986 for the cleanup of the site (PAS-00091241-8).

A letter report from Environ Corporation to the PVSC, dated March 14, 1988, describes the remedial actions taken at the site for remediation of the PCBs and oil in the industrial sewer. Beginning in early 1987, the sewer system was regularly monitored for any accumulation of oil and to remove any floating product. Oil absorbent pillows were installed in a manhole and catch basin on the industrial sewer system to remove any floating oil. These pillows were inspected weekly and changed as frequently as necessary. The removed oil was retained onsite in sealed drums until it was shipped offsite for final destruction and disposal in accordance with State and Federal regulations (PAP-00325294).

The *Presentation of the ECRA Sampling Results for Hexcel Corporation*, dated December 1988, defined 15 areas of environmental concern (AECs) at the facility (PAS-00090240). PCBs were detected at three AECs, including a soil sample collected from AEC 15, the boiler room, at a depth of 8 to 8.5 ft bgs with PCBs at 31 mg/kg (PAS-00090266-67). PCBs were also detected near USTs and aboveground storage tanks

(ASTs) at AEC 1 (0.26 mg/kg) (PAS-00090390) and AEC 7 (0.68 mg/kg) (PAS-00090407).

Three abandoned USTs were removed on June 19 and 20, 1991. The 500-gallon gasoline tank was located north of Building 6, and the two fuel oil tanks (4,000-gallon and 2,000-gallon) were located east of Building 1 and adjacent to the Boiler room (PAS-00089015). Upon removal, holes in the tanks were noted due to corrosion. Soil samples collected from the walls of both excavations detected PCBs (Aroclor-1242 at 24, 32, and 187 µg/kg). Aroclor-1242 was detected in the soil sample collected from the bottom of the gasoline UST excavation at 2,357 µg/kg. In addition, Aroclor-1242 was detected in a water sample collected from the pit of the fuel oil UST excavation at 48 µg/L (PAS-00089019-23).

A 1997 Summary of Historical Soil Data provides an overview of the soil samples collected from 1984 to 1992. As stated in this report, PCBs were detected in soil samples from borings around the boiler room and from borings around the ASTs located west of Building 2. The detection of metals was sporadic, and it was concluded that metals were not of significant concern for this site (PAS-00087498-99).

The November 1999 RAWP Addendum identified several areas of environmental concern, including Base/Neutral and Acid Extractable Organics (BNAs) and Priority Pollutant Metals (PPMs) (AOC 3), PCB contamination at the site (AOC 6), the Saddle River (AOC 8), the storm sewer outfall (AOC 9), and the industrial sewer line (AOC 10) (PAS-00002503).

Surface water and sediment of the Saddle River were characterized in the *Report on Sediment and Surface Water Sampling Program*, dated October 8, 2003. This report documented surface water and soil samples collected from the Saddle River adjacent to the site, as well as samples from a storm sewer outfall located approximately 750 feet south and downstream of the site (PAS-00086056).

The 2011 RIR stated excavation of PCB contaminated soil was expected to be completed in spring of 2011. Additionally, excavation of soil approximately 10 feet by 5 feet by 1-foot deep around sample Surf-7 was performed to remove surficial PCB contamination in order to facilitate the installation of a utility pole (PAP-00324823).

8. Summary of Asserted Defenses

Hexcel asserts, Permitted releases are exempt from the definition of “release” under CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act]. 42 U.S.C. § 9601(10)(H). Applicable permits are described in response to Question 4.3. With respect to PAHs, Hexcel asserts the petroleum exclusion. 42 U.S.C. § 9601(14). Some or all of Hexcel’s liability for the Diamond Alkali Superfund Site was discharged in a Chapter 11 bankruptcy reorganization plan that was approved January 12, 1995.

Hoffmann-La Roche, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

HOFFMANN-LA ROCHE, INC.

Facility Name, Address and Size: Hoffmann-La Roche (Roche), 340 Kingsland Road, Nutley, NJ 07710 (PAS-00123422). As of 1960-61, the site on Kingsland Road consisted of approximately 100 acres in size. Reports dated 1998 and 2004 stated the site as 123 and 125 acres, respectively (PAS-00123422). The Roche site employed 3,000 employees in 2005 (PAS-00123423). Available references did not include the number of work shifts at the site.

1. **Business Type:** From 1940 to 1946, Roche manufactured "ethical prescription medicines." In 1960-61, Roche manufactured bulk "ethical pharmaceuticals" and vitamins and aromatic chemicals. As of 1998, the operations at the site were described as "manufacturing of pharmaceutical preparations." The facilities on the site consist of administration, research and development, and pharmaceutical/medicinal chemical production (PAS-00123424).

2. **Time Period of Ownership/Operations**

   Operator: 1930 to 2015
   Owner: 1928 to 2016

3. **Operational History/COC Use and Presence at the Facility**

   Historical operations on the site in the 1930s included Roche's Strychnine Building (former Building 6), Carpenter/Maintenance Shop (former Building 12), Laradon Building (former Building 10), Sodium Building (former Building 5), Barbituric Building (former Building 4), Raw Product Storage (former Building 9), Boiler Building (former Building 3), garages, storage buildings, and sheds (former Building 2) (PAS-00123423).

   By the 1940s, Roche occupied 90 acres of the site with approximately 28 buildings and a 640,000-gallon aboveground No. 6 fuel oil tank. From 1940 to 1946, Roche manufactured "ethical prescription medicines" (PAS-00123424). As of 1951, Roche still did not own the western portion of the site (west of the rail line); however, Haberland Manufacturing (converted to a chemical company) owned and operated a portion, including a 250,000-gallon reservoir. By the 1960s, many adjoining industrial parcels were acquired by Roche which formed the main complex (PAS-00123423).

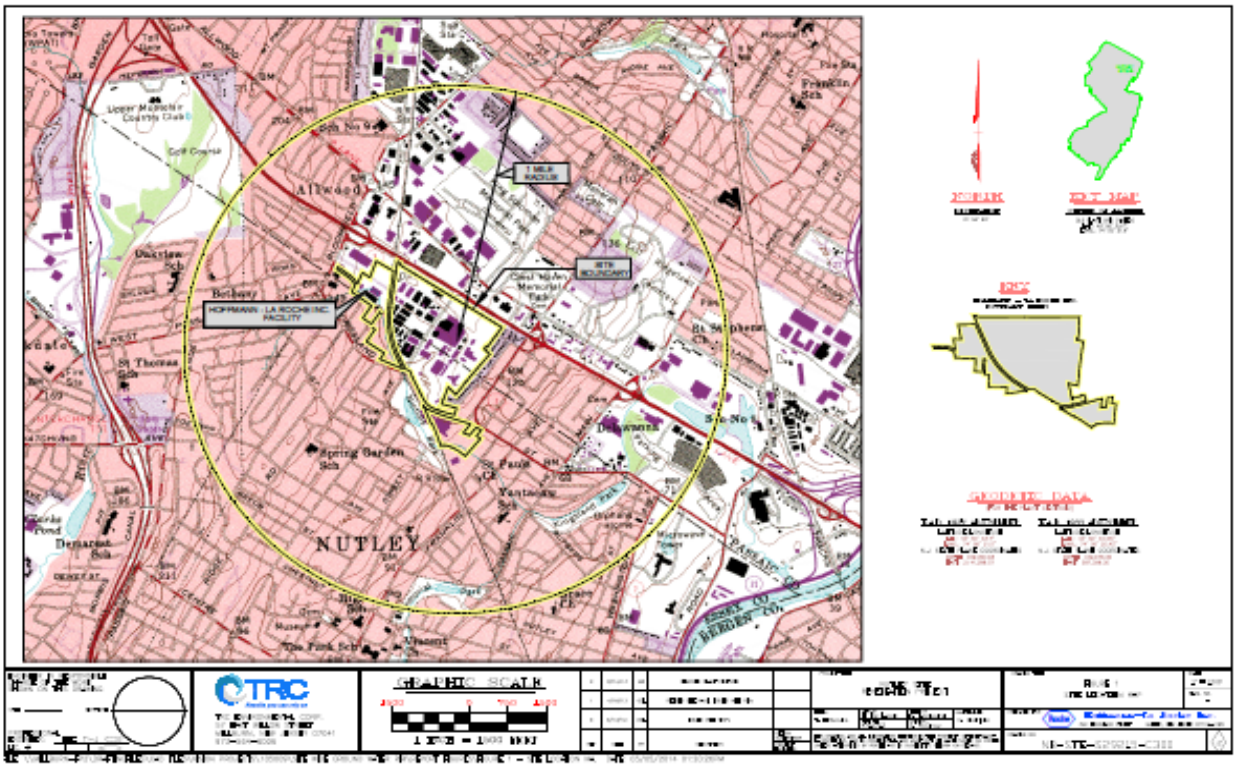
   In 1960-61, Roche manufactured bulk "ethical pharmaceuticals" and vitamins and aromatic chemicals. As of 1998, there were fourteen main products manufactured at the site and were described as "manufacturing of pharmaceutical preparations" (PAS-00123424).

Hoffmann-La Roche, Inc.

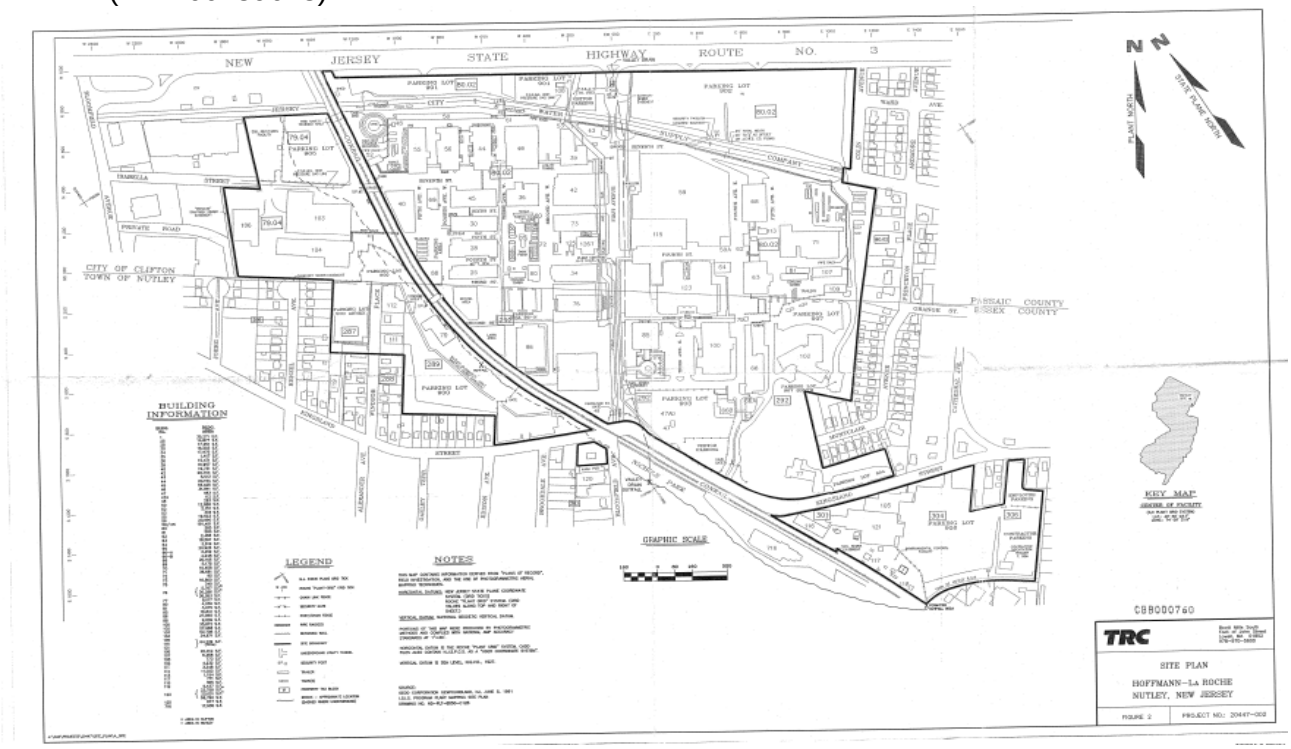
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Facility Data Report



(PAP-00189673)



(PAP-00003021)

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The facilities on the site consisted of administration, research and development, and pharmaceutical/medicinal chemical production. Drum storage of virgin materials and hazardous waste occurred in Building 106. Warehousing of virgin materials, products, intermediates, and equipment occurred in Buildings 103 and 104. Offices and parking were located in Building 112. Vehicle maintenance and storage occurred in Building 70. Trash compaction and vehicle storage occurred in Building 111. Numerous additional buildings (mostly production), storage tanks, and parking lots existed on the side of the site east of the Conrail line (PAS-00123424).

Raw materials were often conveyed to production buildings via underground pipes. In 1993, Roche initiated a program to replace pipes remaining directly in the ground with piping set into concrete trenches (PAS-00123245). Historical storage in tanks on site included the following materials (PAS-00123424-25):

Materials Stored in Tanks			
Hexane	Toluene	1-pentol	3-pentol
Fuel Oil No. 2	Fuel Oil No.6	Kerosene	Gasoline
Diesel Fuel	Solvents	Alcohols	Acids; bases
Product intermediates	Methanol	Dehydrolinalool	Wet Skelly
Dry Skelly	Ethyl Heptanone	Methylene Chloride	Ether
Formamide	Butendiol	Isobutylaldehyde	Waste Oil
Methyl Ethyl Ketone	Methyl Carbitol	Acetone	Methyl Formate
Isophytol	Ethyl Butynol	Beta Ionone	Chloroform
Pseudo Ionone	Propylene Glycol	Sulfuric Acid	Tetrahydrofuran (THF)
Trimethylphenol	Sodium Hydroxide	Acetic Anhydride	Ammonia
Toluene	Dowtherm	Pyridine	

A total of 171 Areas of Concern (AOCs) was identified at Roche, of which 109 AOCs were identified as warranting additional investigation (PAS-00002999-3014). Of these areas, AOC 67 was identified as the process sewer system. This AOC consists of Roche's process sewer system and all service connections to production buildings. The process sewer system was a subgrade piping system used to transport process waste water from manufacturing, laboratory, and support buildings, and also carried sanitary wastes from the facility to Roche's Environmental Control Facility. Many of the service connections were formerly constructed of glass piping. Formerly, many process sewer lines were in direct communication with subgrade soils. In the 1980s and 1990s, cracks in pipes may have released an undetermined volume of process water to the subsurface. Several releases involved oil that contains the COC PAHs (PAS-00003114-7).

Several AOCs (Nos. 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, and 78) were related to the presence of transformers located at the facility. These transformers were managed in accordance with Roche's Discharge Prevention Containment and Countermeasure (DPCC). The transformers were surrounded by an oil containment soil media which permits permeation of rainwater but disallows permeation of oils. This area was slightly bermed and covered with a layer of pea gravel. No releases were documented at these AOCs and therefore no further investigation was warranted (PAS-00003118-28).

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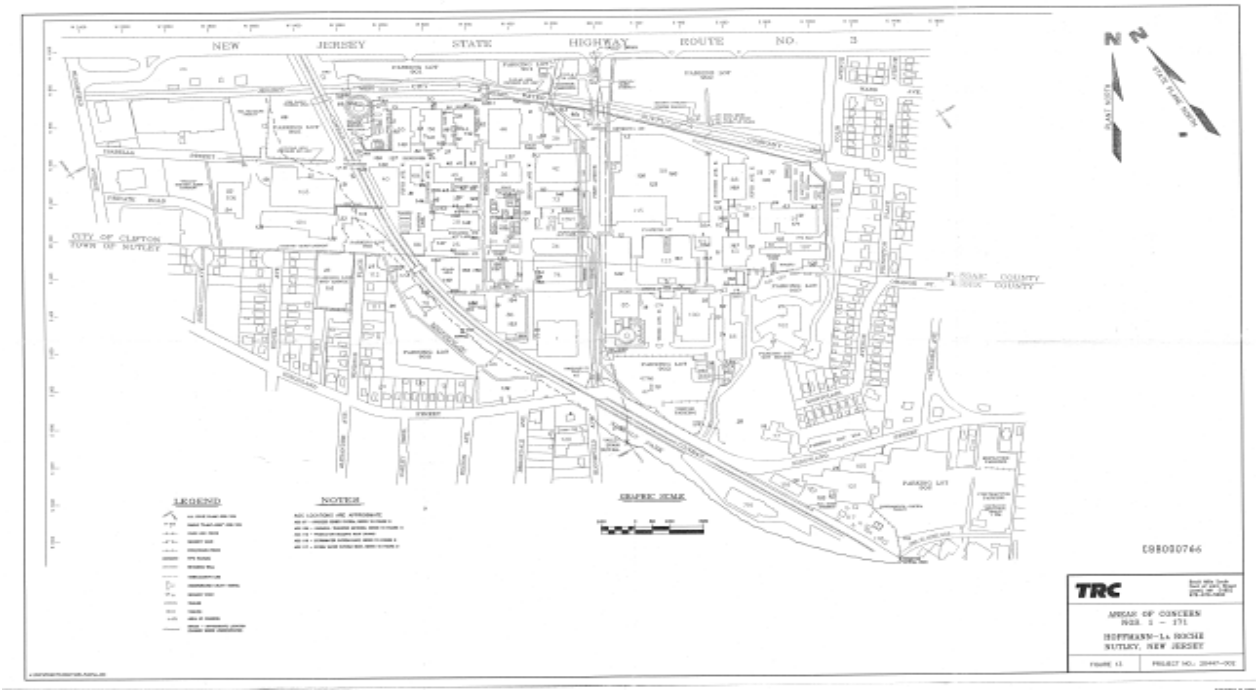
Facility Data Report

AOC 116 was identified as the Storm Sewer System – East Side of Conrail Rail Easement. This storm sewer system was used to drain rainwater from the facility and to convey non-contact cooling water. Historically, the stormwater system may have been connected to the Valley Drain. A former stormwater outfall located across Kingsland Avenue in Nicholas Park was at one time used by Roche as the outlet for stormwater, in addition to the Valley Drain. Several releases were noted from 1988-1994, including 50 gallons of kerosene and 1,000 gallons of No. 6 fuel oil in 1989, but both were diverted to Roche's pretreatment facility (PAS-00003186-87).

AOC 117 was identified as the Storm Sewer System – West Side of Conrail Rail Easement. This storm sewer system was used to convey rainwater from the Roche property west of the Conrail Rail Easement. Stormwater from this area of the facility is discharged to St. Paul's Brook, south east of Building 70. There were no reported releases related to the OU2 COCs (PAS-00003188).

AOC 118 was identified as the Storm Water Outfall – St. Paul's Brook. This outfall received stormwater runoff from the Roche property west of the railroad easement. Storm sewer plans from the 1970s stated that drainage from Building 70 may have connected to the stormwater system in the vicinity of the stormwater outfall. However, during an environmental audit in 1995, a dye test was conducted. The results stated that the drains connected to the Clifton sewer system. Several releases to the storm sewer from chemical storage areas have been documented on the western side of the facility. Due to the documented releases to the storm sewer system from the chemical storage areas, investigation was planned for at this AOC (PAS-00003189).

The figure below identifies the 171 AOCs: (PAS-00003027)



According to the *PRP Data Extraction Form*, dated August 22, 2005, "'[s]urface water from the drainage basin in which (the site) resides are routed ultimately to the Passaic River, located slightly greater than one mile east' of the site. St. Paul's Brook, on the southwest side of the site is enclosed within a subgrade conduit on site except for a 100-foot stretch southeast of Building 70. St. Paul's Brook discharges to the Passaic River (via the Third River). The Valley Drain, which discharges to St. Paul's Brook, is also enclosed within a subgrade conduit. The Valley Drain runs north to south across the site. Both the Valley Drain and St. Paul's Brook are 'natural features that existed prior to the development of the region and contain flows on a year-round basis'" (PAS-00123430).

4. Identified COCs

- PCBs (released)
- PAHs (used, released)
- Dieldrin (detected)
- Copper (used)
- Lead (used, detected)
- Mercury (used, detected)

PCBs

Roche purchased the northwest corner of the site (referred to as northern IA-10) in 1967 (PAP-00215458). This parcel included a former industrial fill area; the filling preceded Roche's purchase. The former industrial fill area contained a variety of waste materials, and PCBs were detected at a range of concentrations, some in excess of 100 milligrams per kilogram (mg/kg) (PAP-00214426).

PCBs were detected at concentrations below 1 mg/kg throughout the site in surface and subsurface soils. Detections greater than 1 mg/kg were primarily located in the northwest corner of the site (PAP-00717667-8).[1]

AOC 107 was identified as the Spill Location on Street North of Building 100. On March 2, 1991, a 10-15 gallon, 100-foot trail of PCB-contaminated transformer oil was released to the roadway due to a broken valve during a transformer relocation by an outside contractor. Federal and state authorities were notified and the area was cleaned by Roche's personnel (PAS-00003177).

Upon the demolition of Building 86 in 2005, Roche sampled demolition debris being used as fill and found that concrete, caulking, paint, and other materials contained PCBs. Two hotspot locations (>50 mg/kg) were identified and excavated and were disposed offsite at appropriate licensed disposal facilities. Engineering controls in the form of layers of sand and geotextile, aggregate, and asphalt, and a deed notice were implemented (PAP-00189813-4).

[1] This Report was revised to include information contained in documents received on May 19, 2020. The additional documents did not change Hoffmann-LaRoche's previous certification.

PAHs

PAHs were detected throughout the site in subsurface soils (PAP-00717657-62).[2]

AOC 105 was identified as the Building 61 Pump House and Appurtenant Piping (Memorandum of Agreement (MOA) IA-4). This area was located in the northern portion of the facility. The building pumped No. 6 fuel oil from the 640,000-gallon aboveground storage tank (AST) located in the northern corner of the facility to the Building 39 boiler house. Historically, the oil transfer pipe was buried directly in the ground. In 1989, the underground line was removed from service and replaced with an aboveground line. This aboveground line was inspected regularly by Roche's personnel. On December 18, 1989, Roche's personnel discovered No. 6 fuel oil in a storm water catch basin on the south side of the facility. The underground line which carried fuel oil from the 640,000-gallon AST to Building 39 had developed a leak in the vicinity of the pump house (Building 61) and oil had flowed into the storm sewer system. At that time this storm sewer was being routed through Roche's pretreatment facility and no oil was discharged to surface water (PAS-00003171).

There were several releases of fuel oils to shallow soils in the immediate vicinity of fuel storage facilities. The following PAHs were detected at the Roche facility at AOC 155 at depths of 4.5-4 feet below ground surface (bgs) collected on February 20, 2002 (PAS-00101494, PAS-00123427):

- Benzo(a)anthracene – 11 mg/kg
- Benzo(a)pyrene – 8.5 mg/kg
- Benzo(b)fluoranthene – 11 mg/kg
- Benzo(k)fluoranthene – 4.6 mg/kg
- Dibenz(a,h)anthracene – 1.1 mg/kg
- Indeno(1,2,3-cd)pyrene – 4.7 mg/kg

Dieldrin

Dieldrin was detected at a maximum concentration of 0.0626 mg/kg in the concrete demolition materials at the former Building 86 (PAP-00189916). Engineering controls in the form of layers of sand and geotextile, aggregate, and asphalt, and a deed notice were implemented (PAP-00189813-4).

Lead

Lead was detected throughout the site in surface and subsurface soils at concentrations less than 10,700 mg/kg. Detections with concentrations above 10,700 mg/kg were almost exclusively located in the northwest corner of the site (PAP-00717663-4).[2]

[2] This Report was revised to include information contained in documents received on May 19, 2020. The additional documents did not change Hoffmann-LaRoche's previous certification.

Hoffmann-La Roche used a lead catalyst that was coated with palladium in the manufacture of Vitamin A in Building 68 (in IA-3, in the northeastern part of the Site). All From 1960 through 1984, an average of 1,760 kilograms (kg) per year of lead acetate was used (PAS-00002944). Lead was detected in soil samples collected at location TP-01-03 from the Proposed Daycare Center Area 2 at a concentration of 3,080 mg/kg (PAS-00101356).

Roche purchased the northwest corner of the site (referred to as northern IA-10) in 1967 (PAP-00215458). This parcel included a former industrial fill area; the filling preceded Roche's purchase. The former industrial fill area contained a variety of waste materials, and lead was detected as high as 153,000 mg/kg (PAP-00214421).

Copper

Small amounts of copper sulfate (average of 616 pounds per year) were purchased for use in production (PAS-00002942).

Mercury

Mercury was detected throughout the site in surface and subsurface soils at concentrations less than 65 mg/kg. The few detections with concentrations above 65 mg/kg were not located together (PAP-00717665-6).

AOC 109 was identified as the Mercury Release Underground Tunnel Building 56 (identified in MOA as IA-5). Mercury (1-2 ounces) was identified by a contractor during tunnel upgrade activities under Building 56. The material was recovered by Roche's personnel (PAS-00003179).

Soil samples were collected in AOC 174 (which was the proposed daycare center Area 2) to assess environmental conditions during a project to site a potential Roche-operated daycare center. This area was located on Roche-owned parcels west of the Conrail easement within Parking Lot 900 Annex and east and south of the former Roche Buildings 111 and 112. Roche had never utilized the subject parcels for pharmaceutical/chemical manufacturing, although, former property owners may have conducted manufacturing operations. Mercury was found at location EB-111-16-2 in Area A at a concentration of 18.5 mg/kg, which exceeded the highest background value reported for inorganic datasets from urban background and New Jersey state-wide background concentrations (PAP-00213097, PAS-00101356).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[3]

[3] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[4] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[5] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[6]

According to a Preliminary Assessment/ RCRA Facility Assessment Report dated May 1998, an assessment of non-indegneous fill "failed to reveal any evidence that non-indigenous fill material was brought to the Roche site to raise topographic elevations or to replace indigenous soils" (PAP-00067784).

Based on a Remedial Investigation (RI) report for Investigative Area No.15 (IA-15), located in the southeast corner of the site, an evaluation of soil boring logs for IA-15 in conjunction with prior investigations performed at adjacent IA-14 determined that historic fill material is present throughout this entire area and appears to extend beyond the IA-15 boundary. IA-15 comprises Tax Block 2101, Lot 1. Kingsland Street borders IA-15 to the north/northwest, IA-14 to the east/northeast, St. Paul's Brook and commercial establishments to the south, and a Conrail railroad line to the west/southwest. Fill material, including bricks, concrete, asphalt, coal/ash, wood and black granular debris are present and widespread over much of the area and ranged in thickness from four feet to 12 feet, with the thickness increasing as the bedrock surface slopes downward towards the south. Fill material across the IA has been reworked during construction of the former buildings and installation of the numerous process, storm sewer and sanitary sewer lines and subsurface vaults associated with the Environmental Control Facility (ECF) (PAP-00068195-96).

According to the Remedial Investigation Report, Investigative Area 11, A total of 13 AOCs 10a, 10b, 28, 58, 59, 67, 116, 164, 165, 173, 181, 188 and the stockpiled Soil Area (no AOC designation) were identified in IA-11 (PAP-00068768). Historic Fill was identified over an extensive portion of IA-11 (PAP-00068770).

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[4] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[5] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[6] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

In addition, Roche purchased the northwest corner of the site (referred to as northern IA-10) in 1967 (PAP-00215458). The IA-10 site geology was described as historic fill material in the Remedial Investigation Report Investigative Area 10, dated December 19, 2013 (PAP-00214329). This parcel included a former industrial fill area; the filling preceded Roche's purchase. The former industrial fill area contained a variety of waste materials, and PCBs were detected at a range of concentrations, some in excess of 100 mg/kg (PAP-00214426). Lead was detected as high as 153,000 mg/kg (PAP-00214421). This former industrial fill area is one of six areas at the site where soils were not remediated and are subject to the Deed Notice (PAP-00215456; 465)

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00214421, PAS-00123427-8, PAP-00717657-62).[7]

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	153,000 mg/kg
Copper	6,740 mg/kg
Mercury	18.5 mg/kg
Benzo(a)anthracene	>160 mg/kg
Benzo(a)pyrene	>120 mg/kg
Benzo(b)fluoranthene	>110 mg/kg
Benzo(k)fluoranthene	>93 mg/kg
Dibenzo(a,h)anthracene	>25 mg/kg
Indeno(1,2,3-cd)pyrene	>67 mg/kg

5. COC Pathways

Sanitary Sewer

Since 1987, the Passaic Valley Water Supply Company and the Jersey City Water Company exclusively supplied water for all aspects of Roche's Nutley, NJ operations. These operations included: non-contact cooling water, production, sanitary and general uses. The amount of water used by the facility was generally equal to the amount of wastewater discharged to the local POTW. The Roche facility discharged approximately 1.8 million gallons of wastewater per day to the Passaic Valley Sewerage Commission (PVSC) under a local permit (PAS-00002877).

The Roche Nutley facility produced several different wastewater streams from site operations including sanitary wastewater, laboratory rinse water, non-contact cooling water, cooling tower blowdown, steam condensate, boiler blowdown and process wastewater. These wastewater streams, in addition to stormwater were managed by Roche to prevent unpermitted discharges to the waters of the State of New Jersey (PAS-0002877).

[7] This Report was revised to include information contained in documents received on May 19, 2020. The additional documents did not change Hoffmann-LaRoche's previous certification.

The Roche site is equipped with two types of sewer systems, process sewer system (commingled with the sanitary sewer) and the storm sewer system which is a completely separate sewer system from the process/sanitary sewer. Effluent discharges from these systems are permitted by the state of New Jersey under the following Roche permits:

- NJPDES/DSW Permit No. NJ0034185 for stormwater runoff commingled with noncontact cooling water (thermal water) discharge to St. Paul's Brook (DSN 002A) for the Roche property east of the Conrail railroad tracks and north of Kingsland Street.

- PVSC Sewer Connection Permit, Permit No. 24402882.

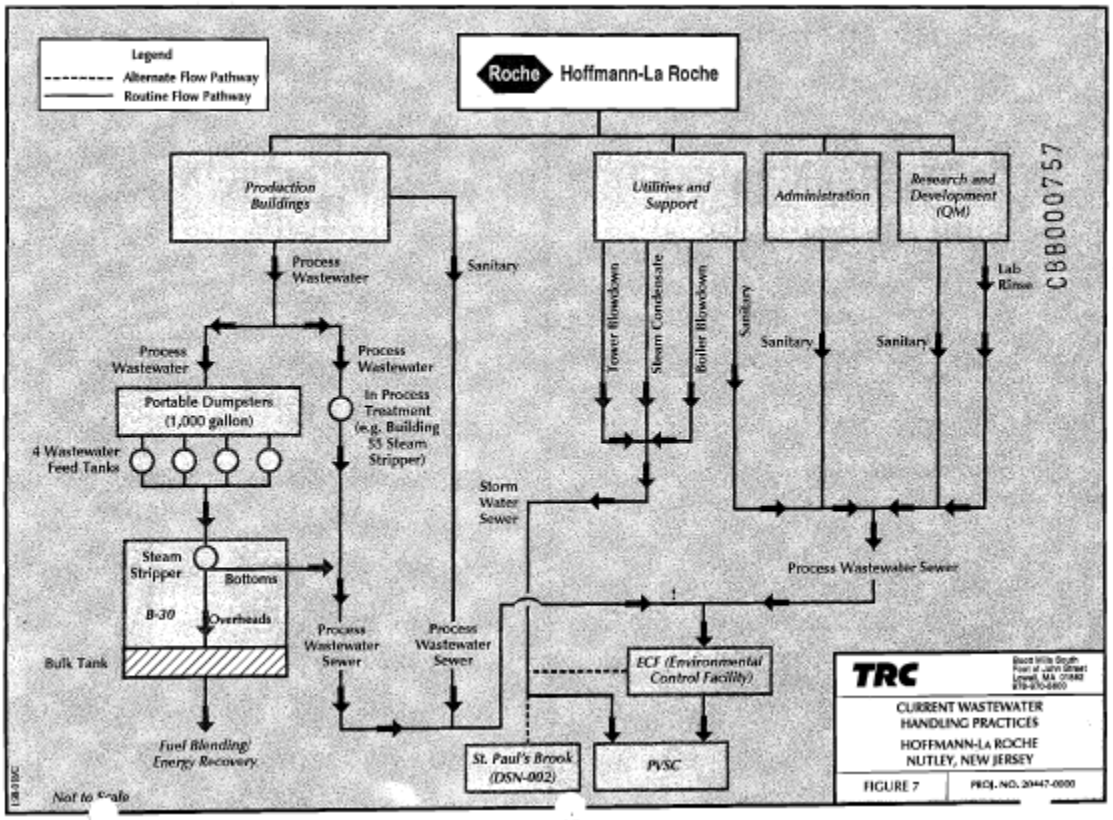
- NJPDES Industrial General Permit No. NJ0088315 for stormwater runoff from the area of the property west of the Conrail railroad easement (PAS-00101296-9). Stormwater from this area discharges directly to St. Paul's Brook upstream of DSN-002A (PAS-00002879, PAS-00101310).

The effluent from Roche to PVSC in August 1978, contained the following contaminants, with a flow rate of 6.304 million gallons per day (gpd): copper at 0.156 ppm, lead at 0.243 ppm, and mercury at 0.002 ppm (PAS-00123426).

It is known that stormwater from the main part of the facility east of the railroad easement was discharged to the City's stormwater system until 1982 when stormwater runoff was rerouted to St. Paul's Brook. In addition, facility drawings from the mid-1960s show that stormwater catch basins east of the railroad easement may have been connected to the Valley Drain, which is a sub-grade water body that flows from north to south through the approximate center of the facility. Having been developed separately from Roche's main facility, stormwater from areas west of the railroad easement (i.e., Building 103/104 area and Building 70 area) flowed into St. Paul's Brook. Process wastewater was channeled through subsurface pipes constructed of materials such as glass, vitrified clay or asbestos concrete which converged at the southern portion of the site. Following the construction of the lime house (Building 47) in the late 1940s, process wastewater was neutralized before it was discharged to the municipal/sanitary wastewater system (PAS-0002878).

Prior to the construction of Roche's ECF in 1982, all of Roche's wastewater was discharged through piping to the city sewer system south of Roche's Kingsland Street entrance. However, this pipe is currently plugged. Roche maintains several regulatory required environmental management plans, including an Industrial Stormwater Pollution Prevention Plan, and a combined Discharge Prevention, Containment and Countermeasure (DPCC), Spill Prevention Control and Countermeasure (SPCC), and Discharge Cleanup and Removal (DCR) Plan. Roche has also developed comprehensive Environmental Health and Safety Standard Operating Procedures (SOPs) and Preventative Maintenance Programs to maintain compliance with a wide-array of environmental regulations. The Environmental Health and Safety SOPs include detailed management practices for solid and hazardous waste management throughout the facility (PAS-0002878-9).

The majority of the process sewer lines lie west of the Valley Drain, where historically the majority of production occurred at the facility. Process sewer lines from the western and eastern halves of the facility converge immediately north of Building 47. From there, the process sewer follows Kingsland Street to the ECF. Process wastewater passed through steam stripping units to reduce/eliminate the solvent loads before the wastewater was discharged to the process sewer. The primary stripping unit was located within Building 30. Wastewater from various production buildings was collected in portable 1,000-gallon tanks (dumpsters) that were located directly outside each production building. On a regular basis (typically within 72 hours of filling), Roche personnel transported the dumpsters to Building 30 where the water was transferred to several wastewater feed tanks. The feed tanks fed into the steam stripping unit. The solvent overheads were directed to a bulking tank and sent offsite for fuel blending in cement kiln operations. The steam stripper bottoms were discharged to the process sewer. Other process wastewater (e.g., from Building 55) was treated in steam stripping units located within the process building itself. Solvents recovered during this operation were recycled for reuse in the process. Wastewater was then discharged to the process sewer. The process sewer system drained wastewater generated from all facility buildings through service connections from all areas of the plant. Process wastewater was gravity fed through the subgrade piping network to Building 47. From there, the sewer pipes left the property and ran along Kingsland Street to Roche's ECF (PAS-00002880-81).



(PAS-00003018)

Storm Sewer and Catch Basins

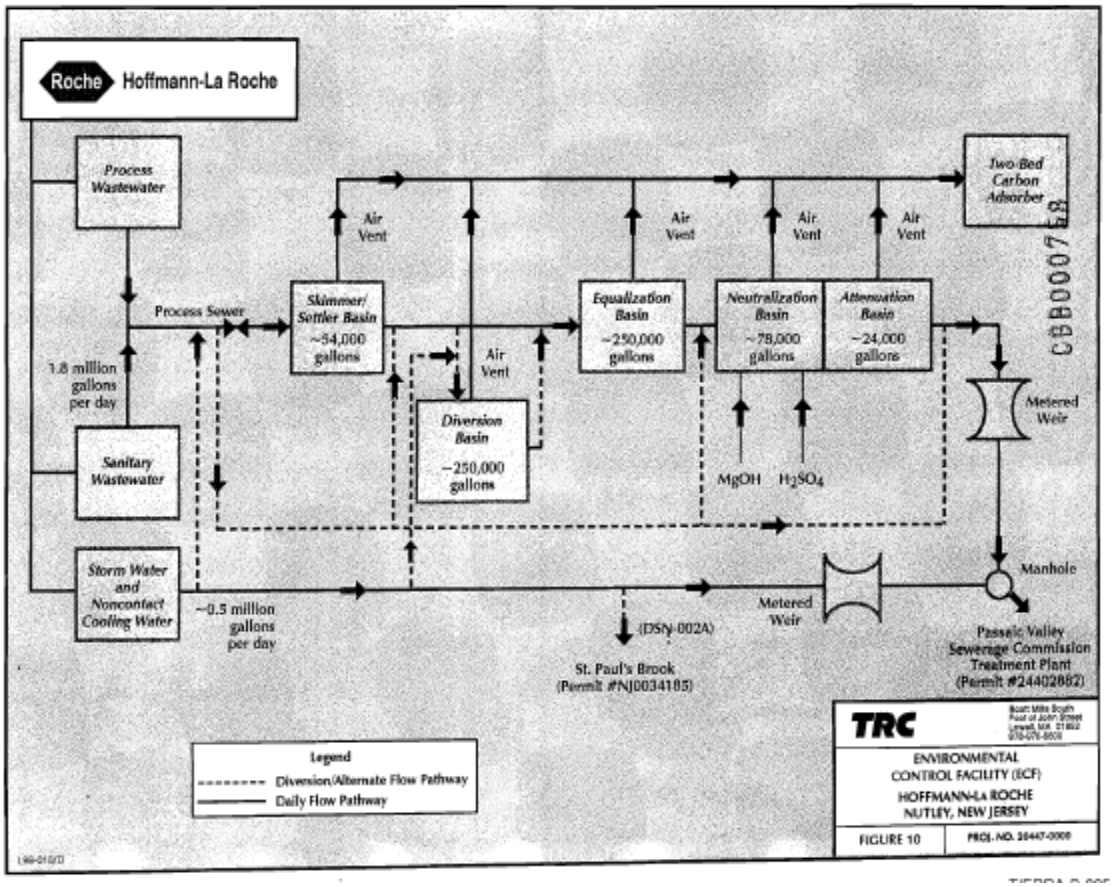
Stormwater from the main part of the Roche facility east of the railroad easement was commingled with non-contact cooling water, steam condensate, and cooling tower blowdowns. During periods of light precipitation or during low flow conditions, the commingled flow was combined with the process sewer wastewater and discharged to the PVSC. During large rain events, Roche was permitted to discharge non-contact cooling water and runoff to St. Paul's Brook at Outfall 002A under NJPDES-DSW Permit No. NJ0034185. Roche's discharge records stated that the last time stormwater was discharged to St. Paul's Brook through Outfall 002A was June 1992.

An Application for Permit to Discharge Wastewater dated January 31, 1990, for Outfall 001, reports that approximately 3.59 million gpd were discharged to the PVSC sewage treatment plant, including 1,142,500 gpd from chemical production, 141,000 gpd from pharmaceutical production, 1,220,000 gpd from utilities and maintenance and 443,850 gpd from stormwater and cooling water (PAP-00717651).[8]

Roche also utilized the Insituform process to reline portions of the storm sewer system that lies beneath production areas both west and east of the Valley Drain. Roche maintained a separate storm sewer system for areas west of the railroad easement (Building 104/103 and Building 70 area). Areas west of the easement were used for administration support and to house general equipment and raw materials warehousing. Roche maintained a General Permit, NJPDES Permit No. 0088315 for discharge of storm water runoff directly into St. Paul's Brook for this area (PAS-00002882). Roche's ECF is located south of Kingsland Street and was identified as Building 116. Roche's ECF was brought online in the summer of 1982. Prior to that time, all process water was channeled through Building 47 where lime and sulfuric acid were used to adjust pH prior to discharge into the municipal sanitary sewer. The ECF was a pretreatment facility that was designed to provide flow equalization, pH neutralization and spill control for treatment of wastewater prior to its discharge to the PVSC Treatment Works. Although Roche maintained both a Sewer Connect Permit (Permit No. 24402882) for discharge of wastewater to the PVSC, and a New Jersey Pollutant Discharge Elimination System (NJPDES) permit (permit No. NJ0034185) for discharge to St. Paul's Brook, all process water, and storm water from the main part of the facility, located east of the Conrail tracks was discharged to PVSC since 1992. Roche carefully monitored the storm water and process sewer systems for releases of volatile organic compound materials using on-line lower explosive limit (LEL) meters which were located within process sewer and storm water manholes. The process sewer system is equipped with 17 LEL meters located at various positions within the system. Six LEL meters were also positioned within the storm sewer system: 3 meters within the plant proper and 3 meters at the ECF. During normal operations, process wastewater entered the ECF through manhole PR-4. The wastewater was pumped through a skimmer/settler basin, through a flow equalization basin, and into a neutralization and attenuation basin, where it was neutralized with either magnesium hydroxide or sulfuric

[8] This Report was revised to include information contained in documents received on May 19, 2020. The additional documents did not change Hoffmann-LaRoche's previous certification.

acid. From the neutralization basin, the water exited the facility and discharged through subgrade piping to PVSC's public treatment works.



(PAS-00003019)

Direct Release

During large rain events, Roche was permitted to send non-contact cooling water and runoff to St. Paul's Brook at Outfall 002A under the NJPDES-DSW Permit No. NJ0034185 (PAS-00002882).

6. Regulatory History/Enforcement Actions

Permits

The facility had a NJPDES/DSW Permit No. NJ0034185 for stormwater runoff commingled with noncontact cooling water (thermal water) discharge to St. Paul's Brook (DSN 002A) for the Roche property east of the Conrail railroad tracks and north of Kingsland Street (PAS-00101310-322; PAS-00002879).

During the period beginning “Modified EDP” and lasting through July 31, 1990, the permittee was authorized to discharge from discharge points designated as Outfalls DSN-001, DSN-003, DSN-004, and DSN-005. The discharge limitation for mercury (total) was 181 grams/day (PAS-00101514). In addition, the final permit was modified to delete the previous conditional limits and monitoring requirements for copper since the permittee did not use any corrosion inhibitors, biocides, or other cooling water additives containing this metal in its non-contact cooling water or cooling water blowdown (PAS-00101321-22).

The facility also held PVSC Sewer Connection Permit, Permit No. 24402882 (PAS-00002879).

Finally, the facility held NJPDES Industrial General Permit No. NJ0088315 for stormwater runoff from the area of the property west of the Conrail railroad easement (PAS-00101299, 305). Stormwater from this area discharges directly to St. Paul’s Brook upstream of DSN-002A (PAS-00002879).

Violations

On April 10, 1947, an inspector discovered oil on Nichol’s Pond, a tributary to Third River. The source was traced to Roche’s power plant upstream on Nichol’s Brook. It was found that a tank truck delivering fuel oil had a spill and lost approximately 100 gallon of fuel oil which escaped through a yard drain into the ditch along the railroad and into Nichol’s Brook. The inspector had the remaining oil cleaned from the yard, and most of the oil having collected in the railroad ditch, this accumulation was skimmed off and carted away (PAS-00101231; PAS-00123430).

On May 19, 2004, a leak was found in the excavation going to the storm drain. The substance released was “oil fue.l” The document states that cleanup was underway (PAS-00101278).

Spills

The following table summarizes known discharges and releases at the Hoffmann-La Roche Facility (note that not all of these releases may be related to releases of OU2 COCs):

Hoffmann- La Roche Discharges				
Date	**Location**	**Media**	**Material Released**	**Estimated Amount**
2/15/82	St. Paul’s Brook	Water/St. Paul’s Brook	No. 2 Fuel Oil	Undetermined
3/22/82	St. Paul’s Brook	Water/St. Paul’s Brook	Paint	Undetermined
8/30/82	Building 106	Soil	Waste Solvents	Undetermined
4/87	Building 68 USTs	Soil	Various Solvents	Undetermined

Hoffmann-La Roche, Inc.

Diamond Alkali OU2 Allocation

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Hoffmann- La Roche Discharges				
Date	**Location**	**Media**	**Material Released**	**Estimated Amount**
4/3/89	St. Paul's Brook	Water/St. Paul's Brook	Hydraulic Fluid	Undetermined sheen observed
12/18/89	Building 61 Area	Soil, groundwater	No. 6 Fuel Oil	Undetermined
1991	Building 35 USTs	Soil, Groundwater	Various Solvents	Undetermined
3/2/91	Street – Building 100	Not applicable	PCB transformer oil	10 gallon
2/92	Building 100 UST	Soil	Fuel Oil	Undetermined
2/92	Building 86 USTs	Groundwater	Fuel Oil	Undetermined
2/92	Building 102	Soil	Fuel Oil	Undetermined
2/10/92	Building 110 UST	Soil/Groundwater	No. 2 Fuel Oil	Undetermined/Soil remediated
2/20/92	Building 47 UST	Soil	No. 2 Fuel oil UST	Undetermined
7/29/92	Tunnel between B-44 and 56	Soil	Mercury	2-3 milliliters
8/92	Building 39 USTs	Soil	Fuel Oil	Undetermined
6/8/95	Building 1	Soil	Hydraulic Oil	1 gallon
1/96	Process Sewer Line	Soil	Process Wastewater	Undetermined
5/29/96	Parking Lot 500 Annex	Not applicable	Hydraulic oil	1 pint
11/97	Building 118	Soil	Diesel Fuel	~ 1 gallon

(PAS-00002988-89)

AOC 105 was identified as the Building 61 Pump House and Appurtenant Piping (Memorandum of Agreement (MOA) IA-4). This area was located in the northern portion of the facility. The building pumped No. 6 fuel oil from the 640,000-gallon AST located in the northern corner of the facility to the Building 39 boiler house. Historically, the oil transfer pipe was buried directly in the ground. In 1989, the underground line was removed from service and replaced with an aboveground line. This aboveground line was inspected regularly by Roche's personnel. On December 18, 1989, Roche's personnel discovered No. 6 fuel oil in a storm water catch basin on the south side of the facility. The underground line which carried fuel oil from the 640,000-gallon AST to Building 39 had developed a leak in the vicinity of the pump house (Building 61) and oil had flowed into the storm sewer system. At that time this storm sewer was being routed through Roche's pretreatment facility and no oil was discharged to surface water (PAS-00003171).

AOC 107 was identified as the Spill Location on Street North of Building 100. On March 2, 1991, a 10-15 gallon, 100-foot trail of PCB-contaminated transformer oil was released to the roadway due to a broken valve during a transformer relocation by an outside contractor. Federal and state authorities were notified and the area was cleaned by Roche's personnel (PAS-00003177).

AOC 109 was identified as the Mercury Release Underground Tunnel Building 56 (identified in MOA as IA-5). Mercury (1-2 ounces) was identified by a contractor during tunnel upgrade activities under Building 56. The material was recovered by Roche's personnel (PAS-00003179).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Heavy Metals Source Determination Study*, Appendix A, Industrial Waste Surveys, Part A – Industrial Site Interviews, Volume 3, dated August 15, 1978
- *Direct Discharge PRP Cases for the Lower Passaic River Study Area, Hoffmann-La Roche*, dated August 22, 2005 (PAS-00101228)
- *Remedial Action Report, Concrete Demolition Materials Contamination MOA Investigative Area 6, Hoffmann-La Roche, Nutley/Clifton, Essex/Passaic County, PI No. 009949*, dated September 2012 (PAP-00189811)
- *Remedial Investigation Report for Investigative Area 10 (IA-10)*, dated December 19, 2013 (PAP-00214315)
- *Ecological Evaluation and Surface Water Remedial Investigation Report*, Hoffmann-La Roche Inc., dated April 2014 (PAP-00214766)
- *Soil Remedial Action Permit Modification*, dated March 2018 (PAP-00215482)
- *PRP Data Extraction Form, Lower Passaic River Study Area* (PAS-00123422)

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

Roche purchased the northwest corner of the site (referred to as northern IA-10) in 1967 (PAP-00215458). This parcel included a former industrial fill area; the filling preceded Roche's purchase. This former industrial fill area contained a variety of waste materials, and PCBs were detected at a range of concentrations, some in excess of 100 mg/kg (PAP-00214426). Lead was detected as high as 153,000 mg/kg (PAP-00214421).

Sediment

According to the surface water and sediment data collected, Roche's operations did not have an impact on St. Paul's Brook, and that contaminants detected in the Brook are the result of runoff from roads and urbanized surrounding areas. Concentrations of COCs adjacent to and downstream of the site were comparable to background concentrations. St. Paul's Brook did not transport COCs from the Roche Site to the Third River (PAP-00214764-831).

Hoffmann-La Roche, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

The table below provides a complete list of COCs detected in sediment (PAP-00214806-807):

Site-Wide Sediment Data (organic) above ESC

Parameter (mg/kg)	ESC		Background			Site Data Summary				Frequency					
	LEL	SEL	Background Mean	Background Max	Background Mean x10	n	Min. Conc.	Max. Conc.	Avg. Conc.	# Detected	# > LEL Limit	#>SEL limit	# > Background Mean	# > Background Max	# > Background Mean x10
2-Methylnaphthalene	0.07	--	0.087	0.35	0.872	35	0	0.287	0.015	6	2	--	1	0	0
Acenaphthene	0.016	--	0.388	1.03	3.88	52	0	0.874	0.104	45	39	--	3	0	0
Acenaphthylene	0.044	--	0.038	0.099	0.383	52	0	0.215	0.04	42	14	--	17	5	0
Anthracene	0.22	3.7	0.927	2.41	9.27	52	0	1.74	0.328	50	20	0	5	0	0
Benzo(a)anthracene	0.32	14.8	3.07	5.73	30.7	52	0.029	9.22	1.19	52	39	0	5	3	0
Benzo(a)pyrene	0.37	14.4	2.7	4.77	27.0	52	0.035	9.03	1.16	52	35	0	6	3	0
Benzo(b)fluoranthene	10.4	--	3.96	6.95	39.6	52	0.062	13	1.6	52	1	--	4	3	0
Benzo(ghi)perylene	0.17	3.2	1.71	2.85	17.1	52	0.029	4.35	0.681	52	38	2	5	3	0
Benzo(k)fluoranthene	0.24	13.4	1.42	2.62	14.2	52	0.016	3.98	0.552	52	31	0	4	3	0
bis(2-Ethylhexyl)phthalate	0.182	0.75	5.12	13.4	51.2	41	0	94.6	3.47	38	23	9	2	2	1
Chrysene	0.34	4.6	3.84	6.71	38.4	52	0.042	10.3	1.38	52	39	3	4	3	0
Dibenz(a,h)anthracene	0.06	1.3	0.433	0.793	4.33	52	0	1.24	0.184	49	38	0	6	3	0
Fluoranthene	0.75	10.2	8.83	16.7	88.3	52	0.051	20.2	3.05	52	37	3	3	2	0
Fluorene	0.19	1.6	0.49	1.24	4.9	52	0	0.941	0.138	47	11	0	4	0	0
Indeno(1,2,3-cd)pyrene	0.2	3.2	1.95	3.28	19.5	52	0.026	5.3	0.778	52	37	3	5	3	0
Naphthalene	0.16	--	0.039	0.094	0.391	52	0	0.764	0.027	22	1	--	5	2	1
Phenanthrene	0.56	9.5	5.77	12.3	57.7	52	0.026	10.1	1.67	52	30	2	4	0	0
Phenol	0.049	0.048	0.077	0.33	0.774	35	0	0.133	0.004	1	1	1	1	0	0
Pyrene	0.49	8.5	6.53	11.9	65.3	52	0.06	16.5	2.44	52	40	3	6	2	0
Total PAHs	4	100	42.2	79.3	422	52	0.458	106	15.3	52	38	1	5	2	0
4,4'-DDD	0.008	0.06	0.006	0.01	0.062	43	0	0.047	0.008	39	14	0	18	10	0
4,4'-DDE	0.005	0.19	0.003	0.007	0.028	51	0	0.238	0.014	46	20	1	29	16	5
4,4'-DDT	0.008	0.71	0.003	0.005	0.035	35	0	0.017	0.005	31	9	0	23	15	0
DDT (Total)	0.007	0.12	0.013	0.019	0.125	57	0	0.241	0.029	53	40	6	25	15	5
Dieldrin	0.002	0.91	0.008	0.019	0.081	35	0	0.023	0.005	24	21	0	7	1	0
Heptachlor epoxide	0.005	0.05	0.0006	0.003	0.006	42	0	0.006	0.001	11	3	0	11	7	2

(PAP-00214806)

Site-Wide Sediment Data (inorganic) above ESC

Parameter (mg/kg)	ESC		Background			Site Data Summary				Frequency					
	LEL	SEL	Background Mean	Background Max	Background Mean x10	n	Min. Conc.	Max. Conc.	Avg. Conc.	# Detected	# > LEL Limit	#>SEL limit	# > Background Mean	# > Background Max	# > Background Mean x10
Arsenic	6	33	2.82	5.2	28.2	52	1.2	15.5	5.23	52	12	0	40	18	0
Cadmium	0.6	10	1.62	4.1	16.2	52	0.1	6.1	0.928	52	25	0	6	2	0
Chromium	26	110	73.1	162	731.1	52	5.3	70.6	25.4	52	18	0	0	0	0
Copper	16	110	93.7	252	937	52	6	261	53.7	52	47	4	5	1	0
Lead	31	250	239	1130	2392	52	5.8	676	98.1	52	41	3	3	0	0
Manganese	630	1100	164	299	1636	52	61.6	1630	423	52	13	3	43	28	0
Mercury	0.2	2	0.076	0.16	0.761	63	0	1.2	0.19	62	20	0	39	24	3
Nickel	16	75	19.1	30.4	191	52	5.9	57.4	19.2	52	31	0	21	5	0
Silver	1	--	0.69	3.1	6.9	52	0	3.6	0.593	38	7	--	17	1	0
Zinc	120	820	303	514	3026	52	24.8	819	163	52	28	0	3	2	0

(PAP-00214807)

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Honeywell International Inc.

Diamond Alkali OU2 Allocation
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Facility Data Report

HONEYWELL INTERNATIONAL INC.

Facility Name, Address and Size: Allied-Signal, Inc., Dundee Warehouse, 65 Lodi Street at Eighth St., Passaic, New Jersey; Block 1029, Lot 25 (PAP-00101453; PAS-00047956); approximately 2 acres (PAP-00198137, PAP-00198138; PAP-00456821). No information for the number of workers and shifts was available in the file material.

1. **Business Type:** Nitrating plant until 1960, and bulk acid distribution facility until 1974 to 1976. After 1976, the facility was used by Allied-Signal, Inc. (Allied-Signal) as a storage facility for engineered plastics and pellets (finished products only) (PAS-00047823).

2. **Time Period of Ownership/Operations**

Operator: 1899 - 1987 (General Chemical/Allied Chemical & Dye Corporation/Allied-Signal, Inc./Honeywell)
Owner: 1899 - 1987 (General Chemical/Allied Chemical & Dye Corporation/Allied-Signal, Inc./Honeywell)

1899: General Chemical Company purchased the site from Dundee Chemical Works on February 25, 1899 (PAP-00198129).

1915: General Chemical Company granted a portion of the site on Eighth Street and south of the General Chemical Company to Paterson Parchment Paper Company on May 14, 1915 (PAP-00198135).

1954: Allied Chemical & Dye Corporation granted a portion of the site on Eighth Street to Donori Corporation on August 30, 1954. General Chemical Company is noted to be the predecessor to Allied Chemical & Dye Corporation (PAP-00198148). A site map showed Donori Corporation was located east of the Dundee Warehouse (PAS-00048059).

1987: Allied Corporation sold facility site to Anthony R. and Elaine Triolo on May 18, 1987 (PAP-00198137-38), who subsequently sold the site to Charles Cangialosi (PAP-00198139-40).

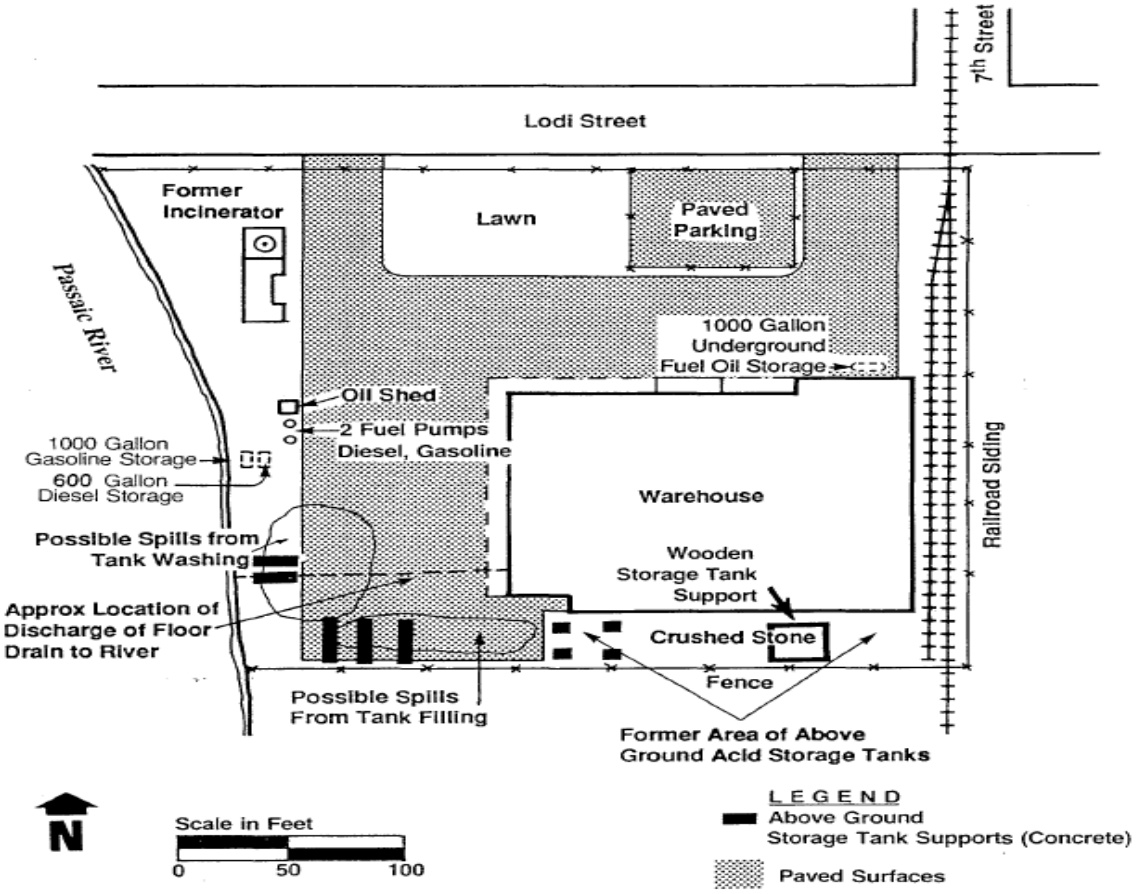
1988: According to an Environmental Cleanup and Responsibility Act (ECRA) Inspection performed on December 8, 1988, Tri-State Building Products was the new owner operating at the facility (PAS-00047956).

3. **Operational History/COC Use and Presence at the Facility**

According to the *ECRA Sampling Plan*, dated January 1987 (ECRA Sampling Plan), Allied-Signal had owned and operated the Dundee Warehouse facility since approximately 1899. The facility operated as a bulk acid distribution facility and a nitrating plant through 1960, when the nitrating operations were discontinued. The acid distribution operations were discontinued in 1974 through 1976. From 1976 through 1986, the facility was used for storage of finished plastic products (i.e., engineered plastics and pellets, such as AC Polyethylene®, Capron [Nylon]® and high density

polyethylene). At the time of the 1987 ECRA Sampling Plan, all on-site activities had been discontinued and the warehouse was vacant (PAP-00197580, 83).

A facility site map from the 1987 ECRA Sampling Plan is included below:



(PAP-00197582)

Note the potential presence of the discharge of the floor drain to the Passaic River as depicted on this figure is discussed in Section 5, Potential COC Pathways.

Hazardous substances reportedly present at the facility and listed in the ECRA Sampling Plan included fuel oil (1,000-gallon subsurface storage tank) and diesel fuel (600-gallon subsurface storage tank) (PAP-00197581). Although the specific processes used at the facility were not identified in the available in the file material, a general description of nitric acid production in the early 1900s was provided. The book *Manufactures 1905, Part IV Special Reports on Selected Industries*, from the Department of Commerce and Labor Bureau of the Census, stated that nitric acid was made commercially by distilling sodium nitrate with sulfuric acid. Sulfuric acid from the “lead pan evaporation” was reported to be used to obtain weaker grades of nitric acid (PAP-00432529-30). According to this reference, the byproduct of this process was a nitre cake, composed of sodium hydrogen sulfate or sodium bisulfate (PAP-00432532).

According to the Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, dated January 1995, nitric acid production also utilized high temperature catalytic oxidation of ammonia over a platinum catalyst. The Sanborn map from 1899 identified "platinum concentrators" adjacent to the "lead acid pans" in the "Sulphuric Acid Chambers" (the same building as the Warehouse in the figure above) (PAP-00445860). This type of process starts with the oxidation of ammonia to create nitric oxide, followed by subsequent further oxidation to nitrogen dioxide, then separation and purification steps. Potential byproducts of this process are water, nitrogen tetroxide, and gaseous nitrogen oxides (PAP-00432459-61, PAP-00432464-67).
While lead was not identified as used in the nitric acid production process, historical Sanborn facility maps from 1899, 1903, and 1910 (show the presence of lead-lined acid storage tanks and lead-lined acid pans known to be used in acid production (PAP-00445860-2).

The *Soil Investigation, Report of Findings,* dated December 5, 1989 (1989 Soil Report), and the *Determination of Ambient Site Conditions and Phase II Supplemental Sampling Report of Findings,* dated April 29, 1991 (1991 Phase II Report) summarized the results of sampling of 10 areas at the site. The areas as well as the chemicals of concern (COCs) that were detected include the following (note: concentrations are provided in the COC-specific portions of Section 4, Identified COCs):

- Sample Area A was characterized by the former presence of subsurface gasoline and diesel storage tanks. Soil sampling results detected maximum concentrations of PAHs at sampling location 1 Mid (depth of 18 to 24 inches) (PAP-00101532).

- Sample Area B was utilized for both tank washing and above ground acid storage (PAP-00101534-35). Lead and polycyclic aromatic hydrocarbons (PAHs) were detected in soils in this area with the highest concentrations in soil sample B-2 (I) and B-3 (I) respectively collected at 3 ft bgs (PAS-00047242).

- Sample Area C was a tank truck delivery area. Raw materials handled in this area included hydrochloric acid, sulfuric acid, ammonia, and liquid silicates (PAP-00101536).

- Sample Area D was the former location of aboveground acid storage tanks (PAP-00101536).

- Sample Areas E and F were characterized by the presence of surficial soil staining (PAP-00101539). The maximum lead concentration in these areas was detected in subsurface soil (PAS-00047239-41).

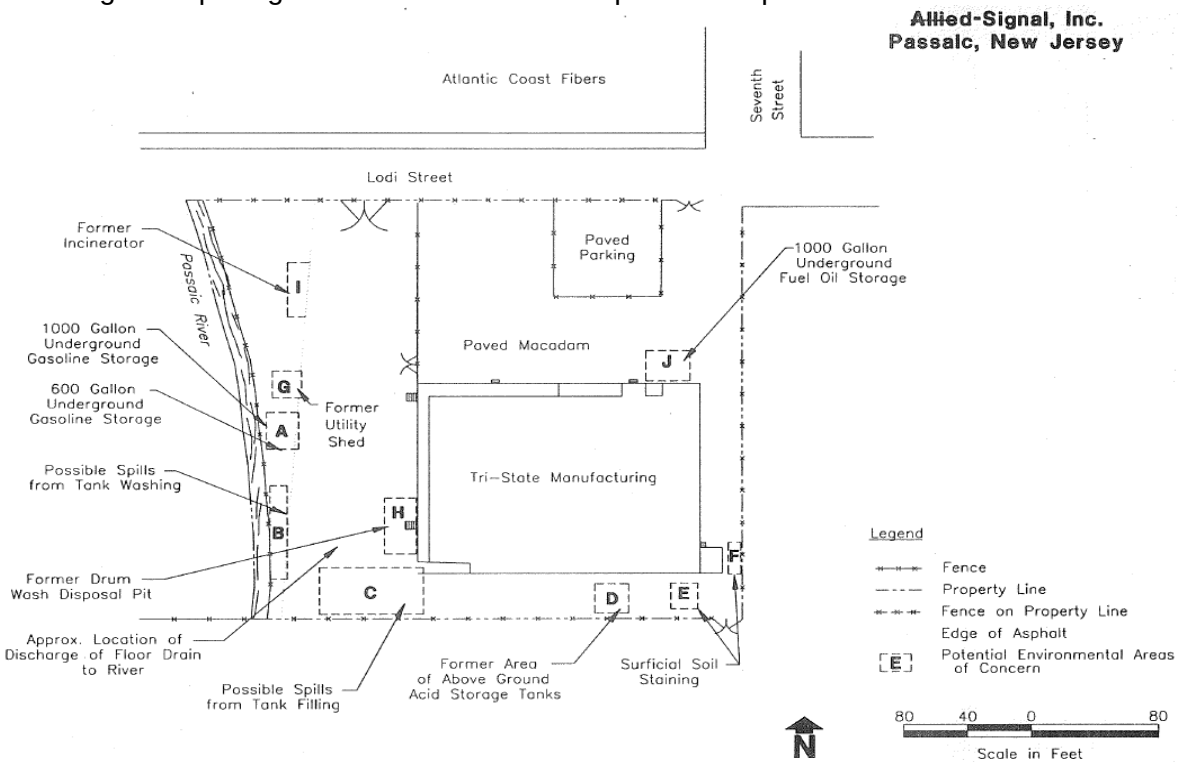
- Sample Area G was the former location of a small utility shed used for the storage of small quantities of gasoline and motor oil (PAP-00101539). Lead was detected at a maximum concentration in subsurface soil in this area (PAS-00047240).

- Sample Area H contained a former drum wash disposal pit that had been filled with cement, preventing access to the pit. The maximum mercury concentration in this area was detected at a depth of 7 to 8 feet below ground surface (ft bgs). PAHs were stated to have been detected at "low concentrations" (PAP-00101543-44). Samples were also collected upstream and downstream of a suspected pipe discharge. The referenced report stated that mercury and lead were detected in the upstream sample (identified as H4) and should, therefore, be considered as occurring as background contamination (PAP-00101546). Note that the subsequent *Report of Findings, Determination of Ambient Site Conditions and Phase II Supplemental Sampling*, dated April 29, 1991 (1991 Phase II Report) identified H5 as the upstream sample (PAS-00109682).Based upon the location of the samples in the figure on PAP-00101545 and the site layout figure above, the site is located at a jog in the Passaic River and H5 was located upstream of H4.

- Sample Area I was the former incinerator. Soil sampling identified maximum concentrations of copper and mercury in surface sample I4 (0 to 6 inches) (PAP-00101546-48). Lead was detected at maximum concentration in surface soil and PAHs were detected at maximum concentrations in subsurface soil in this area (PAS-00047227, 242).

- Sample Area J was characterized by the presence of an abandoned 1,000-gallon underground storage tank (UST) used for storage of fuel oil (PAP-00101548-50).

A figure depicting the location of each Sample Area is presented below:



(PAP-00101352)

The loading docks were located approximately 100-125 feet east of the Passaic River (PAP-00197571). The gasoline and diesel underground storage tanks (USTs) were located along the river (PAP-00101478).

4. Identified COCs

- PAHs (used, detected)
- Copper (detected)
- Lead (used, detected)
- Mercury (detected)

PAHs

USTs containing diesel fuel (600-gallon UST) and fuel oil (1,000-gallon UST) were identified in the ECRA Sampling Plan. Precision testing performed in 1986 found that the diesel and fuel oil tanks were tight. An oil shed and fuel pumps for the diesel and gasoline were also identified on site. In addition, oil staining was noted on the floor of the utility shed (PAP-00197582-83). On June 2, 1987, the diesel UST was excavated and removed (PAP-00101478). PAHs were detected in the samples collected from 18 to 24 inches beneath the base of the excavation, with the highest concentrations from beneath the diesel tank (PAP-00101479, 82).

Based on the ECRA investigations performed in the late 1980s and early 1990s, PAHs were detected at several investigative areas. Maximum detected concentrations in surface soil (0-0.5 ft bgs) at each area are provided in the following table:

Maximum PAH Concentrations in Surface Soil (0-0.5 ft bgs)			
Area	**B**	**H**	**I**
Sample	**B1**	**H5***	**I4**
benzo(a)anthracene	6.0	2.9	7.91
benzo(a)pyrene	5.0	2.1	9.23
benzo(b)fluoranthene	3.8	1.8	9.82
benzo(g,h,i)perylene	2.8	1.1	6.90
benzo(k)fluoranthene	4.2	1.5	6.84
chrysene	5.6	2.8	8.90
dibenzo(a,h)anthracene	1.2	ND	2.33
fluoranthene	10	5.5	11.4
indeno(1,2,3-cd)pyrene	ND	1.2	5.97
pyrene	17	4.5	11.2
Source	(PAP-00101556)	(PAP-00101554)	(PAP-00101560)

All results in mg/kg
ND: Not Detected

*This is a sediment sample collected from 0.5-1 ft bgs upstream from a suspected discharge pipe (PAP-00101543, 46; PAS-00109682).

The *Supplemental Project Tasks, Former Allied-Signal, Dundee Warehouse, Passaic, New Jersey, ECRA Case Number 87133*, dated January 8, 1992 (Supplemental Project Tasks Letter) estimated that the volume of soil in Area B that contained residual carcinogenic PAH compounds above the New Jersey Department of Environmental Protection (NJDEP) soil cleanup guideline of 2.5 mg/kg was approximately 22 cubic yards (PAS-00048047). In addition, the *Focused Feasibility Study and Cleanup Plan*, dated September 15, 1992 (1992 Cleanup Plan), calculated the volume of soil impacted by carcinogenic PAHs to be 47.4 cubic yards (PAP-00101433).

The *Remedial Action Report,* dated June 1994 (1994 RAR), stated that elevated concentrations of base neutral compounds in Area B may be a result of the historical operation of the site (PAS-00047832). In addition, an NJDEP approval letter, dated May 4, 1993, for the 1992 Cleanup Plan noted that the base neutral contamination detected during the August 1989 sampling event at sample locations B-1 (Area B) and I-1, I-3, and I-4 (Area I) appeared to be related to previous site operations (PAP-00101455-56).

PAHs were also detected in subsurface soil at Area A (former USTs) and Area I (former incinerator):

Maximum PAH Concentrations in Subsurface Soil			
Area	**A**	**A**	**I**
Sample (depth)	**1M (18")**	**SB6 (12-14")**	**I2 (3')**
benzo(a)anthracene	139	88	8.1
benzo(a)pyrene	21.1	70	9.7
benzo(b)fluoranthene	109*	68	10.2
benzo(g,h,i)perylene	28.7	37	6.8
benzo(k)fluoranthene	*	50	5.8
chrysene	136	93	8.0
dibenzo(a,h)anthracene	ND	21	2.8
fluoranthene	293	371	9.5
indeno(1,2,3-cd)pyrene	20.2	32	4.9
pyrene	346	156	11.9
Source	(PAP-00101552)	(PAP-00102029)	(PAP-00102026)

All results in mg/kg
ND: Not detected
*The isomers benzo(b)fluoranthene and benzo(k)fluoranthene could not be chromatographically separated under the analyte conditions for these samples. Therefore, the reported concentrations represent the total of these two isomers (PAP-00101552).

Copper

Sample Area I soil results identified copper at a maximum concentration of 257 mg/kg in surface sample I4 (PAP-00101548, 60).

Lead

Lead acid pans were located at the northwest corner of the warehouse building in the 1899 and 1903 Sanborn maps, but were “sulphur furnaces” in the 1910 map. The lead acid tank was located between the lead acid pans and the Passaic River in the 1899, 1903, and 1910 maps. A structure at the same location was present in the 1935 Sanborn map, but was not labeled (PAP-00445860-63).

Lead was detected in site soil at several areas investigated under ECRA in the late 1980s and early 1990s. The highest concentrations of lead in surface soil (0 to 6 inches) detected at each area were as follows: Area B [163 parts per million (ppm)], Area F (1,260 ppm), Area G (845 ppm), and Area I (1,610 ppm) (PAP-00101534, 39, 43, 48; PAS-00047149-50). In subsurface soil, maximum lead concentrations detected at each area were as follows: Area B (816 ppm), Area E (8,030 ppm), Area F (2,250 ppm), Area G (3,560 ppm), Area I (5,350 ppm) (PAP-00102025-28; PAS-00047150).

A 1992 Supplemental Project Tasks Letter estimated the volume of soil in Area E that contained residual lead above the NJDEP soil cleanup guideline of 1,000 mg/kg as being approximately 42 cubic yards. The volume of soil in Area I with residual lead above 1,000 mg/kg was estimated to be approximately 40 cubic yards. Soil in Area F was identified for excavation due to sample results for lead above 1,000 mg/kg, but the volume of contaminated soil was not specified (PAS-00048047-48, 50).

Areas E, F, and I also were stated to be impacted by lead in the 1992 Cleanup Plan. The volumes at each Area to be addressed in the 1992 Cleanup Plan were estimated as follows: Area E (21.3 cubic yards), Area F (13 cubic yards), and Area I (336 cubic yards) (PAP-00101367-69). The 1992 Cleanup Plan noted that these volumes were the amount of soil assumed to contain lead above the proposed Non-residential Surface Soil Cleanup Standard (PAP-00101434-36).

The 1994 RAR stated that the distribution of lead in the soil profile was sporadic and random. However, it also stated that the presence of elevated concentrations of lead, primarily in Area I, may be a result of the use of an incinerator formerly located on the site (PAS-00047832).

Mercury

Mercury was detected at two areas sampled during the ECRA investigation. At Area H, the former drum wash disposal pit, mercury was detected at 0.2, 1.1, and 1.5 mg/kg at depths of 5 to 6, and 7 to 8 feet below ground surface (bgs), respectively (PAP-00101543-44, 56). Samples were also collected from sediment located upstream and downstream of a suspected pipe discharge at Area H (1.3 and 0.3 mg/kg, respectively). The report stated that mercury was detected in the upstream sample and should, therefore, be considered to be occurring as background contamination (PAP-00101546, 54). The subsequent 1991 Phase II Report discussed the upstream and downstream sample locations as opposite to the upstream/downstream locations originally reported in the 1989 Soil Report (PAS-00109682).

At Area I, the former incinerator, soil results identified mercury at concentrations up to a maximum of 8.2 mg/kg in surface sample I4 (PAP-00101548, 60).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP. [1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00101552; PAP-00101548; PAP-00102025, 29).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	8,030 mg/kg
Copper	257 mg/kg
Mercury	8.2 mg/kg
Benzo(a)anthracene	139 mg/kg
Benzo(a)pyrene	70 mg/kg
Benzo(b)fluoranthene	109 mg/kg
Benzo(k)fluoranthene	50 mg/kg
Dibenzo(a,h)anthracene	21 mg/kg
Indeno(1,2,3-cd)pyrene	32 mg/kg

According to the 1991 Phase II Report, ambient soil was sampled to determine whether the observed constituents on site were the result of past site activities or a result of ambient conditions in the native soil/fill profile. The report states that the fill material was

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #42 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

imported and used to modify the site's topography dating back to the inception of site activities in the late 1800s (PAS-00047213). It goes on to state that the occurrence of the analytes in Areas B, E, F, and G, although at concentrations above ECRA guidelines, was considered to be within the range of expected variability based upon the range of analyte concentrations detected at background locations (PAS-00047211-12).

The 1992 Supplemental Project Tasks Letter stated that fill material had been observed at depths that vary from a minimum of approximately 3 feet in the central portion of the site to a maximum of approximately 16 feet in the vicinity of Area A. The fill was characterized by the presence of loose, poorly sorted sand, silt and clay which contained cobbles, brick, ceramics, glass, wood, and ash waste. The fill material was non-homogeneous and discontinuous across the site. In the areas adjacent to the Passaic River (Areas A and I), significant void spaces were encountered during the drilling activities (PAS-00048039).

5. COC Pathways

Sanitary Sewer

A Trip Report Memorandum, dated February 6, 1978, stated municipal water and sanitary wastes were discharged to the municipal water system (PAP-00197571).

A subsequent Trip Report Memorandum, dated April 5, 1978, documented dye tests performed to determine the discharge point from the sewers in the building floor. No dye was observed in the Passaic River, and the report concluded that both the floor drains and sanitary effluents from the warehouse discharged into the municipal sewer system (PAS-00048054).

A municipal trunk sewer line was installed beneath Lodi Street, approximately 150 feet north of the warehouse (PAS-00048054).

Storm Sewer

A storm sewer line was noted to be on site in a Trip Report Memorandum, dated April 5, 1978. The memorandum stated that a pipe entering the river was visible during periods of low river flow; however, according to the Trip Report Memorandum, it appeared that the 16-inch diameter storm sewer drain line had been tied into the municipal system (PAS-00048054).

A Plan & Profile Showing Sewer Conduits & Pipe Lines along Lodi St., dated 1938, identified a 24-inch storm sewer that ran along Lodi Street and discharged to the Passaic River (PAP-00198147).

Direct Release

A Trip Report Memorandum, dated February 6, 1978, identified “three floor drains that discharge directly into the nearby Passaic River,” but the document stated it was unknown if the drains discharged into a storm sewer or directly into the Passaic River. A

storm drain from the parking lot was also stated to discharge to the river (PAP-00197571).

A Trip Report Memorandum, dated April 5, 1978, stated that a pipe entering the river was visible during periods of low river flow; however, it appeared that the 16-inch diameter storm sewer drain line had been tied into the municipal system. Dye testing performed during the site visit determined that the floor drains and sanitary effluents from the warehouse discharged into the municipal sewer system, as no dye was noted in the Passaic River at the proximate location of the sewer (PAS-00048054).

Facility maps from 1965 and 1969 show a 16-inch concrete sewer running across the northern end of the warehouse building and to the Passaic River (PAS-00048059-60), but this feature is not shown on other maps from 1918, 1954, 1974 and 1980. In addition, none of the maps show floor drains in the building connected to the concrete sewer or to the Passaic River as shown in the figure in Section 3 of this report (PAS-00048056-62).

According to the ECRA Sampling Plan, the interior of the warehouse had several floor drains that were believed to be connected to one conduit that ultimately discharged to the Passaic River (PAP-00197583). However, the *ECRA Sampling Plan Addendum*, dated February 1989, stated that the floor drains had been filled with cement, so access to these structures was no longer possible. In addition, the “drainage location, if any,” of the conduit that may have drained to the Passaic River was unknown (PAP-00101494, 98).

According to a letter report regarding the Supplemental Project Tasks, Former Allied-Signal, Dundee Warehouse, Passaic, New Jersey, ECRA Case Number 87133, dated January 8, 1992 (Supplemental Project Tasks Letter), it was proposed to use ground penetrating radar (GPR) or other appropriate geophysical surveying techniques to locate the suspected outfall pipe to the Passaic River. A sample would be collected if the pipe was located (PAS-00048049). No records of these samples and no further information for the geophysical survey results were provided in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

The facility was inspected by the NJDEP as part of the ECRA review process on December 8, 1988. The inspection identified several deficiencies in the proposed characterization activities that would be addressed in the Sampling Plan (PAS-00047955-58).

Violations

There is no information regarding violations in the available file material.

Permits

A Trip Report Memorandum, dated February 6, 1978, stated the facility did not have any NJDEP or National Pollutant Discharge Elimination System (NPDES) permits (PAP-00197570). At this time, no manufacturing activities were taking place at the facility as it was being used for finished plastic storage (PAP-00197580).

7. Response Actions

Characterization Activities

The following characterization reports have been published for the facility:

- 1989 Soil Report prepared by Environmental Resources Management, Inc. (PAP-00101521)
- *Report of Findings, Supplemental Sampling*, dated August 3, 1990 (Supplemental Sampling Report), prepared by Environmental Resources Management, Inc. (PAP-00101995).
- *Report of Findings, Determination of Ambient Site Conditions and Phase II Supplemental Sampling*, dated April 29, 1991, prepared by Environmental Resources Management, Inc. (PAS-00047158).
- 1994 RAR, submitted by AlliedSignal Engineered Materials (PAS-00109740).

Soil

In general, soil sampling in the late 1980s and early 1990s under ECRA found concentrations of lead and PAHs above the ECRA guidelines. PAHs were detected in samples collected at Area A from the base of the 1987 UST excavation, with the highest concentrations from beneath the diesel tank (PAP-00101479, 82). The 1994 RAR stated that elevated concentrations of base neutral compounds in Area B may be a result of the historical operation of the site (PAS-00047832). The highest concentrations of lead were detected in subsurface soil at Area E (8,030 ppm) (PAP-00102025-28). The 1994 RAR stated that the distribution of lead in the soil profile was sporadic and random. However, it also stated that the presence of elevated concentrations of lead, primarily in Area I, may be a result of the use of an incinerator formerly located on the site (PAS-00047832).

Copper and mercury were also detected in site soil. At Area H, the former drum wash disposal pit, mercury was detected at 1.1 and 1.5 mg/kg at depths of 5 to 6 and 7 to 8 ft bgs, respectively (PAP-00101543-44), while Area I soil results detected copper with a maximum of 257 mg/kg in surface sample I4 (PAP-00101548, 60).

The 1989 Soil Report and 1991 Phase II Report summarized the results for sampling of 10 areas at the site. Areas where COCs were detected include the following:

- Sample Area A was characterized by the former presence of subsurface gasoline and diesel storage tanks. Soil sampling results detected maximum concentrations of PAHs at sampling location 1 Mid (depth of 18 to 24 inches) (PAP-00101532).

- Sample Area B was utilized for both tank washing and above-ground acid storage. Lead was detected at 163 mg/kg in a surface sample (0 to 6 inches depth), and PAHs were detected at maximum concentrations in soil sample B-3 (I) at 3 ft bgs (PAP-00101534-35; PAS-00047242).

- Sample Areas E and F were characterized by the presence of surficial soil staining (PAP-00101539). Concentrations of lead ranged from a minimum of 32 mg/kg in E-1 (I) (0.5 to 1 ft bgs) to a maximum of 8,030 mg/kg in E-4 (I) (0.5 to 1 ft bgs) (PAS-00047239).

- Sample Area G was the former location of a small utility shed used for the storage of small quantities of gasoline and motor oil (PAP-00101539, 42-43). Lead was detected up to a maximum concentration of 3,560 mg/kg in soil sample G-1 (I) from 3 ft bgs (PAS-00047240).

- Sample Area H contained a former drum wash disposal pit area that has been filled with cement preventing access to the pit. Mercury was detected at 1.5 mg/kg at a depth of 7 to 8 ft bgs (PAP-00101543-44). PAHs were detected at low concentrations (PAP-00101543-44). Samples were also collected upstream and downstream of a suspected pipe discharge. The report stated that mercury and lead were detected in the upstream sample and should therefore be considered as occurring as background contamination (PAP-00101546). The subsequent 1991 Phase II Report discussed the upstream and downstream sample locations as opposite to the upstream/downstream locations originally reported in the 1989 Soil Report (PAS-00109682).

- Sample Area I was the former incinerator. Soil results detected copper (maximum of 257 mg/kg; sample I4), mercury (8.2 mg/kg; sample I4), (PAP-00101548), and lead (maximum of 5,350 mg/kg; sample I-3 (I)) (PAS-00047242). PAHs were also detected at maximum concentrations in samples SB-6 (PAS-00047238).

- Sample Area J was characterized by the presence of an abandoned 1,000 gallon UST used for storage of fuel oil. PAHs were detected below the quantitation limit of the analytical procedure at 7 to 8 ft bgs (PAP-00101548-50).

Additional sampling to delineate the vertical extent of contamination was reported in the 1990 Supplemental Sampling Report. The report stated that base neutral compounds and lead exhibited a relatively ubiquitous distribution across the site. With the exception of areas A, G and I, no definable centroids of contamination were isolated. The report

stated that nonindigenous fill material may be acting as a residual contaminant source beneath the site (PAP-00102041).

Sampling of four background soil borings from the perimeter of the site was performed in 1991 to determine the ambient soil conditions, according to the *Report of Findings Determination of Ambient Site Conditions and Phase II Supplemental Sampling*, dated April 29, 1991. Lead was detected at concentrations ranging up to a maximum of 1,120 mg/Kg in the 0 to 2 foot sample interval of BG-4 (PAS-00047195-96). Total base neutral organic compounds were detected at a maximum of 158,400 µg/kg from within the fill material. The report concluded that lead and base neutral organic compounds were detected at elevated levels in the background locations, and fill material has impacted the native soil. The report also stated, "the occurrence of the analytes in Areas B, E, F, and G, although at concentrations above ECRA guidelines, is considered to be within the range of expected variability based upon the range of analyte concentrations detected at background locations" (PAS-00047211-12).

Sediment

Samples at Area H were collected from Passaic River sediment upstream of and downstream from a suspected drain pipe. The 1989 Soil Report stated that mercury, lead, and semivolatile organic compounds were detected in the upstream sample and should therefore be considered to be as occurring as background contamination (PAP-00101546). However, it is noted that the subsequent 1991 Phase II Report discussed the upstream and downstream samples as located in opposite directions compared to the upstream/downstream locations originally reported in the 1989 Soil Report (PAS-00109682). Concentrations were as follows:

Sediment Sample Concentrations		
COC (mg/kg)	**H4 (downstream)**	**H5 (upstream)**
Lead	369	101
Mercury	1.3	0.3
Copper	101 J	32 J
Benzo(a)anthracene	1.6	2.9
Benzo(a)pyrene	1.6	2.1
Benzo(b)fluoranthene	1.5	1.8
Benzo(k)fluoranthene	1.3	1.5
Dibenzo(a,h)anthracene	0.6	1.2
Indeno(1,2,3-cd)pyrene	ND	ND

ND: Not Detected
J: estimated concentration (PAP-00101554)

Remedial Activities

NJDEP approved the 1992 Cleanup Plan in a letter dated May 4, 1993 with the following conditions. The letter stated that active remediation of lead was not required by NJDEP due to the apparent sporadic distribution of the lead across the facility. However, the asphalt pavement to be placed over the impacted areas should cover all areas of the site

that were unpaved at that time unless soil sampling was performed to confirm the absence of contamination in exposed areas. In addition, the letter stated that the base neutral contamination detected during the August 1989 sampling event at sample locations B-1 (Area B) and I-1, I-3, and I-4 (Area I) appeared to be related to previous site operations. However, it stated that institutional controls proposed to address site-wide arsenic and lead contamination would also be adequate to address the base neutral contamination. In addition, a Declaration of Environmental Restrictions was required to ensure that the site remained industrial and that the asphalt cap was not disturbed without prior NJDEP notification and proper health and safety precautions (PAP-00101455-56).

The 1994 RAR documented how each area of concern was addressed. Areas A, B, G, and I were capped with a 3-inch stabilized base and 2-inches of asphalt. Areas E and F were capped with a permeable geomembrane and 5-inches of stone (PAS-00109757).

A Remedial Action Protectiveness/Biennial Certification Form - Soil was submitted to NJDEP on June 24, 2013, for the existing deed notice at the Dundee Warehouse property (PAP-00432471). The form included the Declaration of Environmental Conditions, dated March 1, 1994, which limited all alterations, improvements, and disturbances of the affected areas to require previous written consent from NJDEP (PAP-00432479-80). The Remedial Action Permit Application – Soil noted that the Deed Notice was for historic fill at the site (PAP-00432474).

A Soil Remediation Permit was granted to Charles Cangialosi, President of Cangialosi Family Realty LLC by NJDEP on August 28, 2013, to conduct monitoring, maintenance, and evaluation to maintain compliance and effectiveness of the remedial action and its associated institutional and engineering controls (PAP-00432521).

8. Summary of Asserted Defenses

Honeywell asserts that any releases of PAHs at the site were the result of releases of petroleum or fuel oil, which are excluded from CERCLA liability under the petroleum exclusion. See 42 U.S.C. §9601(14); see also Scope of CERCLA Petroleum Exclusion Under Sections 101(14) and 104(a)(2), Memorandum from Francis S. Blake, General Counsel to J. Winston Porter, Assistant Administrator for Solid Waste and Emergency Response, OSWER 9838.1, U.S. EPA, July 31, 1987, at 5.

Diamond Alkali OU2 Allocation
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Facility Data Report

ISP CHEMICALS LLC

Facility Name, Address and Size: ISP Van Dyk, Inc. (ISP), 11 William Street, Belleville, New Jersey (PAS-00010070); 2 parcels, 0.79 acres (chemical plant south of William Street) and 1.49 acres (2 warehouses north of William Street) (PAS-00110586); operated 24 hours/day, 7 days/week; 30 employees (20 operators, 4 shift supervisors, and 6 maintenance mechanics staffed the plant) (PAP-00094606).

1. **Business Type:** Manufacture of specialty chemicals for the personal care industry, such as sunscreens and cosmetic chemicals for both skin care and hair care (PAP-00094606).

2. **Time Period of Ownership/Operations**

   Operator: 1992 to 2001
   Owner: 1992 to present

   1992: International Specialty Products acquired Van Dyk in 1992. ISP Van Dyk, Inc. was a wholly owned subsidiary of International Specialty Products (PAP-00094606). On March 31, 1992, ISP Van Dyk, Inc. purchased the property from Mallinckrodt, Inc. (PAP-00092134; PAS-00010177, 90). Mallinckrodt, Inc. sold the fixed and operating assets of Van Dyke & Company, including the real property at the Belleville facility, to ISP (PAS-00110293).

   2001: ISP Van Dyk, Inc. ceased operations at the facility on or about March 31, 2001 (PAS-00110294). On June 27, 2001, the site was granted from ISP Van Dyk, Inc. to ISP Chemicals LLC (PAS-00010180), and on June 29, 2001, ISP Van Dyk, Inc. merged into ISP Chemicals Inc. (PAS-00010189). ISP Chemicals, Inc. is the corporate successor to ISP Van Dyk, Inc. (PAS-00110294).

   2010: The buildings on the parcel south of William Street were demolished from June 2010 to March 2011. The parcel to the north of William Street was predominantly utilized for warehouse space and employee parking, and continues to be used for document storage by ISP (PAP-00093884).

3. **Operational History/COC Use and Presence at the Facility**

   According to the *Preliminary Assessment for the ISP Chemicals Inc. Facility*, dated April 12, 2002 (2002 Preliminary Assessment), ISP produced and manufactured personal care and cosmetic ingredients (PAP-00092159). A letter from ISP to EPA, dated June 17, 2005, stated that the cosmetic products included a main component in sunscreens (ultraviolet absorbers), emulsifiers, and emollients (PAS-00110586).

   A *Description of Process and Manufacturing Activities Since Acquisition in 1992* (Description of Activities) was prepared by the production supervisor for ISP Van Dyk and dated December 3, 2001. The 2001 Description of Activities stated that the facility separated its product lines by building. Buildings 3, 4, and 4A were primarily dedicated to the manufacture of sunscreen products, which involved creating the ester or "crude" in glass-lined carbon steel reactors. The sunscreens then would undergo a purifying step

by distillation in stainless steel batch distillation units. In addition, cosmetic products requiring solvents, strong acid catalyst, or activated carbon treatment and filtration were produced in Building 4. All other cosmetic products were manufactured in Building 7. The cosmetic product line primarily manufactured in stainless steel reactors were fatty acid-based esters that were either packaged as a liquid or flaked prior to packaging. The plant had two "hot rooms" for re-mobilizing solidified material charged as a liquid (PAP-00094609).

The 2001 Description of Activities also provided a list of each of ISP's products and associated raw materials and manufacturing processes. No chemicals of concern (COCs) were identified on this list (PAP-00094616-75). In addition, a list of chemicals handled at the facility was compiled by ISP in 1995, but did not include any COCs (PAP-00094082).

A list of chemicals that have been used at the property was compiled in the 2002 Preliminary Assessment using Material Safety Data Sheets available from historical operations at the facility. The table included copper chloride 99.995%, copper iodide 99.999%, copper cyanide 99%, mercury, and polychlorinated biphenyls (PCBs) (PAP-00092198, 201-202). However, the document does not specify to what timeframe this list of chemicals used at the facility corresponds. It is noted that the 2002 Preliminary Assessment also stated that ISP never used any substances containing PCBs or mercury (PAP-00092160).

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (used)
- Lead (detected)
- Mercury (detected)

PCBs

The 2002 Preliminary Assessment stated that ISP never used any substances or chemicals containing PCBs (PAP-00092160). In addition, according to an undated list titled Soil Delineation Status and provided as part of the "Changes Made by ISP (1992 to 2001)" document, ISP did not use nor manufacture PCBs (PAS-00110305). The 2002 Preliminary Assessment stated that PCB contamination of various areas within the facility occurred as a result of the PCB-containing heating oil leaking from valves or other fixtures in the oil lines of the hot oil heating system operated by Van Dyk, Inc. prior to 1979 (PAP-00092136). According to a letter from ISP to EPA, dated June 17, 2005, process oil containing PCBs was utilized from 1965 to 1979 as part of the manufacturing process to heat reaction vessels in Building 7 and distillation columns in Building 4. On July 16, 1979, the entire oil system was drained and cleaned to remove PCB contaminated oil in accordance with requirements set forth by the Toxic Substances Control Act (TSCA) (PAS-00110586).

A list of chemicals that have been used at the property was compiled in the 2002 Preliminary Assessment using Material Safety Data Sheets available from historical operations at the facility. The table included PCBs (PAP-00092202). However, the document does not specify to what timeframe this list of chemicals used at the facility corresponds.

ISP Chemicals LLC

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As discussed in the 2002 Preliminary Assessment, PCBs were detected on site soil and remedial excavations were performed by the previous owner, Avon Products, Inc. (Avon). The document stated that Avon was the responsible party (PAP-00092138-40, 61, 80). According to a letter from ISP to EPA, dated June 17, 2005, Avon hired IT Corp. to delineate PCB contamination at the site, which was completed in 1995 (PAS-00110585-86). Maximum concentrations of PCBs in soil samples at identified areas of concern (AOCs) as presented in the *Remedial Investigation Report*, dated August 15, 2006 (2006 RI Report) and the *Remedial Investigation/Remedial Action Progress Report*, dated October 27, 2011 (RI/RA Progress Report) are as follows (see Section 7 for a description of each AOC):

Maximum PCB Concentrations in Soil at Each AOC			
AOC	**PCBs (mg/kg)**	**Sample ID**	**Depth (ft bgs)***
AOC 1 [Fuel Oil Underground Storage Tanks (USTs]	4.63	A1-SS-7A	4.5-5
AOC 4 (Alleyway)	15,800	A27-13A**	1-1.5
AOC 5 (Drum Storage Areas)	0.972	A5B-1B	4.5-5
AOC 7 (Beneath Boiler Room)	10,000	B-15	7-9
AOC 11 (Building No.4 Vent Staining)	4.88	A11-SS-1A	0-0.5
AOC 13 (Building No.7 Hot Room)	0.3254	A27-51C	1.5-2.0
AOC 14 (Historic Filling Station)	0.764	A14-SS-1	4.5-5
AOC 16A (Building No.1 Subsurface Conditions)	2.3	A16A-4A	0-0.5
AOCs 6, 21, 22, 23, 24, 25, and 26 (Floor Staining, Cracks and Deterioration)	336	SB-4B	1-1.5
AOC 27 (Manufacturing Facility Drainage)	15,800	A27-13A**	1-1.5

(PAP-00092622, 24, 26, 28, 32, 34, 65, 71, 72, 74; PAP-00093930)
ft bgs: feet below ground surface
mg/kg: milligrams/kilogram
* The soil boring logs in Appendix F of the 2006 RI Report show that most of the referenced sample locations in this table were covered with 5 to 8 inches of concrete. Only the boring A11-SS-1 at AOC 11 was not installed through concrete (PAP-00092377, 399, 430, 434, 441, 447, 470, 510). The sample at AOC 7 was collected from beneath Building 2 (PAP-00093930).
** Note this appears to be the same sample reported in the 2006 RI Report for both AOCs.

PAHs

Fuel oil underground storage tanks (USTs) were used at the facility as identified in the 2002 Preliminary Assessment:

- Two 25,000-gallon fuel oil USTs were located in the alleyway between Buildings No. 1 and No. 4. The southern tank was reported to have leaked and been abandoned in place by previous site owner Avon in 1993. The northern tank was abandoned in place by ISP on January 16, 1999. The tank was reportedly in good condition with no visibly-observable holes or cracks (PAP-00092137).

- A former 1,000-gallon No. 2 fuel oil UST was located adjacent to the southwestern corner of the facility warehouse building adjacent to William Street. This UST was abandoned in place by ISP on February 23, 1999. The tank was reportedly in good condition with no visibly observable rust holes (PAP-00092141).

- A former 550-gallon No. 2 fuel oil UST was located adjacent to the west side of the warehouse. On September 30, 1998 this 550-gallon UST was excavated and removed (PAP-00092142).

Based on a review of the 2006 RI Report data tables, PAHs were detected at several AOCs. A map depicting the AOC locations is provided in Section 7. Maximum concentrations were detected at the following AOCs:

Maximum PAH Concentrations (in mg/kg) in Soil			
AOC	**4**	**6**	**27**
Sample	**B-30A (1-1.5 ft bgs)**	**SB-11A (0.5-1 ft bgs)**	**A27-9A (2-2.5 ft bgs)**
benzo(a)anthracene	0.944	2.05	8.05
benzo(a)pyrene	1.98	1.51	7.64
benzo(b)fluoranthene	2.14	1.32	5.80
benzo(g,h,i)perylene	1.41	0.880	4.62
benzo(k)fluoranthene	1.55	1.06	5.56
chrysene	6.01	2.85	8.58
dibenzo(a,h)anthracene	0.248 J	0.307	1.58
fluoranthene	0.595	5.71	16.9
indeno(1,2,3-cd)pyrene	0.943	0.914	4.39
pyrene	2.50	5.74	17.7
Source	(PAP-00092651-52)	(PAP-00092681-82)	(PAP-00092687-88)

J: estimated concentration

The *Soils Remedial Action Workplan*, dated October 2008 (Soils RAWP) attributed the detections of PAHs in site soil to the presence of fill material used during construction and grading of the facility (PAP-00099895, 912).

Copper

The 2002 Preliminary Assessment identified copper chloride 99.995%, copper iodide 99.999%, copper cyanide 99% as being used at the site based on Material Safety Data Sheets available from historical operations at the facility (PAP-00092198). The 2002 Preliminary Assessment did not specify the timeframe that copper was used at the facility, and available records did not provide information regarding the use of copper at the facility. No sampling data for copper were identified in the available file material.

Lead

According to the 2006 RI Report, lead was detected at one AOC (AOC 14, Historic Filling Station), at a maximum concentration of 299 mg/kg and a depth of 5.5-6.0 feet below ground surface (ft bgs). Only subsurface soil was sampled in this area. However, the RI Report stated that this AOC was identified based on 1951 and 1961 Sanborn maps, which depicted a filling station with two USTs. A chain of title search stated that Tulsa Oil Company owned a portion of the property north of William Street from 1947 to 1976 (PAP-00092601, 30, 72).

Mercury

The 2002 Preliminary Assessment stated that ISP never used any substances or chemicals containing mercury (PAP-00092160). In addition, according to an undated list titled Soil Delineation Status, ISP did not use nor manufacture mercury (PAS-00110305). According to the 2011 RI/RA Progress Report, the Napier Hat Company historically may have used site buildings or portions of the site for their operations in the early 1900s. Since the hat manufacturing process involved the use of mercury salts, the document stated that those operations are believed to be the source for low levels of mercury found in some soil samples on the site (PAP-00093883).

A list of chemicals that have been used at the property was compiled in the 2002 Preliminary Assessment using Material Safety Data Sheets available from historical operations at the facility. The table included mercury (PAP-00092201). However, the document does not specify to what timeframe this list of chemicals used at the facility corresponds. Mercury was detected at several AOCs as identified in the 2006 RI Report:

Maximum Mercury Concentrations in Soil at Each AOC			
AOC	**Mercury (mg/kg)**	**Sample**	**Depth (ft bgs)***
AOC 1 (Fuel Oil USTs)	3.2	A1-SS-8B	10-10.5
AOC 4 (Alleyway)	11.7	A27-13A	1-1.5
AOC 5 (Drum Storage Areas)	14.8	A5B-4A	0-0.5
AOC 7 (Beneath Boiler Room)	1.9	B-3B	9.5-10.0
AOC 11 (Building No.4 Vent Staining)	4.6	A11-SS-1A	0-0.5

Maximum Mercury Concentrations in Soil at Each AOC			
AOC	**Mercury (mg/kg)**	**Sample**	**Depth (ft bgs)***
AOC 12 (Building No.3 Storage Room Floor/Wall Gap)	1.5	A12-SS-1A	0-0.5
AOC 13 (Building No.7 Hot Room)	0.19	A27-51A	0-0.5
AOC 16A (Building No.1 Subsurface Conditions)	16.4	A16A-2A	0-0.5
AOCs 6, 21, 22, 23, 24, 25, and 26 (Floor Staining, Cracks and Deterioration)	180	SB-4A	0-0.5
AOC 27 (Manufacturing Facility Drainage)	84	A27-23A	0.5-1

(PAP-00092626, 30-32, 35, 50, 58, 64-65, 67, 69, 71)
* The soil boring logs in Appendix F of the 2006 RI Report show that most of the referenced sample locations in this table were covered with 4 to 21 inches of concrete. Only the boring A11-SS-1 at AOC 11 and A27-51 at AOC 13 were installed at the surface without first drilling through concrete (PAP-00092378, 402, 404, 430, 432, 439, 447, 470, 509).

According to an undated list titled Soil Delineation Status and provided as part of the "Changes Made by ISP (1992 to 2001)" document, mercury was present in samples of floor sweepings up to a maximum concentration of 19 parts per million (ppm), and mercury was present in concrete flooring to a maximum level of 4.5 ppm (PAS-00110304).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead,

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #41 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current

copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, lead and mercury detected at the site in soils are presented in the table below (PAP-00092632, 72, 87-88).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	299 mg/kg
Mercury	180 mg/kg
Benzo(a)anthracene	8.05 mg/kg
Benzo(a)pyrene	7.64 mg/kg
Benzo(b)fluoranthene	5.80 mg/kg
Benzo(k)fluoranthene	5.56 mg/kg
Dibenzo(a,h)anthracene	1.58 mg/kg
Indeno(1,2,3-cd)pyrene	4.39 mg/kg

The 2008 Soils RAWP attributed the detections of PAHs in site soil to the presence of fill material used during construction and grading of the facility (PAP-00099895, 912).

5. COC Pathways

Sanitary Sewer

The 2001 Description of Activities stated that contact process wastewater was treated separately for both manufacturing buildings. Contact process wastewater generated in Building 7 was treated for pH if necessary in an available reactor prior to discharge. Wastewater generated in Buildings 3, 4, and 4A was treated by a neutralization system for pH prior to discharge into the sewer. The neutralization system in Building 4A was installed in 1995. In October 1997, an open trench drainage system in Buildings 4 and 4A was removed and collection sumps were installed throughout the buildings. The floors were pitched toward the sumps for proper drainage. Level switches triggered pumps which transferred the collected water to the overhead piping to the wastewater connection to the Passaic Valley Sewerage Commission (PVSC) (PAP-00094608-10).

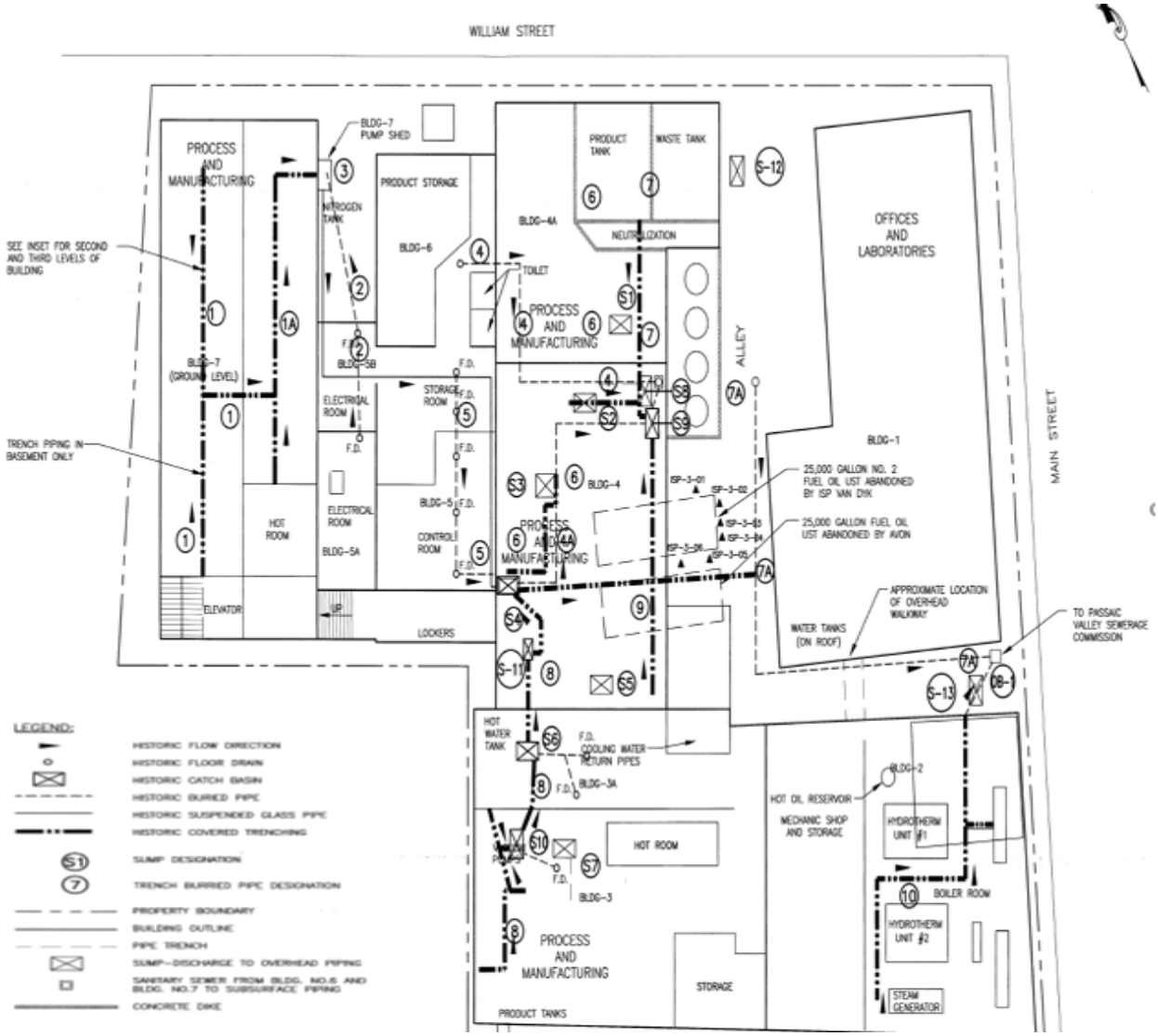
In October 1999, the wastewater outfall system was modified to include additional monitoring equipment, interlocks, piping changes and a tank installation. All water leaving the plants and labs was monitored continuously for lower explosive limit (LEL) and pH (PAP-00094608-10). According to the 2002 Preliminary Assessment, process water from Buildings 3, 4, and 7 was pumped into a wastewater tank prior to discharging to the PVSC (PAP-00092166).

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version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

A map of the historical floor drains, catch basins, and trenches was provided in a letter to NJDEP dated February 25, 2005 (see below). This figure also shows that the site connects to the PVSC sewer under Main Street (PAP-00098699). ISP has submitted specific documentation that the company asserts confirms that there is no combined sewer overflow (CSO) in the vicinity of the Belleville Site. The Allocation Team will take this information into account in its review of relevant sewer systems (PAP-00095359)"



Direct Release

There is no information regarding direct releases in the available file material.

Spills

There is no information regarding COC spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

According to the 2002 Preliminary Assessment, the property was inspected by a representative of the NJDEP on June 14, 2001. The NJDEP inspector noted several areas of stained floors, paving, and walls during the site inspection. The NJDEP inspector required that ISP identify each area, provide its location, identify the substances that were discharged to these areas, and determine whether the discharge had impacted the soil and/or groundwater beneath the subject property (PAP-00092135-36). It is unclear if COCs were associated with these areas.

Violations

As discussed in the 2002 Preliminary Assessment, the PVSC did not note any violations associated with COCs as of January 2, 2002 (PAP-00092176).

Permits

According to a 1999 Superior Court case between the PVSC and ISP (Docket No. C-210-99), the PVSC issued Sewer Connection Permit No. 01407090, with an effective date of July 14, 1997 and an expiration date of July 13, 2002 (PAP-00095324). The permit was not identified in the available records.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- 2002 Preliminary Assessment, prepared by URS Corporation (PAP-00092119). *Baseline Ecological Evaluation for the ISP Chemicals Inc. Facility*, dated August 15, 2006, prepared by URS Corporation (PAP-00092964).
- 2006 RI Report prepared by URS Corporation (PAP-00092577).
- 2008 Soils RAWP, prepared by Geosyntec Consultants (PAP-00099868).
- 2011 RI/RA Progress Report, prepared by Geosyntec Consultants (PAP-00093871).

Soil

The 2002 Preliminary Assessment identified 14 AOCs at the site (PAP-00092136-37). Note that several of the AOCs were not attributed to ISP, and previous owner Avon Products, Inc. was identified as the responsible party. The 14 AOCs were as follows:

- AOC 1: Two 25,000-gallon Fuel Oil USTs Located in the Alleyway Between Buildings No. 1 and No. 4. The southern tank was stated to have leaked and been abandoned in place by previous site owner, Avon Products, Inc., in 1993. The northern tank was abandoned in place by ISP on January 16, 1999. The

tank was reportedly in good condition with no visibly-observable holes or cracks (PAP-00092137).

- AOC 2: Suspected 1,000-Gallon No. 2 Fuel Oil. This UST was determined not to exist (PAP-00092138).

- AOC 3: Exterior Stained Soil Areas Located at the Rear Portions of the Main Manufacturing Building. PCBs were detected at 1.9 ppm in soil, but Avon Products, Inc. was identified as the responsible party and excavated the soil (PAP-00092138-39).

- AOC 4: Main Manufacturing Building Alleyway Soil Contamination. Soil was collected from beneath the main manufacturing building alleyway in 1986. The PCB concentration at 0 to 2.0 ft bgs was 1,300 ppm and the PCB concentration at 6.0 to 8.0 ft bgs was 3.0 ppm (PAP-00092139).

- AOC 5: Drum Storage Areas. Raw and finished materials were stored in the covered outdoor storage area and hazardous waste for disposal was stored in the open outdoor storage area. The 2002 Preliminary Assessment stated there have been no reported spills in the area, the area is paved with asphalt, and no staining or other evidence of a release was observed during a site inspection (PAP-00092139-40).

- AOC 6: PCB Contaminated Building Interior Surfaces. PCBs were detected in chip samples collected from the ceilings, walls, and floors of the buildings in 1986 (PAP-00092140).

- AOC 7: PCB Soil Contamination Located Beneath the Boiler Room Floor. Soil sampling conducted beneath the floor of the boiler room revealed that PCB soil contamination was present at concentrations up to 10,000 ppm. Avon Products, Inc. was identified as the responsible party (PAP-00092140). As stated in the 1994 RI Report prepared by IT Corporation: "There were eight soil borings of the 20 which were advanced along the boiler room/property line perimeter, four each on the eastern and southern property lines… Analytical results of the PCB analysis of these soil samples state there is no surficial or deep PCB soil contamination extending beyond the facility boiler room/property." Total PCB concentrations collected at either one to three feet (four samples along eastern property line; paved surface) or zero to two feet (four samples along southern property line; unpaved surface) below grade, ranged from 0.018 mg/kg to 0.49 mg/kg. Total PCB concentrations in deeper soil samples ranged from not detected to 16 mg/kg (PAP-00101162).

- AOC 8: Former 1,000-Gallon No. 2 Fuel Oil UST. The former 1,000-gallon No. 2 fuel oil UST was located adjacent to the southwestern corner of the facility warehouse building adjacent to William Street. This UST was abandoned in place by ISP on February 23, 1999. The tank was reportedly in good condition with no visibly observable rust holes (PAP-00092141).

- AOC 9: Former 550-Gallon No. 2 Fuel Oil UST. This UST was located adjacent to the west side of the warehouse north of AOC 8. On September 30, 1998, this 550-gallon UST was excavated and removed (PAP-00092142).

- AOC 10: Groundwater Monitoring Well No. 2 (MW-2). A Classification Exception Area (CEA) was established for groundwater based on the presence of PCBs in samples collected from monitoring well MW-2. The NJDEP approved the CEA in a letter dated December 18, 1996 (PAP-00092142).

- AOC 11: Building No. 4 Vent Staining. Black staining from a vent pipe on the roof of Building No. 4 was observed on the roof, the side of the building, and on the landscape stone area below during an initial site inspection (PAP-00092185).

- AOC 12: Building No. 3 Storage Room Floor/wall Gap. An open trench between the wall and floor approximately four inches wide was observed at the eastern side of the room near Tank No. 455, and a one-inch gap between the wall and floor was observed at the southern side of the room. The trench was concrete-lined, but a small crack (approximately 0.1 inch in width) was observed between the wall and the bottom of the south trench. An oily absorbent boom was observed in the trench and the floor and walls appeared to be oil stained PAP-00092186).

- AOC 13: Building No. 7 Hot Room. A small area of deteriorated concrete with exposed soil below was noted in the hot room floor (PAP-00092186).

- AOC 14: Historic Filling Station. The portion of the property located to the north of William Street and at the northwest comer of the intersection of William and Main Streets was noted to be a filling station with two underground storage tanks in 1951 and 1961 Sanborn maps (PAP-00092186-87).

The AOCs relevant to ISP operations included the fuel oil USTs (AOC 1, 8, and 9), drum storage areas (AOC 5), staining on the facility buildings (AOCs 11 and 12), and deteriorated concrete (AOC 13) (PAP-00092137, 39-40, 42, 85-86).

Additional AOCs were identified in the 2006 RI Report:

- AOC 15: 1993 Toluene Spill

- AOC 16/16A: Building No. 1 Elevator Hydraulic Fluid and Subsurface Conditions. A sample of oil from the elevator drip pan in Building No. 1 was reported in 1987 to have had a PCB concentration of 56 ppm, possibly from the elevator hydraulic oil itself.

- AOC 17: Staining Present on Floors and Walls in Building No. 2.

- AOC 18: Building No. 3 Hot Room. Heavy staining was noted to be present in four troughs.

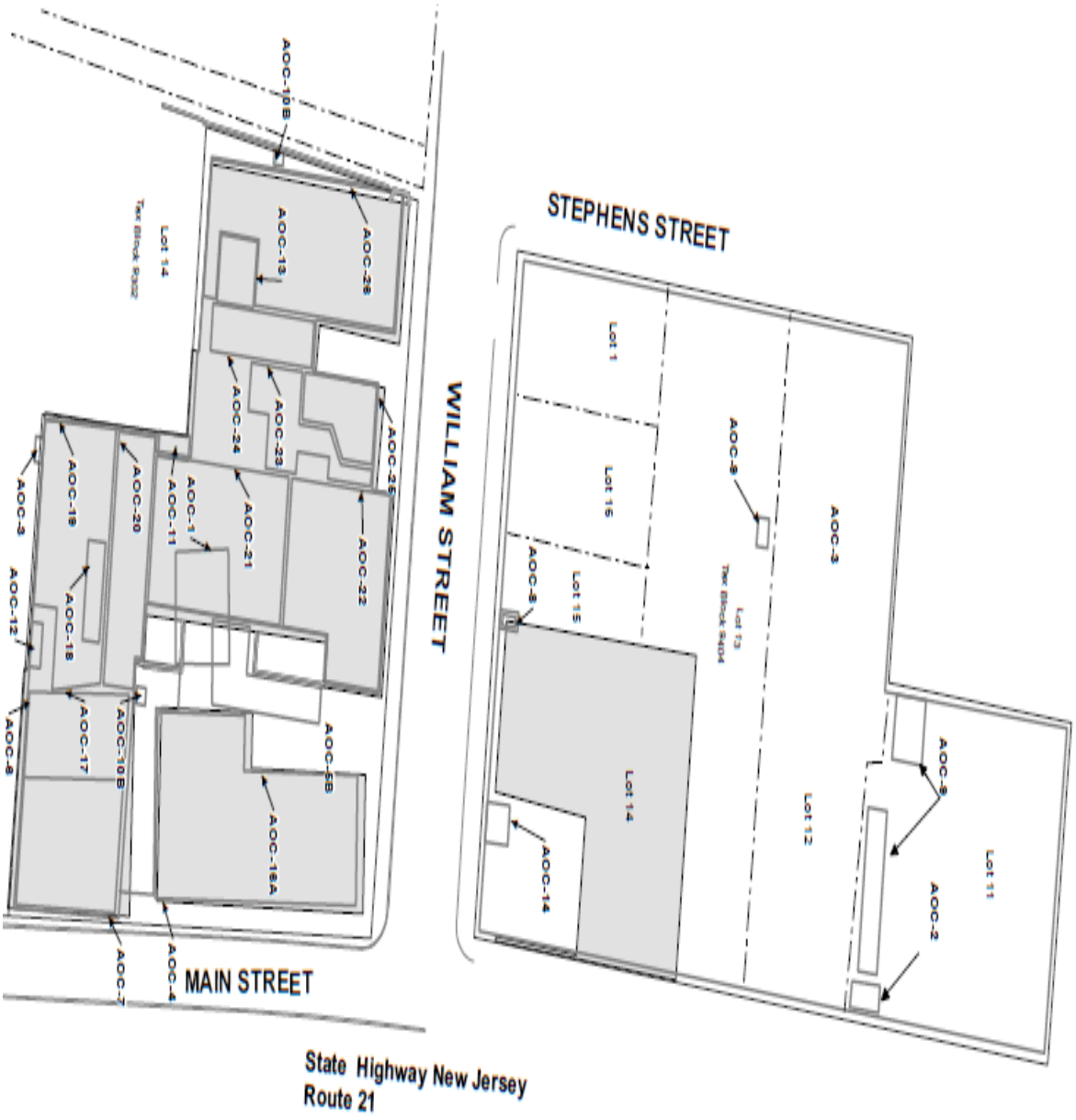
- AOC 19: Open AST Area in Building No. 3. Thick oily sludge was noted to be present on the floor.
- AOC 20: Building No. 3A. Heavy staining was noted to be present on all surfaces. In addition, a floor drain exists near the hot water tank.
- AOC 21: Building No. 4. Heavy staining was noted to be present on the floor.
- AOC 22: Building 4A. Heavy staining was noted to be present on the floor.
- AOC 23: Staining Observed in The Hallway Between Building No.4 and Building No.7
- AOC 24: Building No. 5A and Building No. 5b: Heavy staining was noted to be present on the floor.
- AOC 25: Building No.6 AST Area. Heavy staining was noted to be present on the floor.
- AOC 26: Stained Surfaces in Building No. 7
- AOC 27: Manufacturing Facility Drainage (PAP-00092602-06)

Finally, AOCs 31, 32, and 33 were identified in the 2011 RI/RA Progress Report as follows (AOCs Nos. 29 and 30 were not used in the numbering scheme):

- AOC 31: Subject Property Located North of William Street
- AOC 32: Vapor Intrusion
- AOC 33: Baseline Ecological Evaluation (PAP-00093914)

The AOCs are identified on the following figure from the 2011 RI/RA Progress Report (PAP-00093923):

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ADR Confidential
Facility Data Report



The following figure shows the AOCs in more detail, including the locations of the former USTs, trenches, drains, and the building numbers (PAP-00098696):



PCBs, mercury, and PAHs were detected in soil at several AOCs. The 2008 Soils RAWP identified soils with PCB concentrations up to 15,800 mg/kg as being present at the site. The Soils RAWP stated that leaks and spills associated with a "Therminol" hot oil heating system used from 1965-1976 and a "significant release" from the north Hydrotherm boiler in the early 1970s were believed to be the source of the PCB-impacted soils below certain sections of the site. Mercury was detected at concentrations up to 180 mg/kg, and the mercury-impacted soils were attributed to a previous owner's hat manufacturing process that used mercury salts. In addition, this document attributed the concentrations of PAHs in site soil to the presence of fill material used during construction and grading of the facility (PAP-00099875, 881-2, 895, 912).

Remedial Activities

According to a letter from ISP to EPA, dated June 17, 2005, the NJDEP Environmental Cleanup Responsibility Act (ECRA) was initially triggered when Mallinckrodt Inc. obtained the property from Avon Capitol Corporation on May 3, 1986. Avon Capitol Corporation hired IT Corp. to delineate PCB contamination at the site, which was completed in 1995. On April 7, 1992, the NJDEP Industrial Site Recovery Act (ISRA) was triggered when ISP purchased the site from Mallinckrodt Inc. When ISP operations ceased in April 2001, ISRA was triggered for a third time. ISP entered into a remediation agreement with the NJDEP to combine the three ECRA/ISRA cases, to allow ISP to complete all of the Responsible Party ISRA obligations, and to comply with the TSCA PCB rules (PAS-00110585-86). The Remediation Agreement was signed by ISP on January 8, 2002 (PAS-00110301).

As documented in the 2008 Soils RAWP and 2011 RI/RA Progress Report, six AOCs have received no further action (NFA) approval from NJDEP (i.e., AOCs 2, 3, 5A, 8, 9, 15, and 31), eight were approved for no further investigation (i.e., AOCs 5A, 12, 18, 20, 23, 24, 25, 26) and five AOCs were not related to soil contamination or were due to an error in numbering (i.e., AOCs 10A, 10B, 28, 29, 30, 32) (PAP-00093886-90; PAP-00099889-90).

The 2008 Soils RAWP proposed to excavate all contaminated soils with PCB concentrations in excess of 100 mg/kg and implement engineering (i.e., a cap of at least 6 inches thick extending over the entire) and institutional controls (i.e., deed notice) to limit access and exposure to the contaminants remaining at the site (PAP-00099876-77).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

KEARNY SMELTING AND REFINING CORP

Facility Name, Address and Size: Kearny Smelting and Refining Corp. (KSRC), 936 Harrison Ave., Kearny, NJ,11.8 acres (PAP-00190121). The site is bounded to the north by the Erie-Lackawanna Railroad (originally the Newark and Hudson Railroad), to the east by the Delaware - Lackawanna and Western Railroad, to the south by Harrison Avenue and two industrial properties, and to the west by residential and industrial properties (PAP-00217329). According to the "Current Site Map" created by JMZ Geology, the site includes Block 275 Lots 1B and 2A and Block 276 Lots 1B, 1C, and 3 (PAP-00004657). See Site Map below.

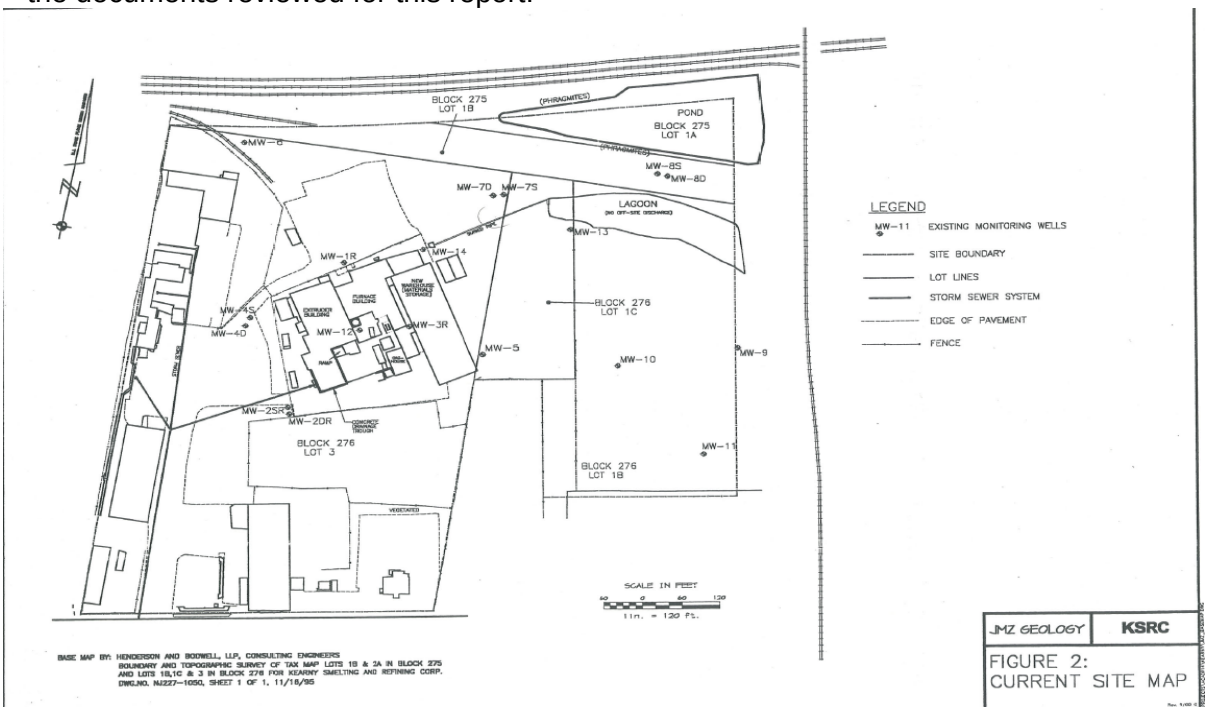
The *Revised Phase II Remedial Investigation Workplan*, dated August 1996 (1996 Rev. Phase II RIWP) provided the following owners of the site:

Property	Acreage	Owner
Block 276 Lot 3	9.61	KRSC
Block 276 Lot 1C	0.594	Michel G Rothschild
Block 275 Lot 1B	0.893	M. Rothschild
Block 275 Lot 2A	0.675	M. Rothschild
Total acreage	11.772	

(PAS-00032551)

Note: Property conveyances were not available in the documents reviewed for this report to verify the ownership and acreage provided in the above table.

Information regarding the number of employees and hours worked was not available in the documents reviewed for this report.



(PAP-00004657)

Diamond Alkali OU2 Allocation
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1. **Business Type:** Casting and extrusion of brass and bronze

2. **Time Period of Ownership/Operations**

Operator: 1944 to Present
Owner: 1944 to Present
(PAP-00190066)

The 1996 Rev. Phase II RIWP listed the following businesses operating on the site:

Business	Nature of Operations
Kearny Smelting	casting and extrusion of brass and bronze
D R Tweed	repair and service of lift trucks
Mac Metals Inc	sales/showroom for architectural metals
West Hudson Auto Body	auto body repair
Athens Diner	restaurant
Delbros Inc	sanitation truck storage
M&G Tool and Die Co	machine shop

(PAS-00032551)

Note: The location of the businesses operating on the site was not provided in the 1996 Rev. Phase II RIWP and no other documents were available to review for verification.

3. **Operational History/COC Use and Presence at the Facility**

KSRC operated a non-ferrous metals manufacturing facility from approximately 1945 until 1975. During the smelting process, KSRC melted approximately 50,000 to 60,000 pounds of scrap metal per day containing copper, tin and/or zinc alloys in a rotary smelting furnace. This process resulted in discharges to a lagoon at the facility (PAS-00003777-78).

A 1986 US EPA Potential Hazardous Waste Site Preliminary Assessment states that substances present at the Kearny Smelting facility included zinc oxide, copper, tin, lead, iron, nickel, and zinc, and that NJDEP alleged that wastewater originating onsite has been discharged to the ground and surface waters (PAP-00004622-24).
According to the 2018 Phase I Environmental Site Assessment, dated April 13, 2018 (2018 Phase I ESA), the site consists “of a 16 acre parcel of land improved with three buildings that are occupied by Kearny Smelting & Refining, two buildings occupied by Mac Metals and three vacant buildings being prepared for demolition. The majority of the existing structures on the site were constructed in the 1940's with the addition of the KSR inventory storage warehouse which was constructed in 2006. KSR's operations include manufacturing custom bronze, brass and nickel silver profiles, sections and extrusions. Mac Metals operations include sales/showroom of architectural metals for KSR. The three vacant buildings are unrelated to KSR's operations” (PAP-00431830).

According to the 2018 Phase I ESA, the following hazardous substances and petroleum products were observed during the site inspection:

Summary

Material	Quantity	Use	Comments
Various Cleaners and Lubricants	Small quantities in plastic bottles and metal spray cans	General Maintenance of industrial operations equipment	Various cleaners and lubricants were observed throughout the Site. All of the materials observed appeared to be properly labeled and stored with no significant evidence of leaks or spills apparent. These materials do not comprise a REC to the Site.
Used Hydraulic Oil	55-gallon drums	Maintenance of industrial operations equipment	The material was observed to be stored inside drums (see subsequent section) and properly labeled.
Hydraulic Oil	55-gallon drums	Maintenance of industrial operations equipment	The material was observed to be stored inside drums (see subsequent section) and properly labeled.
Waste Oil	55-gallon drums	General Maintenance of warehouse equipment	Waste oil is temporarily collected in a series of portable waste oil cans. Waste oil is then transferred to waste oil 55-gallon drums present on the Site (see subsequent sections). Waste oil is reportedly periodically collected by a licensed waste hauler.
Motor Oil	Small quantities in plastic bottles	General Maintenance of warehouse equipment	Various motor oil was observed throughout the Site. All of the materials observed appeared to be properly labeled and stored with no significant evidence of leaks or spills apparent. These materials do not comprise a REC to the Site.
Diesel Fuel	55-gallon drums	Warehouse equipment	The material was observed to be stored inside a drum (see subsequent section) and properly labeled.

(PAP-00431881)

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (detected)

PCBs

The *Phase II Remedial Investigation Workplan,* dated October 1995 (1995 RIWP) states that based on previous investigations, onsite soils have been determined to be adversely impacted by PCBs through both current and historical facility processes and the historical filling of the site (PAP-00190077).

According to the 1996 Rev. Phase II RIWP, the following results for PCBs were reported above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria from the March 1993 soil sampling event:

March 1993 PCB Soil Sampling			
COC	**Sample No.**	**Depth [below ground surface (bgs)]**	**Result (parts per million (ppm)]**
Aroclor 1254	MW1S	8.5 to 9 feet	14.0
Aroclor 1254	SB 1B	0 to 0.5 feet	11.0
Aroclor 1248	SB 12	0 to 0.5 feet	7.2

(PAS-00032615, 17)

PAHs

The 1995 RIWP states that based on previous investigations, onsite soils have been determined to be adversely impacted by metals and PAHs through both current and historical facility processes and the historical filling of the site (PAP-00190077).

According to the 1996 Rev. Phase II RIWP, the following results for PAHs were reported above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria from the March 1993 soil sampling event:

Benzo(a)anthracene NJDEP Non-residential Direct Contact Soil Cleanup Criteria = 4.0 ppm		
Sample No.	**Depth (bgs)**	**Results (ppm)**
SB 10	0 to 0.5 feet	8.6
MW4S	10 to 10.5 feet	4.6
MW7SA	0 to 0.5 feet	3.9

(PAS-00032616, 18, 19)

Benzo(a)pyrene NJDEP Non-residential Direct Contact Soil Cleanup Criteria = 0.66 ppm		
Sample No.	**Depth (bgs)**	**Results (ppm)**
SB 1A	0 to 0.5 feet	2.4
SB 1B	0 to 0.5 feet	3.4
SB 3	0 to 0.5 feet	1.0
SB 5A	0 to 0.5 feet	0.750
SB 7A	0 to 0.5 feet	0.820
SB 8	0 to 0.5 feet	1.2
SB 10	0 to 0.5 feet	7.2
SB 12	0 to 0.5 feet	1.5
SB 13	0 to 0.5 feet	1.8
SB 16	10.5 to 11 feet	0.670
MW2S	8 to 8.5 feet	2.0
MW3S	0 to 0.5 feet	0.860
MW4S	10 to 10.5 feet	3.3
Sample No.	**Depth (bgs)**	**Results (ppm)**
MW5S	10 to 10.5 feet	1.3
MW7SA	0 to 0.5 feet	3.9
MW7SB	0 to 0.5 feet	1.1
MW7D	0 to 0.5 feet	2.7

(PAS-00032615-19)

Benzo(b)fluoranthene NJDEP Non-residential Direct Contact Soil Cleanup Criteria = Not Established (NE)		
Sample No.	**Depth (bgs)**	**Results (ppm)**
SB 10	0 to 5feet	6.2
MW7SA	0 to 5 feet	5.5

(PAS-00032616, 19)

Benzo(k)fluoranthene NJDEP Non-residential Direct Contact Soil Cleanup Criteria = NE		
Sample No.	**Depth (bgs)**	**Results (ppm)**
SB 10	0 to 5 feet	6.6

(PAS-00032616)

A March 4, 2011, Deed Notice states that engineering controls have been implemented to prevent direct contact to underlying PAHs and metals in soils attributed to the underlying slag and historic fill materials across the site (PAP-00190095; PAP-00190123).

Mercury

According to the 1991 Administrative Consent Order (ACO), on September 24, 1986, NJDEP conducted sampling of the facility site. On October 30, 1986, soil sample results revealed that the onsite soils were contaminated with 10 ppm of mercury (PAS-00003779). Note: The 1991 ACO did not provide further details regarding depth and location of the samples. The 1986 NJDEP sampling report was not available for review for this report. Note: The copy of the 1991 ACO provided for this report was an incomplete copy.

According to the 1996 Rev. Phase II RIWP, mercury was not detected above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria (i.e., 270 ppm) during the March 1993 soil sampling event (PAS-00032615-19).

Copper

The October 30, 1986, soil sample results revealed that the onsite soils were contaminated with 17,200 ppm of copper (PAS-00003779). Note: The 1991 ACO did not provide further details regarding depth and location of the samples. The 1986 NJDEP sampling report was not available for review for this report. Note: The copy of the 1991 ACO provided for this report was an incomplete copy.

According to the 1996 Rev. Phase II RIWP, the following results for copper were reported above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria (i.e., 600 ppm) from the March 1993 soil sampling event:

Copper NJDEP Non-residential Direct Contact Soil Cleanup Criteria = 600 ppm		
Sample No.	**Depth (bgs)**	**Results (ppm)**
SB 1A	0 to 0.5 feet	809
SB 3	0 to 0.5 feet	5,120
SB 4	0 to 0.5 feet	7,160
SB 5A	0 to 0.5 feet	926
SB 5B	0 to 0.5 feet	2,170
SB 6	0 to 0.5 feet	13,200
SB 7A	0 to 0.5 feet	1,560
SB 8	0 to 0.5 feet	26,600
SB 9	0 to 0.5 feet	4,420
SB 10	0 to 0.5 feet	10,800
SB 11	0 to 0.5 feet	9,780
SB 12	0 to 0.5 feet	5,640
SB 14	10 to 10.5 feet	1,210
SB 15	11.5 to 12 feet	739
MW3S	0 to 0.5 feet	4,660
MW4S	0 to 0.5 feet	4,070
MW4D	0 to 0.5 feet	4,220
MW5S	0 to 0.5 feet	19,300
MW5S	10 to 10.5 feet	3,180
MW6S	0 to 0.5 feet	24,100
MW7SA	0 to 0.5 feet	1,930
MW7SB	0 to 0.5 feet	1,130
MW7S	8.5 to 9 feet	2,130
MW7D	0 to 0.5 feet	8,710
MW7D	6 to 6.5 feet	2,490

(PAS-00032615-19)

Lead

The October 30, 1986, soil sample results revealed that the onsite soils were contaminated with 15,300 ppm of lead and other metals (PAS-00003779). Note: The 1991 ACO did not provide further details regarding depth and location of the samples. The 1986 NJDEP sampling report was not available for review for this report. Note: The copy of the 1991 ACO provided for this report was an incomplete copy.

According to the 1996 Rev. Phase II RIWP, the following results for lead were reported above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria (i.e., 600 ppm) from the March 1993 soil sampling event:

Lead NJDEP Non-residential Direct Contact Soil Cleanup Criteria = 600 ppm		
Sample No.	**Depth (bgs)**	**Results (ppm)**
SB 3	0 to 0.5 feet	1,820
SB 4	0 to 0.5 feet	1,070
SB 5B	0 to 0.5 feet	3,280
SB 6	0 to 0.5 feet	3,420
SB 9	0 to 0.5 feet	942
SB 10	0 to 0.5 feet	2,140
SB 11	0 to 0.5 feet	2,000
SB 12	0 to 0.5 feet	2,620
MW2S	0 to 0.5 feet	787
MW2S	8 to 8.5 feet	2,610
MW3S	0 to 0.5 feet	2,750
MW4S	0 to 0.5 feet	1,180
MW4D	0 to 0.5 feet	1,240
MW5S	0 to 0.5 feet	3,570
MW5S	10 to 10.5 feet	1,560
MW6S	0 to 0.5 feet	2,520
MW7SA	0 to 0.5 feet	671
MW7SB	0 to 0.5 feet	1,170
MW7D	0 to 0.5 feet	2,500
MW7D	6 to 6.5 feet	896

(PAS-00032615-19)

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs,

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

The following table shows the 1993 results from soil sampling (PAS-00032615-19):

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	3,570 mg/kg
Copper	26,660mg/kg
Mercury	5.02 mg/kg
Benzo(a)anthracene	8.6 mg/kg
Benzo(a)pyrene	7.2 mg/kg
Benzo(b)fluoranthene	6.2 mg/kg
Benzo(k)fluoranthene	6.6 mg/kg
Dibenzo(a,h)anthracene	0.47 mg/kg
Indeno(1,2,3-cd)pyrene	2.7 mg/kg

According to the 1996 Rev. Phase II RIWP, the area in which the site lies was originally marsh land that was reclaimed by filling for the express purpose of industrial development (PAS-00032552). Based on the "historical maps and aerial photos reviewed the majority of the site was filled between 1908 and 1938. Portions of the site along Harrison Ave were filled as early as the 1890s. By 1938 the site filling was completed, and the surface of the site was similar to its present condition….he southern end of the lagoon has been filled over the years reducing the lagoon to its current extent" (PAS-00032553-54).

5. COC Pathways

Sanitary Sewer

According to the *Analysis and Evaluation of Potential Discharges to the Passaic River* report, dated August 2010 (2010 Report), with the exception of the furnace building, all of the buildings on-site were connected to the municipal sanitary sewer system from the time of their construction. All of these buildings discharged sanitary waste only; none had process or industrial discharges. In 1996, the furnace building sanitary discharges were connected to the municipal sanitary sewer system. Verbal approval to connect the plant washrooms with the municipal sewer was given to KSRC by Mr. Mike Petriello, the plumbing inspector with the Town of Kearny construction code office (PAP-00004545).

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Storm Sewer

A September 22, 1989, letter from NJDEP states that the stormwater runoff from the facility was discharging to the surface waters of the state via a newly installed storm drain and sewer (PAP-00004631).

According to the 2010 Report, KSRC was issued a Stormwater Discharge Permit (No. NJ0120073) on May 28, 2001 (effective date: August 1, 2001) (PAP-00004546). There are two stormwater discharge points on the site: DSN-001A is an on-site discharge of stormwater runoff to the lagoon; DSN-002A is a discharge to the municipal storm sewer on Harrison Ave. The Harrison Avenue storm sewer discharges to the Passaic River. DSN-002A is part of an on-site storm sewer which drains the western portion of the site. As such, it receives runoff from building roofs and paved surfaces only. In all of the stormwater discharge monitoring samples collected from DSN-002A since the Permit was issued, the concentrations of all the metals were below the NJ surface water quality standards. Based on the discharge monitoring analytical data, there has been no discharge of contaminants at concentrations exceeding the surface water quality standards to the municipal storm sewer system (PAP-00004546).

According to the 2010 Report, historically, the KSRC lagoon was used as a settling pond for acetylene manufacturing waste water from the S.O.S. Gases facility located adjacent to KSRC on Harrison Avenue. In addition, the lagoon supplied both contact and non-contact cooling water to the KSRC plant. The lagoon also received discharges from the KSRC quality control laboratory. All of these discharges were ceased in 1995; there were no process-related discharges to the lagoon at the time of the report. Although historic process-related discharges to the lagoon did result in contamination of the lagoon water and sediment, no off-site migration or discharge of water from the lagoon occurred because there is no surface water pathway to the surrounding environment (PAP-00004536).

The 2010 Report states that since 2001, on-site groundwater concentrations of cadmium, lead, and zinc continued to decrease; contaminants from off-site upgradient sources continued to migrate onto the site, but due to attenuation are reduced to concentrations below the GWQS on-site; and there has been no migration of contaminants from KSRC to the surrounding area (PAP-00004544).

The 2010 Report concludes that KSRC's process-generated contaminants remain on-site, and do not migrate off-site via groundwater, surface water, movement of soil, or discharges to the municipal sewer systems (PAP-00004533).

Direct Release

According to the 1995 RIWP, there has been filling at the facility related to the construction of railroads located near the northern border of the facility consisting of earth materials mixed with coal combustion ash and cinders. The report also states that an 1871 railroad map shows a number of man-made drainage ditches in the area then occupied by the smelter building and the lagoon. The ditches are noted not to have crossed Harrison Ave, but appear to have drained to Frank Creek approximately 1,000 feet to the east of the site. By 1896, these ditches are no longer present and the marsh

line had moved eastward from its 1839 location. In addition, the construction of the DL&W embankment created two ponded areas—one of which was the KSRC lagoon. A 1938 Map showed that the entire area had been filled by that time with the exception of the lagoon and that the lagoon was landlocked (PAP-00190059-60). Logs from soil borings and monitoring wells stated that the fill material was heterogeneous and that the most common materials found in the fill were brick, concrete, asphalt, wood and glass (PAP-00190060).

The 1995 RIWP states that the KSRC lagoon was used historically to supply both contact and non-contact cooling water to the plant. Cooling water was circulated through the systems requiring cooling and discharged to the lagoon. In addition, the lagoon received discharges from a small quality control laboratory located in the northeast corner of the plant, and from the billet casting pit (PAP-00190078).

A March 10, 1998, letter from JMZ Geology to NJDEP states that the discharge of contact cooling water from the ingot conveyor pit to the lagoon located to the northeast of the plant was ceased in 1995. It also notes that non-contact cooling water from the extrusion line heat exchanger, formerly discharged to the lagoon, was currently being supplied by a closed loop system with water from the contact cooling water holding tank and there were no longer any discharges to either surface or groundwater (PAP-00004665).

A July 10, 1991, letter to NJDEP from KSRC counsel states that he had personally inspected the facility and it was not draining into Frank's Creek and ultimately the Passaic River, as the facility does not border Frank's Creek. It notes that the lagoon on site is completely landlocked (PAP-00004634).

Spills

On October 23, 1987, the Hudson Regional Health Commission sent KRSC a Notice of Violation for a discharge of a hazardous substance (No. 4 Fuel Oil). The oil leak was from the pipes in the pump house which caused approximately 100 to 150 gallons of No. 4 Fuel Oil to spill to the ground (PAS-00032753-55). See further discussion in Section 6 - Regulatory History/ Enforcement Actions and Section 7 - Remedial Activities.

Groundwater

According to the 2010 Report the following five potential discharges to groundwater were formerly present at the KSRC:

<u>Septic Systems</u>

The two septic systems were hooked up to the furnace building and discharged directly to groundwater. One of the septic systems was located to the north of the building and served the office lavatory; the second was located near the southeast corner of the building and served the employee shower room.

Laboratory Sink Discharge

The sink in the facility QA laboratory originally discharged small amounts of spent acids and wash water to the lagoon. In 1995, the lab sink was reconfigured to receive only wash water and condensate from lab equipment and was connected to the office septic system.

Non-Contact Cooling Water

Non-contact cooling water from the extrusion line heat exchanger was also formerly discharged to the lagoon. This practice was also ceased in 1995. The non-contact cooling water is now supplied by a closed loop system with water from the cooling water holding tank. Make-up water is obtained from municipal supply.

Contact Cooling Water

Contact cooling water from the ingot conveyor pit was also formerly discharged to the lagoon. This discharge was ceased in 1995 when new cooling water systems were put into operation. At that time, contact cooling water was pumped to a cooling tower and holding tank located outside of the south wall of the furnace building. Make-up water was obtained from municipal supply. Therefore, there have been no discharges of contact cooling water from that date. In March 2000, ingot manufacturing was ceased and the rotary furnace was taken out of service. The use of contact cooling water ceased at that time.

Exposure of Process Raw Materials and Wastes at the Site Surface

Process raw materials were formerly stored uncovered on gravel paved areas to the south and east of the furnace building. Zinc oxide, a by-product of the ingot manufacturing process, was collected in a baghouse and stored in a shed, both of which were also located to the south of the furnace building. Slag, the waste material of the ingot manufacturing process, was cooled and subsequently crushed in a gravel-paved area to the southeast of the furnace building. In all of these areas, the potential existed for process contaminants to migrate to groundwater through surface water infiltration (PAP-00004536-39).

6. Regulatory History/Enforcement Actions

Permits

KSRC was issued a Stormwater Discharge Permit (No. NJ0120073) on May 28, 2001 (effective date: August 1, 2001). One of the two stormwater discharge points was to the Passaic River (PAP-00004546).

A Soil Remediation Action Permit (RPC 000001) was issued to KSRC on May 16, 2011. The permit required monitoring and maintenance pursuant to Exhibit C of the attached Deed Notice. In addition, it required periodic inspections of any excavations or disturbances that resulted in unacceptable exposure of the soil contamination (PAP-00190090-91).

Inspections/Violations

An inspection conducted at KSRC in January 1984 observed that there were numerous empty and damaged drums stored in the rear of the property. In addition, wastewater was being discharged into the surface or groundwater of the state including overflow from the cooling tower and settling tanks and a surface impoundment used to collect wastewater discharged from the facility. The facility did not have an NJPDES permit at the time (PAS-00003772-73).

On April 14, 1986, NJDEP conducted an inspection of the facility which revealed the mismanagement of hazardous waste and/or solid waste including mounds of incinerator ash, hundreds of metal drums, and transformers on the eastern side of the building, as well as poor housekeeping throughout the site (PAS-00003779).

On October 23, 1987, the facility was issued a Notice of Violation from the Hudson Regional Health Commission for discharge of a hazardous substance (No. 4 oil) and discharge of hazardous substances lead and zinc into surface water (lagoon) (PAP-00004626). A December 16, 1987 letter to the facility from NJDEP states that the facility had been inspected on October 27 and November 5 and that wastewater originating from contact and non-contact cooling water, contaminated storm water runoff, laboratory waste, and a venture air pollution scrubber device was being discharged to an on-site drainage ditch and surface impoundment. The wastewater was noted to ultimately discharge to the groundwater of the State (PAP-00004628).

On December 3, 1990, an investigation at the facility was conducted by NJDEP and the New Jersey State Police. Sampling conducted at this time revealed the presence of zinc, lead and cyanide in the lagoon. The Department maintained that the zinc and lead were the result of a leaking scrubbing device (PAS-00003781).

On October 11, 1991 KSRC entered into an ACO to address the violations that had occurred throughout the years of operation. KSRC was ordered to conduct a Remedial Investigation and Feasibility Study to determine the nature and extent of the problem presented by the discharging of pollutants and hazardous substances at and around the site and the mismanagement of wastes (PAS-00003777-81). Note: The copy of the 1991 ACO provided for this report was an incomplete copy.

An Investigation Report dated December 27, 1994, states that the facility had not implemented best management practices (BMPs) for its General Stormwater Permit. Raw material, scrap, product, slag, and waste was still exposed to stormwater. A bypass line from the contact cooling pit was eventually discharging to the storm sewer. The findings note that the facility was no longer using its lagoon for water for contact cooling water for the ingot furnaces and molds (PAS-00003766).

A July 7, 2010, NJDEP Notice of Deficiency states that concentrations of lead, cadmium and zinc were consistently well above the GWQS in eight sampling episodes. It notes that the Department recognized that groundwater contamination at MW-9 was representative of background contamination levels, but since contaminant levels for cadmium and lead at MW-13 were greater than the levels measured at MW-9, they

considered that an onsite source (lagoon) had been contributing to a portion of the groundwater contamination detected beneath the KSRC facility (PAP-00004672-73).

According to the 2018 Phase I ESA, on October 12, 2012, a site-wide, restricted use Response Action Outcome (RAO) letter was issued for the KSR site. The RAO includes Block 275, Lots 1B and 2A and Block 276, Lots 1B, 1C and 3 (PAP-00431839). Note: The 2012 RAO was not provided for this review.

As part of the 2018 Phase I ESA, site observations were conducted in order to obtain information indicating the likelihood of Recognized Environmental Conditions (RECs) to be present at the site. RECs are defined in the ASTM Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. The following were determined as RECs:

- Two Abandoned in Place Underground Storage Tanks (USTs)
- Former Rail Line Spur
- Former Solvent Aboveground Storage Tanks (ASTs)
- Former Auto Junk Yard
- Vinnie's Sunoco, including the following:
    - Soil and groundwater contamination associated with previously removed gasoline USTs
    - Groundwater contamination associated with previously removed 5,000-gallon No. 2 fuel oil or diesel fuel UST
    - Suspected offsite groundwater plume migration onto subject site

(PAP-00431830)

The following table summarizes the recommendations reached during the 2018 Phase I ESA:

REC/BER	Recommended Action
Filled in Place USTs	Peak recommends site investigation surrounding abandoned in place USTs
Kearny Smelting & Refining Corp (KSR)	Peak recommends the continued monitoring, maintenance, and evaluation for compliance and effectiveness of the CEA institutional control and the filing of Remedial Action Protectiveness/ Biennial Certification Form (Groundwater) in accordance with NJDEP regulations
Vinnie's Sunoco	Peak recommends additional soil and groundwater investigations for impacts associated with Site operations, as well as, potential migration of contaminated groundwater from an offsite source
Two Abandoned in Place USTs	Peak recommends a Phase II site investigation to evaluate potential impacts associated with this REC.

REC/BER	Recommended Action
Former Rail Line Spur	Peak recommends a Phase II site investigation to evaluate potential impacts associated with this REC.
Former Solvent ASTs	Peak recommends a Phase II site investigation to evaluate potential impacts associated with this REC.
Former Auto Junk Yard	Peak recommends a Phase II site investigation to evaluate potential impacts associated with this REC.
Potential Heating Oil USTs Associated with Former Structures	Peak recommends a geophysical survey in the areas of the former buildings to investigate for obvious evidence of USTs or excavation areas from former USTs

(PAP-00431840-41)

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Draft Remedial Investigation Report* dated November 1993 (PAS-00003790)
- *Phase II RI Workplan* dated October 1995 (PAP-00190051)
- *Revised Phase II RI Workplan* dated August 1996 (PAS-00032543)
- *Phase I Environmental Site Assessment* dated April 13, 2018 (PAP-00431824)

The 1993 *Draft Remedial Investigation Report* (RIR) (1993 Draft RIR) states that soil analytical data demonstrated that copper and other metals were not in compliance with current soil cleanup criteria and lead was detected in one well. However, it notes that after 50 years of operation, the impact of the on-site metal contamination in the soils is insignificant in relation to the groundwater and surface water qualities (PAS-00003796). It also states that the water in the lagoon was likely adversely impacting the groundwater quality in the shallow perched zone surrounding the lagoon (PAS-00003799). Note: The pdf of the 1993 Draft RIR was an incomplete version of the report. Neither a complete copy of the Draft nor the Final RIR was available for review for this report.

The 1995 RIWP, states that based on previous investigations the following conclusions can be drawn:

- Site soils have been adversely impacted by metals, PAHs and PCBs through both current and historical on-site processes and the historical filling of the site.

- In general, historical fill and process related soil contamination are indistinguishable due to the presence of similar constituents.
- Lagoon sediments contain contaminants that are derived from run-off, KSRC's processes, and sources unrelated to KSRC.

- The shallow and deep groundwater zones are in communication and both have been contaminated with lead and other metals.

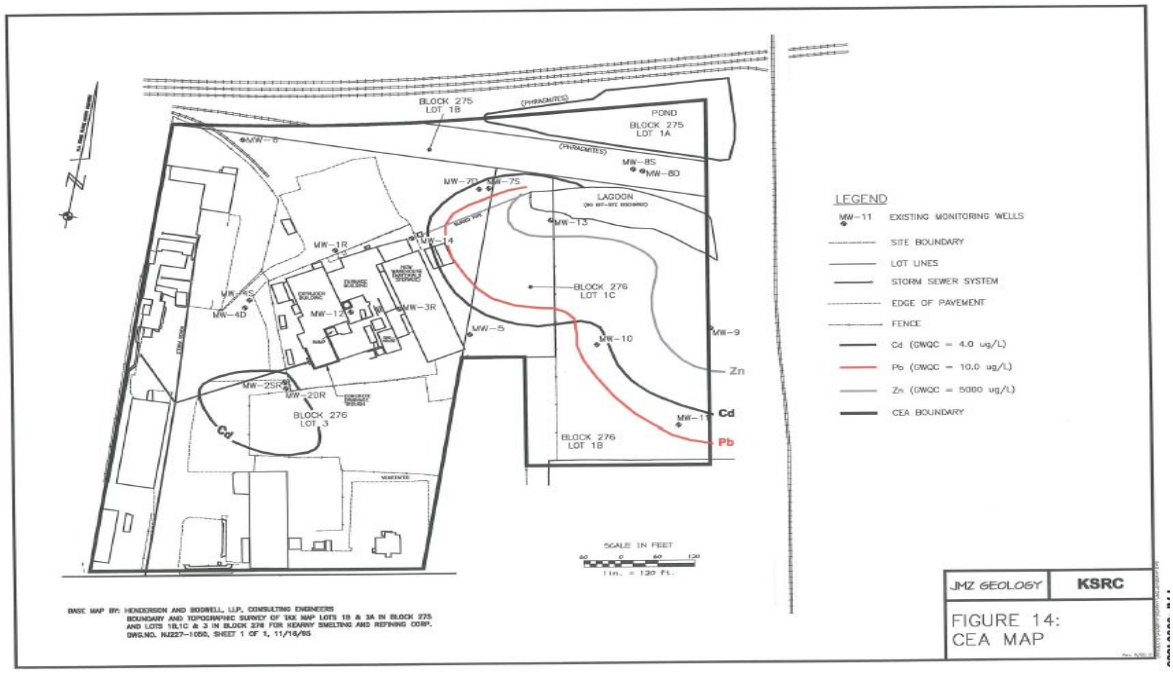
- Discharges to the septic tanks and the lagoon have contributed to shallow groundwater contamination.

- Shallow groundwater flow is currently dominated by a recharge area located beneath the smelter building. (PAP-00190077)

KSRC submitted the 1996 Rev. Phase II RIWP, to address comments received from NJDEP regarding the 1995 RIWP. The purpose of this 1996 Rev. Phase II RIWP was to obtain additional environmental quality information and to complete the characterization of the site (PAS-00032549).

In the Justification for Recommendation of No Further Action letter dated August 3, 2009 (2009 Letter), it is stated that a RAW/CEA, was submitted to NJDEP on September 29, 2000. The RAW/CEA was focused on the use of monitored natural attenuation for those groundwater contaminants "which result from KSRC activities" − cadmium, lead and zinc. The 2009 Letter states that on-site groundwater monitoring demonstrated that all contaminant concentrations, both those originating on-site as well as those from off-site sources were reduced to levels below the GWQS before reaching the downgradient site boundary. It also notes that there was no off-site migration of contaminants at that time (PAP-00004550-52).

The 2009 letter included the following figure from the 2000 RAW/CEA workplan shows the CEA site boundary, monitoring well locations, and the locations of the lead, cadmium, and zinc plumes.



(PAP-00004558)

According to the 2010 Report, the only water that could have migrated from the property to the River was stormwater collected on Harrison Avenue. Stormwater sampling pursuant to KSRC's permit reflect that the samples were always below permit limits and surface water quality standards (PAP-00004546).

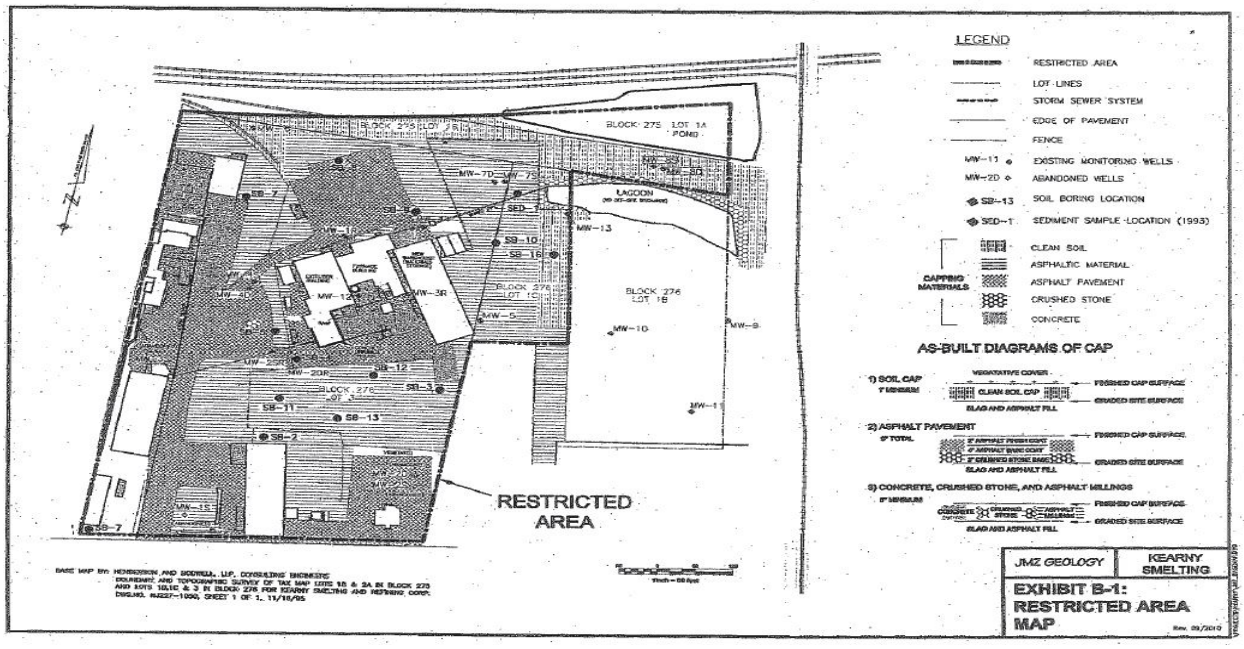
On February 16, 2011, NJDEP approved the Revised RAW stating the workplan was in compliance with the Technical Requirements for Site Remediation, N.J.A.C.7:26E and other applicable requirements. NJDEP concluded that there was insufficient evidence in the groundwater data to conclude that arsenic and nickel are derived exclusively due to migration from offsite sources. The CEA was to include arsenic and nickel as COCs in addition to cadmium, lead and zinc in accordance with TRSR N.J.A.C. 7:26E-8.3(a) (PAP-00217360).

Remedial Activities

In a letter report dated December 4, 1987, KSRC informed NJDEP that upon receipt of the Notice of Violation for No. 4 Oil Fuel spill, the clean-up procedure started with the removal of the pump and pump house. Once removed, an area of approximately 17 feet by 30 feet with a depth of 2 feet was excavated. When the odor of fuel could no longer be detected, digging stopped and five samples were taken; one from each corner and one from the center of the excavation area. Further excavation was required and a total of 16,200 pounds of soil was removed from the excavation area. The samples were analyzed for Total Petroleum Hydrocarbons but not for PAHS (PAS-00032755-56).

The 2009 Letter states that a conceptual Remedial Action Work Plan (RAW) was submitted to NJDEP in May 1997 and was implemented in 1997/1998. Post-remedial groundwater monitoring was also conducted in 1997/1998. Additional groundwater monitoring was conducted during 1999 and 2000. Groundwater monitoring results demonstrated that the capping of the site combined with many other site improvements and process modifications had significantly reduced the concentrations of metals in groundwater across the property (PAP-00004534; PAP-00004549-50).

A March 4, 2011, Deed Notice states that engineering controls have been implemented to prevent direct contact to underlying PAHs and metals in soils attributed to the underlying slag and historic fill materials across the site. The primary control is a cap composed of clean soil, asphalt pavement, concrete, and crushed stone or asphaltic millings (PAP-00190095, 123). See the following site map that shows the restricted area of the site and composition of the cap.



(PAP-00190112)

According to the 2018 Phase I ESA, "*On December 20, 2016, a deed notice termination was submitted to the NJDEP for the redevelopment of a portion of the property for new commercial uses. The existing structures will be razed and new structures will be constructed. On January 26, 2017, the NJDEP approved the deed notice termination. Once the construction is complete and the new caps are in place, the Deed Notice Termination will be filed with the county along with a new deed notice to describe and incorporate the new caps. A modified SRAP [Soil Remedial Action Permit] application will be required after the new deed notice is filed with the county. During redevelopment, construction activities will need to be monitored to ensure that contaminated soil is property handled and disposed, if required. The new engineering controls/caps will need to be approved by the Licensed Site Remediation Professional (LSRP)"* (PAP-00431839). Note: The 2016 Deed Notice Termination and the NJDEP approval was not available in the documents reviewed for this report.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

Leemilt's Petroleum Inc.

Facility Name, Address and Size: Leemilt's Petroleum Inc. (successor by merger to Power Test of New Jersey, Inc.); 86 Doremus Avenue, Newark, New Jersey 07114 (the Newark Terminal); 15.3 acres (PAP-00084077; PAP-00086173); another source states the property is 14.5 acres (PAP-00066677); no information was available in the file material regarding the number of employees that worked at the Newark Terminal. The property is referred to as both the Getty Terminal and the Newark Terminal in the file materials, but is referred to as the Newark Terminal in this Data Report.

1. **Business Type:** Former bulk petroleum storage and distribution terminal (PAP-00066676; PAP-00066932).

2. **Time Period of Ownership/Operations**

Operator: Operators vary by source, but include the following:

- Clay Terminals (an affiliate of Leemilt's Petroleum Inc.) 1985-1997
- Getty Petroleum Marketing, Inc. (GPMI, an unrelated entity) 1997-2012
- Getty Terminals 1985-2011 (PAP-00066678).

Owner: Power Test Realty Company Limited Partnership (PTRC, an affiliate of Leemilt's Petroleum Inc.) 1985-September 18, 2013 (PAP-00084077).

The tables below present a list of owners and operators identified in the *Preliminary Assessment/Site Investigation Report, Former Getty Terminal 56230,* dated March 2014 (PA/SIR) (PAP-00084082):

Name of Operator / Use	From	To
Vacant	2012	Present
Getty Petroleum Marketing Inc.	1984	2012
Texaco Refining and Marketing, Inc.	1960	1984
Tide Water Associated Oil Co	~1952	1960
The Atlantic Refining Company	Before 1950	~1952
Loujac Co.	Before 1931	~1950

Name of Property Owner	From	To
125 Doremus Avenue, LLC	9/18/2013	Present
Power Test Realty Co. Ltd. Partnership	2/1/1984	9/18/2013
Texaco Refining and Marketing, Inc.	1960	1984
Tide Water Associated Oil Co. (1952)	~1952	1960
The Atlantic Refining Co. (1950)	Before 1950	~1952
Loujac Co. (1931)	Before 1931	~1950

Pre-1931: A 1931 Sanborn Map shows that the property located at 86 Doremus Avenue was owned by Loujac Co. and the buildings in the West Yard were vacant

(PAP-00084169). According to the 1931 Sanborn Map, one building in the East Yard is labeled MFG Lacquers and one building is labeled MFG soap (PAP-00084169). There is no additional information regarding any prior use and/or ownership of the property by Loujac Co in the available file materials.

1930: Newark Terminal was constructed for use as a petroleum storage and distribution facility by the Atlantic Refining Company, which operated the facility until approximately 1950 (PAP-00432453, PAP-00066677).

1931: The Newark Terminal was owned by Loujac Co. and all buildings in the West Yard were vacant. The buildings in the East Yard were used for manufacturing of soap and lacquers (PAP-00084077).

1950: Newark Terminal was acquired by The Tidewater Associated Company and was operated by Getty Refining and Marketing Company (GRMC) (PAP-00066677).

1960s: The Tidewater Associated Company merged with the Getty Oil Company (PAP-00066677).

1984: Texaco Inc. acquired the Getty Oil Company in January 1984, and GRMC was re-named Texaco Refining and Marketing Inc. (TRMI) (PAP-00066677).

1984: On December 21, 1984, Texaco Inc., and its affiliated entity TRMI, sold the Newark Terminal to PTRC (an affiliate of Power Test Corp.) (PAP-00084080). The *Remedial Investigation Report, Former Getty Newark Terminal – Area A, 86 Doremus Avenue*, dated July 2014 (the Area A RIR) shows that PTRC was affiliated with Getty Properties Corporation and Getty Realty Corporation (PAP-00066677).

1985: Power Test of New Jersey, Inc. purchased the Newark Terminal from Texaco, Inc. in January 1985 and began its operation of the property (PAP-00020763). The Area A RIR states that Getty Terminals was responsible for operations from 1985 to 2011 (PAP-00066678).

1985: In January 1985, TRMI entered into an administrative consent order (ACO) with NJDEP requiring TRMI to investigate and remediate existing contamination at the Newark Terminal under the Environmental Clean-up and Responsibility Act (ECRA) (PAP-00020764; PAP-00066677).

1995: Power Test of New Jersey, Inc. merged into Leemilt's Petroleum Inc. on January 10, 1995 (PAP-00020762).

1997: GPMI was spun off from Getty Petroleum Corporation as a separate, publicly listed company (PAP-00432452). Getty Petroleum Corporation changed its name to Getty Realty Group on March 21, 1997 (PAP-00020762).

2001: On October 9, 2001, Chevron Corporation (Chevron) and Texaco Inc. merged to form the Chevron Texaco Corporation (PAP-00020762).

2011: GPMI filed for bankruptcy in December 2011 (PAP-00432452). Getty Terminals entered bankruptcy proceedings in 2011 (PAP-00066678). Another source states that GPMI filed for bankruptcy in December 2012 (PAP-00084077).

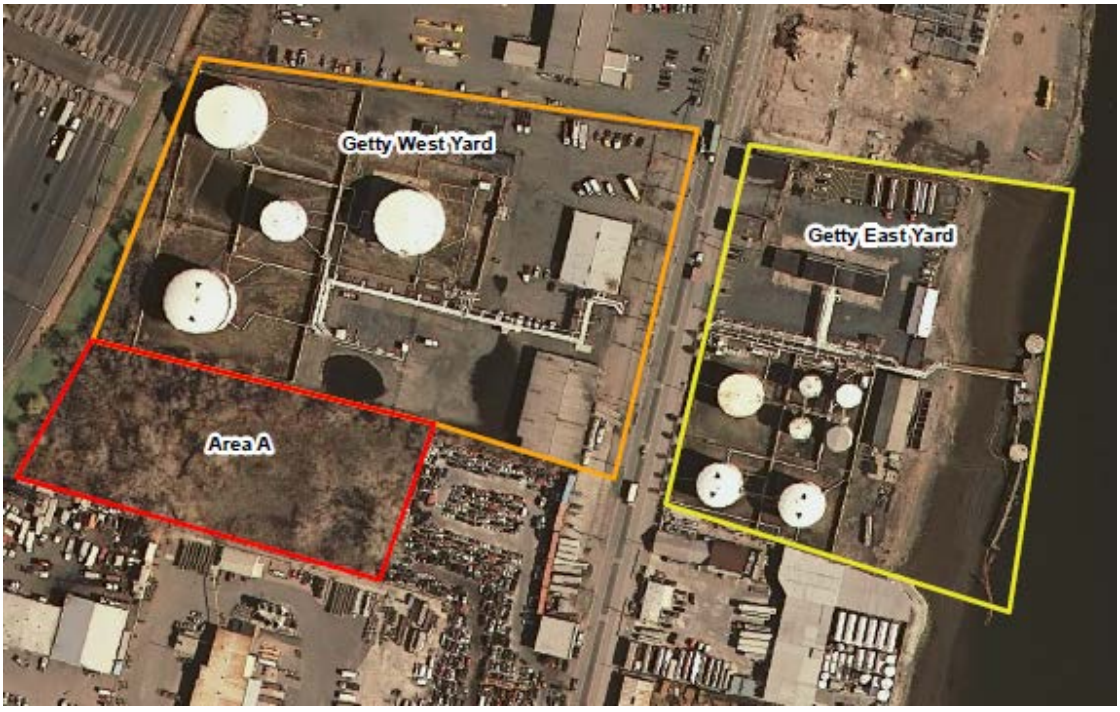
2011/2012: Getty Realty/PTRC took over the Newark Terminal (PAP-00066678).

2012: Site operations ceased in 2012 following the bankruptcy of GPMI (PAP-00083961; PAP-00084077).

2013: On September 18, 2013, PTRC sold the Newark Terminal to 125 Doremus Avenue, LLC (PAP-00066678; PAP-00084080-81).

3. Operational History/COC Use and Presence at the Facility

The Newark Terminal is bounded on the east by the Passaic River, on the west by Interstate 95, and on the north and south by industrial properties (PAP-00083963). Doremus Avenue bisects the property. The Newark Terminal consisted of an area known as the "East Yard" (bounded by the Passaic River and Doremus Avenue) and an area known as the "West Yard" and Area A (bounded by the New Jersey Turnpike/Interstate 95 and Doremus Avenue) (PAP-001661116). The East Yard is identified as Block 5011, Lots 8, 8.01, 8.02 and 8.03, and the West Yard and Area A are identified as Block 5010, Lot 7 (PAP-00066676), although another source identified the property as Block 5010, Lot 21 (PAP-00020762). Area A was formerly Lot 18 in Block 5010 but was later incorporated into Lot 7 (PAP-00066677). A figure presenting the site layout is provided below (PAP-00066705):



According to the *Underground Storage Tank Remedial Investigation Report, Getty No. 56230 – Newark Terminal,* dated April 7, 2006 (UST RIR), the East Yard included two, two-story masonry office buildings, a one-story masonry building that housed the dispatch office and locker room facilities, a fuel loading rack, a foam building, a barge dock, several large capacity above ground storage tanks (ASTs), and multiple containment dikes (PAP-00083018).

The West Yard included an area known as Area A, which was a vacant parcel not used for facility operations (PAP-00066677). According to the *Underground Storage Tank Site Investigation Report, Getty Terminal (West Yard),* dated February 28, 2003 (West Yard UST RIR), the West Yard included a one-story masonry automotive repair building and a one-story masonry warehouse (PAP-00082725).

The PA/SIR states that a review of historic maps and aerial photographs did not show any onsite wastewater treatment, septic systems, or discharge sources (PAP-00084090).

According to the West Yard UST SIR, a 1,000-gallon unleaded gasoline UST, three 54,000-gallon unleaded gasoline ASTs, and one 21,000-gallon No. 2 fuel AST were located at the West Yard (PAP-00082725). The table below presents a list of USTs at the Newark Terminal from the PA/SIR, reflecting the status as of 2014 (PAP-00084135):

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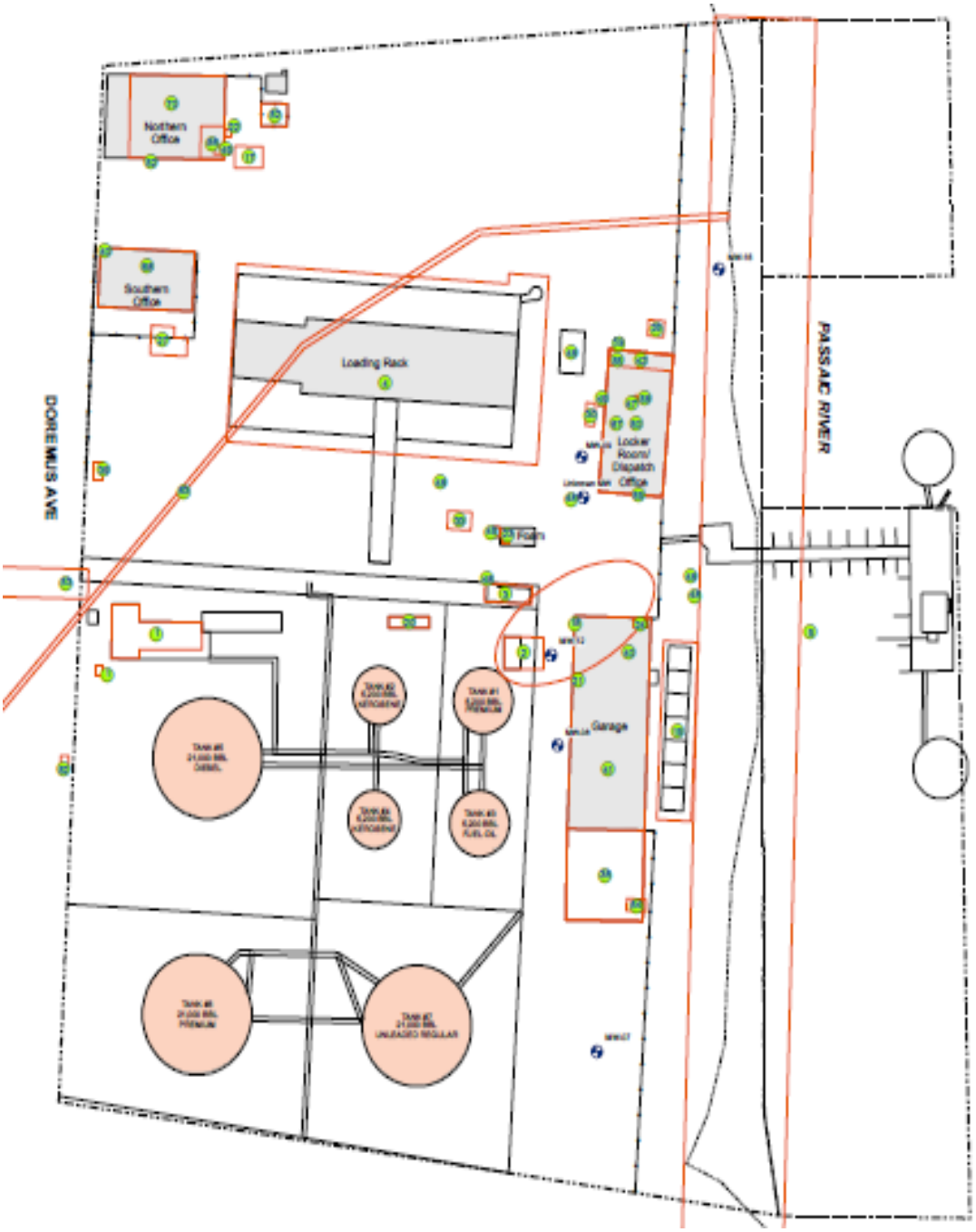
Diamond Alkali OU2 Allocation

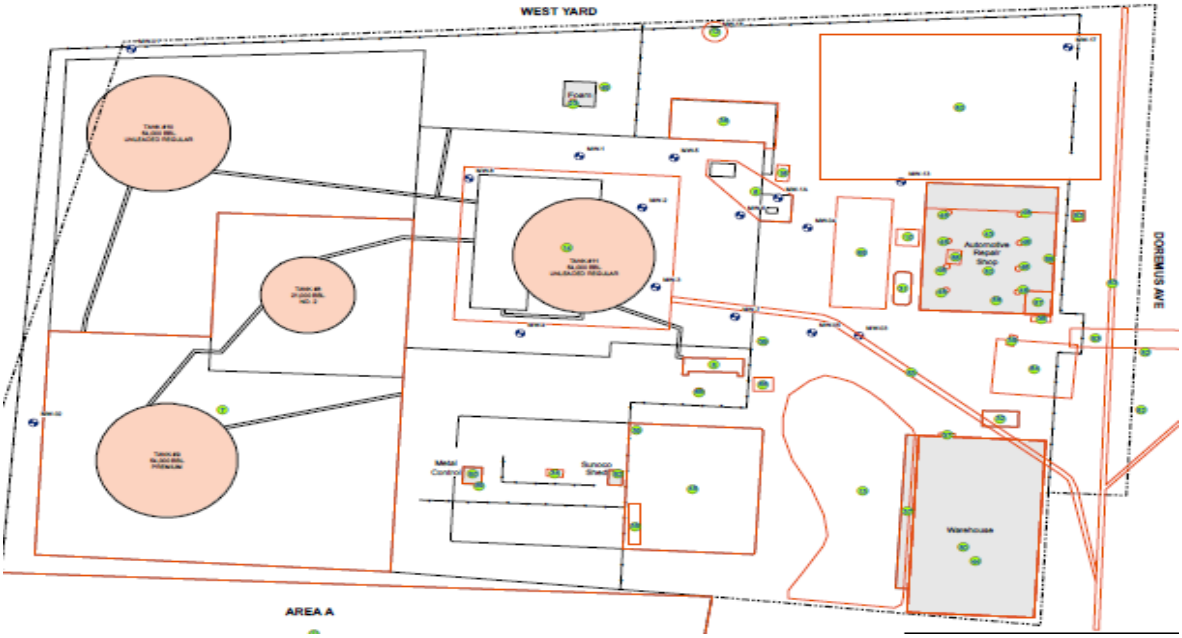
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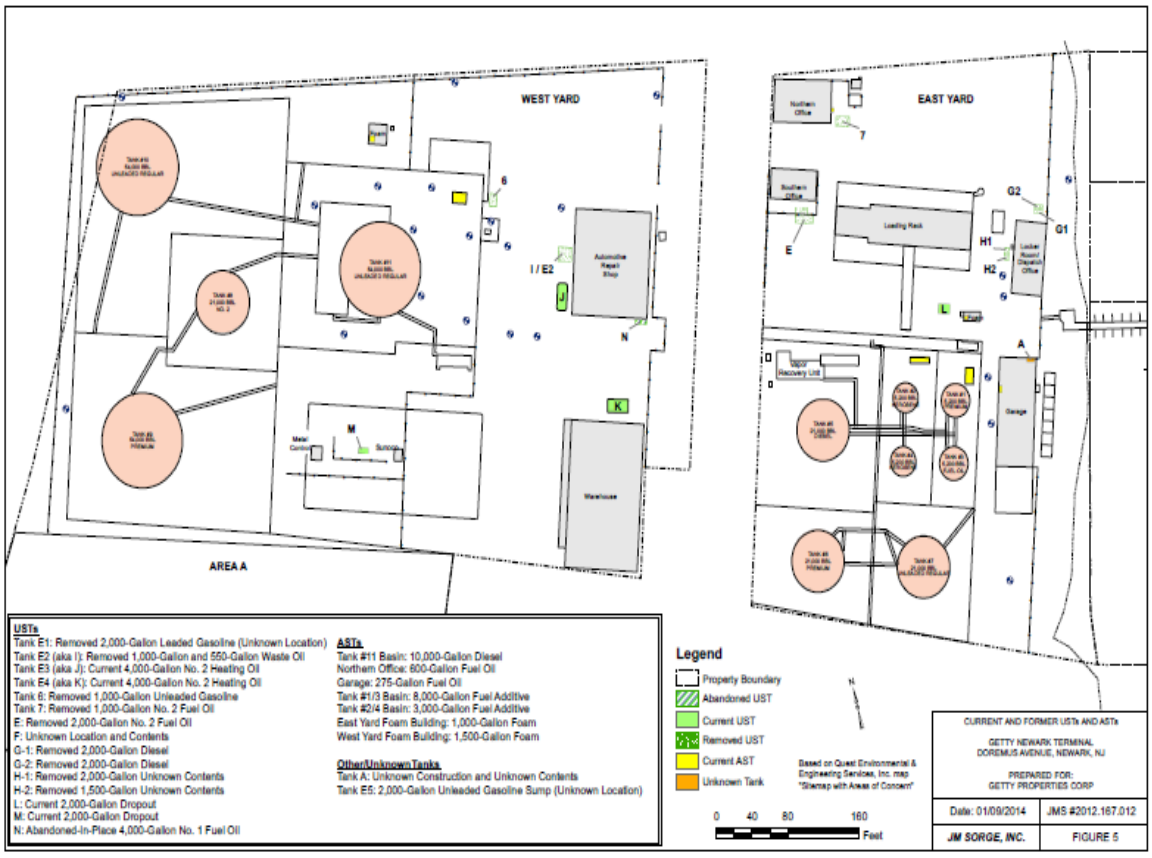
Tank	AOC #	Capacity (Gallons)	Contents	Status	Registered	Closure Number	NJDEP Case #	Yard	Location	Notes
Tank E1		2000	Leaded Gasoline	Removed (2/2/2006)	Yes	N05-4433	06-02-10-1135-08	Unknown	Unknown	
Tank E2	10	550 (registered as 500)	Waste Oil	Removed (2/21/1997)	Yes	TMS #C96-1146	97-2-21-1337-13	West	West of auto repair shop, same location as Tank I	Post excavation soil samples contained TPHC concentrations ranging from 56,600 to 145,000 mg/kg.
Tank E3 (aka J)		4000	No. 2 Heating Oil	Current	Yes	--	--	West	West of auto repair shop	
Tank E4 (aka K)		4000	No. 2 Heating Oil	Current	Yes	--	--	West	North of warehouse	
Tank E5		2000	Unleaded Gasoline	Sump	Yes	--	--	Unknown	Unknown	
Tank 6	16	1000	Unleaded Gasoline	Removed (1/13/2003)	Yes	N02-1799	--	West	East of Tank #11 Basin	Tank in good condition without holes when removed but water and oil were present in tank.
Tank 7	17	1000	No. 2 Heating Oil	Removed (2/21/1997)	Yes	TMS #C96-1146	97-2-21-1736-56	East	East of northern office	Two corrosion holes when tank was removed
A		Unknown	Unknown	Unknown	No	--	--	East	Northeast corner inside garage	Identified on historic maps, not discussed in text of historic reports
E		2000 (previously reported as 1000)	No. 2 Fuel Oil	Removed (1/30/1986)	No	--	--	East	South of southern office, partially under chain link fence	Tank was filled with sand when removed, surrounding stained soil was excavated.
F		Unknown	Unknown	Unknown	No	--	--	Unknown	Unknown	Referred to in NJDEP letter from 4/13/1999, not discussed in text of historic reports
G-1		2000	Diesel	Removed (1/29/1986)	No	--	--	East	North of locker room/dispatch office	Tank was filled with sand when removed and was corroded around seams, surrounding stained soil excavated
G-2		2000	Unknown, discovered during removal of G-1	Removed (1/29/1986)	No	--	--	East	North of locker room/dispatch office under HVAC pad	Tank was filled with sand when removed and was corroded around seams, surrounding stained soil excavated
H-1		2000	Oil	Removed (1/29/1986)	No	--	--	East	West of locker room/dispatch office	Tank was filled with sand when removed and was corroded around seams.
H-2		1500	Unknown, discovered during removal of H-1	Removed (1/30/1986)	No	--	--	East	West of locker room/dispatch office	Tank was filled with sand when removed and was corroded around seams.
I		1000 (previously reported as 100)	Waste Oil	Removed, replaced with 550-gallon Tank E2 (2/4/1986)	No	--	--	West	West of auto repair shop, same location as Tank E2	During tank removal, water with an oil layer was present in the UST.
L		2000	Unknown	Current	No	--	--	East	West of foam building	Fiberglass dropout tank, holds product during transfers for less than 24 hours.
M		2000	Unknown	Current	No	--	--	West	Between Sunoco shack and metal control building	Fiberglass dropout tank, holds product during transfers for less than 24 hours.
N		4000 (previously reported as 2000)	No. 1 Fuel Oil	Abandoned in place (abandoned prior to 1986, attempted to remove on 2/3/1986)	No	--	--	West	Outside southeast corner of auto repair shop	Not removed due to structural concerns with adjacent footings supporting overhead piping. Tank is filled with sand and abandoned in place.

Figures depicting the features of the East Yard and West Yard are presented below (PAP-00084131-132):





A figure depicting the locations of ASTs and USTs at the Newark Terminal is presented below (PAP-00084133):



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The table below presents a list of hazardous materials stored or used at the Newark Terminal from the PA/SIR. The list of materials is based on NJDEP Community Right to Know (CRTK) Surveys for CRTK Facility ID Number 94156800000 (GPMI, 2010-2012) and CRTK Facility ID Number 61763700000 (Getty Petroleum Corporation, 1992-1997). No CRTK records were available for the period of 1998-2009 (PAP-00084086-90):

Material Name	CAS #	Max Inventory Range	Storage method	Location
(Ambitrol) Diethylene Glycol		10,001 to 50,000 lbs	Steel Drums	East Yard Garage
(Ambitrol) Dipotassium Phosphate		10,001 to 50,000 lbs	Steel Drums	East Yard Garage
(Ambitrol) Ethylene Glycol		10,001 to 50,000 lbs	Steel Drums	East Yard Garage
(Lubrizol 8166) Alkylamine		10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8166) Ethylbenzene	100-41-4	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8166) Isopropyl Alcohol	67-63-0	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8166) Xylene	1330-20-7	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8192) Ethylbenzene	100-41-4	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8192) Xylene	1330-20-7	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8195) Ethylbenzene	100-41-4	50,001 to 100,000 lbs	AST	East Yard
(Lubrizol 8195) Ethylhexanone		50,001 to 100,000 lbs	AST	East Yard
(Lubrizol 8195) Xylene	1330-20-7	50,001 to 100,000 lbs	AST	East Yard
(Lubrizol 8247) Xylene	1330-20-7	10,001 to 50,000 lbs	AST	East Yard
(Nalco 5302) Heavy Aromatic		1,001 to 10,000 lbs	Steel Drums	East Yard Garage
(Nalco 5302) Xylene	1330-20-7	1,001 to 10,000 lbs	Steel Drums	East Yard Garage
(Nalco 5312) Amine Fatty Acid		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5312) Amine Substituted R		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5312) Heavy Aromatic NA		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5312) Octyl Nitrate		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5312) Oxtylnitrate		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5313) Heavy Aromatic NA		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5330) Ethylbenzene	100-41-1	10,001 to 50,000 lbs	AST	East Yard
(Nalco 5330) Heavy Aromatic NA		10,001 to 50,000 lbs	AST	East Yard
(Nalco 5330) Naphthalene	91-20-3	10,001 to 50,000 lbs	AST	East Yard
(Nalco 5330) Xylene		10,001 to 50,000 lbs	AST	East Yard
(Valvtect Diesel Guard) Xylenes	1330-20-7	10,001 to 50,000 lbs	Steel Drums	East Yard Garage
(Valvtect) Diethylene Glycol		101 to 1,000 lbs	Steel Drums	East Yard
(Valvtect) Isooctyl Alcohol	26952-21-6	101 to 1,000 lbs	Steel Drums	East Yard
(Valvtect) Kerosene		1,001 to 10,000 lbs	Steel Drums	East Yard
(Valvtect) Propylene Glycol Methyl Ether A		1,001 to 10,000 lbs	Steel Drums	East Yard
(Valvtect) Trimethylbenzene	95-63-6	101 to 1,000 lbs	Steel Drums	East Yard
(Valvtect Diesel G 7RD) Cumene	98-82-8	10,001 to 50,000 lbs	Steel Drums	East Yard Garage
1,1,1-Trichloroethane	71-55-6	11-100 lbs	Can	West Yard Auto Repair Shop
1,2,4-Trimethylbenzene	95-63-6	2,500 to 4,999 lbs	AST	East Yard
Additive Puradd AP6000		2,500 to 4,999 lbs	AST	East Yard
Adhesives		1-10 lbs	Can	West Yard Auto Repair Shop
Calcium Arsenate	7778-44-1	100,000 to 499,999 lbs	Bag	East Yard Garage
Calcium Chloride		101 to 1,000 lbs	Bag	West Yard Warehouse

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Car batteries			Shelf	East Yard Dispatch Office
Chemguard C333 AR-Aqueous Film Forming			Tanks	East Yard Foam House
Cumene	98-82-8	1,001 to 10,000 lbs	Steel Drums	East Yard Garage and West Yards Warehouse
Denatured Fuel Ethanol		Greater than 10 million lbs	AST	East and West Yards
Diesel Additive		101 to 1,000 lbs	Steel Drums	East and West Yards
Diesel Additive Acetate		1,001 to 10,000 lbs	Steel Drums	East Yard Garage
Diesel Additive Isooctyl		101 to 1,000 lbs	Steel Drums	East and West Yards
Diesel Additive Kerosene		1,001 to 10,000 lbs	Steel Drums	East Yard Garage
Diesel Additive Monomethyl		101 to 1,000 lbs	Steel Drums	East and West Yards
Diesel Additive Trimethyl		101 to 1,000 lbs	Steel Drums	East and West Yards
Diesel Exhaust Fluid - DEF			Bulk Storage Containers	East Yard Garage
Diesel Fuel	68476-34-6	1 million to 10 million lbs	AST	East Yard
Ethyl Alcohol	64-17-5	1 million to 10 million lbs	AST	East Yard
Ethylene Glycol	107-21-1	10,001 to 50,000 lbs	Steel Drums	West Yard Warehouse
Fluorescent lamp bulbs			Box	East Yard Garage
Foam, Aqueous film forming		10,001 to 50,000 lbs	Tank inside building	East Yard Foam House
Foam, Protein Hydrolysate		100,001 to 250,000 lbs	Tank inside building	West Yard Foam House
Gasoline, Leaded			ASTs	
Gasoline, Unleaded	8006-61-9	Greater than 10 million lbs	AST and UST	East and West Yards
Hazardous Waste		50,001 to 100,000 lbs	Steel Drums	East and West Yards
Hydrofluoric Acid	7664-39-3	11 to 100 lbs	Plastic bottles or jugs	West Yard Warehouse
Insecticide Gas (Non-Toxic)		Less than 1 lb	Can	West Yard Auto Repair Shop
John Zink Z-Seal Fluid		Unknown	Plastic drums	East Yard Garage
Karnak 71-AF Fibrated Asphalt Coating		Unknown	Can	East Yard
Kerosene			ASTs	East Yard
Lacquer			Unknown	East Yard
Methanol	67-56-1	10,001 to 50,000 lbs	Steel Drums	East and West Yards, East Yard Loading Rack
Methyl Ether	115-10-6	1,000 to 2,499 lbs	Steel Drums	East Yard
Mineral Spirits		1,001 to 10,000 lbs	Steel Drums	East Yard Garage and West Yard Warehouse
Multi-Purpose Gear Lubricant			Steel Drums	
Nalco 5403 Corrosion Inhibitor		Unknown	Steel Drums	West Yard Warehouse
Naphthalene	91-20-3	500 to 999 lbs	Steel Drums	East Yard
No. 2 Fuel Oil		Greater than 10 million lbs	AST and UST	East and West Yards
Paints, Enamel		10,001 to 50,000 lbs	Can	East Yard Garage and West Yard Warehouse
Petroleum Oils		50,001 to 100,000 lbs	Steel Drums	Warehouse West Yard
Petroleum Oils		250,001 to 500,000 lbs	Can	Warehouse West Yard
Polyurethane			Metal Cans	East Yard
Premium Gasoline			Tanks	East and West Yard
Propane	74-98-6	500 to 999 lbs	Cylinder	Auto Repair Shop
Propylene Glycol Monomethyl Ether	107-98-2	1,001 to 10,000 lbs	Steel Drums	East Yard Garage and West Yard Warehouse
Puradd AP-6000 Additive		3,000 gallons	AST	East Yard

Sodium Arsenate	7631-89-2	1,000 to 2,499 lbs	Bag	East Yard Garage
Sodium Chlorate	7775-09-9	10,001 to 50,000 lbs	Bag	West Yard Warehouse
Sodium Chloride		101 to 1,000 lbs	Bag	East Yard Garage
Spirax 75W-90 Synthetic Axle Oil			Steel Drums	
Sulfuric Acid	7664-93-9	11 to 100 lbs	Plastic bottles or jugs	West Yard Warehouse
Tetrahydrofuran	109-99-9		Steel Drums	East Yard
Thinners		11 to 100 lbs	Can	Auto Repair Shop
Tolad 3880R Additive		Unknown	Tote Bin	West Yard Warehouse
Tolad 3881 Additive		5,000 to 9,999 lbs	Tote Bin	East Yard, West Yard Warehouse
Tolad 9110 Additive		Unknown	Unknown	East Yard
Trimethyl Benzene	15551-13-7	10,001 to 50,000 lbs	Steel Drums	East Yard Garage
Vinyl Acetate	108-05-4	2,500 to 4,999 lbs	Steel Drums	East Yard
Waste Oil			AST and UST	East and West Yards
Wax Liquid		11 to 100 lbs	Can	East Yard Broom Closet (Building Unknown)
Xylene	1330-20-7	1,001 to 10,000 lbs	Steel Drums, AST	East Yard Garage and West Yard Warehouse

4. Identified COCs

- PCBs (detected)
- PAHs (stored, detected)
- Copper (detected)
- Mercury (detected)
- Lead (stored, detected)

PCBs

Concentrations of total PCBs ranged from non-detect to 67 milligrams per kilogram (mg/kg) (PAP-00066714-15, 66).

The PA/SIR states that transformers were located in six locations at the Newark Terminal: three locations in the East Yard and three locations in the West Yard. Three wall-mounted transformers were located on the northern office building in the East Yard and appeared to be in good condition with no signs of staining or leaking. Three large pad-mounted transformers were located on a concrete pad, east of the northern office building. The transformers and pad had rust stains and the center transformer had black staining near the base and on the pad directly surrounding the transformer. One pad-mounted transformer was located on a concrete pad in the East Yard, adjacent to Doremus Avenue, which appeared to be in good condition with no significant stains on the transformer or the pad. There were two poles holding pole-mounted transformers in the West Yard, located adjacent to Doremus Avenue. One pole had three transformers and the second pole had one transformer. The pole-mounted transformers appeared to be in good condition with no signs of staining or leaking. A pad-mounted transformer was located on a concrete pad between the automotive repair show and Doremus Avenue, and appeared to be in good condition with no signs of staining or leaking. None of the transformers were labeled as PCB-containing (PAP-00084117-118).

PAHs

According to the *Remedial Investigation Report, Former Getty Newark Terminal – Area A, 86 Doremus Avenue* (Area A RIR), PAH detections in soil are attributed to Historic Fill (PAP-00066685). Concentrations of PAHs in soil included benzo(a)anthracene, ranging from non-detect to 12 mg/kg; benzo(a)pyrene ranging from non-detect to 19 mg/kg; benzo(b)fluoranthene, ranging from non-detect to 23 mg/kg; benzo(k)fluoranthene, ranging from non-detect to 26 mg/kg; indeno(1,2,3-cd)pyrene, ranging from non-detect to 10 mg/kg; and dibenzo(a,h)anthracene, ranging from non-detect to 2.8 mg/kg (PAP-00066716-18).

Copper

Concentrations of copper in soil were as high as 2,030 mg/kg (PAP-00086279-296). No additional information regarding the presence or use of copper at the Newark Terminal could be located in the available file materials.

Lead

Paint was stored in one-gallon and five-gallon cans and stacked in plastic wrapped cardboard boxes on pallets located in a garage area at the East Yard of the Newark Terminal (PAP-00432453).

In addition, several racks of clear-cased batteries were stored at the Newark Terminal in connection with a telephone system and fire alarm system (PAP-00432453-54). The batteries were the approximate size of a motorcycle or tractor battery (PAP-00432454). Concentrations of lead in soil were as high as 2,160 mg/kg (PAP-00086279-296).

Leaded gasoline was stored at the Newark Terminal, based on the table of hazardous materials provided in the PA/SIR (PAP-00084086-90).

No additional information regarding the presence or use of lead at the Newark Terminal could be located in the available file materials.

Mercury

Concentrations of mercury in soil were as high as 2.3 mg/kg (PAP-00086279-296). No additional information regarding the presence or use of mercury at the Newark Terminal could be located in the available file materials.

Historic Fill

The Allocation Team has determined that the property is located on regional Historic Fill as designated by the NJDEP.[1]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00066714-15, 66; PAP-00086279-296; PAP-00086279-296).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,160 mg/kg
Copper	2,030 mg/kg
Mercury	2.3 mg/kg
Benzo(a)anthracene	12 mg/kg
Benzo(a)pyrene	19 mg/kg
Benzo(b)fluoranthene	23 mg/kg
Benzo(k)fluoranthene	26 mg/kg
Dibenzo(a,h)anthracene	10 mg/kg
Indeno(1,2,3-cd)pyrene	2.8 mg/kg
Total PCBs	67 mg/kg

* Metals data taken from the data tables in the *Remedial Investigation Report, Former Getty Terminal 56230, 86 Doremus Avenue*, dated April 2016 (PAP-00086279-96); PAHs data taken from Table 3 in the Remedial Investigation Report, Former Getty Newark Terminal – Area A, 86 Doremus Avenue, dated July 2014 (the Area A RIR) (PAP-00066716-18); PCBs data taken from Table 2 of the Area A RIR (PAP-00066714-15).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to the affidavit of Dale Holden, a former employee of Getty Petroleum Corporation, Historic Fill at the Newark Terminal was not disturbed, with the exception of the removal of USTs. Any Historic Fill excavated as part of the UST removals was properly handled and disposed of off-site, and was replaced with clean fill (PAP-00432454).

According to the Area A RIR, the presence of Historic Fill in Area A has been confirmed based on multiple lines of evidence including characterization of soil borings completed at the property, aerial photograph review, NJDEP Historic Fill maps, and the results of soil sampling that has confirmed the presence of PAHs and metals often associated with Historic Fill (PAP-00066685). Historic Fill is approximately two to ten feet deep in Area A. The Historic Fill was placed periodically between the early 1900s to the early 1970s (PAP-00066678).

According to the *LNAPL Interim Remedial Measures Report, Former Getty Terminal 56230,* dated December 2013, the entire Newark Terminal is within an area of Historic Fill, as mapped by NJDEP. Fill material was typically observed from the surface to approximately five to eight feet below ground surface (bgs) (PAP-00083961). The PA/SIR states that an evaluation of Historic Fill was conducted in the East and West Yard in November 2006 by Conestoga-Rovers & Associates (CRA) on behalf of Chevron. CRA concluded, based on soil analytical data, boring logs, historic fill maps, and correspondence with NJDEP, that Historic Fill was present throughout the full extent of the East and West Yards. CRA also concluded that PAHs and lead in soil were indicative of Historic Fill (PAP-00084092).

The *Remedial Investigation Report, Former Getty Terminal 56230, 86 Doremus Avenue*, dated April 2016, identified four metals and eight PAHs that were determined to be related to Historic Fill based on statistical analysis, including: arsenic, beryllium, lead, vanadium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthese, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, and ideno(1,2,3-cd)pyrene (PAP-00086186).

5. COC Pathways

The Newark Terminal is located on the west bank of the Passaic River. The East Yard is bounded to the east by the Passaic River (PAP-00083019; PAP-00083962). The Passaic River is located approximately 580 feet east of the West Yard (PAP-00082725; PAP-00083310). Area A is covered with vegetation, which according to the Area A RIR, mitigates the risk of potential erosion of PCB, PAH, and lead-impacted surface soil (i.e., Historic Fill) and transport via surface water runoff. No permanent surface water bodies exist on the property. The Passaic River is located approximately 1,000 feet east of Area A (PAP-00066697).

According to the PA/SIR, the entire Newark Terminal, as well as other properties along Doremus Avenue, are subject to flooding during significant storm events. The entire Newark Terminal and surrounding areas were flooded during an October 2012 storm (PAP-00084094). During flooding events, regional contamination from the Passaic

River, other industrial sites in the area, and regional Historic Fill are comingled with potential site-related impacts from the Newark Terminal AOCs (PAP-00084099).

Sanitary and Storm Sewer

Stormwater in the East Yard was collected in storm drains that led to an oil/water separator that discharged to the Passaic River, and was regulated pursuant to New Jersey Pollutant Discharge Elimination System Permit No. NJ0026034. Monitoring requirements pursuant to the NJPDES Permit included quarterly stormwater sampling, analysis, and reporting on Discharge Monitoring Reports (DMRs) (PAP-00432454).

The PA/SIR states that no storm sewer drains were observed in the West Yard (PAP-00084115).

Sanitary waste at the Newark Terminal was discharged to the PVSC system (PAP-00432454). Both the city water lines and the sanitary sewer lines are located on Doremus Avenue (PAP-00083311).

According to the PA/SIR, multiple storm drains and trench drains were identified within the loading rack area in the East Yard. These drains eventually connect to the oil/water separator that discharged to the Passaic River. The loading rack area is paved with concrete (PAP-00084096). The oil/water separator flooded in October 2012 and the area around the separator is frequently flooded by the Passaic River (PAP-00084105).

The PA/SIR also stated that the automotive repair shop in the West Yard includes eight floor drains, but the integrity of the drain piping and the final drainage point of these floor drains have not been determined. Some of the floor drains were filled with debris and the floor of the shop was heavily stained and greasy (PAP-00084115).

According to the PA/SIR, there were two slop sinks located in the automotive repair shop of the West Yard. There was also a slop sink in a closet in the locker room/dispatch office building. All three slop sinks had slight staining and are believed to be connected to the municipal sewer system (PAP-00084120).

Although plans of the drainage systems in the West Yard (PAP-00717684; dated 1983) and East Yard (PAP-00717679; dated 1984) show a connection between the yards under Doremus Avenue, an affidavit from former employee Mr. Dale Holden states that the connection was never installed (PAP-00717677). In addition, in 1994, a tracer dye test was performed by Tyree Organization, Ltd. The tracer study concluded that the final discharge point for the West Yard trench drain system and the Vehicle Repair Garage floor drain system was the City of Newark sanitary sewer system and not the East Yard oil/water separator (PAP-00717681).[5]

Direct Release

[5] This Report was revised to include documents received on June 5, 2020. The additional documents did not change Leemilt's Petroleum Inc.'s previous certification.

According to the PA/SIR, stormwater at the Newark Terminal was regulated pursuant to New Jersey Pollutant Discharge Elimination System (NJPDES) Permit No. NJ0026034, which applies specifically to an oil/water separator located in the East Yard adjacent to the Passaic River. This oil/water separator discharges directly to the river (PAP-00084091). No additional information regarding direct releases to the Passaic River at the Newark Terminal could be located in the available file materials.

Spills

The PA/SIR identified several NJDEP case numbers including:

- case No. 97-2-21-1337-13 (associated with AOC 10);
- case No. 97-2-21-1736-56 (associated with AOC 17);
- case No. 03-05-16-1549-38 (associated with AOC 1);
- case No. 04-02-13-0606-39 (associated with AOC 13);
- case No. 04-02-13-0619-23 (associated with AOC 13);
- case No. 05-02-23-1219-45 (associated with AOC 2 and AOC 20);
- case No. 06-02-10-1135-08 (associated with AOC 25);
- case No. 06-03-06-1407-55 (associated with AOC 1); and
- case No. 10-01-22-0348-17 (associated with AOC 14) (PAP-00084077, 91).

Case E20120316 is also identified in the RA/SIR (PAP-00084077). Case No. 03-05-16-1549-38 was determined to be an air release in the PA/SIR (PAP-00084095). The PA/SIR states that the incident associated with case No. 06-03-06-1407-55 appeared to be a simulated spill associated with a containment drill based on the description, but also states that it cannot be determined if an actual discharge occurred based on the available documentation (PAP-00084094). Similarly, the PA/SIR states that the incident associated with case No. 05-02-23-1219-45 appeared to be a simulated spill associated with a containment drill based on the description, but also states that it cannot be determined if an actual discharge occurred based on the available documentation (PAP-00084095). The case numbers associated with AOCs 13 and 14 appear to be related to unleaded gasoline releases and are unlikely to have contained OU2 COCs (PAP-00084101-102). The case number associated with AOC 25 appears to be related to a leaded gasoline release (PAP-00084106). It is unclear if the remaining case numbers are associated with OU2 COCs based on the available file materials.

A list of the 70 AOCs (not all of which are spills) identified at the Newark Terminal, including those associated with the case numbers listed above, is provided in Section 7 below.

6. Regulatory History/Enforcement Actions

Inspections and Violations

According to the PA/SIR, approximately 1,500 cubic yards of soil and debris were illegally placed in two piles at Area A in 1996. In addition to soil, the identified piles included tires, wood, concrete, metal, and other debris. The material was removed for

off-site disposal (PAP-00084093). It is unclear if the piles of soil and debris contained OU2 COCs based on the available file materials.

Permits

Stormwater at the Newark Terminal was regulated pursuant to NJPDES Permit No. NJ0026034 (PAP-00066869).

According to the PA/SIR, the permits noted above apply specifically to an oil/water separator located in the East Yard adjacent to the Passaic River, which discharges directly to the river (PAP-00084091).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- *LNAPL Interim Remedial Measures Report, Former Getty Terminal 56230,* dated September 2017 (PAP-00086766);
- *Remedial Investigation Report, Former Getty Terminal 56230, 86 Doremus Avenue*, dated April 2016 (PAP-00086165);
- *Remedial Investigation Report, Former Getty Newark Terminal – Area A, 86 Doremus Avenue*, dated July 2014 (Area A RIR) (PAP-00066671);
- *Preliminary Assessment/Site Investigation Report, Former Getty Terminal 56230,* dated March 2014 (PA/SIR) (PAP-00084072);
- *LNAPL Interim Remedial Measures Report, Former Getty Terminal 56230,* dated December 2013 (PAP-00083957);
- *LNAPL Free Product Interim Remedial Measures Report, Getty Terminal No. 56230 (West Yard),* dated May 27, 2011 (PAP-00083305);
- *Remedial Action Work Plan*, dated January 23, 2008 (PAP-00066671);
- *Underground Storage Tank Remedial Investigation Report, Getty No. 56230 – Newark Terminal,* dated April 7, 2006 (UST RIR) (PAP-00083013);
- *Baseline Ecological Evaluation Report,* dated February 23, 2006 (PAP-00066799);
- *Remedial Investigation Sampling Results for Area A*, dated March 31, 2005 (PAP-00066676);
- *Remedial Investigation Report, Getty Terminal No. 56230 (West Yard),* dated June 16, 2004 (PAP-00082888);
- *Underground Storage Tank Site Investigation Report, Getty Terminal No. 56230 (West Yard),* dated February 28, 2003 (West Yard UST SIR) (PAP-00082720);
- *Remedial Action Report for PCB Soils in Area A, Volume I Report, Getty Newark Terminal*, dated July 25, 1997 (PAP-00066760, PAS-00005678); and
- *Area A Closure Report, Newark Terminal, Newark New Jersey, ECRA Case No. 84455,* dated November 1991 (PAP-00066737).

Sewer

According to the PA/SIR, the loading rack drains and associated manholes were inspected in 1997. Soil and debris underneath the steel grating were manual removed and a high pressure water jet was used to flush the remaining sediment from the pipes into the collection system, which discharges to the oil/water separator. Following the cleaning activities, the drains were visually inspected and found to be constructed of concrete and lined with steel sheeting. The integrity of the collected drains was intact (PAP-00084096). The site visits conducted during the preliminary assessment/site investigation found that several of the loading rack drains were blocked with debris and were not functioning (PAP-00084097, 116).

The PA/SIR states that four sumps are located in the East Yard: one associated with the vapor recovery unit for Tank No. 5 and three associated with the fire protection or sewer systems, including a sump on the west side of the locker room/dispatch office building, a sump on the west side of the foam building, and a sump inside the northern office building. Black stains were visible near the bottom of the sump adjacent to the locker room/dispatch office building. There is one sump located in the West Yard, northeast of the foam building. Water in this sump had a sheen which may have been due to surface runoff from the adjacent loading area and heavy rain during the inspection (PAP-00084116).

Soil

Soil sampling was conducted at the East Yard and West Yard on behalf of Getty Petroleum Corporation between April 2013 and April 2014, specifically focusing on 12 of the 70 AOCs identified at the Newark Terminal (PAP-00086183).

Remedial Activities

According to the PA/SIR, there were two Industrial Site Recovery Act (ISRA) cases: E84455 related to the sale of the Newark Terminal to PTRC by Texaco Inc. in 1984 and E20120316 related to the cessation of operations by the bankruptcy of the operator, GPMI, in 2012 (PAP-00084077). Various remedial activities related to these two cases are presented below.

Implemented by Texaco/Chevron

According to the PA/SIR, two 2,000-gallon diesel USTs identified as Tanks G-1 and G-2 were removed from the East Yard of the Newark Terminal on January 29, 1986. The USTs were located to the north of the locker room/dispatch office building. Tank G-1 had previously been abandoned and filled with sand. During excavation of Tank G-1, a second sand-filled tank (Tank G-2) was found beneath the HVAC system pad. Piping was found on three sides of the excavation, but all piping appeared to be abandoned. Both USTs, associated piping, and stained soil were removed to a depth of 8-10 feet. The USTs were both observed to be corroded around the seams. Correspondence from NJDEP stated that they had no registration or records of the installation or removal of these USTs (PAP-00084108).

The PA/SIR states that a 2,000-gallon UST and a 1,500-gallon UST identified as Tanks H-1 and H-2 were removed from the East Yard of the Newark Terminal on January 29, 1986. The USTs were located to the west of the locker room/dispatch office building. The former contents of these USTs were not identified. Tank H-1 had previously been abandoned and filled with sand. During excavation of Tank H-1, a second sand-filled tank (Tank H-2) was found. Tank H-2 was strapped into an open-bottomed concrete-walled vault. The USTs were both observed to be corroded around the seams. Both the USTs and stained soil were removed to a depth of 6-8 feet. A vacuum truck was used to remove oily water from the excavation. Correspondence from NJDEP stated that they had no registration or records of the installation or removal of these USTs (PAP-00084108-109).

The PA/SIR states that a 2,000-gallon No. 2 fuel oil UST identified as Tank E, located south of the southern office building, was removed from the East Yard on January 30, 1986. Prior to removal, the tank was reported as a 1,000-gallon UST, but during removal it was discovered to be a 2,000-gallon UST. The tank appeared to be previously abandoned and had been filled with sand. Stained soil was removed to 8 feet bgs and the excavation was backfilled with sand. Correspondence from NJDEP stated that they had no registration or records of the installation or removal of this UST (PAP-00084107).

According to the PA/SIR, contractors attempted to remove a 4,000-gallon fuel oil UST identified as Tank N from the West Yard between January 31 and February 3, 1986. Prior to removal, the tank was reported as a 2,000-gallon UST, but during removal it was discovered to be a 4,000-gallon UST. Tank N had previously been abandoned and filled with sand. Tank N was located near footings that support overhead piping and could not be removed. Correspondence from NJDEP stated that they had no registration or records of the installation or removal of this UST (PAP-00084111);

The PA/SIR states that a 1,000-gallon waste oil UST identified as Tank I, located west of the automotive repair shop, was removed from the Newark Terminal on February 3-4, 1986. Prior to removal, the tank was reported as a 100-gallon waste oil UST, but during removal it was discovered to be a 1,000-gallon UST located inside an open bottomed concrete-walled vault. Water with an oil layer was present inside the UST prior to removal. Following tank removal, soil within the vault was removed to a depth of 6-8 feet and a new 550-gallon fiberglass tank was installed within the vault. The replacement 550-gallon waste oil UST was removed on February 21, 1997 under closure number No. C96-1146. The UST contained no holes, but stained soils and a sheen were noted during tank removal. NJDEP assigned case number No. 97-2-21-1337-13. Post-excavation samples were analyzed for total petroleum hydrocarbons (TPHC) (PAP-00084099).

According to the Area A RIR, remedial investigation and reporting activities in Area A of the Newark Terminal occurred between May 1988 and March 2005 (PAP-00066676). In 1988, eleven soil borings (SB-1 through SB-11) were advanced to groundwater within Area A to investigate and characterize the soil and a total of 35 soil samples were submitted for analysis of TPHC and lead (PAP-00066679). Total lead concentrations ranged from 1.3 mg/kg to 8,200 mg/kg (PAP-00066680).

The Area A RIR, states that in May 1990 soil containing TPHC and lead was delineated and excavated to the approved cleanup levels (500 ppm for TPHC; 1,000 ppm for lead; 1 ppm for volatile organic compounds (VOCs); and 10 ppm for Base Neutrals). PCBs were found during waste classification sampling, requiring another phase of investigation. Area A Phase II Investigation activities were performed in November 1990 to further delineate and investigate PCBs, TPHC, lead, BNs, and VOCs. Soil with levels of TPHC, PCBs, and BNs exceeding cleanup levels was excavated. The ECRA cleanup guideline of 5 ppm was used for PCBs. Post-excavation samples were collected in January 1991 and some sample results for PCBs and TPHC exceeded the cleanup levels (PAP-0006680).

The Area A RIR also summarizes the Phase III investigation activities that were performed from May 1991 through September 1991, as well as a final soil excavation. Approximately 4,000 tons of soil were excavated from Area A during Phases II and III (PAP-00066681). In a letter dated June 12, 1992, the NJDEP declined the request for a No Further Action (NFA) determination because post-excavation sampling was not deemed sufficient (PAP-00066681, 754-758).

According to the Area A RIR, Phase IV investigation activities were performed at Area A in March 1993, which found that PCBs were detected at various locations within Area A at concentrations exceeding the Non-Residential Direct Contact Soil Cleanup Criteria (DCSCC) (PAP-00066681).

According to the Area A RIR, further investigation of soil was conducted between December 1994 and January 1995. A total of 36 samples were collected to delineate PCBs and 25 samples were collected to delineate PAHs. Six samples were also collected off-site, to the southwest of Area A. Results showed that the most elevated PCB concentrations (10 to 67 ppm) existed in soil along the southwestern property boundary and in off-site sampling locations (PAP-00066681-82).

Results also showed that PAHs were detected throughout Area A soils. Investigative activities for Area A also included review of aerial photographs from the 1947, 1959, 1963, 1969, 1973, and 1982, which provided evidence of historic fill placement. Areas observed to undergo the most disturbances in Area A correspond to areas of highest PCB concentrations. In a letter dated December 6, 1996, the NJDEP accepted the evidence of historic fill (PAP-00066681-82).

In 1996, Area A was divided into Areas 1 through 4 to facilitate addition delineation of soil contamination. Following delineation efforts, 229 tons of soil were excavated from Area A to remove PCBs above 20 mg/kg (PAP-00066682).

In February 2004, additional sampling efforts were conducted which included the installation and sampling of eleven soil borings along the perimeter of Area A and four borings within Area A. Surface soil samples were also collected at six locations (PAP-00066686-87).

According to the PA/SIR, Chevron proposed a deed notice and cap for Area A in August 2013 (PAP-00084100).

Implemented by GPMI

According to the PA/SIR, a steel 1,000-gallon No. 2 fuel oil UST identified as Tank 7 was removed from the East Yard on February 21, 1997. The tank closure was associated with approval No. C96-1146. During tank removal, groundwater with a sheen was encountered at 2-3 feet bgs and NJDEP assigned case number No. 97-2-21-1736-56. Post-excavation samples showed that soil was impacted with TPHC at concentrations ranging from 26,500 to 39,000 mg/kg (PAP-00084104).

According to the West Yard UST SIR, a 1,000-gallon unleaded gasoline UST (Registration No. 004475) identified as Tank 6 was closed at the West Yard. Closure activities were completed on January 13, 2003, under closure number No. N02-1799 (PAP-00082725-26; PAP-00084103). Prior to excavation work, approximately 1,688 gallons of water and unleaded gasoline were removed from the UST and transported off-site for disposal via vacuum truck (PAP-00082726). The removal of 1,688 gallons of water and gasoline implied that the UST may have leaked (PAP-00084103). The UST was removed and transported for scrap recycling. No associated piping was uncovered during tank removal. No holes or corrosion were observed upon inspection of the tank. There were no visual observations of impacted soils within the excavation. Six post-excavation samples were collected from the sidewalls and analyzed for total VOCs. No exceedances of NJDEP soil criteria were detected. The excavation was then backfilled with pea gravel (PAP-00082727-28).

According to the UST RIR, a 2,000-gallon fiberglass gasoline UST (Registration No. 004475) was closed at the East Yard and closure activities were completed on February 2, 2006 (PAP-00083018, 20). Approximately 625 gallons of liquid were removed from the UST via vacuum truck. Due to the presence of product lines and utility lines, the UST was removed from the excavation in pieces. Subsurface soils were impacted, as demonstrated by petroleum odors, stained soils, and elevation PID readings ranging from 80 to 2,400 ppm. No associated piping was uncovered during tank removal. Fifty tons of soil were removed and disposed offsite during UST removal activities (PAP-00083020-21). Four post-excavation samples were collected from the sidewalls and analyzed for total VOCs, and benzene was detected above the NJDEP soil criteria of 1 mg/kg in three of the four samples. The excavation was backfilled with clean fill (PAP-00083022-23). Table 2 shows that samples were also analyzed for lead and concentrations ranged from 18.2 to 50.4 mg/kg (PAP-00083030).

Implemented by Getty Properties Corp

According to the PA/SIR, there was an initial list of 70 AOCs identified at the Newark Terminal, 53 of which require additional investigation or remediation. A list of AOCs is presented below (PAP-00084078-80):

- AOC 1: Vapor Recovery Unit in Tank #5 Basin
- AOC 2: 8,000-Gallon Fuel Additive AST and Tank Pump (Tank #1/#3 Basin)
- AOC 3: Pump and Bleeder Valves Staining (North of Tanks #1-#4)
- AOC 4: Loading Rack Drainage System
- AOC 5: West Yard Valve Units by Southeast Wall of Tank #11 Basin
- AOC 6: 10,000-Gallon Diesel AST in Tank #11 Basin
- AOC 7: Sandblasting Grit (Tank #8 and #9)
- AOC 8: Closure of Well MW-10
- AOC 9: River Mass Loading Assessment
- AOC 10: Auto Repair Shop Former 1,000-Gallon Waste Oil UST (UST I) and 550-Gallon Waste Oil UST (Tank E2)
- AOC 11: Area A (Chevron)
- AOC 12: West Yard Free Product in MW-18 Area
- AOC 13: 2004 Gasoline Spill
- AOC 14: Tank #11 Gasoline Spill
- AOC 15: East Yard Free Product in MW-12 Area
- AOC 16: West Yard Former 1,000-Gallon Unleaded Gasoline UST (Tank 6)

- AOC 17: Northern Office Former 1,000-Gallon No. 2 Fuel Oil UST (Tank 7)
- AOC 18: Regional Site-Wide Ground Water
- AOC 19: Oil/Water Separator
- AOC 20: 3,000-Gallon Fuel Additive AST (Tank #2/#4 Basin)
- AOC 21: East Yard Garage 275-Gallon Fuel Oil AST
- AOC 22: East Yard Northern Office 600-Gallon Fuel Oil AST
- AOC 23: East and West Yard 1,000-Gallon and 1,500-Gallon Foam ASTs
- AOC 24: East Yard Garage Tank A (Potential UST)
- AOC 25: Former 2,000-Gallon Leaded Gasoline UST (Tank E1)
- AOC 26: 2,000-Gallon Unleaded Gasoline Sump (Tank E5)
- AOC 27: East Yard Southern Office Former 2,000-Gallon No. 2 Fuel Oil UST (UST E)
- AOC 28: UST F
- AOC 29: Dispatch Office/Locker Room Former Two 2,000-Gallon Diesel USTs (UST G-1 & G-2)
- AOC 30: East Yard Former 1,500-Gallon UST and 2,000-Gallon UST (UST H-1 & H-2)
- AOC 31: Auto Repair Shop 4,000-Gallon No. 2 Fuel Oil UST (UST J)
- AOC 32: West Yard Warehouse 4,000-Gallon No. 2 Fuel Oil UST (UST K)
- AOC 33: East Yard 2,000-Gallon Dropout UST (UST L)
- AOC 34: West Yard 2,000-Gallon Dropout UST (UST M)
- AOC 35: Auto Repair Shop Abandoned 4,000-Gallon No. 1 Fuel Oil UST (UST N)
- AOC 36: West Yard Fuel Loading Area
- AOC 37: Warehouse Loading Docks
- AOC 38: Garage Loading Dock
- AOC 39: Dumpsters and Shipping Container
- AOC 40: Chemical Storage Cabinets
- AOC 41: Garage Material Storage
- AOC 42: Locker Room/Dispatch Office Electrical Room Material Storage
- AOC 43: Auto Repair Shop Material Storage

- AOC 44: Warehouse Material Storage
- AOC 45: West Yard Former Drum Storage Area
- AOC 46: Auto Repair Shop Floor Drains
- AOC 47: Locker Room Floor Drain
- AOC 48: Storm Sewer Collection System and Drains
- AOC 49: Fire and/or Sewer Sumps
- AOC 50: Roof Leaders
- AOC 51: Historic Fill
- AOC 52: Electrical Transformers
- AOC 53: Terminal Piping
- AOC 54: Open Pipes
- AOC 55: Compressor Vent Discharge
- AOC 56: East Yard Northern Office Fire Pump/Boiler Room
- AOC 57: Auto Repair Shop Boiler Room
- AOC 58: Slop Sinks
- AOC 59: Air Vents and Ducts
- AOC 60: West Yard – Northeast Side Adjacent to Doremus Avenue
- AOC 61: Potential Former Septic System
- AOC 62: Site Flooding
- AOC 63: Former Railroad Siding and Rail Cars
- AOC 64: Former West Yard Boiler House (1931)
- AOC 65: Former West Yard Chemical Storage (1931)
- AOC 66: Former Elevators (1931)
- AOC 67: Former Soap Manufacturing (1931) / East Yard Barrel Storage (1950)
- AOC 68: Former Lacquer Manufacturing (1931) / Motor Oil Warehouse (1950)
- AOC 69: Former Gasoline Pump Equipment Storage (~1950 – 1952)
- AOC 70: Former Oil Filling Area (1950 – 2003)

The locations of the AOCs are depicted on the two figures included above in Section 2, which show the features of the East Yard and West Yard, as well as the AOC numbers (numbers within the green circles) (PAP-00084131-132).

8. Summary of Asserted Defenses

Leemilt's asserts that while there are reports of petroleum releases and/or discharges at the Facility, these releases fall within CERCLA's petroleum exclusion, including any constituent PAH COCs. See Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601(14).

Legacy Vulcan, LLC

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

LEGACY VULCAN, LLC

Facility Name, Address and Size: Balbach Smelting and Refining Corporation Site/Vulcan Site/Kolker Site/Inland Chemical Corporation Site/McKesson Envirosystems Site/Safety-Kleen Envirosystems Site; 600 Doremus Avenue (also 504-508 Doremus Avenue), Newark, New Jersey 07105; 29 acres; 150 employees working seven days per week, three shifts per day (PAS-00010501).

1. **Business Type:** Production, distribution and sale of construction materials and industrial chemicals (PAS-00010515). Primary chemical manufacturing products included chlorine, caustic soda, chloromethane, methylene chloride, hydrochloric acid, bleach, chloroform, and plasticizers (PAP-00188319; PAP-00366038-39; PAP-00366830; PAS-00010506)

2. **Time Period of Ownership/Operations**

Operator: 1952-1975
Owner: 1952-1974

1952: According to a *Remedial Investigation Report*, prepared for Safety-Kleen Envirosystems Company, dated August 1994, Vulcan's predecessor, Kolker Chemical Company (Kolker) (and/or Leon A. Kolker), owned the facility from approximately May 5, 1952, to approximately July 19, 1963, when Vulcan acquired Kolker (PAP-00188319-20). [It is noted that according to a November 4, 1991, Directive and Notice to Insurers Letter, prior to Vulcan's ownership, Kolker produced nonferrous inorganic salts from the 1920s until 1962. The document also states that in 1961, Vulcan purchased Kolker and dissolved Kolker in 1964 (PAS-00010336).

1962: Vulcan operated the site as a chemical production facility from 1962 until May 1975 (PAP-00188320).

1974: According to a January 14, 1976, letter from Vulcan Materials Company, Inland purchased certain assets of Vulcan, including a chlor-alkali plant and real property on May 1, 1974. This included agreements that Vulcan would continue operation of their chlor-alkali facilities and chloromethanes plants at the site in part using chlorine and other raw materials supplied by Inland (PAP-00186853; PAP-00186886-93; PAP-00188783-89; PAP-00187163-75).

1975: On or about May 1, 1975, Inland shut down operations of the chlor-alkali plant, and Vulcan terminated operation of the chloromethanes plant on or about May 15, 1975 (PAP-00186853).

1981: According to a September, 2001, *Documentation of Environmental Indicator Determination*, Inland and McKesson Envirosystems Company (MEC) merged in 1981 (PAS-00091937).

1982: On October 10, 1982, an explosion and fire destroyed much of the facility. The New Jersey Department of Environmental Protection (NJDEP) closed the site two days later (PAS-00091937).

1987: According to the *Certification of Virgil W. Duffie, III, Esq.*, in March 1987, the issued and outstanding shares of common stock of MEC were sold to Nucer, a former wholly owned subsidiary of Safety-Kleen Systems, Inc. Subsequent to March 31, 1987, Nucer and MEC merged into a new corporation named Safety-Kleen Envirosystems Company (PAS-00187236).

1998: In 1998, Safety-Kleen Systems, Inc. was acquired by, and became a wholly owned subsidiary of Laidlaw Environmental Services, Inc. At or about the same time, Laidlaw Environmental Services, Inc. changed its name to Safety-Kleen Corp. and renamed its newly acquired subsidiary Safety-Kleen Systems, Inc. (PAP-00187236).

3. Operational History/COC Use and Presence at the Facility

Kolker manufactured a number of organic and inorganic chemicals, including non-ferrous inorganic salts, chlorine, chloroform, methyl chloride, methylene chloride, and plasticizers (PAP-00188319; PAP-00366038-39; PAP-00366830). In addition, Kolker's use of PCBs at the facility is documented by sales records from Monsanto indicating they purchased at least 183,000 pounds of PCBs (including Aroclors 1242, 1248, 1254, and 1260) between 1958 and 1962 (PAP-00366041-53; PAP-00366040). It is noted that documentation of the use of PCBs at the facility was not identified in the available file material.

Vulcan acquired Kolker in 1963 and produced a variety of chemicals during its 13 years in operation at the site, including, but not limited to, chlorine, caustic soda, chloroform, methyl chloride, hydrochloric acid and methylene chloride, as noted in a November 4, 1991, Directive and Notice to Insurers Letter (PAS-00010337). As reported by a June 20, 1972, Waste Effluent Survey, chlorine and caustic soda were produced by the electrolysis of sodium chloride brine solution, in the chlor-alkali facility. In the chloromethanes facility methylene chloride was produced by the thermal chlorination of methyl chloride. Byproduct hydrogen chloride was reacted with methanol to produce methyl chloride (PAS-00010501).

According to a January 14, 1976, letter from Vulcan Materials Company, Inland purchased certain assets of Vulcan on May 1, 1974. This included agreements that Vulcan would continue operation of their chlor-alkali and chloromethanes plant at the site, in part using chlorine and other raw materials supplied by Inland until May 1975 (PAP-0186853; PAP-00186886; PAP-00188783; PAP-00187163).

According to a letter prepared by Inland, dated June 27, 1975, lead was generated as a result of the chlor-alkali process (PAP-00188223). An Inland memorandum, dated December 7, 1973, explains how lead was generated in this process. According to the memorandum, the tops of the anodes in which the chlorine was manufactured were cast from concrete. When a cell top was rebuilt, graphite anodes were bolted to a bus bar

assembly in the cell top. The junction between the graphite and the bus bar assembly was fixed by pouring molten lead into the cell top. The lead was painted with asphalt to protect the lead from exposure to chlorine (PAP-00362239). This operation was shut down in May 1975 (PAP-00188218).

4. Identified COCs

- PCBs (used by Kolker)
- Copper (released by Balbach)
- Lead (released by Balbach, released by Vulcan, detected)
- Mercury (released by Balbach)

It is noted that, according to an Administrative Consent Order, dated June 23, 1993, the site constitutes a portion of a larger tract of land on which Balbach Smelting and Refining, Inc. (Balbach) conducted smelting and refining of lead, copper, and precious metal-based ores from at least the 1890s until 1938 (PAP-00186325-6). Balbach was reportedly one of the largest metals refiners in the world at the time (PAP-00186326), and according to a *Phase II Remedial Investigation Work Plan*, prepared by Blasland, Bouck, & Lee, Inc., dated March 1995, Balbach processed "substantial quantities" of ores and generated a variety of "toxic" heavy metals, resulting in lead, copper, and mercury contamination attributable to Balbach's operations (PAS-00011253-4; PAP-00362426, 35-38). In addition, according to a *Phase II Remedial Investigation Report*, prepared by BBL, dated December 1995 (1995 Phase II RI), Balbach filled the site with smelter slag (PAP-00364135; PAP-00188312, 52-53; PAP-00186325-6; PAP-00362426, 36). In 1993, an Administrative Consent Order was issued by NJDEP which exempted Safety-Kleen Environsystems Company from responsibility for remedying conditions resulting from the former metal refining practices at the site, or from any other activities which pre-dated 1952 (PAS-00011257).

Further, according to the 1995 Phase II RI, metallic constituents detected in soil during Safety-Kleen Envirosystems Company's Phase I and Phase II remedial investigations were related to historical smelting operations conducted by Balbach, and were not related to post-1952 operations. This was confirmed by the results of statistical analyses performed on the Phase I RI soils data. The report states that the results of this statistical analysis were accepted by NJDEP in a May 3, 1995, Phase II RI Work Plan conditional approval letter (PAP-00364123; PAS-00010852-3).

PCBs

Kolker's use of PCBs at the facility is documented by sales records from Monsanto indicating they purchased at least 183,000 pounds of PCBs (including Aroclors 1242, 1248, 1254, and 1260) between 1958 and 1962 (PAP-00366041-53; PAP-00366040). It is noted that documentation of the use of PCBs at the facility was not identified in the available file material.

No sampling data were available from the time period during which Vulcan operated at the site.

Lead

According to a letter prepared by Inland, dated June 27, 1975, lead was generated as a result of the chlor-alkali process (PAP-00188223). Vulcan issued a report on November 29, 1972, titled *Vulcan Materials Company Newark, New Jersey Plant* that detailed a number of environmental concerns at the site, including the presence of "high levels" of contaminants in the plant effluent which discharged to the Newark Bay. Samples collected from the effluent from July 11, 1972, to July 22, 1972, show the water to be contaminated with lead (10 pounds per day), among other contaminants (PAS-00010465). The report also discussed the installation of a "spillage collection system" to reduce caustic losses from equipment malfunctions, operator errors and weekly equipment washouts (PAS-00010337).

According to the *Vulcan Materials Company Newark, New Jersey Plant* dated November 29, 1972, the calculated quantity of lead added to the plant effluent as a result of process operations was 10 pounds per day (PAS-00010465). Vulcan reported that they did not know of any feasible method for a significant reduction in lead, and that the lead concentration in the total plant effluent and in the chlorine-caustic unit effluent was 0.1 to 0.3 parts per million (ppm). The methylene chloride unit effluent contained about 1 ppm lead, while the cathode wash water contained lead at 0.1 to 14 ppm. Vulcan stated that part of the lead could be removed from the latter two streams, but that they contained only 10 to 15 percent of the average of 10 pounds per day discharged in the effluent. They went on to state that only a 10 percent reduction of lead was practical, and that this would be achieved by the fourth quarter of 1973 (PAS-00010469).

The following lead data were available from 1973 and 1974:

- In April 1973, the concentrations of lead in plant effluent ranged from 0.015 ppm to 0.076 ppm (PAP-00217718).
- In October 1973, the concentrations of lead in plant effluent ranged from 0.003 ppm to 0.090 ppm (PAP-00219175).
- In November 1973, the concentrations of lead in plant effluent ranged from 0.001 ppm to 0.009 ppm (PAP-00219176).
- In March 1974, after Vulcan's outside lab began using a new sample preparation methodology, the concentrations of lead in plant effluent ranged from 0.16 ppm to 0.45 ppm; net pounds per day ranged from 4 to 28 net pounds per day (PAP-00219181).
- In April 1974, the concentrations of lead in plant effluent ranged from 0.14 ppm to 0.65 ppm; net pounds per day ranged from 4 to 48 net pounds per day (PAP-00188992).
- In June 1974, the concentrations of lead in plant effluent ranged from 0.004 ppm to 0.3 ppm and 0.06 to 20 net pounds per day (PAP-00219184).

It is noted that Vulcan's monthly discharge monitoring results from January 1974 through April 1974 describe that the independent laboratory used by Vulcan to analyze its wastewater samples changed its method of sample preparation resulting in increases in reported lead discharges (PAP-00188996; PAP-0185401; PAP-00185411; PAP-00188992).

According to the *Expert Report of Michael Werth*, prepared for McKesson Corporation, dated April 2019, the mass of lead discharged to Newark Bay from the site via Outfall 001 during Vulcan's operations was approximately 6,600 pounds. An estimated 820 pounds of lead were discharged by Inland in excess of permit limits (PAP-00402571-573, 583, 595-602).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

It is noted that according to a memo prepared by NJDEP, dated December 14, 1979, three soil borings show compacted fill and cinder from 0 to 10 feet (PAP-00187208). According to a *Remedial Investigation Report*, prepared for Safety-Kleen Envirosystems Company, dated August 1994, the entire site is covered with fill which dates back to before 1911 (PAP-00188312). In addition, according to a *Phase II Remedial Investigation Work Plan*, dated March 1995, surface soil extending to 7 to 10 feet is composed of fill material of variable composition (PAP-00362435). Finally, according to the 1995 Phase II RI, metallic constituents detected in soil during Safety-Kleen Envirosystems Company's Phase I and Phase II remedial investigations were related to

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

historical smelting operations conducted by Balbach, and were not related to post-1952 operations. This was confirmed by the results of statistical analyses performed on the Phase I RI soils data. The report states that the results of this statistical analysis were accepted by NJDEP in a May 3, 1995, Phase II RI Work Plan conditional approval letter (PAP-00364123; PAS-00010852-53).

No sampling data were available from the time period during which Vulcan operated at the site.

5. COC Pathways

The facility is located at the mouth of the Passaic River where it enters Newark Bay (just north of River Mile 0.0) (PAP-00402573, 76).

Sanitary and Storm Sewer

As reported by a June 20, 1972, Waste Effluent Survey, Vulcan was not connected to the Passaic Valley Sewerage Commission (PVSC) system; sanitary wastes were disposed in septic tanks (PAS-00010503).

Direct Release

According to a *Vulcan Materials Company Chemicals Division* report, dated March 4, 1969, water drawn from Newark Bay was used by the facility for cooling, barometric condensers, and "other" condensers and then returned to Newark Bay (PAS-00058035). The report goes on to state that pollutants could enter effluent at the barometric condensers or through accidental spills or leaks in the system (PAS-00058037). This would have included the lead contaminated effluent discussed in Sections 4 and 5 above.

As reported by a June 20, 1972, Waste Effluent Survey, Vulcan discharged 5,387,000,000 gallons of wastewater to Newark Bay (PAS-00010502). The facility also reported in the 1972 Waste Effluent Survey that they were not connected to the PVSC system; sanitary wastes were disposed in septic tanks (PAS-00010503).

According to a letter prepared by Vulcan, dated April 26, 1972, the only facility discharge point was a main plant drain discharging into Newark Bay (PAS-00010499).

According to a National Pollutant Discharge Elimination System (NPDES) Application dated September 27, 1976, the facility held a NPDES permit (#NJ0001279) at least as early as December 30, 1972. The application states the facility had one discharge point to a surface water body via outfall 001; the receiving water body was listed as "Tidal Waters #3; Newark." The discharge volume was listed as 10,000 gallons per day (PAP-00185803-07).

According to a memo prepared by Inland, dated June 3, 1974, a flooding condition due to heavy rains was documented by Vulcan, and consisted of a drainage ditch overflowing across plant property, picking up contaminants from the soil. A pump was

installed to transfer surplus water in the ditch back into the plant water disposal system (PAP-00188969).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

According to a *Vulcan Materials Company Chemicals Division* report, dated March 4, 1969, “some discoloration” at the point of wastewater discharge to Newark Bay was observed during an inspection on March 4, 1969 (PAS-00058036).

Enforcement Actions

According to a *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor*, dated November 1969, the New Jersey State Department of Health had issued “pollution abatement orders” to Vulcan (PAS-00058707). Details of the reason for the order are not provided in the report. According to a letter prepared by legal counsel for Vulcan, dated November 5, 1969, Vulcan was given notice to install and provide wastewater treatment and disposal facilities, and to cease discharging “industrial waste or polluting matter” into the Passaic River (PAP-00217398). There is no indication that COCs were associated with the referenced discharge. According to the letter, Vulcan was in the process of addressing the order. It also states that water was taken into the plant from Newark Bay at a point north of the “main sewer," which was used for cooling purposes, and “it picks up a minimal amount of waste which will be the subject of intensive treatment and control” (PAP-00217398-404).

NJDEPE issued a Directive and Notice to Insurer, dated October 31, 1991, to Vulcan directing Vulcan to pay NJDEPE for the completion of a remedial investigation and feasibility study of the site (PAS-00010336-38).

Permits

As reported by a September 27, 1976, NPDES Application, the facility held a NPDES permit (#NJ0001279) as early as December 30, 1972 (PAP-00185805).

7. Response Actions

There is no information regarding sampling data during which Vulcan operated in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

NATIONAL-STANDARD COMPANY

Facility Name, Address and Size: National-Standard Company – Athenia Steel Site; 714-716 Clifton Avenue, Clifton, New Jersey; 35 acres (PAP-00382569); Information on number of employees and shifts per day was not identified in available file material.

1. **Business Type:** Rolling and heat-treating of flat spring steel (PAP-00382575)

2. **Time Period of Ownership/Operations**

   Operator: 1938 to 1988
   Owner: 1938 to 1999

   1907: National-Standard Company (National Standard) was founded in Chicago, Illinois, in 1907. At the same time, Athenia Steel Company began its operations at 714-716 Clifton Avenue, Clifton, New Jersey (PAS-00012920).

   1938: National Standard acquired the site from Athenia Steel Company in 1938 (PAP-00090916).

   1988: Operations at the Clifton Avenue site were terminated in 1988 (PAP-00090916; PAP-00091040).

   1999: National Standard sold the property to the City of Clifton in September 1999 (PAP-00197478).

3. **Operational History/COC Use and Presence at the Facility**

   According to a *Decommissioning and Demolition Report*, dated September 25, 1989 (1989 D&D Report), operations at the site included the production of various flat wire and strip steel products, including high carbon steel wire and strips from hot rolled steel bands and strips (PAP-00090960, 62). Acid baths were utilized to clean steel stock and the finished product was coated with petroleum oil to retard oxidation (PAP-00090990). Molten lead was historically used to heat and soften steel stock (PAP-00090925). Site studies commissioned by National Standard reported that drawing, cutting, heat treating, cleaning, and other site operations required the use of, or resulted in the generation of, the following materials of note:

   - Gasoline (leaded and unleaded);
   - Lead (elemental lead);
   - Lubricating oils;
   - Mineral spirits;
   - No. 2 fuel oil;
   - No. 4 fuel oil;
   - Preservative oils;
   - Waste oil and water; and,
   - Water soluble oil (PAP-00090962, 66, 70, 72).

According to the 1989 D&D Report, on-site heat and hot water were historically produced via the burning of coal. By the mid- to-late 1960s, No. 2 fuel oil, natural gas, and propane were substituted for coal as a source for heat and hot water production (PAP-00090962, 85). According to an *ECRA Cleanup Plan Report*, dated August 21, 1989 (1989 ECRA), a former coal gasification plant was also located on the site. The coal gasification plant was used to convert coal into "usable gas product" and to supplement energy needs for daily manufacturing operations. The specific time-period that the coal gasification plant operated is not reported (PAP-00197095; PAP-00090985).

The 1989 ECRA states that there were two landfill areas present on the site that received site generated production waste materials, and off-site soils, asphalt, and concrete debris, until this practice was discontinued in the mid-1970s. Ash and cinders from the operation of the on-site power house and coal gasification plant were present within the landfill areas and beneath portions of the main plant buildings (PAP-00197095). According to a *Disruption and Closure Permit Application*, dated June 1, 1989, lead dross (scum from the surface of the molten lead) and soils with elemental lead associated with operations at the site also were placed in the landfill; however, investigations, including borings and test pits, did not reveal lead dross in the landfill (PAP-00197231). It was estimated that a total of 170,000 cubic yards of miscellaneous debris was present within the landfilled areas (PAP-00197232).

According to a *Report of Findings, Phase I Sampling and Analysis for National Standard*, dated March 29, 1988 (1988 Phase I Report), site rinse water from the manufacturing lines was originally discharged to at least three, and possibly five, cesspools or dry wells until the 1970s when the discharges were connected (after pre-treatment) to the Passaic Valley Sewerage Commission (PVSC) system (PAP-00196946; PAP-00090922; PAS-00101870).

Based on review of available file material, it is unclear what OU2 COCs may have been in the rinse water, if any; however, copper, lead, and mercury were identified in soil when the bottoms of the cesspools/dry wells were sampled. This is discussed further in Section 4 below. According to the 1989 *ECRA*, there were three on-site cesspools, which reportedly received rinse waters from the manufacturing lines from the early 1900s to approximately 1973. The cesspools were approximately 18 feet deep. They were believed to be constructed of fitted rock walls without caulking, and to have soil bottoms, which facilitated the dissipation of the rinse waters into the subsurface. The 1989 ECRA states that it should be noted that the term “cesspool” was used, but in actuality they were dry wells, since they did not receive sanitary waste or wastewater discharges. In addition, a drywell was located north of the site which reportedly received surface runoff from the roof drains and the surrounding site areas (PAP-00197122).

4. Identified COCs

- PCBs (detected)
- PAHs (generated, detected)
- DDx (detected)
- Copper (detected)
- Lead (used, detected)
- Mercury (detected)

PCBs

A landfill area was located in the central portion of the site and was reportedly used for disposal of construction debris (PAS-00101893). According to a *Report of Findings, Hydrogeologic Investigation, Phase II*, dated February 10, 1989 (1989 Phase II Report), PCBs were detected in soil in the vicinity of the landfill in one soil sample at a concentration of 4.68 parts per million (ppm) at a depth of 10 to 12 feet in 1987 (PAP-00091630).

An oil separator pond was located adjacent to the area of a process wastewater treatment building into which wastewater and oil were pumped. Solids were settled and oil was skimmed from the pond prior to the discharge of the wastewater to Weasel Brook (PAP-00090963). It is reported that use of the oil separator pond was discontinued as of 1976 (PAP-00091003). According to the 1988 Phase I Report, PCBs were detected in one soil sample in this area at a concentration of 0.17 ppm at a depth of 4.5 to five feet in 1987; no surface soil samples were collected. All other samples were reported as non-detect for PCBs (PAP-00196960).

PCBs were identified in soil near the railroad right-of-way (PAP-00091024). According to the 1988 Phase I Report, PCBs were detected in one soil sample in this area at a concentration of 16 ppm at a depth of zero to 0.5 feet in 1987. All other samples were reported as non-detect for PCBs (PAP-00196988).

PCBs were identified in soil in the vicinity of three transformers owned by the electrical utility (PAP-00090965, 1012, 1015-17). According to the 1988 Phase I Report, PCBs were detected in surface soil (zero to 0.5 feet) in this area at concentrations ranging from 0.465 ppm to 8.4 ppm in 1987 (PAP-00196973, 77).

PAHs

According to the 1989 D&D Report, on-site heat and hot water were historically produced via the burning of coal. By the mid- to-late 1960s, No. 2 fuel oil, natural gas, and propane were substituted for coal as a source for heat and hot water production (PAP-00090962, 85).

According to an *ECRA Cleanup Plan Report*, dated August 21, 1989 (1989 ECRA), a former coal gasification plant was also located on the site. The coal gasification plant was used to convert coal into "usable gas product" and to supplement energy needs for daily manufacturing operations. The specific time-period that the coal gasification plant operated is not reported (PAP-00197095; PAP-00090985).

According to the 1989 Phase II Report, high molecular weight PAHs were detected in soil associated with the landfill used for disposal of construction debris (PAS-00101893; PAP-00091634). In addition, the 1989 D&D Report indicates that PAHs were identified in soil beneath several of the site's underground storage tanks (PAP-00090976-81).

DDx

According to a *Northern Area Soil Remedial Investigation Report and Remedial Investigation Work Plan*, dated December 21, 2005, dichlorodiphenyldichloroethylene (4,4-DDE) and dichlorodiphenyltrichloroethane (4,4-DDT) were detected in soil samples at "trace concentrations" (PAP-00197495, 541-44). 4,4-DDE was detected at a maximum concentration of 0.0028 ppm, and 4,4-DDT was detected at a maximum concentration of 0.0043 ppm in 2005 (PAP-00197495).

Copper

Copper was identified in soil in the vicinity of the landfill used for construction debris (PAS-00101909, 913). According to the 1988 Phase I Report, copper was detected at concentrations of 3 ppm to 610 ppm at a depth of 13 to 15 feet in 1987 (PAP-00196953).

Copper was identified in soil in the vicinity of the oil separator pond (PAP-00091001, 1003, 1007). According to the 1988 Phase I Report, copper was detected at concentrations of 3.3 ppm to 198 ppm at a depth of four to five feet in 1987 (PAP-00196962).

The site used three on-site cesspools/drywells from the early 1900s to approximately 1973. The three cesspools were noted to have received rinse waters from manufacturing lines. In addition, the site had a dry well located to the north which received surface runoff from the site's roof drains and surrounding site area (PAP-00090965). Copper was identified in soil near the cesspools (PAP-00090998). According to the 1988 Phase I Report, copper was detected at a maximum concentration of 175 ppm in samples collected from the bottom of the cesspools at a depth of 20 feet in 1987 (PAP-00196945).

A drum storage area was located along the western section of the main site area and was used for waste oil storage. It is reported that stained soils were observed in this area (PAP-00091013-14; PAP-00090965). According to the 1988 Phase I Report, copper was detected in one sample at a concentration of 38 ppm at a depth of 22 to 28 inches in 1987 (PAP-00196981).

Copper was identified in soil near the railroad right-of-way. According to the 1988 Phase I Report, copper was detected at concentrations of 19.6 ppm to 99 ppm at a depth of zero to six inches (PAP-00196988).

Lead

Molten lead was historically used to heat and soften steel stock (PAP-00090925). According to a *Disruption and Closure Permit Application*, dated June 1, 1989, lead dross (scum from the surface of the molten lead) and soils with elemental lead associated with operations at the site also were placed in the landfill; however, investigations, including borings and test pits, did not reveal lead dross in the landfill (PAP-00197231).

Lead was identified in soil in the vicinity of the landfill used for construction debris (PAS-00101872, 885-88, 909, 913-14). According to the 1989 Phase II Report, lead was detected in this area at concentrations at high as 240,000 ppm at a depth of five to seven feet. A sample collected from zero to two feet had a lead concentration of 8,200 ppm; a sample collected from one to three feet had a lead concentration of 160,000 ppm (PAP-0091628).

Lead was identified in soil in the vicinity of the oil separator pond (PAP-00091000-01, 1003, 1007). According to the 1988 Phase I Report, lead was detected at concentrations of 10.5 ppm to 17,650 ppm at a depth of four to five feet (PAP-00196962).

A drum storage area was located along the western section of the main site area and was used for waste oil storage. It is reported that stained soils were observed in this area (PAP-00091013-14; PAP-00090965). According to the 1988 Phase I Report, lead was detected in one sample at a concentration of 13 ppm at a depth of 22 to 28 inches in 1987 (PAP-00196981).

Lead was identified in soil near the railroad right-of-way (PAP-00091023-24). According to the 1988 Phase I Report, lead was detected at concentrations of 190 ppm to 705 ppm at a depth of zero to 0.5 feet (PAP-00196988).

According to the 1988 Phase I Report, lead concentrations detected in soil samples in the area of the three on-site cesspools/drywells were as high as 1,470 ppm in samples collected from the bottom of the cesspools at a depth of 18 to 20 feet (PAP-00196947). According to a *Pilot Response on Soil Delineation*, dated February 24, 1997, National Standard collected a soil sample from beneath a former underground process sewer line in approximately 1988 or 1989. Lead was detected at a concentration of 590 ppm. This area of contamination was subsequently excavated in 1990. Post-excavation sample data identified lead at a maximum concentration of 217 ppm, below the New Jersey Department of Environmental Protection's (NJDEP) "residential direct contact soil cleanup criterion" of 400 ppm (PAS-00101976-78). National Standard also collected a soil sample beneath a second underground process sewer line at the same time. Excavation of this area also was conducted. Post-excavation confirmation samples had lead concentrations of 2,350 ppm (at 13-13.5 feet) and 3,770 ppm (at 16 feet). A second round of excavation occurred, and another post-excavation confirmation sample had a lead concentration of 3,840 ppm (at 23-23.5 feet). Therefore, a third round of excavation was conducted. Post-excavation sample data identified lead at a maximum concentration of 205 ppm, below the NJDEP "residential direct contact soil cleanup criterion" of 400 ppm (PAS-00101979-83). Based on review of available file material, it is unclear how these process sewer lines were connected to the site's sewer system.

Lead was identified in soil in the vicinity of three transformer pads (PAP-00090769). According to an *Expedited Remediation Investigation Report for Northern and Southern Areas*, dated February 2000, lead was detected at concentrations of 120 mg/kg to 3,500 mg/kg at a depth of zero to 0.5 feet (PAP-00090789).

Mercury

Mercury was identified in soil in the vicinity of the landfill used for construction debris. According to the 1988 Phase I Report, mercury was detected at a maximum concentration of 0.41 ppm at a depth of 13 to 15 feet in 1987 (PAP-00196953).

Mercury was identified in soil in the vicinity of the oil separator pond. According to the 1988 Phase I Report, mercury was detected at concentrations of 0.3 ppm to 0.54 ppm at a depth of three to five feet in 1987 (PAP-00196962).

The site used three on-site cesspools/drywells from the early 1900s to approximately 1973. The three cesspools were noted to have received rinse waters from manufacturing lines. In addition, the site had a dry well located to the north which received surface runoff from the site's roof drains and surrounding site area (PAP-00090965). According to the 1988 Phase I Report, mercury was detected at a maximum concentration of 0.4 ppm in samples collected from the bottom of the cesspools at a depth of 15 to 17 feet in 1987 (PAP-00196945).

A drum storage area was located along the western section of the main site area and was used for waste oil storage. It is reported that stained soils were observed in this area (PAP-00091013-14; PAP-00090965). According to the 1988 Phase I Report, mercury was detected in one sample at a concentration of 0.16 ppm at a depth of 22 to 28 inches in 1987 (PAP-00196981).

Mercury was identified in soil near the railroad right-of-way. According to the 1988 Phase I Report, mercury was detected at concentrations of 0.28 ppm to 0.31 ppm at a depth of zero to six inches (PAP-00196988).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 contaminants of concern (COCs): PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper,

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #41, #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current

and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

While the Allocation Team has determined that the facility is not located in an area designated by NJDEP as containing Historic Fill, it is noted that according to a *Delineation Soil Sampling in AOCs as Referenced in NJDEP Letter of May 18, 1994*, dated November 4, 1994, the upper five to ten feet of the oldest portions of site was underlain by fill material. The fill material consisted of brick fragments, reworked sand and gravel, and coal ash that was distributed over the site during former site operations as structural fill. The area where these materials were found all lie within the presently defined landfill (PAP-00091421).

Finally, it is noted that Weasel Brook was culverted in 1987 along the entire length of the site, and runs in a concrete channel in the northern portion of the site and in an enclosed culvert adjacent to the central portion of the site (i.e., Active Area) (PAP-00090921).

The maximum levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00197401-19; PAP-00196962; PAP-00196953; PAP-0091628).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	240,000 mg/kg
Copper	610 mg/kg
Mercury	0.54 mg/kg
Benzo(a)anthracene	12.2 mg/kg
Benzo(a)pyrene	8.963 mg/kg
Benzo(b)fluoranthene	15.359 mg/kg
Benzo(k)fluoranthene	18.105 mg/kg
Dibenzo(a,h)anthracene	0.304 mg/kg
Indeno(1,2,3-cd)pyrene	5.57 mg/kg

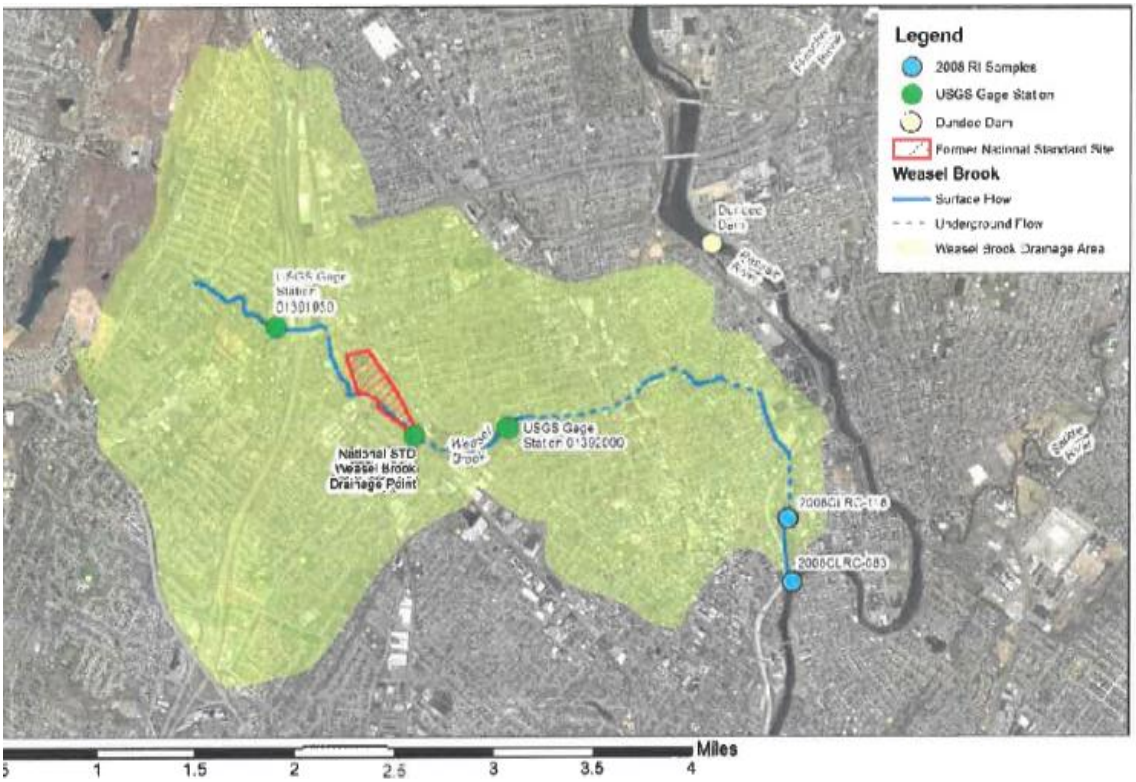
5. COC Pathways

Weasel Brook, a tributary to the Passaic River, runs along the western border of the site; the site is two miles inland and three miles upstream of the Passaic River (PAP-00090916).

version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The location of the site relative to the Passaic River is depicted below (PAP-00090916):



* USGS Gauging Station 01392000 also represents the location of Weasel Brook Pond.

Sanitary and Storm Sewer

Historically, rinse waters from manufacturing lines were discharged directly into cesspools from the early 1900s until approximately 1973, as discussed in a *Preliminary Assessment Report*, dated November 17, 2016 (PAP-00382596). The 1988 Phase I Report states that site pickling rinse water lines discharged to at least three, and possibly five, cesspools or dry wells until the 1970s when the discharges were connected (after pre-treatment) to the PVSC system (PAP-00196946; PAP-00090922; PAS-00101870).

As noted previously, the cesspools were approximately 18 feet deep. They were believed to be constructed of fitted rock walls without caulking, and to have soil bottoms, which facilitated the dissipation of the rinse waters into the subsurface. The 1988 Phase I Report states that it should be noted that the term “cesspool” was used, but in actuality they were dry wells, since they did not receive sanitary waste or wastewater discharges. In addition, a drywell was located north of the site which reportedly received surface runoff from the roof drains and the surrounding site areas (PAP-00197122).

According to a letter prepared by National Standard, dated June 27, 2017, various site wastewaters were discharged to the PVSC system from the mid-1970s to 1988 under a PSVC permit (PAP-00090922). A process wastewater treatment facility was built in the mid-1970s, which was used to adjust the pH of industrial wastewater prior to discharge to the PVSC system (PAS-00101870).

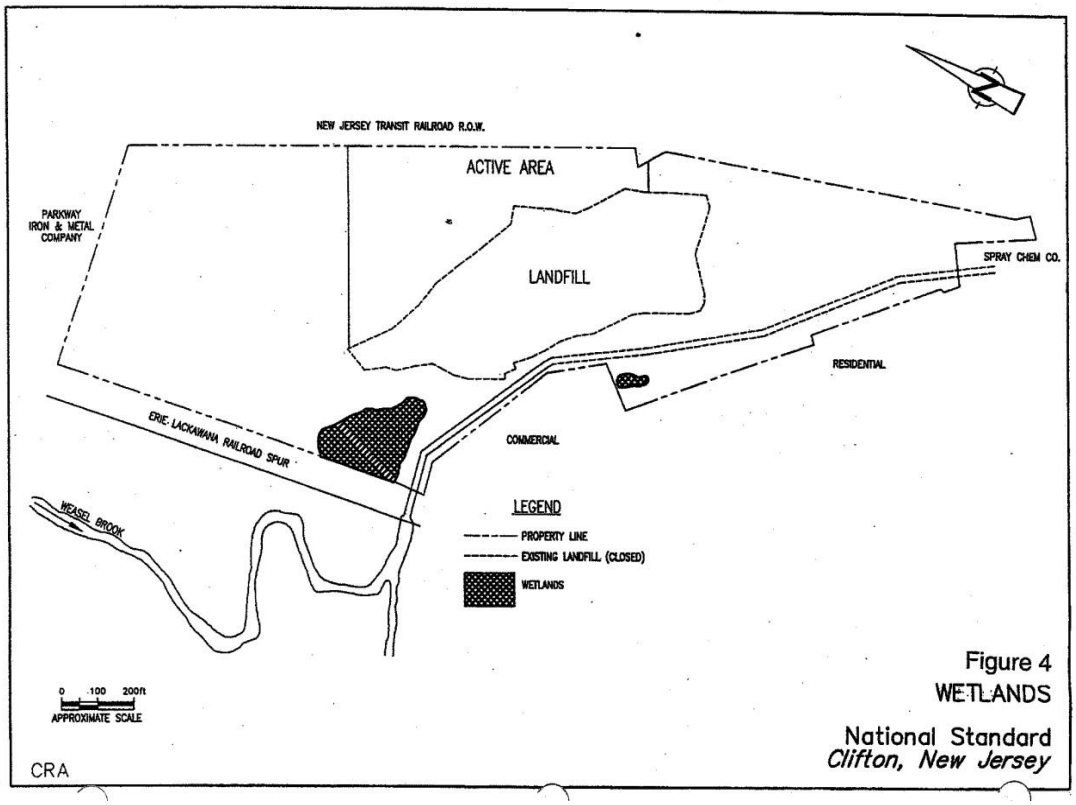
National Standard received Industrial Waste Permit (3402932) for discharge into the PVSC system in 1981. The permit was effective June 1, 1981 to June 1, 1986. The permit covered sanitary waste to Outlet 1 and a second outlet that was to be metered. By August 1981, the site was to re-route non-contact cooling water away from Outlet 1 and were required to comply with monitoring requirements contained in “Interim Mercury Pretreatment Regulations” (PAP-00196916-23). The permit indicates that National Standard was not required to monitor their discharges for OU 2 COCs (PAP-00196921-22).

It is noted that according to an undated memorandum prepared by NJDEP, process wastewater discharges received no treatment, with the exception of pH adjustment, before discharge to the PVSC system, but that completion of a treatment plant was scheduled for 1983. The process wastewater volume was approximately 10,000 gallons per day and the sanitary water volume was approximately 3,000 gallons per day (PAP-00196914).

Direct Release

As stated previously, Weasel Brook, a tributary to the Passaic River, runs along the western border of the site (PAP-00090916).

The location of the site relative to Weasel Brook is depicted below (PAP-00090788):



According to an undated memorandum prepared by NJDEP, the site had two discharges to Weasel Brook which consisted of non-contact cooling water from metal rolling operations (discharge 001) and from air compressors (discharge 002) (PAP-00196914). The site had a New Jersey Pollutant Discharge Elimination System (NJPDES) permit NJ0000035 for discharge of site stormwater to surface water. It is reported that non-contact cooling water from rolling operations and air compressors, as well stormwater were discharged via Outfalls 001 and 002 to Weasel Brook (PAP-00090932). A copy of the permit was not identified in the available file material. It is noted that PVSC reported that, as of July 1972, "polluting discharges" were occurring from three of four outlets to Weasel Brook (as opposed to two outfalls) (PAS-00101850, 52-54).

Based on review of the PVSC violation documentation for August 14 to December 31, 1972, following the PVSC inspection in July 1972 which reported "polluting discharges" to Weasel Brook, the site agreed at the end of 1972 to connect the boiler house drain to the city sewer, seal the site cesspools, and pump their waste into holding tanks for scavenger disposal. PVSC reported that the required steps to end the discharges were made by July 1973 (PAS-00101850, 52-54).

According to the 1989 D&D Report, an oil separator pond was located adjacent to the area of the process wastewater treatment facility into which wastewater and oil were pumped. Solids were settled and oil was skimmed from the pond prior to the discharge of the wastewater to Weasel Brook (PAS-00101870). Use of the oil separator pond was discontinued as of 1976 (PAS-00101910).

It is noted that Weasel Brook was culverted in 1987 along the entire length of the site, and runs in a concrete channel in the northern portion of the site and in an enclosed culvert adjacent to the central portion of the site (i.e., Active Area) (PAP-00090921).

According to a *Disruption and Closure Permit Application*, dated June 1, 1989, site drainage occurred through sheet flow to Weasel Brook or conveyance through existing concrete pipe storm sewer lines. One pipeline conveyed water from the northern most buildings and discharged along the slope, north of landfill. The other pipeline drained the southern half of the buildings and conveyed water through a 15-inch pipe at a manhole, near the wastewater treatment plant. Additional drainage from the building roofs discharged to the surface along a railroad spur. Drainage of the southern portion of the site occurred through drop inlets in the piped section of Weasel Brook (PAP-00197245).

An *Expedited Remedial Investigation Report for Northern and Southern Areas*, dated February 2000, states that Weasel Brook drained the site and the surrounding area. Rain ran off to the low area to the southwest of the former Main Building area, and to the low area to the southeast of the former Main Building area. This runoff and all other local surface runoff was received by Weasel Brook, which flowed through the site, and discharged into the Passaic River to the east of the site (PAP-00090753; PAP-00090767). Further, groundwater was reported to discharge into Weasel Brook during the seasonal low water table that occurs in October (PAS-00101871). However, NJDEP concluded that there is no hydraulic connection between the site and Weasel Brook since culverting was completed (PAP-00090921).

Spills

With respect to the observed releases to Weasel Brook, it is noted that in 1947, patches of oil film observed in Weasel Brook were traced by PVSC to the site. A waste lubricating oil separator pit was found to be flooded and overflowing into the "clear water discharge line" to Weasel Brook. National Standard reportedly cleaned the pit out “at once” (PAS-00101848).

6. Regulatory History/Enforcement Actions

Inspections

According to an undated memorandum prepared by NJDEP, the site was inspected on June 17, 1981, to determine whether the permittee was in compliance with the requirements of their NPDES Permit (No. NJ0000035) issued on September 30, 1980 (PAP-00196914). No deficiencies with respect to COCs were noted based on review of the document.

Violations/Enforcement Actions

According to a PVSC *Annual Report*, dated 1973, on August 14, 1972 PVSC inspectors collected samples of discharges from site outfalls, and analysis showed the samples “were polluting.” On August 16, 1972, PVSC wrote to National Standard, informing them

of the pollution and directing that they cease polluting at once. On August 21, 1972, National Standard replied that they had temporarily diverted the flow from entering Weasel Brook. On December 14, 1972, National Standard agreed to connect the boiler house drains to the city sewer and to seal the cesspools and handle the waste by pumping it to holding tanks for scavenger disposal. They estimated they could complete the work by the end of March 1973. On July 9, 1973, PVSC received a call and inspection revealed that the cesspool had been sealed, a 6,000-gallon fiberglass storage tank and piping installed, and the system ready for operation (PAS-00034750-52). No information on whether COCs were detected in the discharge was available.

NJDEP issued an Administrative Order and Notice of Civil Administrative Penalty Assessment to National Standard in August 1987 due to improper hazardous waste storage and management (PAS-00004222-28).

Permits

According to a letter prepared by National Standard, dated June 27, 2017, various site wastewaters were discharged to the PVSC system from the mid-1970s to 1988 under a PSVC permit (PAP-00090922). A process wastewater treatment facility was built in the mid-1970s, which was used to adjust the pH of industrial wastewater prior to discharge to the PVSC system (PAS-00101870).

The site had a NJPDES permit (NJ0000035) for discharge of site stormwater to surface water. It is reported that non-contact cooling water from rolling operations and air compressors, as well stormwater were discharged via Outfalls 001 and 002 to Weasel Brook (PAP-00090932). A copy of the permit was not identified in the available file material.

National Standard received Industrial Waste Permit (3402932) for discharge into the PVSC system in 1981. The permit was effective June 1, 1981 to June 1, 1986. The permit covered sanitary waste to Outlet 1 and a second outlet that was to be metered. By August 1981, the site was to re-route non-contact cooling water away from Outlet 1 and were required to comply with monitoring requirements contained in Interim Mercury Pretreatment Regulations (PAP-00196916-23). The permit indicates that National Standard was not required to monitor their discharges for OU 2 COCs (PAP-00196921-22).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- *Report of Findings, Phase I Sampling and Analysis for National Standard*, dated March 29, 1988 (PAP-00196932);
- *Report of Findings, Hydrogeologic Investigation, Phase II*, dated February 10, 1989 (PAP-00091594);

- *ECRA Cleanup Plan Report***,** dated December 1989 (PAP-00091429);
- *Delineation Soil Sampling in AOCs as Referenced in NJDEP Letter of May 18, 1994*, dated November 4, 1994 (PAP-00091412);
- *Expedited Remediation Investigation Report for Northern and Southern Areas*, prepared for National-Standard, dated February 2000 (PAP-00090753);
- *Site Investigation Report*, dated October 2001 (PAP-00090726); and,
- *Northern Area Soil Remedial Investigation Report and Remedial Investigation Work Plan*, dated December 21, 2005 (PAP-00197474).

Sewer

National Standard collected a soil sample from beneath a former underground process sewer line in approximately 1988 or 1989, as discussed in a *Pilot Response on Soil Delineation*, dated February 24, 1997. Lead was detected at a concentration of 590 ppm. This area of contamination was subsequently excavated in 1990. National Standard also collected a soil sample beneath a second underground process sewer line at the same time. Excavation of this area also was conducted. Post-excavation confirmation samples had lead concentrations of 2,350 ppm and 3,770 ppm. A second round of excavation occurred, and another post-excavation confirmation sample had a lead concentration of 3,840 ppm. Therefore, a third round of excavation was conducted and confirmation sample concentrations were below the NJDEP's "residential direct contact soil cleanup criterion" (PAS-00101976-80). Based on review of available file material, it is unclear how these process sewer lines were connected to the site's sewer system.

Weasel Brook

According to a letter report prepared by National Standard's environmental consultant, dated October 13, 2006, surface water and sediment samples were collected from three locations in Weasel Brook after National Standard's receipt of EPA's General Notice Letter in November 2005. The purpose of collecting the data was twofold: (1) determine whether there are contaminants of concern in Weasel Brook at levels that could potentially impact the Passaic River and (2) determine whether the site could potentially be a source of any impact (PAS-00107896). One surface water/sediment sample was collected upstream of the site and two surface water/sediment samples were collected downstream of the site (approximately 2,400 feet and 2,800 feet downstream, respectively). Samples were analyzed for PCBs, PAHs, and metals. Results were as follows:

- Benzo(b)fluoranthene and pyrene were detected in the surface water sample collected from Weasel Brook Park Lake inlet (i.e., the first downstream sample) at concentrations below their respective "NJDEP surface-water standards" (PAS-00107899). Neither constituent was detected in the sample collected from the Weasel Brook Park Lake discharge location (i.e., the furthest downstream sample location) (PAS-00107902).

- The concentration of mercury [(0.157 micrograms per Liter (µg/L)] slightly exceeded its "standard" (0.144 µg/L) in the Weasel Brook Park Lake inlet sample (PAS-00107899, 912). According to the letter report prepared by National Standard's consultant, dated October 13, 2006, the "isolated, low-level" observance of mercury is not indicative of any identifiable potential source (PAS-00107900).

- The sediment sampling results showed the presence of "several PAHs and metals at concentrations exceeding applicable sediment screening criteria." These exceedances were identified in the sample collected from the Weasel Brook Park Lake discharge (i.e., the furthest downstream sample) and in the upriver sample. The intermediate sample location (i.e., the first downstream sample location) exhibited "no PAH detections above applicable guidance values." The same observation was reported for metals.

- Overall, the letter report prepared by National Standard's consultant, dated October 13, 2006, concluded that while select PAHs and metals, "marginally exceed their surface water or sediment quality criteria," the data show that the National Standard site "is not the source for these observed constituents in water and sediment." The letter report also concluded that "the distribution of these constituents points to potential upriver as well as potential alternate downriver sources (including natural background) for the constituents and concentrations observed in Weasel Brook" (PAS-00107901).

- No PCBs were detected in either sediment or water samples along the study reach of Weasel Brook (PAP-00090920; PAS-0010789-900).

Based on the results of the evaluation, the consultant concluded "there is no data to support U.S. EPA's assertion that the former National-Standard facility in Clifton, New Jersey is connected to the contamination in the Study Area" (PAS-00107896).

Soil

Between 1984 and 1994, COCs were identified in soil associated with the following operations (petroleum hydrocarbons detections are noted as they may be indicative of COC releases):

- A landfill area was located in the central portion of the site and was reportedly used for disposal of construction debris (PAS-00101893). Petroleum hydrocarbons, lead, copper, and PCBs were identified in soil in the vicinity of the landfill (PAS-00101872, 909, 911-13). According to the 1988 Phase I Report, lead was detected at a concentration of 41,200 ppm at a depth of 13 to 15 feet. Copper was detected at concentrations of 3 ppm to 610 ppm at a depth of 13 to 15 feet. Mercury was detected at a maximum concentration of 0.41 ppm at a depth of 13 to 15 feet (PAP-00196953). In addition, according to the 1989 Phase II Report, lead was detected in this area at concentrations at high as 240,000 ppm at a depth of five to seven feet. A sample collected from zero to two feet

had a lead concentration of 8,200 ppm; a sample collected from one to three feet had a lead concentration of 160,000 ppm (PAP-0091628). PCBs were detected at a maximum concentration of 4.68 ppm (PAP-00091630). High molecular weight PAHs were detected in soil associated with the landfill area (PAP-00091634).

- A spray pond was located adjacent to the power house and former coal gasification and steam power plants and used as a cooling pond (PAP-00090963; PAP-00091008). Petroleum hydrocarbons were identified in soil in the vicinity of the spray pond (PAP-00091008, 1011; PAP-00196964).

- An oil separator pond was located adjacent to the area of a process wastewater treatment facility into which wastewater and oil were pumped. Solids were settled and oil was skimmed from the pond prior to the discharge of the wastewater to Weasel Brook (PAP-00090963). It is reported that use of the oil separator pond was discontinued as of 1976 (PAP-00091003). Petroleum hydrocarbons, lead, copper, and PCBs were identified in soil in the vicinity of the oil separator pond (PAP-00091000-01, 1003, 1007). According to the 1988 Phase I Report, lead was detected at concentrations of 10.5 ppm to 17,650 ppm at a depth of four to five feet. Copper was detected at concentrations of 3.3 ppm to 198 ppm at a depth of four to five feet. Mercury was detected at concentrations of 0.3 ppm to 0.54 ppm at a depth of three to five feet (PAP-00196962). PCBs were detected in soil in this area at a maximum concentration of 0.17 ppm (PAP-00196960).

- Petroleum hydrocarbons, PCBs, pesticides, metals, and lead were identified in soil near the railroad right-of-way (PAP-00091023-24). According to the 1988 Phase I Report, lead was detected at concentrations of 190 ppm to 705 ppm at a depth of zero to 0.5 feet. Copper was detected at concentrations of 19.6 ppm to 99 ppm at a depth of zero to six inches. Mercury was detected at concentrations of 0.28 ppm to 0.31 ppm at a depth of zero to six inches (PAP-00196988). PCBs were detected in soil in this area at a maximum concentration of 16 ppm in 1987 (PAP-00196988).

- The site used three on-site cesspools/drywells from the early 1900s to approximately 1973. The three cesspools were noted to have received rinse waters from manufacturing lines. In addition, the site had a dry well located to the north of which received surface runoff from the site roof drains and surrounding site area (PAP-00090965). Petroleum hydrocarbons, lead, and copper were identified in soil near the cesspools (PAP-00090996-98). According to the 1988 Phase I Report, lead concentrations detected in soil samples were as high as 1,470 ppm in samples collected from the bottom of the cesspools at a depth of 18 to 20 feet (PAP-00196947). Copper was detected at a maximum concentration of 175 ppm in samples collected from the bottom of the cesspools at a depth of 20 feet. Mercury was detected at a maximum concentration of 0.4 ppm in samples collected from the bottom of the cesspools at a depth of 15 to 17 feet (PAP-00196945).

- A drum storage area was located along the western section of the main site area and was used for waste oil storage. It is reported that stained soils were observed in this area (PAP-00090965, 1013-14). Petroleum hydrocarbons and metals were identified in soil near the drum storage area (PAP-00091013, 1018-19). According to the 1988 Phase I Report, copper was detected in one sample at a concentration of 38 ppm at a depth of 22 to 28 inches. Lead was detected in one sample at a concentration of 13 ppm at a depth of 22 to 28 inches. Mercury was detected in one sample at a concentration of 0.16 ppm at a depth of 22 to 28 inches (PAP-00196981).

- Petroleum hydrocarbons, PCBs, and lead were identified in soil in the vicinity of three transformer (PAP-00090965, 1012, 1015-17; PAP-00090769). According to the Phase I Report, PCBs were detected in soil in this area at a maximum concentration of 8.4 ppm in 1987 (PAP-00196973, 77). According to an *Expedited Remediation Investigation Report for Northern and Southern Areas*, prepared for National-Standard, dated February 2000, lead was detected at concentrations of 120 mg/kg to 3,500 mg/kg at a depth of zero to 0.5 feet (PAP-00090789).

- Petroleum hydrocarbons, PAHs, and lead were identified in soil beneath "several" of the site's underground storage tanks (PAP-00090966, 976-81, 1028-29). According to a 1989 D&D Report, PAHs were identified in soil beneath several of the site's underground storage tanks (PAP-00090976-81). Lead concentration data were not identified in the 1989 D&D Report.

According to a *Revised Soil and Groundwater Remedial Investigation Work Plan*, dated February 25, 2005, a total of 44 areas of concern (AOCs) have been identified at the site (PAP-00197351). Lead was detected in soil at each AOC based on sampling conducted in 1990 and 1991 (PAP-00197400-49). The maximum reported concentration of lead was 87,000 ppm. This data is listed as being associated with both AOC 8 (the area between the former Main Building and the railroad track areas) and AOC 37 (the area of the former transformer located within former Building No. 5) (PAP-00197360, 363, 418, 44). In addition, PCBs were associated with AOC 6 (former locations of Buildings 2, 3, 4, 6, and 14), AOC 8 (the area between the former Main Building and the railroad track areas), AOC 9 (Transformer Substation No. 1), AOC 36 (stained soil along railroad tracks), AOC 37 (former transformer in Building 5), and the landfill area. The maximum detected concentration of PCBs was 16 mg/kg (PAP-00197408-10, 17-18, 20, 43-44). The northern section of the site was acquired separately in the mid-to-late 1950s. According to a *Northern Area Soil Remedial Investigation Report and Remedial Investigation Work Plan*, dated December 21, 2005, DDx compounds were detected in soil samples at "trace concentrations" (PAP-00197495, 541-44). 4,4-DDE was detected at a maximum concentration of 0.0028 ppm, and 4,4-DDT was detected at a maximum concentration of 0.0043 ppm in 2005 (PAP-00197495).

Remedial Activities

The site was closed and demolished in 1988/1989. Numerous site investigations and remedial activities were conducted at the site following its closure in 1988 under the oversight of the NJDEP (PAP-00090917-18; PAP-00195394). National Standard entered into a Remediation Agreement with NJDEP in 1999 (PAP-00382460-67).

Responses to NJDEPE Letter of May 18, 1994, with Regard to the 0-2 Foot Activities Conducted at the National Standard Company, dated August 15, 1994, states that the soil interval from zero to two feet below ground surface (bgs) was excavated at 22 AOCs, primarily to address lead contamination (PAP-00091124-47).

According to a *Delineation Soil Sampling in AOCs as Referenced in NJDEP Letter of May 18, 1994*, dated November 4, 1994, as a result of all the field investigative sampling activities at the site, remedial action was proposed to address 12 "cleanup areas." The remedial activities involved the excavation of soils in the 12 identified areas. These 12 cleanup areas included the cesspools and drywells, landfill, oil separating pond, spray pond and fuel house, transformer west of Building 28-A, former PSE&G (Public Service Electric and Gas Company) substations, drum storage area, compressor blowdown area, stained soils along railroad tracks, inactive septic tanks, underground storage tanks, aboveground storage tanks, and building demolition areas. In July 1990, an *Addendum to the ECRA Cleanup Plan Report***,** dated July 27, 1990, was submitted to the NJDEP. This addendum report focused on additional excavation of the cleanup areas to depths greater than originally proposed to achieve a former site cleanup standard of 250 ppm for lead. As a result, 29 cleanup areas were then identified as requiring further action. Eight of these cleanup areas were new areas located outside the boundaries established for the original 12 cleanup areas. The other 21 proposed cleanup areas were deeper excavations within the original 12 proposed cleanup areas. This totaled 41 proposed cleanup areas at the site (PAP-00091427-28). From August through November 1990, field work was conducted, and 870 post-excavation samples were collected (PAP-00091428).

As discussed in a *Pilot Response on Soil Delineation*, dated February 24, 1997, National Standard collected a soil sample from beneath a former underground process sewer line in approximately 1988 or 1989. Lead was detected at a concentration of 590 ppm. This area of contamination was subsequently excavated in 1990. National Standard also collected a soil sample beneath a second underground process sewer line at the same time. Excavation of this area also was conducted. Post-excavation confirmation samples had lead concentrations of 2,350 ppm and 3,770 ppm. A second round of excavation occurred, and another post-excavation confirmation sample had a lead concentration of 3,840 ppm. Therefore, a third round of excavation was conducted and confirmation sample concentrations were below the NJDEP's "residential direct contact soil cleanup criterion" (PAS-00101976-80). Based on review of available file material, it is unclear how these process sewer lines were connected to the site's sewer system.

Petroleum hydrocarbons, PCBs, and lead were identified in soil in the vicinity of three transformer owned by the electrical utility (PAP-00090965, 1012, 1015-17). According to an *Expedited Remediation Investigation Report for Northern and Southern Areas*, dated

February 2000, this area was excavated to a depth of 2.5 feet bgs, and seven confirmation sample results were below the NJDEP "Residential Direct Contact Soil Cleanup Criteria" (PAP-00195403). According to a *Site Investigation Report*, dated October 2001, approximately 146 cubic yards of PCB and petroleum-impacted soil was excavated from this area and disposed off-site (PAP-00090728).

Petroleum hydrocarbons, lead, and copper were identified in soil near the cesspools (PAP-00090996-98). According to an *Expedited Remediation Investigation Report for Northern and Southern Areas*, dated February 2000, National Standard excavated 260 cubic yards of soil from this area to a depth of 27 feet bgs to remove lead above concentrations of 250 mg/kg (PAP-00090771).

According to a *Revised Soil and Groundwater Remedial Investigation Work Plan*, dated February 25, 2005, for the purpose of redeveloping the property, the former National Standard site was divided into four large areas including: , (1) the Southern Area; (2) the Northern Area; (3) the Active Area of the former steel plant; and (4) the Landfill Area. Previous soil sampling conducted by National Standard has established "clean" boundary lines separating the "relatively uncontaminated" Northern and Southern Areas from the contaminated Active Area and the Landfill. A total of 44 areas of concern AOCs were identified at the site (PAP-00197351). The following is a list of excavations that were conducted at the AOCs:

- AOC 9 consists of the former transformer pads in the Southern Area. AOC 9 was excavated to a depth of 2.5 feet bgs.
- AOC 10 consists of a former dry well and underground stoup sewer lines located in the Northern Area. The area was excavated to a depth of 15.5 feet bgs.
- AOC 14 consists of the former cesspool D area located in the Northern Area. AOC 14 was excavated to a depth of 27 feet bgs and 260 cubic yards of soil were removed.
- AOC 15 is the location of former Building No. 39. This area was excavated to depths ranging from 4.75 to 7.5 feet bgs.
- AOC 18 is located within the area of former Building No. 39 and within AOC 5. This area was excavated to a depth of 8 feet bgs.
- AOC 24 is the area of former Building No. 39 and is located within AOC 5. The area was excavated to 11.5 feet bgs.
- AOC 26 is in the area of former Building No. 9 and is located within AOC 5. AOC 5 was excavated to an average depth of 6 feet bgs. AOC 26 was excavated to a depth of 14 feet bgs.
- AOC 27 is in the area of former Building No. 8 and is located within AOC 5. This area was excavated to a depth of 9.5 feet bgs.
- AOC 30 is located in the area of former Building No. 7 and was excavated to a depth of 5 feet bgs.
- AOC 4 is the location of former Building No. 7. AOC 4 was excavated to a depth of 5 feet bgs.
- AOCs 6E and 6F are located within AOC 6, which was excavated to 5 feet bgs. AOCs 6E and 6F were excavated to depths of 10 feet and 8 feet bgs.

- AOCs 11 and 17 are located in the area of the former underground process sewer. The resulting excavation was 14.5 feet bgs.
- AOC 12 is the former underground storm sewer line. The area was excavated to a depth of 11.5 to 16 feet bgs.
- AOC 16 is an area of the former underground process sewer lines. AOC 16 was excavated to a depth of 8.5 feet bgs.
- AOC 19 is the area of former Building No. 30 and is located west and outside of AOC 5. The area was excavated to a depth of 3.5 to 4.0 feet bgs.
- AOC 20 is the location of the former underground process sewer line located within AOC 2. AOC 2 was excavated to a depth of 5 feet bgs. The excavation in AOC 20 was extended to 9 feet bgs.
- AOC 21 is the location of the former underground process sewer line. The area was excavated to depths ranging from 13 to 18 feet bgs.
- AOC 22 is located between AOC 21 and the on-site landfill. This area was excavated to 22 feet bgs.
- Area 25 is the former concrete pipe trench located west of Building Nos. 28 and 28A and adjacent to AOC 2. The area was excavated to 10 feet bgs.
- AOC 28 is the area of former Building No. 7A and is located within AOC 4, which was excavated to a depth of 5 feet bgs. Several phases of excavation were conducted in AOC 28 with the resulting excavation extended to 9 feet bgs.
- AOC 29 is located in the area of former Building No. 8. The area was excavated to a depth of 4.0 to 4.5 feet bgs.
- AOC 31 is the area of former Building No. 28 and is located within AOC 5. AOC 5 was initially excavated to 5 feet bgs and the excavation in AOC 31 was extended to 8 feet bgs.
- AOC 32 is the area of former Building No. 28 and is located within AOC 5. The area was excavated to 9.5 feet bgs.
- AOC 34 is the area of former Building No. 10 and is located within AOC 5. This area was excavated to 13 feet bgs, but the excavation was extended to 19 feet bgs.
- AOC 35 is the area of former Building No. 8 and is located within AOC 5. The area was excavated to a depth of 9.5 feet bgs. Two additional excavations were conducted in this area: one was extended to 12 feet bgs and the other was extended to 15 feet bgs.
- AOC 36 is located in the former railroad area along the northern property boundary. The area was excavated to a depth of 8.5 feet bgs.
- AOC 37 is the area of the former transformer located within former Building No. 5. The area was excavated to 20 feet bgs.
- AOC 38 is the area of the former Building No. 6 and is located within AOC 6. The area was excavated to 9.5 feet bgs.
- AOC 40 is the area of the former Building No. 4 and is located within AOC 6. The area was excavated to 10 feet below.
- AOC 42 is the location of removed subsurface piping. The subsurface pipe and surrounding soils were excavated and post-excavation samples were collected from the 6.5 to 7.0-foot depth interval.

- AOC 1 consists of a former oil/water separator located on the western side of the on-site landfill and includes AOC 41 (Area Adjacent to the Former Oil/Water Separator). AOC 1, including AOC 41, was excavated to a depth of 4.5 feet bgs.
- AOC 2 is the location of former Building No. 28 and includes portions of AOC 20 (Former Location of Process Sewer Line) and AOC 25 (Area of Former Concrete Pipe Trench Located West of Building Nos. 28 and 28A). Remediation of this AOC was conducted via many small excavations over many phases.
- AOC 3 is the location of former Building Nos. 7 and 4. AOC 3 was excavated to a depth of 8.5 feet bgs.
- AOC 5 is a large area that incorporates many smaller AOCs. AOC 5 was excavated to an average depth of 5 feet bgs. Areas 33A and 35A were excavated to depths of 18 and 15 feet bgs, respectively.
- AOC 6 consists of the area of former Building Nos. 2, 3, 4, 6 and 14 (includes a portion of AOC 8) and is located to the northeast of the on-site landfill. The area was excavated to a depth of 5 feet bgs.
- AOC 6C is located immediately north of the on-site landfill in the southern portion of AOC 6. The area was excavated to a depth of 5 feet bgs.
- AOC 7 is in the area between former Building Nos. 6A and 8. The area was excavated to a depth of 6 feet bgs.
- AOC 8 is the area between the former Main Building and the railroad track areas. The area was excavated to a depth of 3 feet bgs.
- AOC 13 is the former Cesspool B area and is located within the western corner of AOC 5. AOC 5 was excavated to a depth of 6 feet bgs. AOC 13 was excavated further to a depth of 20.5 feet bgs.
- AOC 23 is the former concrete pipe trench located west of the plant building. The concrete pipe trench and adjacent soils were excavated to a depth of 3 feet bgs initially. The excavation was extended to 7 feet bgs.
- AOC 33 is the area of former Building Nos. 10 and 11 and underground process sewer lines (located within AOC 5). The area was excavated to 12 feet bgs initially. The excavation was extended to 18 feet bgs.
- AOC 39 is the area of the former Building No. 4 and is located within AOC 6. The area was excavated to a depth of 10 feet bgs initially. The excavation was extended to 15 feet bgs (PAP-00197355-64).

Each of the excavations were conducted primarily to address lead contamination. PCBs detected at AOCs 36, 37, and 8 were also addressed via these excavations. Post-excavation confirmation samples were collected at each excavation (PAP-00197355-64).

NJDEP issued a “no further action” determination for the Southern Area in a letter dated May 10, 2002. This portion of the site was subsequently redeveloped as senior housing by the City of Clifton (PAP-00197351). The Northern Area also received a “no further action” determination for soil from NJDEP on November 17, 2006 (PAP-00384059). The central and eastern portions of the site were capped and “closed.” Buildings in the area formerly used for manufacturing operations in the northeastern portion of the site were demolished and soil remediation was conducted (PAP-00090917-18; PAP-00195394). Further information on the remedial efforts in the northeastern portion of the site was not identified in the referenced document. Review of a *Remedial Investigation Report*

Addendum, dated February 28, 2017, indicates that remediation of the Active Area of the former steel plant and Landfill Area is ongoing (PAP-00384059-60).

8. Summary of Asserted Defenses

National Standard asserts the following:

- That any release of petroleum, including crude oil of any fraction thereof, is not a CERLCA hazardous substance under 42 U.S.C. §9601(14).

- The federally permitted exclusion applies to National Standard's discharge under 42 U.S.C. §9607(J).

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

NEU HOLDINGS U.S. CORPORATION

Note: EPA originally identified Eden Wood Corporation, a Delaware Corporation, ("Eden Wood") as the PRP and successor entity to the Whippany Paper Board Co., Inc. ("WPBC") facility at 1 Ackerman Avenue in Clifton, NJ ("Clifton Mill") that is the subject of this data report. Additional corporate research completed in responding to a 104(e) request received from EPA confirmed that Neu Holdings U.S. Corporation ("Neu Holdings")—and not Eden Wood—is the successor to WPBC. Neu Holdings will henceforth be identified as the PAP associated with the WPBC facility.

Facility Address and Size: 1 Ackerman Avenue, Clifton, New Jersey. According to a 1987 boundary survey of the site, the site consisted of a "Clifton Tract" (5.497 acres) and "Passaic Tract" (1.488 acres) totaling 6.985 acres (PAP-00198414-415). According to the New Jersey Department of Environmental Protection (NJDEP) Environmental Cleanup Responsibility Act (ECRA) General Information Submission (GIS) in 1987, the legal description was City of Clifton Block 4-15, Lot 1 and 2 and City of Passaic Block 51 Lot 1. The document did not state the acreage (PAS-00113546). The site is to the east by the Passaic River, to the west by the former Dundee Canal, and to the north by Ackerman Avenue. The Passaic River bank is shored up by sheet pilings (PAS-00113605). Note: The Dundee Canal no longer exists. It was filled to accommodate Route 21 Freeway between 1997 and 2005 (PAP-00198505). According to Neu Holdings U.S. Corporation's Response to the EPA's Request for Information pursuant to CERCLA 104(e), this facility is located at RM 17.2, 8.9 miles from the northern terminus of OU2. According to the Industrial Directory of New Jersey the number of employees for 1940-1941 was 189 (PAS-00113455-56). According to the Industrial Directory of New Jersey the number of employees for 1946 was 275 (PAS-00113458-59). A Herald-News article from June 11, 1982, stated that the facility once employed 150 employees (PAS-00113961). Note: No other information regarding the number of employees was found in the documents provided for this report. A Securities and Exchange Annual Report dated 1971 stated that the business worked a 24-hour day, five to six days a week (PAP-00102308).

See the following 2017 EDR Aerial Photo for site location. The site is outlined in red.



(PAP-00374493)

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

1. **Business Type:** Manufactured paperboard products using recycled waste paper as raw material. The plant produced unbleached container board, unbleached box board, and other unbleached paper boards. The plant also produced roofing felt for a time in the 1970s (PAP-00102359-62).

2. **Time Period of Ownership/Operations**

Owner: 1933-1987
Operator: 1933-1980

1933: On January 5, 1933, Frank Desiderio Sons, Inc. transferred title to the Clifton Plant to Clifton Paper Board Co., Inc. (PAP-00374468), which was incorporated in New Jersey in October 1932 (PAP-00198402). .
WPBC was incorporated in November 1933 (PAP-00198401).

1946: Botany Worsted Mills transferred title to Block 1051 Lot 1 to Clifton Paper Board Company, Inc. on February 1, 1946 (PAP-00374471).

1955: Clifton Paper Board Company, Inc. and WPBC were merged in 1955 and the surviving entity of the merger was WPBC (PAP-00198403, 7).

1980: WPBC filed for Chapter 11 Bankruptcy proceedings in February 1980 and planned to reorganize and partially liquidate assets, including the Clifton Mill (PAP-00102373-417).

According to the 2006 PRP DEF, WPBC filed for Chapter 11 bankruptcy in February 1980 but continued to operate the company until June 1980, when funds ran short (PAS-00113427); however, an article in The Herald News, dated June 1982, noted that the Clifton Mill had been partially gutted by fire in April 1980 and had never reopened (PAS-00113961).

On November 10, 1980, WPBC submitted a proposed Plan of Reorganization under Chapter 11 of the Bankruptcy Code. The plan of reorganization is by means of partial liquidation of assets (PAP-00102373).

1981: In March 1981, the Bankruptcy Court issued a Confirmation Order for WPBC's Chapter 11 Plan, which discharged WPBC from any and all debts arising prior to entry of the Confirmation Order (PAP-00102386-87). WPBC did not operate the Clifton Mill after issuance of the Confirmation Order (PAS-00113953).

1986: NPN, Inc., a Delaware corporation, acquired approximately 76% of the outstanding shares of WPBC and subsequently merged into WPBC (PAS-00113547-48). A December 1986 Administrative Consent Order ("1986 ACO") in connection with an NJDEP ECRA-triggered transaction states that NPN, Inc. had made a tender offer for all of WPBC's stock (PAS-00113661).

1987: On October 1, 1987, WPBC sold the facility site (City of Clifton Block 4-15, Lot 1 and 2 and City of Passaic Block 1051, Lot No. 1) to an unrelated third party, V. Ponte & Sons, Inc., a New York Corporation (PAP-00102234-42). On October 8,

1987, Ponte's counsel informed NJDEP that pursuant to the contract of sale with WPBC, Ponte agreed to assume the responsibility of achieving ECRA compliance for the facility site under the 1986 ACO (PAS-00113513).

In December 1988, Ponte sold Clifton Block 4-15, Lot 1 and 2 and Passaic Block 1051, Lot No. 1 to Recycled Paper Board, Inc. of Clifton, New Jersey (PAP-00102243).

2005: Recycled Paper Board, Inc. ceased operations at the facility (PAP-00198428).

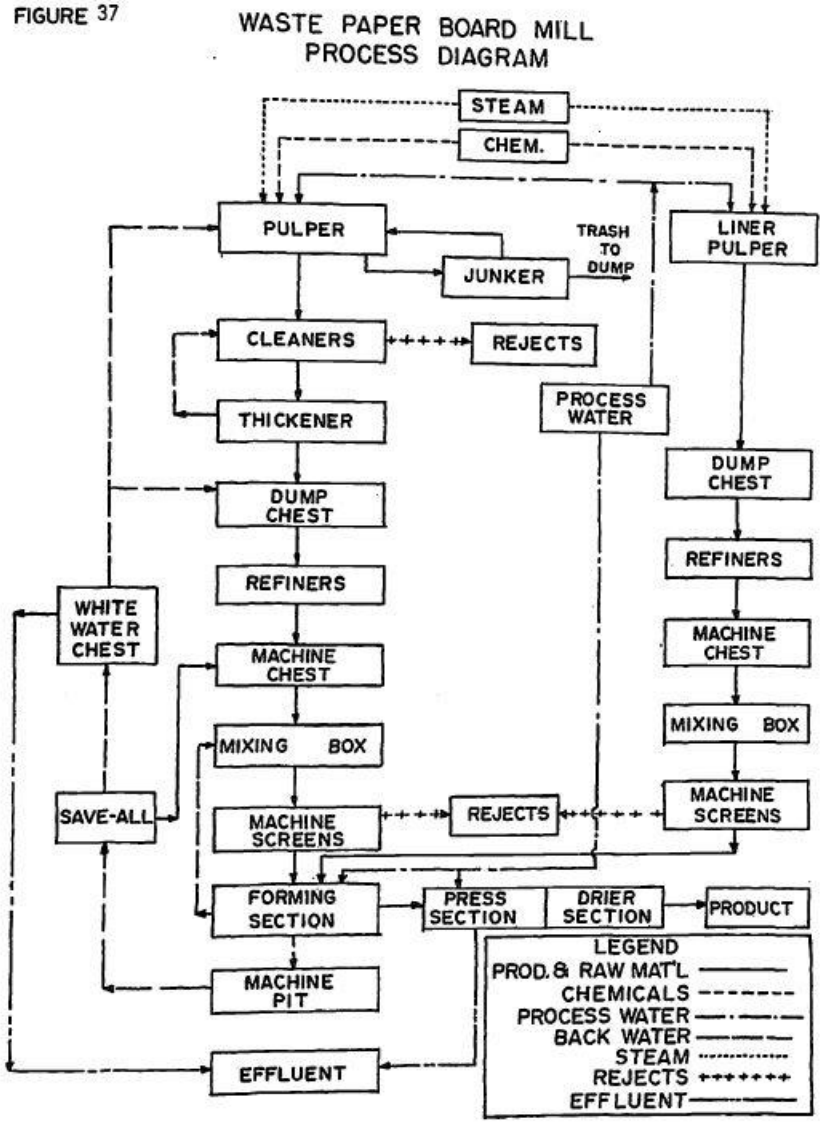
3. Operational History/COC Use and Presence at the Facility

Based on title research and Sanborn maps, the property was developed and owned/operated by others for paper board product manufacturing dating back to at least 1903, when it was owned by Carlton Paper Co (PAP-00374489). In 1971 the facility had an estimated annual capacity of approximately 82,500 tons and operated at 75% capacity (PAP-00102308). In 1978, WPBC had an estimated annual capacity of approximately 82,500 tons of product and was operating at 58% of capacity. At that time, WPBC occupied 169,600 square feet of floor space, truck-docking facilities were located onsite, and rail transportation was nearby (PAP-00102357; PAS-00113427).

According to a 1971 Securities and Exchange Annual Report, the facility engaged in the business of manufacturing and selling containerboard, boxboard and other grades of paperboard. The products were processed from substantially all recycled material. During 1970, the facility also commenced production and sale of roofing felt used in the building industry (PAP-00102302, 308).

According to the publication, *State-of-the-Art Review of Pulp and Paper Waste Treatment*, prepared by Dr. Harry Gehm for EPA and dated April 1973, the Clifton Mill was categorized as a Waste Paper Board Mill by EPA (PAP-00102579). The following diagram shows the process of a typical Waste Paper Board Mill.

FIGURE 37



(PAP-00102568)

The initial breakdown of the waste paper involved mixing the waste paper with hot water in hydrapulpers. The hot water softened the paper which made separation easier. After the hydrapulpers, the materials were transferred to heavy-duty “beaters” that mechanically separated the paper fibers. After mechanical separation, the pulp was ready to be made into paper. This process involved the use of various paper making machines—e.g., foundriniers and cylinders. This process orients the fibers to make paper more or less stiff and involves drying, forming, and rolling the pulp into finished paper board. The wastewater from this process was sent to the Passaic Valley Sewerage Commission (PVSC) (PAP-00198586-87).

An Inventory and Appraisal dated August 1980 (1980 Inventory and Appraisal) in connection with WPBC’s bankruptcy proceeding listed the following chemicals were listed as being at the Clifton Mill:

WPBC Chemical List	
Quantity	**Chemical**
900 Pounds	Acc-Cyfor Drylite
1200 Pounds	Aluminum Paste
2000 Pounds	Aluminum Sulphate
400 Pounds	Alamask 308 DX
500 Pounds	Basic Brown TB
150 Pounds	Calco Nigro 02P
1000 Pounds	Calcocid Orange RR
1000 Pounds	Chrysodine Y
1700 Pounds	Lycoid 250
1760 Pounds	Paracol 802D
400 Pounds	Starch
1400 Pounds	Alum Sulph STD GRD Dry
500 Pounds	BA-11
1600 Pounds	Burolock
110 Gallons	Burn Rite
440 Pounds	Calgon NFL 25
120 Pounds	Flake Caustic Soda
9 Drums	Resin-HCR-5
200 Pounds	Sal Soda
450 Pounds	Santosite Sodium
800 Pounds	Felt Wash Dricid
500 Gallons	Mineral Spirits

(PAP-00102400)

According to the 1980 Inventory and Appraisal, the Clifton Mill site contained 52,000 gallons of No. 6 fuel oil, 500 gallons of No. 2 fuel oil, as well as five cartons of mercury and incandescent lamps (PAP-00198594, 97). The Inventory and Appraisal did not include any entries for bleaching equipment or bleaching chemicals (PAP-00102414-15; PAP-00102391-400; PAP-00198589-97).

According to a *Section 4M/6J Remedial Investigation Report Route 21 Freeway Extension*, dated 1995 (1995 Route 21 Report), a portion of the subject property had the Dundee Canal running adjacent to it. According to the report: A 1935 Sanborn Map of the canal shows the Clifton Paper Board Company had two “Acid Tanks” and a “Coal Pile” bordering the eastern shore of the canal. The coal pile is not visible in the 1940 aerial photograph (PAS-00114024). A 1961 aerial photograph showed that drums were stored adjacent to the Clifton Paper Board facility on the eastern shore of the Dundee Canal, and a 1974 aerial photograph showed that the drums present on the eastern shore of the canal in the 1961 aerial photograph had been removed and replaced by tractor trailers (PAS-00114025). Note: The sampling investigation for the 1995 Remedial Investigation occurred in the canal and not on the former Clifton Mill property or the Passaic River. In addition, the aerial photos and Sanborn maps referenced in the 1995 Route 21 Report were not attached to the report and have not been reviewed. The interpretation of the aerials and Sanborn Maps was included in this report to describe facility operations.

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

Note: Detections of the COCs discussed below were obtained in connection with investigations and remedial actions under ECRA and ISRA by owners of the site after WPBC sold it in 1987. These subsequent owners (V. Ponte & Sons, Inc. and Recycled Paper Board, Inc.) are not related to WPBC and are not PAPs in this allocation process.

PCBs

According to undated results of EPA Priority Pollutant Volatile Compounds included in the 2006 PRP DEF, 2,100 µg/kg (2.1 mg/kg) of PCB-1254 was detected in soil sample No. VP/DS1 (PAS-00113687). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

A February 1986 memorandum from NJDEP regarding its review of the July 25, 1985 Sampling Plan and February 4, 1986, Addendum stated that an inspector identified two transformers on the site and that documentation must be provided stating that they did not contain PCBs (PAS-00113605-7). A May 1988 report by HWEC in connection with ECRA-related sampling said that 3 soil samples were collected on May 18, 1988 at an interval of zero to six inches from the transformer area and tested for PCBs (PAS-00113523-4). The report summarized the PCB results as follows: “The total PCBs detected in the soil samples collected in the transformer area ranged from 0.05 mg/kg to 1.3 mg/kg. Since the NJDEP threshold level for total PCB’s in soil is between 1 mg/kg to 5 mg/kg, excavation of these materials is not proposed.” (PAS-00113525). An undated ECRA *Environmental Concern Tracking Sheet* identified the transformer area as a location of concern for potential PCB contamination, noted a PCB concentration of “1.3” and an action level of “5.0”, and stated that the “outcome” was no further action required (PAS-00113602-3).

According to the *Remedial Investigation Report and Remedial Action Workplan (RIR/RAW) for the Property Known As Former Recycled Paperboard* and prepared by Environmental Waste Management Associates (EWMA) dated October 2007 (2007 EWMA RIR/RAW), during a January 27, 2006 site inspection by EWMA, three transformers were identified on the Property. It was determined that all three transformers did not contain PCBs. In addition, no staining or other evidence of discharges was noted in the vicinity of any of the transformers (PAP-00198528).

PAHs

On March 22, 1989, Hazardous Waste Engineering Consultants (HWEC) on behalf of Recycled Paper Board of Clifton, Inc., ECRA Case No. 85193 submitted analysis results to NJDEP (PAS-00113531-541). The analytical results were from the soil testing around the abandoned drum storage area (PAS-00113531). Three grab samples were collected on November 29, 1988 on the west side of the structure. The results follow:

WP GS-1 (Depth 6-12 inches)	
Compound detected	**Results micrograms/kilogram (µg/kg)**
phenanthrene	130 J
anthracene	34 J
pyrene	220 J

J indicates that the compound was present in the soil sample, but the concentration is estimated as it is below the specified minimum detection limit.

(PAS-00113692; PAS-00113535, 541)

WP GS-2 (Depth 13-19 inches)	
Compound detected	**Results µg/kg**
naphthalene	590
phenanthrene	36 J
pyrene	26 J

J indicates that the compound was present in the soil sample, but the concentration is estimated as it is below the specified minimum detection limit.
(PAS-00113692; PAS-00113535, 541)

WP GS-3 (Depth 20-26 inches)	
Compound detected	**Results µg/kg**
naphthalene	34 J
phenanthrene	96 J
pyrene	120 J
benzo(b)fluoranthene	110 J
benzo(a)pyrene	6 J

J indicates that the compound was present in the soil sample, but the concentration is estimated as it is below the specified minimum detection limit.
(PAS-00113692-93; PAS-00113535, 541)

Undated results of EPA Priority Pollutant Volatile Compounds state that 150 (J) micrograms/kilogram (µg/kg) of benzo(a)anthracene and 450 µg/kg of pyrene were found in soil sample VP/DS1 (PAS-00113683-84). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post-excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

Dioxins/Furans

Sampling of soil and groundwater carried out in 2005 did not detect dioxins/furans in facility site soils (PAP-00198542-55).

Copper

On March 22, 1989, HWEC on behalf of Recycled Paper Board of Clifton, Inc., ECRA Case No. 85193 submitted analysis results to NJDEP (PAS-00113531-541). The analytical results were from the soil testing on the soil around the abandoned drum storage area (PAS-00113531). Three grab samples were collected on November 29, 1988 on the west side of the structure and all samples were analyzed for Priority Pollutant Metals which included copper.

Copper		
Sample Number	**Depth**	**Results mg/kg**
WP GS-1	6-12 inches	27
WP GS-2	13-19 inches	705
WP GS-3	20-26 inches	147

(PAS-00113535, 541; PAS-00113699)

Undated results of EPA Priority Pollutant Volatile Compounds included in the 2006 PRP DEF stated that 2,440 mg/kg of copper was found in soil sample VP/DS1 (PAS-00113688). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

Lead

On March 22, 1989, HWEC on behalf of Recycled Paper Board of Clifton, Inc., ECRA Case No. 85193 submitted analysis results to NJDEP (PAS-00113531-541). The analytical results were from the soil testing on the soil around the abandoned drum storage area (PAS-00113531). Three grab samples were collected on November 29, 1988 on the west side of the structure and all samples were analyzed for Priority Pollutant Metals which included lead.

Lead		
Sample Number	**Depth**	**Results mg/kg**
WP GS-1	6-12 inches	173
WP GS-2	13-19 inches	2,420
WP GS-3	20-26 inches	277

(PAS-00113535, 541; PAS-00113699)

Undated results of EPA Priority Pollutant Volatile Compounds included in the 2006 PRP DEF stated that 457 mg/kg of lead was found in soil sample VP/DS1 (PAS-00113688). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post-excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19). .

A *Remedial Action Report* (RAR) prepared by EWMA dated November 2016 (2016 EWMA RAR) stated that sixteen soil borings were installed at the Former Recycled Paperboard property on August 9, 2005, to investigate the gross leaching potential in areas where elevated lead concentrations had been previously detected in connection with investigation of historic fill on the property (PAP-00198429). Soil samples were collected for analysis from the layer of fill material in all sixteen of the borings installed on August 9, 2005. A review of analytical results from the August 9, 2005 of soil sampling event showed that total lead was detected at concentrations ranging from 467 ppm to 29,400 ppm (PAP-00198525). The analytical results stated that total lead concentrations ranged from 467 parts per million (ppm) to 29,400 ppm. The TCLP analysis method stated that concentrations of lead were detected at approximately 3 orders of magnitude less than the total lead analysis method (PAP-00198525). The leachability testing showed that the lead was very non-leachable, even under extreme acidic conditions of the test (PAP-00198524). The report concluded that although lead was detected at elevated concentrations at the property, the horizontal and vertical sampling showed that lead is contained in the layer of fill material at the property and not a result of previous on-site operations (PAP-00198429-30).

Groundwater samples collected in December 2005 exhibited lead concentrations above the GWQS in only one monitoring well, 11.2 µg/L in MW-3. Samples from the other 2 wells did not identify lead above the method detection limit (PAP-00198430). A confirmatory groundwater sampling round was conducted in December 2006. All samples exhibited lead concentrations that were non-detectable above the method detection level in all monitoring wells. Based on the two groundwater sampling rounds, EWMA concluded that lead contamination associated with the historic fill does not impact the groundwater conditions at the property (PAP-00198431).

Mercury

On March 22, 1989, HWEC on behalf of Recycled Paper Board of Clifton, Inc., ECRA Case No. 85193 submitted analysis results to NJDEP (PAS-00113531-541). The analytical results were from the soil testing on the soil around the abandoned drum storage area (PAS-00113531). Three grab samples were collected on November 29, 1988 on the west side of the structure and all samples were analyzed for Priority Pollutant Metals which included mercury.

Mercury		
Sample Number	**Depth**	**Results mg/kg**
WP GS-1	6-12 inches	Undetected
WP GS-2	13-19 inches	2.4
WP GS-3	20-26 inches	1.8

(PAS-00113535, 541; PAS-00113699)

Undated results of EPA Priority Pollutant Volatile Compounds included in the 2006 PRP DEF identified 2.9 milligrams/kilogram (mg/kg) of mercury in soil sample VP/DS1 (PAS-00113688). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post-excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

Historic Fill

The Allocation Team has determined that the facility site is located on regional historic fill as designated by the NJDEP.

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[1] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[2] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of historic fill at varying levels, not atypically at or exceeding residential soil standards.[3]

Two excavations on the east side of the site building during an ECRA investigation in 1988 encountered significant historic fill material consisting of "bricks, concrete, cinders and metal intermixed with sand and gravel" at a depth of 10.5 feet (PAS-00113518). EWMA conducted subsurface investigation during July and August of 2005 under ISRA for the express purpose of determining the extent and makeup of fill material, which had been identified as an Area of Concern for the site (PAP-00198503. 521-528). A total of 33 soil borings were installed to investigate the presence of historic fill (PAP-00198521). Fill material consisting of ash, cinders, concrete and wood pieces was observed in each of 17 borings ranging from one foot to 12.5 feet thick (PAP-00198425, 429; PAP-00198521). The 2007 EWMA RIR/RAW, concluded as follows: "Based on the fact that only PAH compounds and metals were detected in soil at concentrations greater than their respective NJDEP MSSCC and since the contamination is concentrated within the fill layer, EWMA considers the elevated PAH and metals in soil to be a result of the fill material on the subject site and not a result of former operations conducted at the site." (PAP-00198523).

The 2016 EWMA RAR noted that historic fill was discovered on the property during the removal of four underground storage tanks in 1988 (PAP-00198429). Later investigations performed in 2005 determined that the fill material ranged from "one foot thick to 12.5 feet thick in certain areas." (PAP-00198429).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00198481).

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[1] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[2] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[3] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	94,800 mg/kg
Copper	7,880 mg/kg
Mercury	52.7 mg/kg
Benzo(a)anthracene	5.04 mg/kg
Benzo(a)pyrene	4.7 mg/kg
Benzo(b)fluoranthene	3.8 mg/kg
Benzo(k)fluoranthene	3.56 mg/kg
Dibenzo(a,h)anthracene	1.34 mg/kg
Indeno(1,2,3-cd)pyrene	2.67 mg/kg

The maximum detected concentrations of all COCs listed above were found to be associated with historic fill at the site as determined by a Licensed Site Remediation Professional (LSRP) pursuant to ISRA after extensive investigation of fill material at the site in 2005 (PAP-00198550; PAP-00198553; PAP-00198554; PAP-00198549).

Due to the presence of lead, mercury, and copper, related to historic fill above their respective NJDEP soil standards, restricted land use and engineering controls were implemented in a Deed Notice (PAP-00198447). NJDEP approved the Deed Notice to address the contamination in the historic fill. The Deed Notice was recorded on April 4, 2016 (PAP-00198488-97).

A 1931 aerial photograph shows that there are structures in existence at the Clifton Mill site 1931, two years before WPBC's predecessor acquired it in 1933 (PAP-00374506).

There is no indication from a review of provided documents that WPBC facility operations disturbed contamination located in historic fill.

5. COC Pathways

Direct Release

According to the 2006 PRP DEF, the following releases occurred at the Clifton Paper Mill, during the time periods of Clifton Paper Board Company and WPBC.

- In February, May, July and September, 1947, PVSC stream contamination reports documented Clifton Paper Board Company, at 1 Ackerman Ave., Clifton, New Jersey, was discharging industrial waste consisting of paper pulp, oily industrial waste liquid, and paper waste board into the Passaic (PAS-00113923, 925, 927, 929). These events are discussed in more detail in the Violations section of Section 6, below.

- According to a New Jersey Department of Health Field Information Report from 1971, a 12-inch pipe of unknown origin was discharging from WPBC into the Passaic River. The report states that the pipe was located near an unspecified bridge.

- According to a New Jersey Department of Health Field Information Report from 1972, a 10-inch pipe of unknown origin was discharging from WPBC via the bulkhead into the Passaic River. The report notes that the "entire area was steaming from hot water." (PAS-00113429).

- The facility discharged to the Passaic River pursuant to five National Pollution Discharge Elimination System (NPDES) permitted outfalls for some period during facility operations and ceasing in 1977. Outlet 002 was used for filter backwash and Outlet 004 for boiler blowdown. The use of the other outlets was not identified in the report (PAS-00113566-67). See also the Violations section of Section 6, below.

Sanitary and Storm Sewer

WPBC stated in their March 1985 *NJDEP ECRA General Information Submission* that the industrial facility discharged to the Passaic Valley Sewage Authority (PVSA) [sic] system (PAS-00113609).

According to the 2006 PRP DEF, the City of Clifton sanitary sewer line runs south on Ackerman Avenue, then east on Randolph Avenue. The line then runs south on Highland Avenue before it empties into the PVSC Trunk Line (PAS-00113432).

Spills

In January 1948, PVSC documented Clifton Paper Board Company had an incident with a discharge consisting of pulp waste and sewage into the Passaic River. The discharge was due to a slightly open by-pass valve (PAS-00113931) and was eliminated immediately by the facility by closing the valve tightly.

On October 3, 1949, PVSC reported that a flood in the heater room at Clifton Paper Board caused wastes to be discharged to the river. It was reported that ‘‘the waste was diverted to their by-pass and into Passaic River due to an electrical failure and the issue was repaired and eliminated." (PAS-00113933).

On March 2, 1956, a mixture of oil and water flowing out of a 16-inch pipe was observed on Clifton Paper Board Company property. The flow was coming out of a flap valve and discharging into the Passaic River from the Clifton Paper Board Company property. It was discovered that the pipe was clogged which prevented the flow from going into the sanitary sewer. The clog was removed which remedied the situation that same day (PAS-00113935).

On December 18, 1956, there was a small oil slick flowing from a 14-inch pipe into the Passaic from the Clifton Paper Board Company property. The pipe had a flap valve attached to it with a wooden wedge keeping the valve open. The superintendent was notified, and he stated that the pipe was used to drain rainwater from the loading area and that the oil was from trucks parked there. He was unable to provide an explanation for the wedge, and it was removed and the issue was corrected (PAS-00113937).

On August 8, 1969, WPBC was informed that they had a leak in the 20-inch steel pipeline carrying waste to the trunk sewer causing a small amount of pollution to reach the Passaic River. PVSC wrote a letter to WPBC asking the company to fix the line and received a response from WPBC that it would replace the entire line while company employees were on strike. . During the strike, no material would be in this line and therefore there would be no pollution. The repair was made by August 21, 1969 and all sources of potential pollution had been eliminated (PAS-00113559-60).

On December 29, 1969, a sanitary sewer line underneath a sidewalk broke, allowing industrial waste to enter into a catch basin that flowed into the Passaic River. The plant was shut down with the discovery of this break and repairs were made before the plant reopened on January 5, 1970 (PAS-00113560).

On June 1, 1977, WPBC called to advised the PVSC that a ¾-inch cleanout cap had blown off the 20-inch company force main and discharged sewage to the Passaic River. All operations in the plant were stopped. A new cap was installed, and the plant was back in operation the same day (PAS-00113563).

A review of available documents did not provide information regarding the volume or constituents of any discharges or spills to the Passaic River, with the exception of the 1976 outlet discharge exceedances described in the Violations section of Section 6, below. However, the PVSC reports for the incidents described above state that releases to the Passaic were of short duration.

6. Regulatory History/Enforcement Actions

Inspections

During a January 27, 2006, site inspection when the facility was owned by an unrelated third party, EWMA identified three transformers on the property. One transformer was located on the eastern side of the building on the property and the remaining two were located on the western side of the building. EWMA stated that the transformer on the eastern side of the building was installed in the last three years and did not contain PCB fluids. The remaining two transformers on the western side of the building had been refurbished within the last three years and had never contained PCB fluids. All three of the transformers were located over competent concrete within fenced-in enclosures. No staining or other evidence of discharges was noted in the vicinity of any of the transformers (PAP-00198528).

Violations

In 1947, PVSC stream contamination reports documented four incidents of discharge from Clifton Paper Board Company, at 1 Ackerman Ave., Clifton, New Jersey, into the Passaic. The February incident involved paper pulp being discharged. This was caused by the failure of the main pump occurring over the weekend and the smaller reserve pump not being able to handle the total load. The issue was fixed within a day of the inspection (PAS-00113923). The May report involved industrial paper pulp due to a valve not being closed fully; the report states the valve was closed thus resolving the violation (PAS-00113925). The July report involved an oily discharge

from a partly open valve, which was corrected after notification by the inspector (PAS-00113927). The September report involved paperboard discharge intended for the sanitary sewer due to an electrical breakdown in the main sewer pump which was corrected "within the hour" (PAS-00113923, 925, 927, 929).

In March and December 1956, Clifton Paper Board received violations for oil and water discharges from a pipe, described in the Spills section of Section 5, above (PAS-00113935; PAS-00113937). The violations were eliminated on the next day in March and on the same day in December.

On June 1, 1977, WPBC called to advise the PVSC that a ¾-inch cleanout cap had blown off the 20-inch company force main and discharged sewage to the Passaic River. All operations in the plant were stopped. A new cap was installed and the plant was back in operation the same day. This eliminated the violation (PAS-00113563).

In September 1976, PVSC notified WPBC that they had two of five outlets (002 and 004) were above values that PVSC did not consider acceptable for discharge limits into the Passaic River for suspended solids, turbidity, and pH, none of which are COCs. WPBC was advised to connect the outlet to the sanitary sewer for permit compliance or treat the effluent before discharge. WPBC determined they would pipe the discharge into the sanitary sewer temporarily, but recycle the water in the future (PAS-00113566). Lines for boiler blowdown (discharge outlet 004) were installed on March 12, 1977, and the discharge to the Dundee Canal was eliminated. After taking five months to receive the pump from the vendor, discharge outlet 002 (filter backwash) was fixed by October 1977 (PAS-00113567). It is noted that flow from the filter backwash was polluting suspended solids and turbidity for approximately 10 minutes at 9:00 a.m. and 1:00 a.m. each day, and the flow was estimated at 300 gallons per minute. Outside of those times, the discharge was non-polluting (PAS-00113566-67).

Permits

The Facility discharged to the Passaic River pursuant to five National Pollution Discharge Elimination System (NPDES) permitted outfalls for some period during facility operations and ceasing in 1977. Outlet 002 was used for filter backwash and Outlet 004 for boiler blowdown. The use of the other outlets was not identified in the report (PAS-00113566-67).

On November 7, 1980, EPA sent a letter to WPBC regarding NPDES Application Permit No. NJ0001457. Upon review of application documents, EPA determined that a NPDES permit may not be necessary since the company was bankrupt and the plant was shut down (PAP-00374507).

An NJDEP ECRA General Information Submission was issued in March 1985 that was triggered by the agreement of sale between WPBC and Ponte. It stated that WPBC did not have a New Jersey Pollutant Discharge Elimination System permit at the time (PAS-00113609, 612). Note: The Clifton Mill had been shut down since April of 1980 (PAS-00113953, 961).

Copies of the above-described permits were not available for review for this report.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility. These documents were prepared in connection with investigations of the subject facility under ECRA and ISRA conducted by subsequent owners of the Clifton Mill facility – V. Ponte & Sons and Recycled Paper Board – that are not related to WPBC. However, these documents are relevant because they evidence site conditions, including the absence of COCs in site soils from WPBC operations at the facility and the existence of COCs in historic fill on the site. These reports provide evidence that there were no potential or known off-site migration of contaminants during WPBC's period of ownership from 1933 to 1987.

- *Final Report of Site Remedial Activities* of WPBC NJDEP- ECRA Case No. 85193 for Recycled Paper Board of Clifton, NJ dated January 11, 1991 (PAS-00113481).
- *Preliminary Assessment/Site Investigation Report* completed in May 2006 (PAP-00198427). This document was not available for review but was referenced in the November 2016 *Remedial Action Report*, listed below.
- *Remedial Investigation Report/Remedial Action Workplan* for Property known as Former Recycled Paperboard, 1 Ackerman Ave., Clifton, NJ dated October 2007 (PAP-00198498).
- *Remedial Action Report* Former Recycled Paperboard, dated November 2016 (PAP-00198421).

Soil

A February 24, 1986, ~~a~~ NJDEP internal memorandum (1986 NJDEP Memorandum) cited six areas of concern after the review of the July 25, 1985, Sampling Plan and its February 4, 1986, Addendum plus a NJDEP site inspection report of October 2, 1986:

- Tank 1, a 1,000-gallon underground tank containing mineral spirits
- Tank 2, a 3,000-gallon underground tank containing mineral spirits
- Tank 3, a 4,000-gallon underground tank containing hydraulic oil
- Tank 4, a 1,000-gallon underground tank containing No. 2 fuel oil
- Stained soils at the fill line for an aboveground 160,000-gallon No. 6 fuel oil tank
- Stained soils in the drum storage area (PAS-00113605)

According to the 1986 NJDEP Memorandum, petroleum hydrocarbon contamination of soils in excess of 100 ppm had been identified at all of the underground tank storage areas and the stained soil at the aboveground storage tank and drum storage area had not been sampled and analyzed. The memorandum recommended that NJDEP require these areas to be addressed further in the Sampling Plan (PAS-00113605-07).

In December 1986, NJDEP issued an Administrative Consent Order (1986 ACO) for NPN, Inc. and WPBC, ECRA Case 85193. This ACO was entered in connection with NPN, Inc.'s acquisition of WPBC stock, which triggered ECRA obligations. The ACO required NPN, Inc. to submit a complete delineation of environmental contamination onsite and any off-site environmental contamination resulting from discharges of hazardous wastes or substances on or from the property (PAS-00113660-68). WPBC subsequently sold the Clifton Mill to an unrelated third party, V. Ponte & Sons on October 1, 1987 (PAP-00102234 –0102242).

By letter October 8, 1987, attorneys for Ponte notified NJDEP that Ponte assumed responsibility for achieving ECRA compliance at the Clifton Mill facility at 1 Ackerman Ave in accordance with the 1986 ACO (PAS-00113513-14). Ponte assured NJDEP they would assemble the technical information and prepare an implementation schedule in a timely fashion (PAS-00113513-14). Ponte thereafter completed the ECRA process which consisted of the investigation and remediation, where necessary, of the 6 areas of concern noted in the 1986 NJDEP Memorandum. NJDEP issued a No Further Action determination letter on February 27, 1991, stating that cleanup of ECRA Case 85193 was completed and that the site was considered to be in full compliance with ECRA (PAP-00198509; PAP-00102547)

According to the 2007 EWMA RIR/RAW, characterization activities conducted in connection with ECRA Case 85193 included four underground storage tanks (containing mineral spirits, hydraulic oil and No. 2 fuel oil), stained soil beneath a fill pipe of a 160,000-gallon aboveground No. 6 fuel oil storage tank and stained soil in a drum storage area (PAP-00198508-19). The 2007 EWMA RIR/RAW noted that the consultant conducting the work under ECRA Case 85193 (HWEC) concluded that elevated concentrations of total petroleum hydrocarbons (TPHC) were due to the presence of fill material and not the result of a discharge from the former USTs~~.~~ (PAP-00198511-12).

According to the 2007 EWMA RIR/RAW, EWMA completed the PA/SIR in May 2006. The 2006 PA/SIR was submitted to NJDEP in conjunction with the Former Recycled Paperboard facility, ISRA Case E20050496, which had ceased operations at the facility in 2005~~.~~ (PAP-00198424).
The 2006 EWMA PA/SIR investigated nine AOCs of which the following six were recommended for No Further Action:

- AOC 1: Above Ground Storage Tanks
- AOC 3: Silo
- AOC 4: Above Ground Piping
- AOC 5: Former Drum Storage Area/Hazardous Material Storage
- AOC 8: Transformers
- AOC 9: Loading/Unloading Area/Railroad Spur (PAS-00198502)

The 2006 EWMA PA/SIR identified three AOCs that required further investigation. They were AOC 2: Underground Storage Tanks; AOC 6: Piping Trenches; and AOC 7: Historic Fill (PAP-00198502-503). The 2006 EWMA RIR/RAW documented the investigation into these three AOCs and provided recommendations if further action was

necessary under the New Jersey Technical Requirements for Remediation (PAP-00198502). With respect to the underground storage tanks (AOC 2) EWMA requested that a no further action determination be issued based on the facts that impacted soils had been removed from the vicinity of the former underground tanks, that TPHC concentrations were determined to be the result of fill material (not releases from the tanks) and that NJDEP had issued a NFA determination for the tanks in February 1991 (PAP-00198512, 14, 16, 17). EWMA also requested a no further action determination for the piping trenches based on the results of an inspection of the trenches that showed they were intact with no holes, cracks or breaches (PAP-00198520).

EWMA conducted soil and groundwater of the property to investigate AOC 7 (Historic Fill) (PAP-00198521-28). The investigation consisted of 33 soil borings - 17 throughout the site in July 2005 and 16 more in August 2005 in areas where the results from the July borings were elevated for lead. The investigation also included groundwater testing of five monitoring wells and an additional 2 rounds of groundwater testing from 3 wells to further evaluate the impact of lead in the fill material. Analytical results of soil and groundwater testing stated that several contaminants typically associated with historic fill were present in soil and groundwater at the facility. EWMA summarized the investigation results as follows: "The results of the Preliminary Assessment and Site Investigation sampling conducted to date have not revealed any on-site sources of contamination other than historic fill that has been identified at the site. Sampling of the fill material has revealed concentrations of PAHs and metals that exceed the NJDEP MSSCC. Fill material is generally present throughout the site at depths ranging from site grade to approximately 12.5 feet…Based on the two groundwater sampling rounds, EWMA has concluded that lead contamination is associated with the historic fill and does not impact groundwater conditions at the Property." (PAP-00198528).
The 2016 EWMA RAR stated: "Based on the fact that only PAH compounds and metals were detected in soil at concentrations greater than their respective NJDEP RDCSCC and since the contamination is concentrated in the fill material, EWMA considers the elevated PAH and metals in soil to be the result of the fill material on the Property and not a result of former operations conducted at the Property. (PAP-00198429). Note: The PA/SIR discussed above was not included in the documents provided for review of this Data Facility Report. Instead, the above information was obtained from the November 2016 RAR.

Groundwater

By letter of March 22, 1989, regarding Recycled Paper Board ECRA Case No. 85193 to NJDEP, HWEC reported the results of groundwater samples collected in November 1988 from five groundwater monitoring wells that were installed at the former Recycled Paper Board facility in 1986. In addition to the sampling of these wells, HWEC conducted a "half-mile radius well search." The study of the half-mile well search revealed 46 groundwater supply and groundwater monitoring wells installed in the vicinity of the facility that had Petroleum Hydrocarbon odors in their water. Of the 46 wells listed in the search, at least ten have recorded in their installation logs the detection of a gas, oil or petroleum hydrocarbon odor. One such well installation record from a gas station, located up-gradient to the Recycled Paper Board facility, stated there were very strong petroleum hydrocarbon vapors at 15 to 22 feet below grade. Another

site upriver from Recycled Paper Board recorded in the monitoring well installation log that there was a strong solvent odor during installation of the wells (PAS-00113533).

HWEC stated that based on the groundwater contours developed for this report there was a southeastern flow of groundwater and that according to the groundwater elevations, MW-1 served as the background well (PAS-00113533). The monitoring well MW-1 is located along the western property boundary which is up-gradient with respect to the site's easterly groundwater flow direction (PAP-00198426).

HWEC concluded that all relevant information showed the groundwater contamination detected in the monitoring wells is similar to that detected in the background well, MW-1. HWEC concluded that the detected groundwater contamination at the Recycled Paperboard facility "is from an off-site location and not from soil contamination on the property", so further remediation should not be required (PAS-00113533).

The 2007 EWMA RIR/RAW report ~~by EWMA~~ stated that soil boring activities in July, August and December of 2005 encountered groundwater at depths ranging from 7 to 14 feet below ground surface (bgs). Based upon the groundwater elevation, data recorded from the monitoring wells, which were installed during the historic fill investigation, groundwater was noted to flow in the easterly direction across the site, which corresponds to the topography and flow of the Passaic River (PAP-00198504). As noted above, the 2005 investigation by EWMA determined that groundwater exceedances of PAHs and metals were attributed to historic fill (PAP-00198425). In addition, lead contamination associated with the historic fill did not impact groundwater conditions at the property (PAP-00198531).

Remedial Activities

By a letter dated May 24, 1988, Ponte's consultant, HWEC, notified NJDEP they had completed the Phase I soil cleanup program initiated for WPBC under ECRA Case Number 85193 (PAS-00113516). Areas of environmental concern included in the soil cleanup program were a 1,000 and a 3,000-gallon mineral spirits tanks; a 4,000-gallon hydraulic oil tank; a 1,000-gallon fuel oil tank; a 160,000-gallon aboveground fuel oil storage tank; and the former drums storage area (PAP-00113516-17). These were the 6 Areas of Concern identified in the 1986 NJDEP Memorandum (PAS-0113605). Approximately 1,180 cubic yards of Petroleum Hydrocarbons-contaminated (PHC) - soil was excavated and removed from these areas in May 1988 (PAS-00113516-17).

Underground Storage Tanks

Excavation No. 1 was associated with the former 1,000-gallon mineral spirits tank on the northeast side of the site building (PAS-00113516, 26). The final depth of the excavation was measured at about 14.5 feet bgs (PAS-00113517; PAP-00198512). Post-excavation soil samples were collected from 3 locations within the excavation and the analytical results for TPHCs ranged from 5 mg/kg to 18 mg/kg (PAS-00113519-20; PAP-00198512).

Excavation No. 2 was associated with the former 3,000-gallon mineral spirits tank on the east-central side of the building. (PAS-00113516, 27; PAP-00198573; PAP-00198514) The depth of the excavation was 10.5 feet and fill material was noted to 10.5 feet (PAP-00198514). Eight post-excavation soil samples were collected from within the excavation and samples submitted for TPHC analysis. Detected TPHCs ranged from 45 mg/kg to 674 mg/kg (PAP-00198514). HWEC conducted a sieve analysis on a representative sample of fill material and concluded that the elevated concentrations of TPHC were due to the presence of fill material in the excavation and not the result of a discharge from the former UST (PAS-00113518; PAP-00198515, 17).

Excavation No. 3 was associated with the former 4,000-gallon hydraulic oil UST on the southeast side of the site building (PAS-00113528; PAP-00198516; PAP-00198573). The depth of the excavation was 10.5 feet bgs (PAS-00113518, 28). Materials encountered during the excavation were considered fill and consisted of bricks, concrete, cinders and metal intermixed with sand and gravel (PAS-00113518). Post-excavation soil samples were collected from 8 locations within the excavation and analyzed for TPHC. Detected TPHC ranged from 48.7 mg/kg to 411 mg/kg (PAS-00113520-21; PAP-00198516). HWEC conducted a sieve analysis on a representative sample of fill material and concluded that the elevated concentrations of TPHC were due to the presence of fill material in the excavation and not the result of a discharge from the former UST (PAP-00198517).

Excavation No. 4 was associated with the former 1,000-gallon No. 2 fuel oil tank on the northwest side of the building (PAS-00113517, 29; PAP-00198511; PAP-00198573). The depth of the excavation was 8 feet bgs (PAS- 00113518; PAP-00198511). Fill material was noted to 8 feet bgs (PAP-00198511). Four post-excavation soil samples were collected within the excavation and analyzed for TPHC. Analytical results for TPHC ranged from 55.3 to 2,990 mg/kg. Vapor analyzer screening of the same sample that had the concentration of 2,990 mg/kg showed a concentration of less than 100 mg/kg. Examination of the non-odorous material revealed blackish pieces of unburned coal like material mixed in the sandy soil (PAS-00113522). HWEC conducted a sieve analysis on a sample of fill material within the excavation and concluded that the elevated concentrations of TPHC were due to the presence of fill material (including coal/unburned cinders) in the excavation and not the result of a discharge from the former UST (PAS-00113522-23; PAP-00198511-12).

Drum Storage Area

Excavation of impacted soil at the drum storage area on the west side of the building could not be completed during the May 1988 excavation activities because a concrete pad was encountered along the building wall at a depth of 12 inches (PAS-00113518). A sample (Sample No. VP-DS1) was collected at a depth of 12 inches below the surface along the edge of the concrete and analyzed for PP+40 and PHC (PAS-00113519). The PHC result was 1,340 mg/kg and HWEC determined that additional excavation in this area would be necessary. Soil was removed from the drum storage area to a depth of 4 feet bgs on October 31, 1989 PAS-00113485; PAP-00198518). Four post-excavation samples were collected at depths ranging from 13 inches to 19 inches below grade. The post excavation samples were analyzed for total PAHs, PCB's, BN+15, antimony, cadmium, copper, mercury, and zinc. The analytical results from these analyses stated

that the level of compounds detected in the post-excavation samples were below the respective NJDEP soil action levels (PAS-00113485; PAP-00198519). PCBs were non-detect (PAP-00198519).

160,000-gallon Aboveground No. 6 Fuel Oil Storage Tank

The excavation of impacted soil beneath the fill pipe of the 160,000-gallon aboveground No. 6 fuel oil storage tank (AST) could not be completed during the May 1988 excavation activities because groundwater was encountered at seven inches bgs (PAS-00113518). HWEC determined that further excavation and testing was needed for the area of the AST (PAS-0011351818). The AST was located on the southwest side of the site building (PAP-00198573). Between October 31, 1989 and August 1990, the stained soil was excavated from around the fill pipe of the AST (PAS-00113485-86). Post excavation samples were collected and analyzed for PHCs content after each excavation. The report did not state the depth of the samples taken only that each time more soil was excavated. By July 13, 1990, 26 cubic yards of soil had been excavated. The following is a breakdown of the series of sampling events results.

- October 31, 1989 PHCs ranged from 572 mg/kg to 1,380 mg/kg
- December 22, 1989 PHCs ranged from 271 mg/kg to 1,150 mg/kg
- January 30, 1990 PHCs ranged from 270 mg/kg to 2.920 mg/kg
- June 29, 1990 PHCs ranged from 16 mg/kg to 301 mg/kg
- July 13, 1990 three post-excavation samples were taken for the final post excavation sample analysis. Surficial water was encountered at 5 feet bgs therefore a base sample could not be collected. Three sidewall samples were taken 0” to 6” intervals above water level. One sample detected PHCs at 182 mg/kg.
- On August 17, 1990, three additional excavation samples were taken at the same location as the July 13, 1990 sampling.
- August 22, 1990 half a cubic yard of soil was excavated due to the July 13, 1990 sample result of 182 mg/kg (PAS-00113485-87).

The level of lead detected in the site soils that were excavated from the drum storage area and from beneath the fill pipe to the AST was slightly above the RCRA threshold level and classified the soil as a RCRA hazardous waste. The lead was detected at 5.02 ppm and 5.08 ppm (PAS-00113491).

The results from the post-excavation sample analysis stated that the highest detected level of lead was 14 µg/kg (ppb). Almost equal levels of lead were detected in each area during the waste classification analysis, thus indicating that the level of lead is characteristic of the site soils. Similarly, the detected level of lead in the post-excavation samples collected from the drum storage area can be assumed to be characteristic of the site soils (PAS-00113491).

On February 27, 1991, NJDEP issued a Full Compliance Letter for the WPBC facility stating that the Clean-up Plan dated October 21, 1989 had been implemented and completed for ECRA Case Number 85193 (PAP-00102547).

According to the 2016 EWMA RIR/RAR, on April 13, 2015, four soil borings (SB-I to SB-4) were installed on the southern portion of the property to evaluate the subsurface conditions in the area under the former 160,000-gallon No. 6 Fuel Oil AST within AOC-1 (PAP-00198437-38). The boring depths were 20 feet bgs. Historic fill material was encountered in all borings on the Property ranging in depth from site grade to as deep as 12.5 feet below surface grade. This fill material consisted of ash, cinders, crushed brick, concrete and wood pieces followed by sandy silt and clay (PAP-00198438).

The soil samples taken from the soil borings were visually inspected and screened using a Mini-RAE 2000 PID for the presence of total volatile organic compounds (VOCs). Soils were also examined for evidence of free product contamination, discoloration or odors. There was no indication of organic vapors or contamination or discharge. Therefore, samples were not submitted for analysis (PAP-00198437-38). EWMA concluded that soils beneath the former AST were not impacted by any discharge or spill from the AST (PAP-00198447).

According to the 2016 EWMA RAR, based on the presence of contaminants related to historic fill (AOC 7) above their respective NJDEP soil standards, a Deed Notice and engineering controls (i.e., surface cap) was filed with the Passaic County Clerk on April 4, 2016. The surface cap over the entire Property is to prevent exposure to the contaminants of concern (PAP-00198444).

8. Summary of Asserted Defenses

Neu Holdings asserts the “Respondent denies that WPBC released COCs from its operation of the Clifton Plant to the Passaic River and OU 2. Even if it did, WPBC’s liability for any such releases was discharged as a matter of law in bankruptcy on March 31, 1981. On February 8, 1980, WPBC commenced a voluntary proceeding under Chapter 11 of the United States Bankruptcy Code, 11 U.S.C. §§101 et seq. (the “Bankruptcy Code”) in the United States Bankruptcy Court for the District of New Jersey (the “Bankruptcy Court”), said proceedings having been designated In re Whippany Paper Board Co. Inc., Case No. 80-00426”. USEPA was aware at the time of WPBC’s bankruptcy proceedings and had an opportunity to participate in the same.

On March 31, 1981, the Bankruptcy Court entered an Order confirming WPBC’s reorganization plan. Per the plan of reorganization and the bankruptcy code, the confirmation of the reorganization plan discharged WPBC from any and all “debts that arose before the date of such confirmation.” (PAP-00102386)

“USEPA has suggested that the bankruptcy discharge does not pose a barrier to USEPA’s claim because the bankruptcy discharge occurred long before EPA initiated a response action at the Diamond Alkali Site. However, the Bankruptcy Code Section 101(5) defines a “claim” to include a right to payment that at the time of a debtor’s bankruptcy remains “unmatured” and/or “contingent,” and it is well-established that a potential liability may qualify as a “claim” for bankruptcy discharge purposes even if it has not yet fully accrued into a cognizable cause of action under applicable non-bankruptcy law. 1 Collier on Bankruptcy, 101.05 at 101-39 (16th Ed. 2017) (As defined in the Bankruptcy Code, the term “‘[c]laim’ . . . include[s] a cause or action or right to payment that has not yet accrued or become cognizable.”). In the environmental

context, a Chapter 11 bankruptcy debtor may be discharged from any and all potential liabilities related to a pre-confirmation release or threatened release of hazardous substances even if such release does not become the subject of any investigation and/or resulting response costs until several years (or even decades) after the debtor's Chapter 11 plan has been confirmed.

"In this case, WPBC ceased operating the Clifton Plant in April of 1980, before the March 31, 1981 confirmation of its Chapter 11 Plan and never resumed operation of the Clifton Plant before selling it to V. Ponte & Sons on October 1, 1987 (PAS-00113953). Accordingly, even if WPBC's operation of the Clifton Plant resulted in the release of COCs into the Passaic River (of which there is no evidence), the liability of WPBC for any such release was discharged upon the court's confirmation of its Chapter 11 Plan".

Evidence shows that the Clifton Plant operations during the period of WPBC's ownership and operation did not include COCs and that the Clifton Plant property was not a conduit for discharging COCs into the River. As such, the former Clifton Plant, which is located nearly nine miles from OU2, did not discharge COCs that could have had any material impact to the Passaic River or OU2. Especially considering that Neu Holdings' wholly-owned subsidiary contributed approximately $1.8 million toward lower Passaic River investigation and a removal action for which it had no responsibility at all, Neu Holdings should bear no further liability for the Diamond Alkali Site or OU2.

Neu Holdings also asserts the following defenses to liability that will be set forth in more detail in its position papers: (i) the petroleum exclusion, (ii) the permitted discharge defense, (iii) that any releases of COCs from the site occurred when the facility was owned/operated by others before or after WPBC (i.e. Ponte and/or Recycled Paper Board), and/or (iv) liability for the Lower Passaic River Site is the responsibility of Ponte, who expressly assumed and notified NJDEP of its environmental responsibility for the former Clifton Mill. (PAS- 00113513-14) Neu Holdings reserves the right to assert other defenses to liability and raise other accompanying litigation risks.

The Newark Group, Inc.

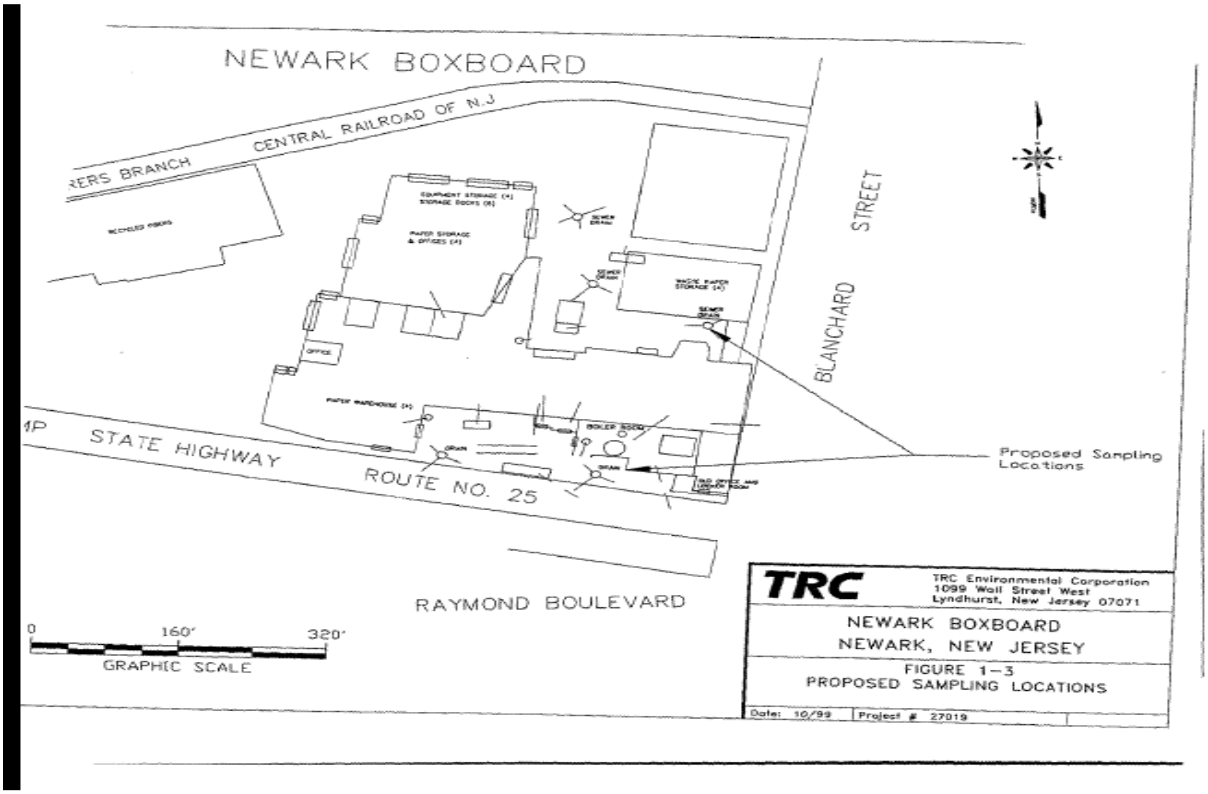
Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

NEWARK GROUP, INC.

Facility Name, Address and Size: Newark Boxboard/Newark Boxboard Company, Inc./Newark Boxboard Company; 17 Blanchard Street, Newark, New Jersey. (PAP-00114815; PAS-00000432)." 150 employees reported in 1978, manufacturing 24 hours per day, 6-7 days per week (PAS-00000432). In 2003, it was reported that the facility employed 45 hourly employees and approximately 12 other employees (PAS-00004277). The acreage of the facility is approximately 7 acres (PAP-00352934; PAP-00114812). See the following figure for location of facility.



(PAP-00352940)

1. **Business Type:** Paperboard manufacturer through the recycling of wastepaper (PAS-00000432; PAS-00103684).

2. **Time Period of Ownership/Operations**

   Operator: 1912/1913 to 2003 (PAP-00114815-16; PAS-00123408)

   Owner: 1912 or 1968 to March 28, 2013 (PAS-00004272; PAP-00352946-49)

   According to a Site History section of the *Remedial Investigation Report with LNAPL Interim Remedial Measures Report*, dated November 2016, the site was operated by Newark Board Paper Mills from approximately 1892 to approximately 1908, then by George W. Downs Company Paper Mill from approximately 1908 to 1912 with Newark

Boxboard beginning operations in 1912 (PAP-00114815-16; PAP-00352928-29). Note: The *Response of The Newark Group, Inc. to the USEPA Request for Information*, dated April 2003 (Response to Request for Information) described The Newark Group's ownership as "1968 to 'present" (PAS-00004272). There is no documentation available to state that the operations of Newark Board Paper Mills or George W. Downs Company Paper Mill are affiliated with Newark Boxboard.

Newark Boxboard was incorporated as a New Jersey corporation on April 10, 1912 (PAP-00428161).

According to the Response to Request for Information, The Newark Group purchased the Newark Boxboard facility from R.W. "Dick" Lewis on September 13, 1968 (PAS-00004277; PAS-00076564). From 1940 to 1968, the facility was owned and operated by Margaret Lewis and R.W. "Dick" Lewis; neither being related to The Newark Group (PAS-00004277).

The Newark Group, Inc. is the successor to Newark Group Industries, Inc., which is the successor to the Newark Boxboard Company (PAS-00004278).

On March 28, 2013, The Newark Group, Inc. conveyed the property to 60 Lockwood Associates, LLC (PAP-00352946-49).

3. Operational History/COC Use and Presence at the Facility

The Newark Boxboard facility produced recycled paperboard in various caliper ranges. The facility recycled approximately 42,000 tons per year of old newspapers, old corrugated containers and municipal curbside collection papers. Grades produced were plain chip, laminating chip, partition chip, and lined chip (PAS-00004269).

Reports to the PVSC during the years 1925, 1926, and 1927 identified Newark Boxboard as discharging self-identified wash water via the storm sewer to the Passaic River. The "polluting" discharge was characterized as having high suspended solids and odors. The wash-water discharge reportedly frequently blocked a nearby creek (PAS-00103660, 682, 689, 695, 945, 950). The 1926 and 1927 reports note that Newark Boxboard was connected to the PVSC (PAS-00103694-95; PAS-00103945).

A February 6, 1926, Letter to Passaic Valley Sewerage Commissioners identified Newark Boxboard as a polluter with the listed pollutant being "foul paper wastes" (PAS-00103660). In March 1926, Newark Boxboard stated in a letter to the Passaic Valley Sewerage Commission (PVSC) that they had stopped all pollution (PAS-00103682). However, according to the *Report on the Status of Pollutions from Industrial Establishments* prepared in November 1926, Newark Boxboard was still considered a polluter discharging old paper sludge at times to the Passaic River (PAS-00103695). The Report also notes that Newark Boxboard was connected to the PVSC (PAS-00103694).

According to the Response to Request for Information, Book Covers, Inc., a New Jersey corporation incorporated on October 19, 1960, was merged into Newark Group

Industries, Inc. on May 2, 1988 to form BCI Newark. BCI Newark formerly operated at the site and was a separate division of The Newark Group. During the time it operated at the site, it was reported that no hazardous substances, other than those contained in "over-the-counter" cleaners and similar products generally available to the consuming public and in their original packaging, were used, generated, stored, disposed or otherwise handled in its manufacturing process (PAS-00004278).

According to a *Notice of Administrative Revocation from NJDEP*, dated October 2005, the New Jersey Department of Environmental Protection (NJDEP) confirmed that Newark Boxboard had ceased all activities requiring a NJPDES permit. Therefore, NJPDES permit No. NJG0107000 was revoked effective August 31, 2005 (PAP-00114672).

In a "1978/1979 City of Newark, New Jersey Feasibility Study, Pollution Abatement Program," industrial discharge was noted on the easterly line of the Morris Canal storm sewer with Newark Boxboard identified as the sole industrial contributor to the discharge in that segment of the line. An estimated discharge of 0.16 million gal per day (MGD) was identified from Newark Boxboard (PAS-00103883). The Feasibility Study characterized that discharge as "polluted" (PAS-00103891), but none of the "pollutants" analyzed in the stormwater samples taken along the Morris Canal storm sewer east of Lockwood Street (MC-100 and MC-104) were COCs (PAS-00103903-PAS-00103905; PAS-00103873)."

Newark Boxboard's 1980 PVSC Sewer Connection Application noted concentrations in wastewater discharged to the sanitary sewer of the parameters lead, mercury, and copper (PAP-00115480). Samples collected as part of Newark Boxboard's PVSC Sewer Connection Application in January 1980 reported copper at 0.316 milligrams per liter (mg/L), lead at 0.942 mg/L, and mercury at 0.0016 mg/L (PAP-00115480). It also was reported in the Application that a total of 365,000 gallons was discharging annually to the storm sewer (PAP-00115476)."

In 1986, a *Worker and Community Right to Know Survey* reported that polychlorinated biphenyls (PCBs) were on site in a transformer casing (PAP-00113837). According to a Response to Request for Information, dated April 2003, PCB-bearing transformers were removed from the facility in 1988. No information regarding releases associated with transformers at the facility was identified based on a review of available documents.

Polycyclic aromatic hydrocarbons (PAHs) were detected in the surrounding soil in sampling conducted in 2012 at the former 30,000-Gal No. 6 Fuel Oil Underground Storage Tank (UST) (PAP-00114705-06).

A Community Right to Know Survey from 1992 reported that Newark Boxboard's chemical inventory included copper as a component (60-69%) of a product (Certanium 70F) which was stored in the Store Room (PAP-00114452). In 1993, the Community Right to Know Survey reported that Newark Boxboard's chemical inventory included lead as a component (25-49%) of dry film and copper as a component (60-69%) of a product which were still stored in the Store Room (PAP-00114465-66)."

Test results for boxboard stock, plain chip paperboard, old newspaper, and old corrugated cuts from 1993 and 1994, included with the Response to Request for Information, were all reported as "Pass" for lead, mercury, PCBs, dichlorodiphenyltrichloroethane (DDD), dichlorodiphenyldichloroethane (DDE), and dioxin indicating the results were less than their respective limits (PAS-00075522-46).

Community Right to Know Surveys from 1994 through 1998, and 2000 through 2002 reported that Newark Boxboard's chemical inventory included pure, solid copper (PAP-00114472; PAP-00114488; PAP-00114519; PAP-00114521; PAP-00114524; PAP-00114538; PAP-00114570; PAP-00114644).

According to a Response to Request for Information, the Site has operated under the Resource Conservation and Recovery Act (RCRA) Hazardous Waste Generator ID Number EPA ID NJD000556837 (PAS-00004267). The Response additionally reported that hazardous substances being utilized, manufactured, discharged, released, stored or disposed of by Newark Boxboard included PCBs, copper, lead, and mercury (PAS-00004267-68).

4. Identified COCs

- PCBs (present in transformers)
- PAHs (used and released)
- Copper (used and released)
- Lead (used and released)
- Mercury (generation and release)

PCBs

A December 10, 1985 letter from Newark Boxboard to the Newark Fire Department reported the discovery of PCBs in one of the transformers at the site (PAP-00352912). The transformers were properly disposed of in 1988 (PAP-00112964-65).

PAHs

During the removal of the 2,500 gallon No. 6 fuel UST in 1991, an inspection of the tank and excavation revealed signs of corrosion on the fuel oil tank and visual evidence of contamination in the excavation. During excavation the piping and the tank were observed to be leaking. 13 discrete soil samples were collected from the underground tank excavation and submitted to a laboratory for analysis to assess the condition of the soil surrounding the tank. All soil samples collected from the excavation were analyzed for Petroleum Hydrocarbons utilizing EPA Method 418.1. Because some samples contained greater than 100 ppm of petroleum hydrocarbons, five samples were analyzed for base neutrals utilizing EPA Method 8250+15. Pyrene was detected at 12,000 µg/kg in one sample (PAP-00114157-58, 61, 64).

As noted in the *Remedial Investigation Report with LNAPL Interim Remedial Measures Report*, dated November 2016, samples were collected in 2012 as part of the remediation of the soils at the location of the former 30,000-Gallon No. 6 Fuel Oil UST. One sample location southeast of the former UST location contained benzo(a)anthracene at 5 ppm; benzo(a)pyrene at 3.6 ppm; benzo(b)fluoranthene at 2.0

ppm and, dibenzo(a,h)anthracene at 0.91 ppm. In addition, the Low Molecule Weight (LMW) PAH, naphthalene was detected at 36 ppm (PAP-00114705-06).

Metals – Copper, Lead and Mercury

An April 1980 PVSC Heavy Metals Source Determination Study, Phase II reported that Newark Boxboard had an average daily flow to the PVSC determined during two consecutive days of sampling of 0.3560 MGD and flow-proportioned results of composite samples on two consecutive days expressed on a mass basis were 0.938 pounds (lbs.) per day of copper, 0.891 lbs. per day of lead, and 0.0048 lbs. per day of mercury (PAS-00103655; PAP-00206256; PAP-00206296).

A March 1975 Waste Effluent Survey for PVSC reported that a semi-quantitative scan of metal ions found copper to be less than 0.20 parts per million (ppm) and lead between 0.20 to 1.0 ppm (PAP-00114473). A five-day average found that the waste effluent was being discharged at 317,000 gal per day in 1975 (PAP-00114474).

A 1978 Industrial Waste Questionnaire stated that facility wastewater was not treated prior to discharge to the sewer (PAS-00000441), but the facility's 1980 PVSC Sewer Connection Application described the following pretreatment process: "A Sinclair floatwash unit is used to remove fibers from the white water so that it can be reused on showers, sealing water, hoses, etc. The excess of this clarified water is discharged to city sewer. Screens have 60 [micron] openings" (PAP-00115477). The 1978 Questionnaire reported that previous measurements showed a daily flow of 563,000 gal per day with sample results for lead and copper at 1.0 mg/L and 0.2 mg/L, respectively (PAS-00000441).

Wastewater analysis results from 1974 to 2002 included with the Response to Request for Information reported results for copper ranging from 0.042 to 0.64 ppm; lead ranging from 0.004 to 0.942 ppm; and, mercury ranging from 0.0002 to 0.001 ppm (PAS-00075548). Pounds generated per year in wastewater from 1975 to 2002 were reported ranging from 6.5 to 352.21 lbs. for copper; 0.97 to 283.3 lbs. for lead; and 0 to 0.55 lbs. for mercury (PAS-00075550).

Samples collected in December 1994 from the PVSC discharge show that in regards to copper, two of the three samples were above the Threshold Value, but all three were below the Local Limit. The average results were above the Threshold Value and below the Local Limit. For lead and mercury, all three samples were below the Threshold Value and Local Limits with the average results also below both limits. The results for copper ranged from 0.06 mg/L to 1.7 mg/L; lead ranged from 0.005 mg/L to 0.016 mg/L; and mercury was not detected (less than 0.001 mg/L) (PAP-00114480, 83-85).

According to the Response to Request for Information, Newark Boxboard began reporting the concentrations of metals in its effluent in approximately 1997. From 1997 to 2002, the annual paperboard production at the site ranged from 73,426,000 lbs. to 79,788,000 lbs. and the average total daily wastewater flows ranged from 47,419 gal to 91,332 gal. For 1997 to 2002, the annual range of metals discharged to the PVSC (expressed as pounds of metal per pound of product) by the facility was as follows:

- Copper (9 x 10^{-8} to 6 x 10^{-7})
- Lead (1 x 10^{-8} to 4 x 10^{-8})
- Mercury (0 to 3 x 10^{-9}) (PAS-00004270)

Pretreatment Monitoring Reports from July 1997 through December 2002 reported copper, mercury, and lead concentrations all within the Permit requirements. Copper, mercury, and lead were detected at low levels in various samples over the five year period (PAP-00112755-818).

Pretreatment Monitoring Reports Concentration Range			
Year	**Copper**	**Lead**	**Mercury**
1997	<.01	<0.001 – 0.047	<0.001
1998	0.01 - 1.4	<0.001 - 0.087	<0.001
1999	<0.001 – 2.0	<0.001 – 0.033	<0.001
2000	0.01 – 0.71	<0.001 –0.018	<0.001 – 0.004
2001	<0.01 – 1.94	<0.001 – 0.023	<0.001 – 0.003
2002	<0.01 – 0.19	<0.001 – 0.046	<0.0005 – 0.001

The following table presents the results of PVSC discharge analysis for samples collected from January to June 2003:

PVSC Discharge Monitoring Data					
Month	**Copper**	**Lead**	**Mercury**	**Total Volume Discharged**	**Citation**
January 2003	0.16 mg/L	0.047 mg/L	Not detected	2,688,600 gal	PAP-00114572, 77
February 2003	0.41 mg/L	0.029 mg/L	Not detected	2,042,450 gal	PAP-00114586-87
March 2003	0.07 mg/L	0.029 mg/L	Not detected	1,655,300 gal	PAP-00114600, 08
April 2003	0.03 mg/L	0.018 mg/L	Not detected	1,788,900 gal	PAP-00114611, 19
May 2003	0.04 mg/L	0.021 mg/L	Not detected	2,678,700 gal	PAP-00114623, 30
June 2003	0.02 mg/L	Not detected	0.0004 mg/L	4,422,300 gal	PAP-00114633, 40

Historic Fill

The Allocation Team has determined that the property boundary for 17 Blanchard does partially overlap the regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and

[1]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	68.1 mg/kg
Copper	60.1 mg/kg
Mercury	0.13 mg/kg
Benzo(a)anthracene	5 mg/kg
Benzo(a)pyrene	3.6 mg/kg
Benzo(b)fluoranthene	2 mg/kg
Dibenzo(a,h)anthracene	0.91 mg/kg

Note: The sample results for metals listed in this table are from the soil sampling done in the area assumed to be where the historic creeks had existed. It was concluded that historic fill was present on 17 Blanchard based on visual inspection of soil borings along the property boundary of 17 Blanchard and 60 Lockwood Street, therefore no analysis was available.

The *Remedial Investigation Report with LNAPL Interim Remedial Measures Report*, The Newark Group, Inc. Facility, 60 Lockwood Street (Block 2412; Lot 58), 84 Lockwood Street (Block 2412; Lot 17), 17-61 Blanchard Street (Block 2412; Lot 75) dated November 2016 (2016 RIR), stated that according to the NJDEP's GIS database and New Jersey Geological Survey's 2009 Historic Fill of the Elizabeth Quadrangle map, the site is located within mapped Historic Fill boundaries. This was corroborated by observations made during the site soil investigation, which identified fill material consisting primarily of sand and gravel, with varying amounts of ash, glass, wood, and brick in the upper five to eight feet of soil (PAP-00114681-82). Note this report includes sites that are not part of this allocation and the historic fill discussed above is for all Newark Group properties.

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[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

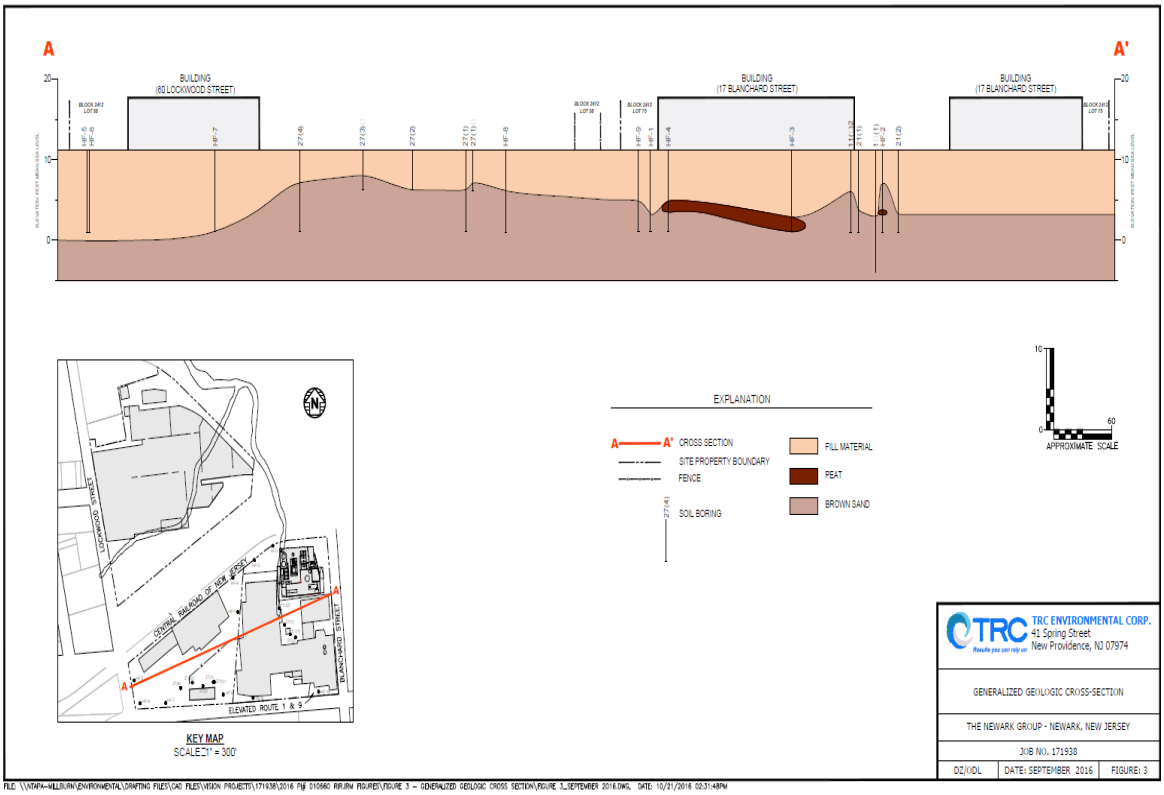
The 2016 RIR stated that according to a 1908 historical Sanborn map, two creeks historically crossed the 17 Blanchard Street property. The creeks were reportedly filled sometime between 1892 and 1908; however, no detailed information or sampling data are available for this fill material. Therefore, in September 2012, soil sampling was conducted to evaluate potential impacts associated with the fill material. Two soil borings were advanced in the area of the two former creeks to approximately 5 feet bgs. No discoloration or elevated PID readings were observed during field screening; therefore, one soil sample was collected from each boring from approximately 0 to 0.5 feet bgs. Copper, lead and mercury were detected; however, it was concluded that the SPLP analytical results demonstrated that the low levels of lead and mercury in the soil would not have the potential to impact groundwater; therefore, further investigation of these metals was not warranted. This area was to be included in the site-wide historic fill investigation (PAP-00114710-11).

The 2016 RIR reported the following investigation into the site-wide historic fill. “In the February 2012 SIR, 16 soil borings were advanced to investigate nine specific areas of concern. Based on the characterization of the recovered soils, materials consistent with the presence of historic fill materials (i.e., cinders, ash, wood, glass, and concrete fragments) were identified in the shallow subsurface throughout the site.

In addition, four of the five soil samples collected from fill material within AOC 27: Railroad Tracks (60 Lockwood Street) contained elevated concentrations of arsenic and PAHs above the Residential Direct Contact Soil Remediation Standard (RDCSRS), Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS), or Default Impact to Ground Water Soil Screening Levels (DIGWSSL). These constituents and the concentrations detected are consistent with those typically observed in historic fill material. Therefore, in accordance with the Technical Requirements for Site Remediation (TRSR), additional soil characterization was conducted to determine if historic fill material is present throughout the site (PAP-00114711-12).

Further investigation for the historic fill at 17 Blanchard and 60 Lockwood Street was conducted in 2014. Soil borings were advanced along the property boundary of 17 Blanchard Street and 60 Lockwood Street parcels. The borings were advanced to the top of native material (approximately 10 feet bgs) to visually evaluate the extent and thickness of the fill material. Fill material consisting of cinders, brick fragments and crushed concrete was identified in all borings. The fill material extended to between approximately 8.5 and 10 feet bgs, but did not intersect the shallow ground water table, which was encountered between approximately 8 and 13 feet bgs (PAP-00114712). Note: Only visual inspection was conducted on these samples; no soil sampling was analyzed.

See the following figure obtained from the 2016 RIR for a geological cross-section to demonstrate fill material that exists beneath 17 Blanchard.



(PAP-00114722)

A *Response Action Outcome*, dated December 23, 2016 was issued by TRC Environmental Corp. for the remediation of several Areas of Concern at the Newark Group properties. The Response Action Outcome stated that it did not include contamination resulting from the presence of historic fill (PAP-00115447-51).

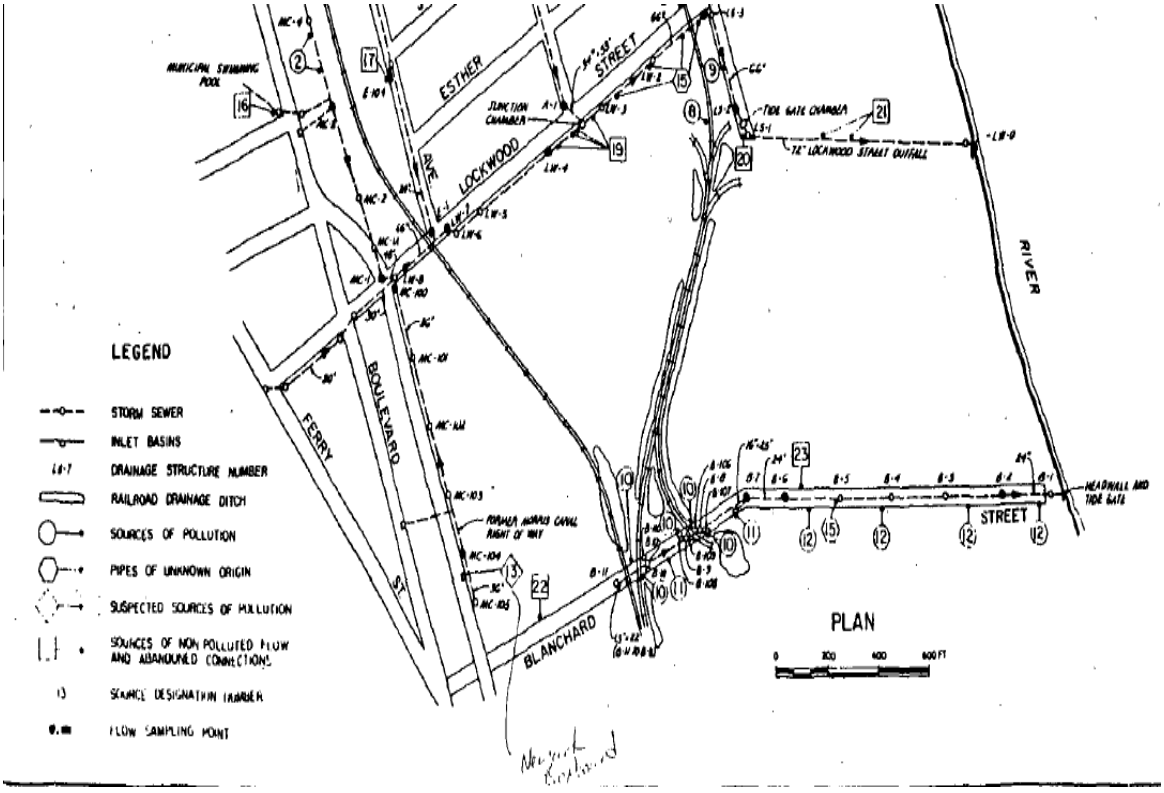
5. COC Pathways

Storm Sewer

A 1977 data verification sheet identified the following sources of intermittent wastewater discharges from Newark Boxboard to the Passaic River via a storm sewer: (1) Rewinder Brake Cooling Water; (2) Floor Drains; (3) Sump Pump Discharge; and, (4) Vent Line from Condensate Tank (PAS-00103684-85).

An August 30, 1977 letter from the PVSC to Newark Boxboard Company noted that during an inspection, several of Newark Boxboard discharges to the Morris Canal storm sewer appeared to contain objectionable materials such as boiler blowdown, process wash down, and minor amounts of spilled petroleum products. The discharge was noted to reach the Passaic River through the Lockwood Street outfall (PAS-00103713-14).

The following map shows the location of Newark Boxboard relative to the storm sewer and the Passaic River. Number 22 shows the location of the continuous low volume discharge of cooling water entering the gutter from Newark Boxboard.



(PAS-00004238)

According to the Response to Request for Information, in approximately 1980, Newark Boxboard rerouted the non-contact cooling water, process wash down water, and boiler blow down wastewater to discontinue its discharge to the Morris Canal storm sewer. These waters were discharged to the PVSC. Currently the connection to the storm sewer is sealed. Floor drains in collection areas and process areas return excess water to a central collection tank where it is re-used in the papermaking process. Excess water that is not reused is discharged to the PVSC (PAS-00004273).

According to a March 30, 2000, letter report to NJDEP, Water Discharge Permit No. NJ0107000, there were five sewer drains around the facility, three located around the waste paper storage building and the other located at the loading dock. All five drains empty into surface water (PAP-00352933).

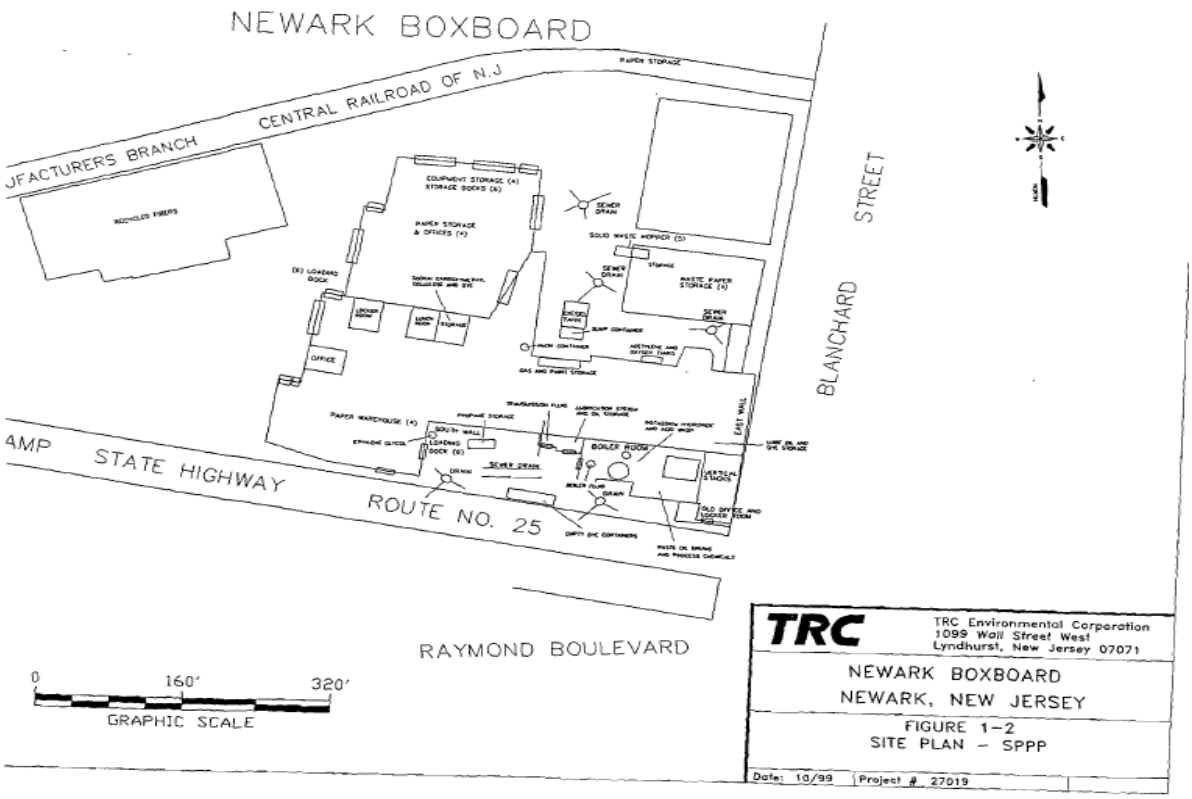
All stormwater in open paved areas was directed to a series of storm sewers, stormwater generated on unpaved areas abutting the northern portion of the facility building was piped to a stormwater intake trench. Stormwater from the storm drains flows directly to a storm main which ultimately joined a main for disposal via the municipal sewerage system. The facility diverted several of the roof drains to the

storage sump for use in the recycling process or discharge to the local publicly owned treatment works (POTW) through PVSC Non-Domestic Wastewater Permit No. 2040 1402, expiration date of July 4, 2001 (PAP-00352934).

The 2000 letter report also stated that the main area of potential pollutant sources which may affect the quality of stormwater discharges were the three sewer drains around the waste paper storage facility. As part of the Stormwater Pollution Prevention Plan (SPPP), Newark Boxboard proposed to divert three of the storm drains in the Waste Paper Storage Area to the building sump. It was reported that the only other potential areas where stormwater discharge exposed to source materials which could not practicably be prevented or eliminated are storm drains located in parking areas (PAP-00352934).

On October 3, 2000 NJDEP confirmed that the diverting of the three sewer drains around the waste paper storage facility to the basement sump was a sound Best Management Practice to eliminate the exposure of stormwater to these source materials. Once the project was complete an inspection was needed to evaluate eligibility for coverage under the General Industrial Stormwater Permit (NJ0088315) (PAP-00352942).

See the following Site Plan from the above discussed SPCC.



(PAP-00352941)

Sanitary Sewer

According to a 1979 Sewer Connection Application, 127,527,500 gallons of water was used for sanitary sewer (PAS-00103669).

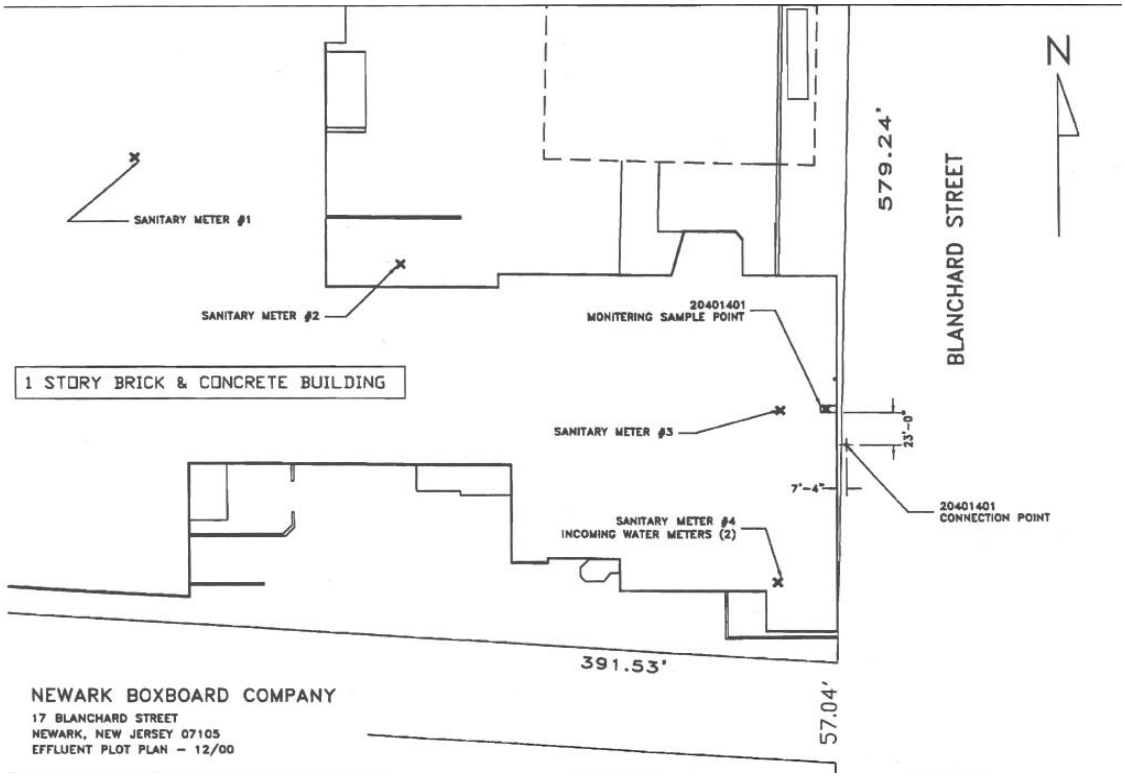
According to a June 25, 1979 letter to EPA, Newark Boxboard stated that "all process and sanitary waste were discharged to the Newark City Sewer. At that time the following processes were discharged:

- Point A: 1-inch pipe from Rewinder Brake Cooling Water and two 4-inch floor drains
- Point B: Two 1 ¼-inch Sump Pump discharge and a 2-inch vent line from condensate tank

(PAP-00115469)

Newark Boxboard had Sewer Connection Permit Number 20402400, for the discharge of wastewater to the PVSC effective July 27, 1981 with an expiration date of July 27, 1986 (PAP-00352943). According to the Response to Request for Information, the connection to PVSC was the only point of discharge from the site. Newark Boxboard reported that it had always been in compliance with its PVSC permit (PAS-00004267).

The following map included in the site's 2001 sewer use permit application shows the location of the effluent connection point and the monitoring sample collection point:



(PAP-00114536)

6. Regulatory History/Enforcement Actions

Inspections

On July 30 and 31, 2002, a Compliance Evaluation and Assistance Inspection (CEAI) was conducted by NJDEP. No potential violations were noted. It was noted that a revised SPPP was submitted December 22, 2000. The inspection also noted that contaminated stormwater goes to PVSC via floor drains. The stormwater from roof-drains and areas with no source materials was discharged through three outfalls where sampling and monitoring were required (PAP-00352930-32).

Violations

A 1970 Stream Contamination Report reported that on April 6, 1970, as a result of negligence, a violation occurred at Newark Boxboard when approximately 500 gal of paper pulp overflowed into a driveway and then into the Blanchard Street storm sewer (PAS-00035386).

Permits

Newark Boxboard Permit Summary				
Permit No.	**Issued by:**	**Use**	**Dates**	**Discharge Limits**
20401400	PVSC	Sewer Connection	July 27, 1981 - March 1992	Copper, Lead, Mercury
20402402	PVSC	Sewer Connection	March 1992 - July 14, 2001	Copper, Lead, Mercury
20200033	PVSC	Sewer Connection	July 15, 2001 - June 30, 2006,	Copper, Lead, Mercury
NJ0107000	NJDEP	Stormwater	1997 - May 31, 2002	Not known

A Public Notice of Newark Boxboard's application for a NPDES permit was issued on August 1, 1980 (PAP-00113923-25). The final permit, NJ0031682, did not become effective, however, because USEPA ultimately determined that a permit was not required because the subject discharge had been rerouted to the PVSC (PAP-00114014-16).

The site operated with a PVSC Sewer Connection Permit No. 20401400, issued on July 27, 1981 (PAP-00352943). The permit expired July 27, 1986 (PAP-00352943). The permit was renewed and was effective from July 14, 1986 through July 14, 1991 and July 14, 1991 through July 14, 1996 (PAP-00113822; PAP-00113854-67).

In March 1992, Permit No. 20401400 was revised and the site operated a PVSC Sewer Connection Permit No. 20402402 through July 14, 1996 (PAP-00113854; PAP-00114405). The permit was renewed and was effective from July 14, 1996 through July 14, 2001 (PAP-00114495).

From July 15, 2001, through June 30, 2006, the site operated with a PVSC Sewer Connection Permit No. 20200033 (PAP-00114546).

A March 30, 2000, letter from Newark Boxboard to the NJDEP stated that Newark Boxboard at the time operated under stormwater discharge permit Number NJ0107000 and was requesting the NJDEP to re-issue the facility a general permit upon implementation of the SPPP since contact between the stormwater and source materials would be eliminated upon the implementation of the plan (PAP-00352933).

An April 2003 letter from Newark Boxboard to the NJDEP transmitted an application for permit renewal as the stormwater discharge permit Number NJ0107000 expired May 31, 2002. The permit renewal application removed one of the outfalls and stated the flow from that outfall was redirected for internal use (PAP-00114646-71).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Closure Report at Newark Boxboard 17 Blanchard St, UST No. 106607 dated November 1991 (PAP-00114144)
- Remedial Investigation Report with LNAPL Interim Remedial Measures Report, The Newark Group, Inc. Facility, 60 Lockwood Street (Block 2412; Lot 58), 84 Lockwood Street (Block 2412; Lot 17), 17-61 Blanchard Street (Block 2412; Lot 75) dated 2016 (PAP-00114673)

According to the 2016 RIR, additional remediation was conducted in 2012 at the location of the former UST. In September 2012, five soil borings were installed and five soil samples were collected to further delineate light nonaqueous phase liquid (LNAPL) and evaluate potential petroleum-related PAH impacts to soil. At one sample location southeast of the former UST location benzo(a)anthracene was detected at 5 ppm; benzo(a)pyrene was detected at 3.6 ppm; and, dibenzo(a,h)anthracene was detected at 0.91 ppm. In addition, the PAH, naphthalene was detected at 36 ppm (PAP-00114705-06).

According to the 2016 RIR, soil sampling was conducted in September 2012 to evaluate potential impacts associated with fill material suspected at the location of two former creeks. Two soil samples were collected. PAHs were not detected above the most stringent remediation standards or screening levels in either sample. Mercury was detected at 0.13 mg/kg in one sample (PAP-00114710-11, 5135). Lead and copper were also detected, but not above the most stringent remediation standards or screening levels (PAP-00114711, 5159, 5161). The concentrations detected were as follows:

Analyte	Sample 1 Result	Sample 2 Result
Copper	60.1 mg/kg	37.7 mg/kg
Lead	10.3 mg/kg	68.1 mg/kg
Mercury	Not detected	0.13 mg/kg

Analyte	Sample 1 Result	Sample 2 Result
Benzo(a)anthracene	Not detected	0.0480 mg/kg
Benzo(a)pyrene	Not detected	0.0441 mg/kg
Benzo(b)fluoranthene	Not detected	0.0417 mg/kg
Benzo(k)fluoranthene	Not detected	0.0322 mg/kg
Benzo(g,h,i)perylene	Not detected	0.0493 mg/kg
Chrysene	Not detected	0.0476 mg/kg
Dibenzo(a,h)anthracene	Not detected	0.0134 mg/kg
Fluoranthene	Not detected	0.0927 mg/kg
Indeno(1,2,3-cd)pyrene	Not detected	0.0325 mg/kg
Phenanthrene	Not detected	0.0483 mg/kg
Pyrene	Not detected	0.0797 mg/kg

(PAP-00115134-35, 58-61)

Remedial Activities

As reported in the 1991 Closure Report for Newark Boxboard Company, on June 18, 1991, 2,500 gallons of No. 6 heating oil were transported from the NBB facility for offsite disposal (PAP-00114156, PAP-00114175). On September 24-27, 1991, approximately 1,050 tons of soil were excavated at the NBB facility and transported for offsite recycling (PAP-00207817). According to the Official Certificate of Recycling by TPS Technologies Inc., 1,036.14 tons of petroleum-contaminated soil were received for recycling from Newark Boxboard (PAP-00208199).

On March 12, 1992, NJDEP notified Newark Boxboard Co. that they had complied with the Departments existing requirements regarding corrective action for the investigated UST system. Therefore, no further corrective action was required (PAP-00112753).

According to a Discharge Investigation and a Corrective Action Report, dated April 22, 1992, prepared by Vectre Corporation, analysis of post-excavation soil samples following the removal of the 30,000-gallon No. 6 heating oil UST on June 19-21, 1991 stated that soils in the vicinity of the UST had been impacted by heating oil. In September and October 1991, soil borings and additional monitoring wells were drilled to delineate the extent of free product and soil contamination (PAP-00207811). PAHs were found in several soil samples. Naphthalene concentrations ranged from 83,000 to 120,000 mg/kg; fluorene ranged from 12,000 to 18,000 mg/kg; phenanthrene ranged from 42,000 to 57,000 mg/kg; and, pyrene was found in one soil sample at 12,000 mg/kg (PAP-00114164-65). Laboratory comments accompanying the results for fluorene and pyrene note that the compounds were detected below the method detection limit (PAP-00114164-65).

8. Summary of Asserted Defenses

A 2016 Request for *De Minimis* Settlement on behalf of The Newark Group stated that they were not associated with any release or discharge of dioxins, furans, or PCBs into the Lower Passaic River (PAP-00115458). Because Newark Boxboard used recycled feedstock, and not virgin pulp, it did not perform chlorine or any other pulp-bleaching

processes that may result in the formation of dioxin (PAP-00115459). It was also stated that the only association between Newark Boxboard and any of the three primary COCs is Newark Boxboard's off-site disposal of PCB-containing transformers in 1988 (PAP-00115460).

The Newark Group asserts the following:

- PAHs in Newark Boxboard facility soil and groundwater associated with the release from a UST of No. 6 fuel oil cannot give rise to CERCLA liability under the Act's petroleum exclusion, CERCLA § 101(14) [42 U.S.C. § 9601(14)]; and,

- To the extent a nexus is alleged between the Newark Boxboard's discharges to the PVSC and COCs in the Passaic River, some or all of such discharges are subject to CERCLA's federally permitted release exemption, CERCLA §§ 101(10) & 107(j) [42 U.S.C. §§ 9601(10), 9607(j)]

Newark Morning Ledger Co.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

NEWARK MORNING LEDGER COMPANY

Facility Name, Address and Size: Newark Morning Ledger Co. (NML); 1 One Star Ledger Plaza Newark, NJ 07101 [Block 104, Lot 21 (Building) and Block 105, Lot 6 (Parking Lot)]; approximately two acres (PAP-00000636). In 1978, NML had 793 full time and 458 part time employees working three shifts per day, seven days per week (PAS-00077359). By 1990 NML employed 950 full time and 100 part time employees working three shifts per day, 365 days per year (PAS-00077384). In August 1992, printing operations ceased and former production areas were repurposed (PAP-00000636).

1. **Business Type:** NML is a newspaper publishing company that published The Star-Ledger and The Sunday Star-Ledger newspaper (PAP-00000492; PAS-00077054). The principal raw materials include newsprint, ink, and photo substances (PAP-00000439).



(PAP-00000677)

2. Time Period of Ownership/Operations

Operator: 1966 to December 2014 (PAP-00000636)
Owner: 1964 to 2015 (PAP-00000946)

According to the Case Inventory Document (CID) for Newark Star Ledger, Sanborn Maps identified historical operations at the site from 1892 to 1966 consisted of a former tannery, various manufacturing tenants, a leather finishing business, and a printing press/printing machine rebuilding operation. A deed notice, with an engineering control, for contaminants of concern (COCs), which include polynuclear aromatic hydrocarbons (PAHs), and mercury, was filed for the site on December 19, 2014. The CID reported the exceedances of multiple SVOCs and metals are attributable to historic fill. In addition, groundwater was presumed to be impacted by Historic Fill COCs found in site soils (PAP-00000515, PAP-00212775).

NML began operations at its Star-Ledger Plaza, Newark, New Jersey site in 1966. In or about August 1992, NML ceased production operations at the site. From that time to the present, operations at the Newark site have consisted of advertising, editorial, circulation, administration, composition, and office support (PAS-00077005).

3. Operational History/COC Use and Presence at the Facility

As reported in the *Preliminary Assessment (PA)/Site Investigation (SI)/Remedial Investigation (RI)/Remedial Action Report (RAR)*, dated February 2015 (2015 Report), historical NML operations at the site included:

1966 - 1972 Printing Operations

Printing operations from 1966 to 1972 consisted of two processes: typesetting and photoengraving (PAP-00000639).

Typesetting consisted of the setting of words for each story and advertisement into metal type on a linotype machine. The metal was an alloy of lead, tin, and antimony. The lines of type were melted down onsite and the alloy was reused. Typesetting produced no waste. NML maintained smelters in which they would melt down the alloy plates and reuse the materials. The smelters were reportedly removed in the 1970s after the alloy platemaking operations ceased (PAP-00000639). Based on the available file material, it is unclear if the reference to smelters is to a traditional definition of a smelter or rather a melting pot.

Photoengraving operations involved the etching of photographs onto zinc plates. Waste from these operations included film scraps, which were discarded for off-site disposal, and the zinc plates, which were melted down and reused. Spent nitric acid from etching operations was diluted with water and discharged to the sanitary sewer pursuant to a permit issued by Passaic Valley Sewerage Commission (PVSC). Available references did not include a copy of this permit. Photodeveloping solutions were diluted and discharged in the same manner (PAP-00000639).

Platemaking involved an assembly process of the typesetting operations discussed above. Once the page of type was assembled, it was pressed by a device called a "mat roller" onto a sheet of damp, soft cardboard. The cardboard, once pressed with the words and pictures for a particular page, were dried in a special dryer. Dried mats were sent to the stereotyping department where they were set in a casting machine. Molten lead alloy flowed against the mat creating a metal copy of it; plates were then cooled with water. After the newspaper was printed, the lead plates were melted down and reused. Small quantities of impurities generated during the melting process were sent offsite for disposal. Cardboard mats were discarded off-site and wastewater from the cooling process was discharged to the sanitary sewer via a permit with PVSC. Available references did not include sampling data for this wastewater discharge (PAP-00000639-40).

Waste ink and waste solvent used to clean the presses were combined and collected in drums. Minute amounts of lubricating oils were also drummed. All drums were stored in a designated room awaiting proper disposal. Waste inks and solvents were picked up by the suppliers and transported to facilities chosen by the supplier. Used lubricating oils were sent to a recycling facility (PAP-00000640; PAS-00077009).

1972 - 1992 Printing Operations

Printing operations during this time were done by keyboarding the letters onto photon tape, the tape was then fed into a reader that printed in a form suitable for transfer to a dummy page. Photographs were taken with special cameras and converted to dots; this was called "velox". The velox was pasted onto the dummy page with the type and the entire page was then photographed (PAP-00000641).

Beginning in 1979 all liquid photographic wastes were run through a silver recovery unit. All silver recovered from the unit was sold to a private vendor. The remaining waste was diluted with water and discharged to the sanitary sewer via a permit with PVSC. The negative of the dummy page was applied to a plate made of photopolymer plastic; the plate was then subjected to ultraviolet light and rinsed with water. The wastewater was discharged to the PVSC via NML's permit. Waste negatives were sold for scrap (PAP-00000640).

According to a letter dated February 23, 1990, NML generated two types of "waste process materials" including: 1) waste ink (non-hazardous) and 2) waste petroleum naptha (waste solvents). Approximately 60-70 55-gallon drums of waste ink (non-hazardous were produced per month. NML purchased approximately 508 55-gallon drums of ink per month. The ink was used to print the newspaper. The drums of waste ink were stored in a separate designated and contained area in the building basement. The empty ink drums were sent back to the manufacturer, not manifested. Waste petroleum naptha (waste solvents) was sent out to a sales/service company. All solvents were stored in a solvent safety room in the building (PAS-00077448).

The majority of chemicals/hazardous materials were stored/used in the basement area Mezzanine, and second floor of the site. Those areas included the Reel Room/Press Room, Maintenance Shop/Department, Lift Area, Machine Shop, Forklift Area, and Press Deck (PAP-00000644). Black ink containing PAHs was stored in aboveground storage tanks (ASTs) in the Tank Room of the basement area.

1992 - October 2014

Platemaking, printing, and mailroom processes at the site ceased in August 1992. Versions of typesetting and photoengraving were now paginated on computers. Occasionally hand-pasted dummy pages were produced (PAP-00000640).

In 1996, NML installed a unit that recycled the small quantity of photochemicals, which were used until operations ceased at the site. The photochemicals were recycled through the unit multiple times before they were diluted, filtered and slowly discharged to the sanitary sewer (PAP-00000640). Available references did not report the composition of the photochemicals and whether they contained any of the COCs. NML's PVSC permit was terminated in November 1993 since the newspaper was not being printed at the site. Domestic waste was still discharged to the sanitary sewer (PAP-00000640).

4. Identified COCs

- PAHs (use, detected)
- Copper (detected)
- Lead (use, storage)
- Mercury (detected)

PAHs

According to Community Right-to-Know surveys ranging from 1988 through 1992, hazardous materials included small amounts of napthalene (PAP-00000645).

A Statement Regarding the Presence of PAHs in Carbon Black by the International Carbon Black Association reported trace levels of PAHs are associated with carbon black in ink (PAP-000264260). Carbon black is a component of the black newsprint ink used by NML (PAP-00000642).

According to the CID for Newark Star Ledger, the two 5,000-gallon aboveground ink tanks formerly located in the Ink Tank Room located in the basement of the site were removed during cessation of operations in 1992. Two soil borings were advanced through the concrete in the former Ink Tank Room. No exceedances of the most stringent SRS were detected in either sample. Specific contaminant concentration data results for this area were not included in the available references. No further investigation was warranted for this AOC (PAP-00000513).

There were two minor fires in the Newark site's pressroom. During both occasions, the automatic sprinkler system was activated. The water discharged by the sprinkler system was released to the floor drains, which discharge to the sanitary sewer (PAS-00077014, PAS-00077545).

Metals – Copper, Lead and Mercury

Based on a document entitled "*Executive Summary"*, prepared by Occidental or its consultants, dated July 13, 1995, hazardous substances stored, used or produced at the site included copper, lead and mercury of which documented discharges via CSO to the river included copper 0.133 milligrams per liter (mg/L), lead 0.061 mg/L and mercury 0.003 mg/L (PAP-00212775). According to the *PVSC - Heavy Metal Source Determination Phase II Industrial Contribution after Pretreatment Sub Area 0*, drafted in 1978, the concentrations and sampling results were sometime between 1976-1978.

According to a Response to *Request for Information Letter*, dated March 6, 1997, from 1966 to 1972 NML used a lead, tin, and antimony alloy for typesetting; however, it produced no waste. The lines of type were melted down on site and the alloy was reused (PAS-00077008). Note samples of effluent discharged to PVSC and collected in 1972 contained less than 0.030 milligrams per kilogram (mg/kg) of lead and in 1975 lead concentrations were not detected (PAP-00212784, 89). Note the available documents do not specify where the samples were collected or the discharge flow rate.

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00000558; PAP-00212775).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	240 mg/kg
Mercury	0.99 mg/kg
Benzo(a)anthracene	49 mg/kg
Benzo(a)pyrene	39 mg/kg
Benzo(b)fluoranthene	44 mg/kg
Benzo(k)fluoranthene	24 mg/kg
Dibenzo(a,h)anthracene	5.8 mg/kg
Indeno(1,2,3-cd)pyrene	24 mg/kg

Based on the undated *Initial Receptor Evaluation Narrative*, soil results obtained from site investigation activities, the following compounds were in exceedance of the most stringent Soil Remediation Standards (SRS) benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, napthalene, lead, and mercury. Since the compounds were found across the site, they were attributable to Historic Fill (PAP-00000549). The chart below details the concentrations.

Contaminant	Concentration (mg/kg)	Depth (feet)
Naphthalene	14	5-5.5
Chrysene	64	4.5-5
Benzo(a)anthracene	49	4.5-5
Benzo(b)fluoranthene	44	4.5-5
Benzo(k)fluoranthene	24	4.5-5
Dibenzo(a,h)anthracene	5.8	4.5-5
Indeno(1,2,3-cd)pyrene	24	4.5-5
Beryllium	0.8	4.5-5
Lead	240	4.5-5
Mercury	0.99	4.5-5

(PAP-00000558)

According to a *Response Action Outcome Form*, dated June 23, 2015, groundwater sampling has not been conducted at this site, but based on the observed presence of Historic Fill, it was concluded that contamination related to regional Historic Fill may be present in the groundwater underlying the site (PAP-00004510). NML was issued a soil remedial action permit No. RAP150001, effective on June 1, 2015 for the entire site and a Classification Exception Area (CEA) VIC15001 was established as of May 28, 2015 (PAP-00004512).

According to the Deed Notice, dated December 10, 2014 (Deed Notice), Historic Fill materials were present at the site on Block 104, Lot 21 and Block 105, Lot 6. At Block 104, Lot 21, Historic Fill materials were observed to extend to a maximum depth of approximately 12.5 feet below ground surface (bgs). Historic Fill materials on Block 105,

Lot 6 were found to terminate at a depth of approximately 5 feet bgs. Fill materials were comprised predominantly of cinders, ash, concrete, and "cave-in" asphalt. COCs comprised metals, PAHs, and naphthalene. Fill material were identified in each of the seven advanced soil borings taken on Block 105, Lot 6 (PAP-00004500; PAP-00000565-72).

5. COC Pathways

Direct Release

According to a 1976 *Overflow Analysis of Passaic River Overflows,* the overflow chamber for the City Dock CSO district is "on the east side of intersection of Raymond Blvd. and Raymond Plaza East." The district is served by one 108" x 90" rectangular concrete sewer outfall to the Passaic River. Under normal dry weather flow conditions, the flow is diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow enters the interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River (PAS-00032870).

Storm Sewer

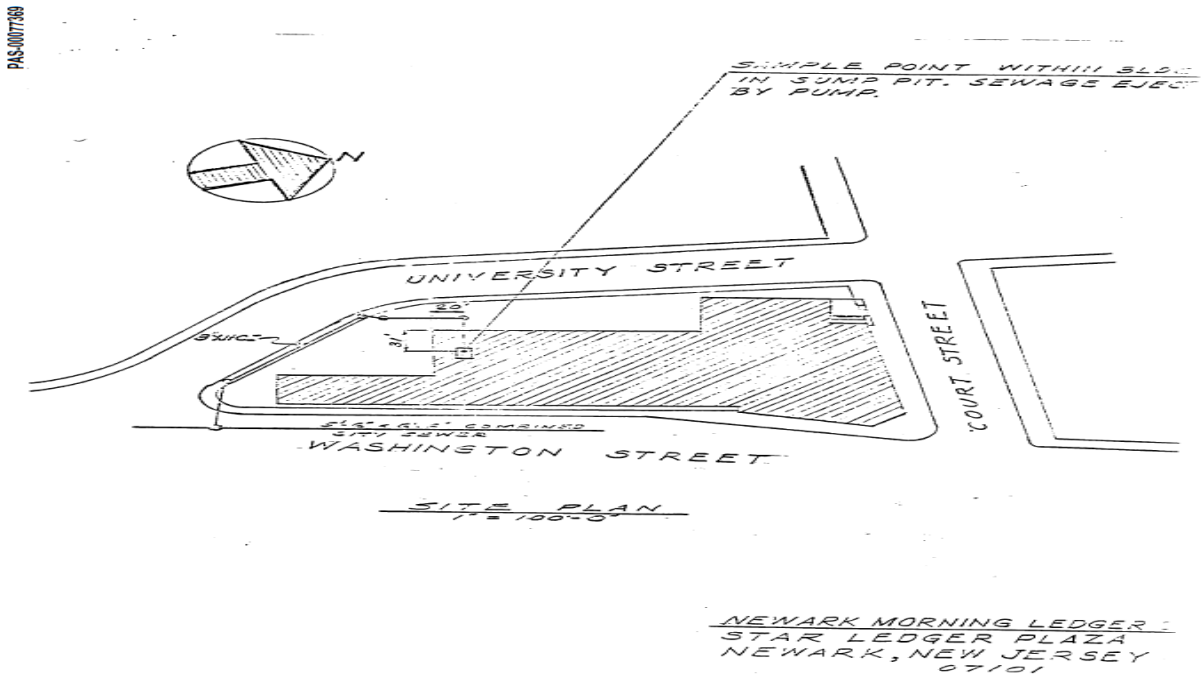
According to a Response to *Request for Information Letter*, dated March 6, 1997, there are storm sewers on site, which receive storm runoff from external areas of the site, such as parking lots. It is believed the storm sewers were first installed between 1965 and 1966 when the building was constructed at the site. Some storm sewers may have been installed after that date (PAS-00077013). Discharges to the storm sewer were directed to the PVSC sewers in University Avenue. The 2015 Report reported that inks were delivered to the site via tanker truck and were unloaded at the Ink Fill Port located adjacent to the southwestern corner of the site. In addition, a storm sewer grate was observed at the end of the Loading & Unloading/Ink Fill Port area (PAP-00000644).

According to 2015 Report interviews, pits existed beneath the Reel/Press Room, which was located in the basement area of the site and operated until 1992. The pits contained drains, which were connected to the sanitary sewer and were blocked in the early 1980s. The Reel/Press Room pits were blocked and cemented over in the early 1990's. During the 2015 Report site inspections, multiple floor drains were observed within the former Paper storage area, Mechanical Room, in the basement, and throughout the upper floors of the site (PAP-00000646).

In addition, newspaper printing operations from 1966 through 1972 included hot type setting which involved the use of lead smelters to melt down used lead plates and create new lead plates for printing (PAP-00000646). According to the Case Inventory Document (CID) for Newark Star Ledger, lead dust from the smelters would have vented to the roof and been discharged by the roof leaders to the storm water drains surrounding the subject property (PAP-00000515). Based on the 2015 Report, storm water during the time of hot type setting printing operations (1966-1972) was connected and managed by the PVSC (PAP-00000646). Based on the available file material, it is

unclear if the reference to smelters is to a traditional definition of a smelter or rather a melting pot.

A storm water grate was observed at the southern end of the Loading/Unloading Area. Approximately five single storm water sewers were observed adjacent to the sidewalks within the roadway of Washington Street, University Avenue, and Court Street. No staining and/or evidence of a release were observed during the 2015 Report site inspection (PAP-00000647).

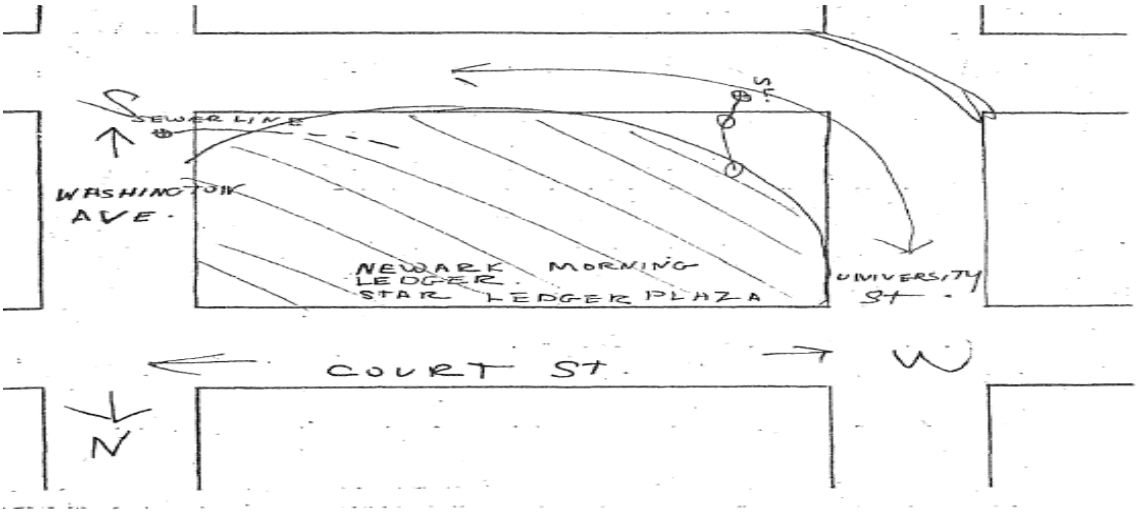


(PAS-00077369)

Sanitary Sewer

There had been two minor fires in the Newark site's pressroom and during both occasions; the automatic sprinkler system was activated. The water discharged by the sprinkler system was released to the floor drains, which discharge to the sanitary sewer (PAS-00077014, PAS-00077545).

According to the *PVSC - Heavy Metal Source Determination Phase II Industrial Contribution after Pretreatment Sub Area 0*, drafted in 1978 with sampling results from sometime between 1976-1978, NML contributed 0.133 mg/L of copper, 0.061 mg/L of lead, and 0.003 mg/L of mercury to the Passaic River through the combined sewer outfalls (PAP-00212776-77).



(PAP-00212790)

According to a *Waste Effluent Survey*, dated July 18, 1972, NML used 26,506,876 gallons of water from the City of Newark, New Jersey in 1971 (PAP-00212780). According to a *Report of Water and Wastewater Analysis*, dated April 16, 1975, copper sampled in a 24 hour composite sample equaled 0.20 mg/l (PAP-00212789). NML's applications for sewer connection permits documented the following water usage:

Reporting Year	Sanitary Water (gallons)	Process Water (gallons)	Cooling Make-up Water (gallons)	Total Water Use (gallons)
1972	13,253,438	11,928,094	1,325,344	26,506,876
1978	9,195,912	8,276,321	919,591	18,391,824
1986	17,222,814	12,500,000	4,128,300	33,851,114
1990	16,858,690	15,172,821	1,685,869	33,717,380
1991	10,273870	9,246,483	1,027,387	20,547,740

(PAS-00077049-109; PAS-00077311-475)

6. Regulatory History/Enforcement Actions

A NJDEP Site Remediation Program Remedial Action Protectiveness/Biennial Certification Form - Soil states a Deed Notice was filed on December 22, 2014 (PAP-00004521).

According to a Soil Remedial Action Permit for Historic Fill letter from NJDEP, dated May 28, 2015, NML received a Soil Remedial Action Permit No. RAP15001 (Deed Notice with engineering control for Historic Fill) which became effective on June 1, 2015 for Block 104, Lot 21 and Block 105, Lot 6 and required monitoring, maintenance, and evaluation for compliance and effectiveness of the remedial action and its associated institutional and engineering controls (PAP-00004474-77, 83)

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

According to the PVSC Application for a Sewer Connection Permit, NML held NJPDES Industrial Waste Permit No. 991304296. Sewer water was received by an unknown body of water (PAS-00077365) and was intermittently occurring between the hours of 6pm and 6am averaging 90,000 gallons daily (PAS-00077367, 403). Pretreatments included silver filtration systems and a wet scrubber for dust on press (PAS-00077368). Note flow rates, discharge monitoring and concentrations were not provided in the application.

NML held wastewater discharge permit number 20402590 between September 22, 1981 and September 15, 1996 (PAS-00077328, 340-41; PAP-00000406, 421) and discharged from outlet(s) number(ed) 20402590-42500-0201 located in the basement on the University Street side) (PAP-00000480). Storm sewer grates were observed in this area and discharges of storm sewer water were directed to the Passaic Valley sewers (PAP-00000644). Note flow rates, discharge monitoring and concentrations were not provided in the permit.

On November 8, 1993, permit 20402590 was terminated and NML was no longer required to submit monitoring data to PVSC since only domestic waste would be discharged from this site (PAS-0077407).

NML was issued identification number NJD991304296 in connection with its manifesting small quantities of Resource Conservation and Recovery Act (RCRA) waste (PAS-00077005). According to a 1988 Annual Generators Report this site generated greater than 10 tons of hazardous waste, but less than 100 tons during the calendar year (PAS-00077072).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- A Preliminary Assessment (PA) / Site Investigation (SI) / Remedial Investigation (RI) / Remedial Action Report “2015 Report” was completed on February 9, 2015 (PAP-00000628-660 (written report) to 4473 with attachments).

Soil

As reported to the NJDEP *Site Remediation Program Preliminary Assessment/Site Investigation*, soil analytical results were greater than the most stringent Direct Contact Soil Remediation Standards as well as the Ground Water Soil Screening Levels (IGWSSL) for PAHs, metals, and mercury in AOC 1 (Underground Storage Tank), AOC 3 (Loading and Unloading Areas/Ink Fill Port), and AOC 12 (Historic Operations) (PAP-00000520, 649-50, 651-652).

AOC 1 - Underground Storage Tank (Abandoned)

According to the 2015 Report, samples were collected from the tank invert, which was extrapolated to be from 12-12.5 feet bgs. Samples were analyzed for Extractable Petroleum Hydrocarbons (EPH) Category II (CATII) with contingent PAH analysis on 25% of the results where EPH was detected a concentrations greater than 100 mg/kg (PAP-00000648).

Soil samples SB-3, SB-4, and SB-5 exhibited EPH concentrations above 100 mg/kg (172, 266, and 401 mg/kg, respectively). Therefore, soil borings SB-4 and SB-5 were analyzed for PAHs. Both samples exhibited concentrations exceeding the NJDEP Direct Contact SRS and default IGWSSLs for multiple PAHs including benzo(a)anthracene (5.9 mg/kg). benzo(a)pyrene (5.7 mg/kg), benzo(b)fluoranthene (7.5 mg/kg), dibenzo(a,h)anthracene (0.99mg/kg) and indeno(1,2,3-cd)pyrene (3.0 mg/kg) (PAP-00000648; PAP-00000663).

Based on the constituents identified, the concentrations of PAHs were assumed to be associated with Historic Fill at the site and not a release from the UST. PAHs detected in samples associated with AOC 1 were therefore addressed through a deed notice and engineering controls (PAP-00000648).

AOC 3 - Loading and Unloading Areas/Ink Fill Port

According to the 2015 Report, soil samples collected at AOC 3 (Loading and Unloading Areas/Ink Fill Port) exceeded the default IGWSSL for mercury at 0.24mg/kg, 0.84 mg/kg, and 0.16 mg/kg, respectively in soil samples SB-9, SB-10(4.0-4.5 ft. bgs) and SB-10 (9.5-10 ft. bgs) (PAP-00000649).

PAHs were detected in SB-9 in excess of the NJDEP Direct Contact SRS and default IGWSSLs. The PAHs detected were indicative of Historic Fill and not a release from the loading and unloading areas. Therefore, the PAHs were addressed through a deed notice and engineering controls (PAP-00000649).

AOC 12 - Historic Operations

Building Parcel

According to the 2015 Report, two soil borings SB-6 and SB-7 were advanced to investigate historical operations conducted at the site prior to the construction of the NML building (PAP-00000651).

Analytical results exhibited exceedances of multiple SVOCs and metals, including: napthalene (14 mg/kg) and chrysene (64 mg/kg) exceeded Residential Direct Contact SRS (RDCSRS) and IGWSSL and benzo(a)anthracene (49 mg/kg), benzo(a)pyrene (39 mg/kg), benzo(b)fluoranthene (44 mg/kg), benzo(k)fluoranthene (24 mg/kg), dibenzo(a,h)anthracene (5.8 mg/kg), and indeno(1,2.3-cd)pyrene (24 mg/kg) exceeded NRDCSRS, RDCSRS, and IGWSSL. Several metals including lead (240 mg/kg) and mercury (0.99 mg/kg) were detected in exceedance of their respective default IGWSSLs (PAP-00000651, 664-66).

- Mercury was detected at a concentration of 0.99 mg/kg in SB-6. The NJDEP's default IGWSSLs for mercury is 0.1 mg/kg. The concentration of mercury detected was consistent with NJDEP background studies for urban areas within the state. Therefore, the concentration of mercury detected in SB-6 was attributable to natural background concentrations (PAP-00000651).

- Lead was detected at concentrations in exceedance of its respective IGWSSL of 90 mg/kg in soil sample SB-6. However, analytical data collected from a deeper soil sample collected from soil boring SB-6 demonstrated that the concentration of lead extinguishes to levels below the default IGWSSL at depths greater than two feet above the groundwater table (PAP-00000651).

- SB-7 exhibited exceedances of multiple PAHs including: naphthalene (exceeded RDCSRS), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene [exceeded Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS), RDCSRS, and IGWSSL] and indeno(1.2,3-cd)pyrene (exceeded RDCSRS) (PAP-00000651).

Parking Lot Parcel

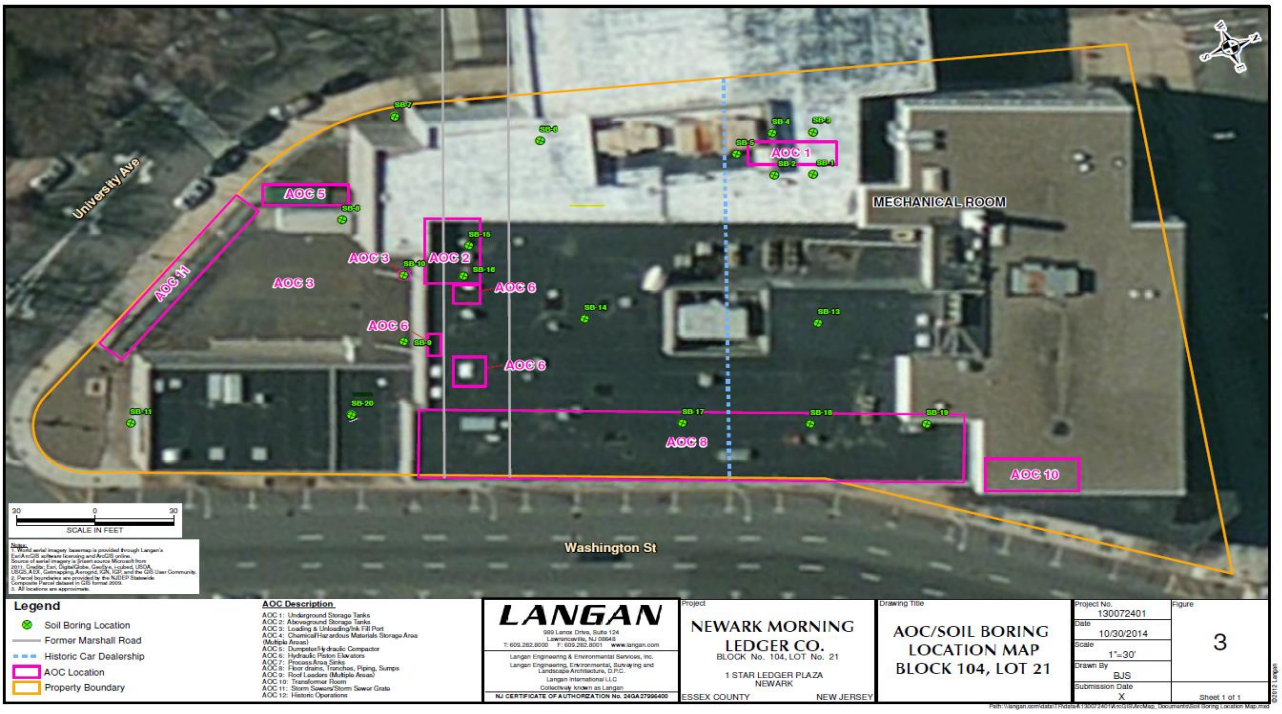
According to the 2015 Report, seven soil borings were advanced on August 4, 2014 to investigate surficial anomalies identified during the geophysical survey (PAP-00000652).

- A soil sample (1.5-2.0 feet bgs) analyzed for metals and exceedances included lead and mercury above their respective IGWSSLs (PAP-00000652).

- A soil sample (3.5-4.0 feet bgs) exhibited exceedances of multiple PAHs and metals. PAH exceedances included: benzo(a)anthracene (exceeded RDCSRS

and IGWSSL), benzo(a)pyrene (exceeded RDCSRS, NRDCSRS, and IGWSSL), and indeno(1,2,3 cd)pyrene (exceeded IGWSSL). Several metals including lead and mercury were also detected in exceedance of their respective IGWSSLs (PAP-00000652).

SVOCs and metal exceedances were assumed to be associated with Historic Fill at the site and were addressed through a Deed Notice and engineering controls (PAP-00000652).



(PAP-00000678)

Remedial Activities

As reported by the 2015 Report, the following remedial activities were implemented:

- A Deed Notice was filed restricting the use of the site to nonresidential uses. The Deed Notice boundary included the entirety of the property boundary (Building Parcel and the Parking Lot Parcel) as identified by the metes and bounds for the site

- The existing NML building footprint, the asphalt paving, the building, and the existing parking lot serve as the contaminant cap (engineering control) restricting direct contact with the subsurface soils and have to remain in place.

- A Remedial Action Permit for Soils was submitted for NJDEP approval. The permit requires maintenance of the cap and biennial inspection and certification of the cap

to demonstrate that the cap is competent and protective of public health, safety, and the environment.

- A groundwater CEA/WRA associated with Historic Fill was established. The CEA/WRA included the entirety of the property boundary (including the Building Parcel and the Parking Lot Parcel) (PAP-00000634).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

NOKIA-LUCENT TECHNOLOGIES INC.

Facility Name, Address and Size: Lucent Technologies Inc., 100 Central Avenue, Kearny, New Jersey. The property is 147 acres on the South Kearny peninsula. The facility is located on the Town of Kearny Block 288, Lots 7, 9, 10.01 and 10.02 (PAP-00367653, 663). In 1978, the facility had 6,350 employees (PAS-00080317), while in 1984, the facility had 4,000 employees (PAS-00080504). Available references did not state the number of shifts at the facility.

1. **Business Type:** Manufacturing and assembly of electro-mechanical devices required to interconnect the national telephone network (PAS-00080505).

2. **Time Period of Ownership/Operations**

   Operator: Western Electric Company Kearny Works (1925 to 1984)
   Owner: Western Electric Company Kearny Works (1925 to 1984)

   Nokia-Lucent Technologies Inc. (Lucent) operated and owned the facility as Western Electric Company Kearny Works (Kearny Works) from 1925 to 1984, according to the February 28, 1997 response to an EPA Request for Information (PAS-00080504). The Western Electric Company, Inc. had purchased the property in 1925 and sold it to the Union Minerals and Alloys Corporation in May 1984 (PAS-00080509). In addition, on January 27, 1983, the Western Electric Company announced plans to close the Kearny Works manufacturing facility in stages over several years (PAS-00080463). Western Electric Company, Inc. changed their name to AT&T Technologies, Inc. on January 3, 1984 (PAS-00080509). On December 29, 1989, the company merged into American Telephone and Telegraph Company, which changed its name to AT&T Corp. on April 20, 1994 (PAS-00080510).

   According to Lucent's February 28, 1997, response to an EPA information request, Lucent Technologies Services Company was a subsidiary of AT&T Corp. that was transferred to Lucent Technologies Inc. on February 1, 1996 (PAS-00080510). According to the *Supplemental Preliminary Assessment/Site Investigation/Remedial Investigation Report* (PA/SI/RI Report), dated May 2016, Lucent merged with Alcatel SA of France in 2006, forming Alcatel-Lucent (PAP-00367663). In January 2016, Alcatel-Lucent USA Inc. (ALU) became an indirect subsidiary of Nokia Corporation. The PA/SI/RI Report stated that the transaction through which Nokia Corporation would obtain ownership interest in ALU's ultimate parent corporation, Alcatel-Lucent SA, was expected to be finalized sometime in 2016 (PAP-00367653).

   The current owner of the site is RTC Properties. As stated above, Union Minerals and Alloys Corporation purchased the property in 1984. This company is a subsidiary of Neu, Hugo Corp., which changed its name to River Terminal Development Company ("RTC") in 1988 (PAS-00073217).

3. Operational History/COC Use and Presence at the Facility

Operations

Lucent's 1997 response to an EPA information request stated that the facility manufactured parts (e.g., switchboards and consoles, cables and wire, key equipment, connectors and molding, precious metal plating, sheet metal piece parts, etc.) for electromechanical assembly operations. Operations included plating, cleaning or degreasing, organic coating, and lubrication. The operations generated wastes and used small quantities of containerized chemicals, solvents, coating materials and oils that were stored primarily in workshops and occasionally outdoor storage yards. Auxiliary functions necessary for plant operation, such as a Powerhouse, a Garage, and electrical distribution required fuel tanks and oil containing transformers (PAS-00080505).

According to an Affidavit signed in May 1996 by former employee Mr. Daniel Bartel, the facility manufactured transformers for 25 years. The plant also manufactured copper wire and cables lined with lead and polyethylene (PAS-00080249).

An undated list of the chemicals used in the metal finishing processes at Kearny Works included copper cyanide and lead fluoborate (PAS-00080261).

A 1977 *Spill Control and Countermeasure Plan* for the facility documented the procedures for a welded steel oil storage tank located about 480 feet from the river bulkhead, two feet above grade on a piled concrete foundation, and surrounded by a steel dike. The oil was used to generate steam in the adjacent powerhouse facility. The tank was 60-feet in diameter and 40-feet high and oil was delivered by barge. The plan stated that the tank had been in operation since 1962 and no spills had occurred (PAS-00080375).

Waste Water

Lucent stated in their 1997 response to an EPA information request that waste water was discharged to the municipal sewer from 1925 to 1984 (PAS-00080507). A letter documenting a telephone discussion between Western Electric and the Passaic Valley Sewerage Commissioners (PVSC) on March 8, 1972, stated that all industrial waste water was disposed into the sanitary sewer for treatment at the municipal sewerage treatment plant located in South Kearny on the Hackensack River (PAP-00126611-12).

A 1969 *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor* listed five pipes from Western Electric as discharging directly to the Passaic River in a table titled "Direct Waste Discharges, Passaic River" (PAS-00114005). A 1972 letter documenting a telephone discussion between Western Electric and the PVSC stated the effluent discharged to the Passaic River was from storm drains and the power house cooling water (PAP-00126611-12). According to an *Environmental Information Survey of 1972*, dated June 1, 1973, there were five discharges from the facility containing untreated industrial and sanitary waste to the sanitary sewer, and the additional (sixth) discharge was stated to be to the

"stream." This discharge consisted of the untreated "once-through" cooling water used for the power house air conditioning. The survey noted that a waste treatment plant was under construction (PAS-00080294).

Once the on-site water treatment plant was built in 1974, the facility submitted an application for a National Pollutant Discharge Elimination System (NPDES) permit to discharge to the Passaic River. The confirmation of this application stated the wastewater was previously discharged to the municipal sewerage system (PAP-00126621). The NPDES permit NJ 002 0443 was issued with an effective date of April 30, 1974 and expired April 30, 1979 (PAP-00127219). The permit set maximum limits for discharge 002 for total and soluble lead (1.05 and 0.05 milligrams/liter [mg/L], respectively), total and soluble copper (1.2 and 0.2 mg/L, respectively), and volume (1.1 "MGD") (PAP-00127223).

Six discharges to the Passaic River were identified in the 1974 NPDES permit: A, B, C, D, 001, and 002 (PAP-00127222-23). A letter from Kearny Works to the EPA, dated January 15, 1976, stated Outfall 002 was from the treatment plant, Outfall 001 was from the plant air-conditioning, and Outfalls A, B, C, and D were storm water lines that went through or under the buildings. The four storm water outfalls carried street and parking lot runoff, as well as roof drainage, building sumps, and emergency city water drains. Tide water was stated to run up the full length of these drains (PAP-00126620).

A NPDES permit renewal application for Western Electric Company, dated September 15, 1978, details four of the outfalls from the facility. The outfalls appear to be the same as the outfalls identified above, but the lettered outfalls were numbered instead (PAS-00073224-28).

- Outfall 001 was from the power house and has been used since September 1966. Water was taken from the lower Passaic River and used during the summer months (when the outside temperature is greater than 60 degrees F) to cool the heat exchanges of the air conditioning system prior to discharge back to the river through this outfall (approximately 4,000,000 gallons/day for three months of the year). Municipal water was used for the continuous boiler blowdown (30,000 gallons/day), yearly chemical free cleaning and blowdown of four boilers (100,000 gallons/boiler), and regeneration of water softeners, and then discharged through this outfall (PAS-00073229-31).

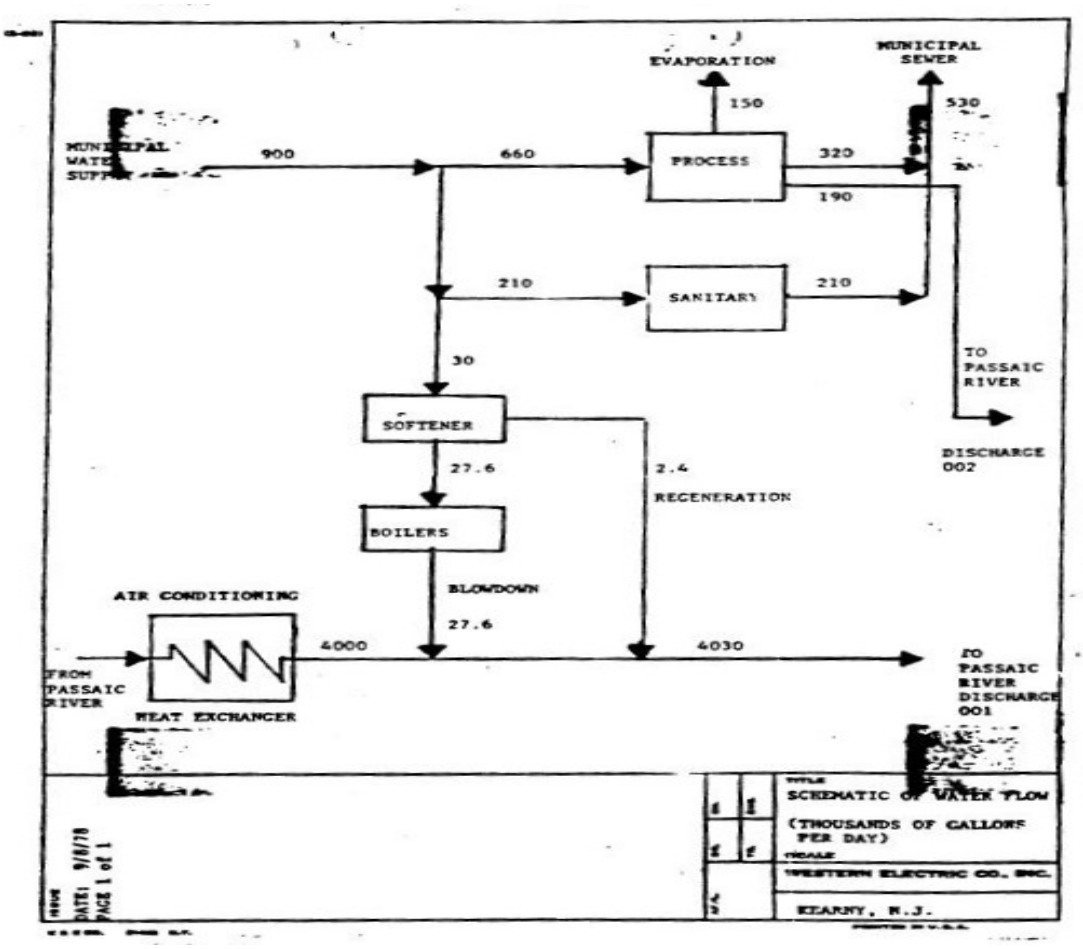
- Outfall 004 was continuous surface water from streets, parking lot, and roof drains. It was identified as the "Mdse. Bldg. South Outfall" and noted to have begun in 1925 (PAS-00073239-41).

- Outfall 005 was continuous surface water from streets, parking lot, and roof drains. It was identified as the "Mdse. Bldg. North Outfall" and noted to have begun in 1925 (PAS-00073248-50).

- Outfall 006 was continuous surface water from streets, parking lot, and roof drains. In addition, some cooling water, drinking fountain water, steam condensate, fire mains, and miscellaneous sources of small volumes of clean

water were discharged through this outfall. It was identified as the “170-171 Bldgs. Outfall” and noted to have begun in 1925. The previous serial number was 000D (PAS-00073257-59).

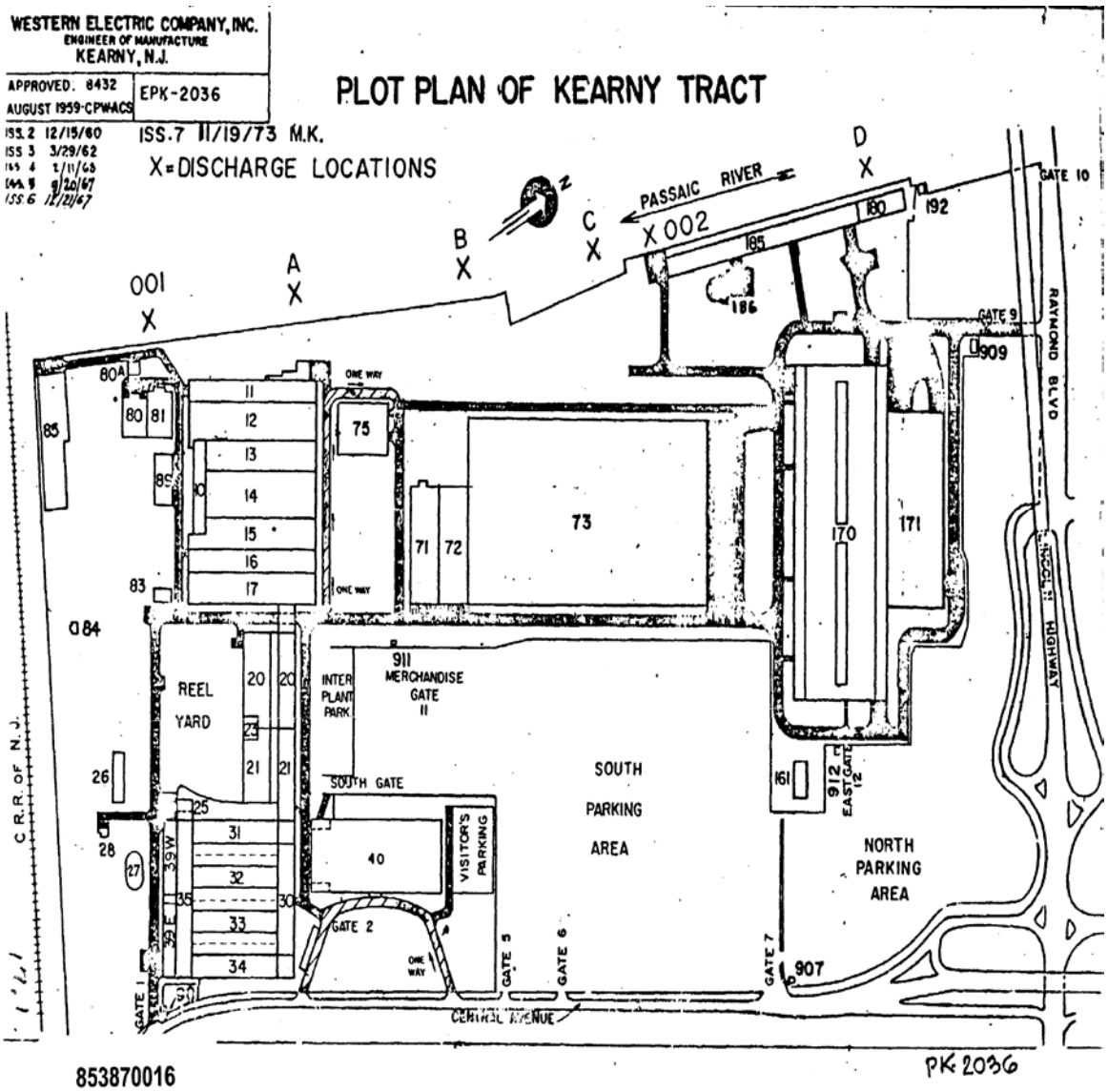
The following diagram of the water flow at the facility in 1978 was included in the NPDES application. It showed 190,000 gallons per day were discharged to the Passaic River through Outfall 002, and 4,030,000 gallons per day were discharged to the Passaic River through Outfall 001:



(PAS-00073226)

An Affidavit from former employee Mr. Bartel discusses the six outfalls; four from storm sewers, one from the waste water treatment plant, and one from the power plant condenser. The storm sewers were stated to be connected to two drains located within the drum storage area at the southern end of the facility. The Affidavit stated that the waste water treatment plant discharged treated water to the Passaic River, and prior to the construction of the waste water treatment plant in 1973, treated process water was discharged to the Passaic River through storm sewers. The treatment procedures for this waste water were unknown to the employee (PAS-00080249-50).

Diagram PK-2036 was provided with the 1997 response to an EPA information request and shows the approximate locations of the six outfalls to the Passaic River, which are the "x" locations on the figure below:



853870016
(PAS-00080516)

An undated list of chemicals regularly drained to the city sewers included paint spray booth flocculent, dyes, soap, emulphor (emulsifying agent), wire drawing compound, copper sludge, oil, phosphates, acids, and photographic chemical developers. The list stated it was exclusive of those chemicals intended for the waste treatment plant (PAP-00126613). An undated diagram of the copper plating process showed that rinse water was discharged to a waste treatment pit (PAP-00126618), but it is not clear where the pit was located at the facility and if it was part of the waste water treatment plant.

According to a memorandum dated April 25, 1977, circuit board cleaner CU-3 and Oakite 90 solution could be disposed into the sanitary sewer sump without treatment (PAP-00126619). In addition, two memoranda dated January 29, and February 2, 1979, state that spent diluted silk screen chemicals were disposed to the sanitary sewer at a rate of ten gallons per week in 1979 (PAP-00126615-16). The documents do not include information for if these discharges contained OU2 COCs.

Hazardous Waste

According to the 1997 response to an EPA information request, the facility was an authorized hazardous waste generator and storage facility under EPA ID No. N.J.D. 002139053 (PAS-00080504). In addition, waste materials were accumulated in an authorized waste yard prior to disposal in accordance with the Resource Conservation and Recovery Act (RCRA). Prior to the issue of RCRA regulations, the facility followed the various company instructions for storage, transfer, use, and disposal of hazardous substances (PAS-00080505-6). A 1961 Hazards-Toxic, Corrosive, and Flammable Materials instruction defined the hazardous materials and handling requirements used to minimize hazards at the plant (PAS-00080278). However, only the first two pages of this plan were available in the file material.

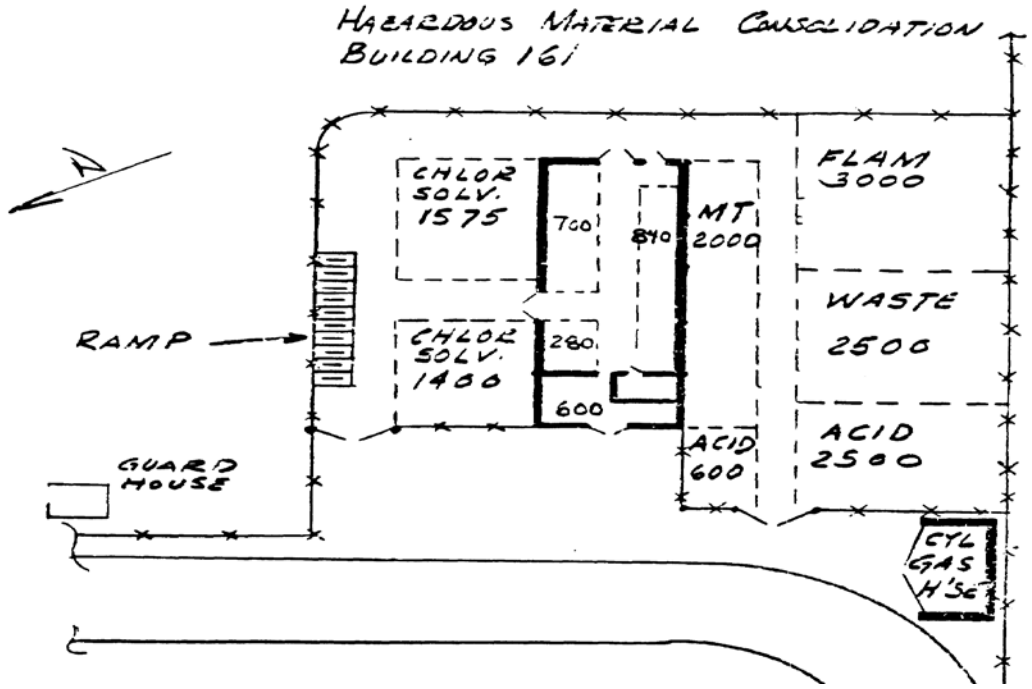
Correspondences from September 1976 discussed the disposal of copper protecting wastes. A Copper Cleaner solution was stated to be a hazardous waste disposed in drums to be shipped off-site. Another flammable chemical solution Redox was stated to contain mostly Stoddard solvent to be disposed as a hazardous waste (PAS-00080295-96).

A letter to a Mr. J.R. Mandel, dated December 7, 1979, described the hazardous material storage areas located outside in the Acid Yard south of 185 Building and the “O.P. yard” south of Building 20. Subdivisions in the Acid Yard included the metal finishing area to the north, an empty drum area, and a “PWB” (acronym was not defined) area to the south. The O.P. Yard included a waste area to the north and a new material area to the south (PAS-00080313).

A memorandum dated November 12, 1979, stated that partially filled drums of hazardous waste had been consolidated at the O.P. yard, but the practice of tipping the drums to pour out the waste was hazardous and would be discontinued in accordance with New Jersey’s new spill law (PAS-00080312).

According to hazardous waste survey forms from 1980, in addition to the solvent wastes, the facility produced 3,850 gallons of caustic waste, 2,350 gallons of acid wastes, and 3,700 gallons of solid waste per year (PAS-00080339-44).

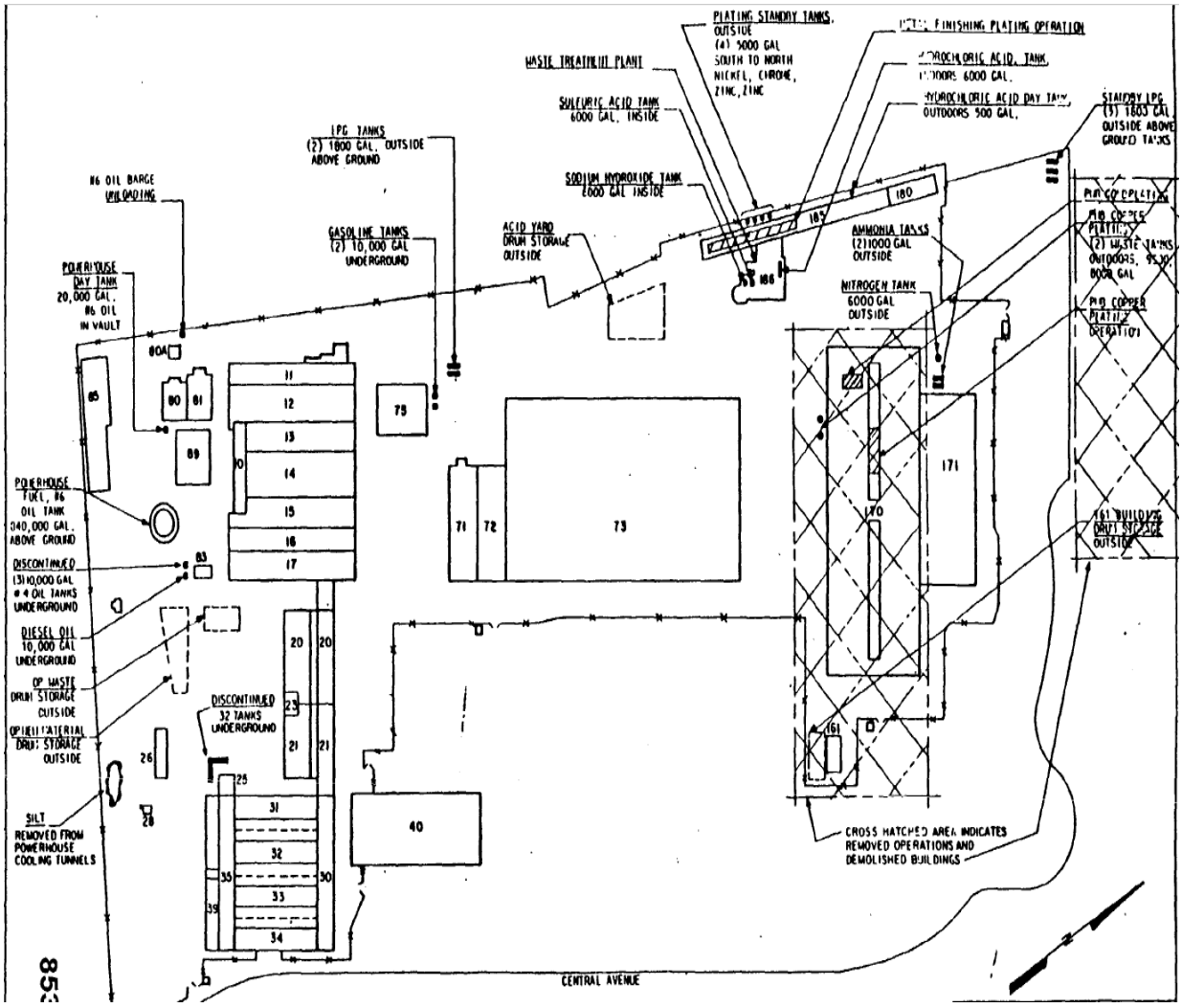
Building 161 appears to have been a consolidation point for hazardous material:



(PAS-00080315)

Miscellaneous

An inventory of the facility's storage locations was provided on a grid-based facility map. The list included various oil and gasoline underground and above ground storage tanks, but no spills or leaking tanks were noted. The list also stated that silt pumped from Powerhouse cooling water tunnels was examined for contaminants, found to be "environmentally innocuous" and deposited at Grid Index J-2. Buildings 170 and 161, shown as the cross hatched rectangles at Grid Index 1-15, were environmentally cleaned and demolished in 1981. Building 170 was the former location of copper plating operations. In addition, dried copper-bearing sludge was present on the basement floor of Building 85, which is located near the Passaic River at the southwestern corner of the site. Finally, it was noted that prior to 1963, a large coal pile was maintained in the area defined by Grid Indices F-H-2-3. The weight of the coal probably produced soil settlement, and there may be a thin layer of coal fines under the current gravel surface (PAS-00080497-99).



(PAS-00080500)

4. Identified COCs

- PCBs (used, released)
- PAHs (detected)
- Dieldrin (detected)
- DDx (detected)
- Mercury (used)
- Copper (used, released)
- Lead (used, released)

Lucent stated in their 1997 response to an EPA information request that PCBs, copper, and lead were used at the facility (PAS-00080504).

PCBs

According to an Affidavit from former employee Mr. Bartel, the facility manufactured transformers for 25 years. Although the exact time period for this manufacturing is not specified, Mr. Bartel worked at the Kearny Works from 1952 to 1985 (PAS-00080249).

No further information for the manufacturing of transformers at the facility was found in the available references.

A Selected Substance Report, dated July 1, 1980, stated PCBs were in fixed transformers and a small stock, but were not used in the production operations (PAS-00080319).

During a 1981 inspection, PCBs were stated to be in the 13 transformers located at the site. The transformers used "pyranol" and "abestol" as the dielectric fluid. Seven transformers were located inside installations and the remaining six were outside. Two of the outdoor transformers were not functional and considered storage tanks. A drum storage area was located inside the basement of Building 32 with a total of 12, 30-gallon drums containing virgin PCB liquid used for transformer make-up (PAS-00080395-96). The transformers used as storage tanks were disposed in 1982, and the drum storage area was moved to the fifth floor of Building 25 to be above the 100-year flood level (PAS-00080456).

A memorandum dated January 8, 1982, stated that all transformers had less than 50 parts per million (ppm) PCBs except four transformers that had 56 to 120 ppm PCBs. Three were located at the wire mill, while the fourth was located at the west end of the row outside “170-S.” The four transformers would be disposed as PCB contaminated (PAS-00080419-20).

As presented in the Amended Environmental Cleanup Plan, dated July 1985, soil samples were collected May 2-10, 1985, and the reported maximum detection of total PCBs (89,000 µg/g – or ppm) was at two to three feet at the Kearny Works site. A maximum total PCBs concentration of 33,000 µg/g was reported for surface soil (PAS-00129816-17).

PAHs

The 2016 PA/SI/RI Report attributed most of the concentrations of PAHs in soil to Historic Fill, but noted that PAHs concentrations in soil near Building 170 were likely due to the demolition of Building 170 (PAP-00367770). Building 170 was identified as the former “assembly” building inherited from Ford Motor Company and demolished in 1981 (PAP-00367664).

Dieldrin and DDx

Pesticides were analyzed in soil samples collected and reported in the 2016 PA/SI/RI Report. Dichlorodiphenyltrichloroethane (DDT), Dichlorodiphenyldichloroethane (DDD), and Dichlorodiphenyldichloroethylene (DDE) were detected in site soil at various locations. Maximum concentrations of each were 1,600 micrograms per kilogram (µg/kg) (DDT), 400 µg/kg (DDD), and, 720 µg/kg (DDE). Dieldrin was detected at one background location at a depth of 2.5 to three feet a concentration of 0.0075 milligrams per kilogram (mg/kg) (PAP-00367769, 887-893).

Metals – Copper, Lead and Mercury

A letter dated October 18, 1977, regarding the transportation of hazardous materials stated that mercury was used in various Kearny products (mercury switches, relays, etc.) (PAS-00080307). In addition, a "residue from printed wiring board land area copper plating" is identified as a hazardous waste generated by the facility in a *Generator Annual Hazardous Waste Report* for 1981 (PAS-00080436).

Characterization of the wastewater treatment plant effluent was documented in a 1981 Wastewater Treatment Plant survey. The average concentrations over the first nine months of 1981 reported total and soluble lead (0.05 mg/L for both) and copper (0.21 and 0.16 mg/L, respectively). The survey noted that there were two instances in 1981 when the NPDES permit levels were not met, but the exceeding parameters and concentrations are not specified. The 9-month averages proceeding the inspection for lead and copper were at or below Permit levels (PAS-00080368-69).

Metals were noted to be present in the waste water generated by the facility, as monitoring of the treatment plant sludge in 1980 through 1982 detected copper and lead at concentrations ranging from 940 to 4,300 mg/kg for copper and 270 to 80,000 mg/kg for lead (PAP-00126742-84). A sample of the sludge filter cake analyzed in 1982 was determined to contain 1.1% copper and 0.44% lead (PAS-00080423). A seven-day composite sample of the sludge filter cake from 1982 detected copper and lead at 2,300 and 2,400 mg/kg, respectively, but the concentrations were based on the wet weight of the sample with 79% moisture (PAS-00080422). According to the Industrial Process Wastewater Sludge Reports from the early 1980s, the sludge was transported to and disposed at the Hackensack Meadowlands Landfill in Kearny, New Jersey (PAP-00126741).

An undated letter stated the waste water treatment sludge produced at the facility from electroplating operations did not have concentrations of contaminants above the RCRA Part 261, Subpart D, "Hazardous Waste from Nonspecific Sources" levels (PAS-00080316). The Selected Substance Report attached to the letter was dated July 1, 1980, and identified contaminants present at the site, including copper and lead, but concentrations were not provided (PAS-00080316-9).

A laboratory report on a sample of "tunnel sludge" collected in 1981 did not have detections of mercury or lead (PAS-00080356).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 53 (NJDEP map identifying locations of recognized historic fill).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00367853, 57, 66; PAP-00371976).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	7,650 mg/kg
Copper	12,000 mg/kg
Mercury	20.5 mg/kg
Benzo(a)anthracene	120 mg/kg
Benzo(a)pyrene	120 mg/kg
Benzo(b)fluoranthene	170 mg/kg
Benzo(k)fluoranthene	62 mg/kg
Dibenzo(a,h)anthracene	22 mg/kg
Indeno(1,2,3-cd)pyrene	81 mg/kg

The 2016 PA/SI/RI Report attributed the widespread PAHs and metals contamination detected across the site to Historic Fill. To support this conclusion, the PA/SI/RI Report established a historic fill profile that would be used to evaluate results in operating areas of the site where AOCs are located. In addition, fill material was observed to be present in 210 of 220 soil borings installed (PAP-00367723-24, 31-34). The PA/SI/RI Report also stated: "The average lead concentration is substantially higher in topsoil than in either fill material and likewise provides a strong indicator for DAP [diffuse anthropogenic pollution], as the most likely source for lead in surface soils is historic emissions associated with leaded gasoline, particularly given the vicinity of the Site to Route 1 and 9 bypass (Lincoln Highway), Pulaski Skyway, New Jersey Turnpike and other high-volume, long standing roadways" (PAP-00367737); indicating that elevated lead concentrations are possibly not site-related, but anthropogenic.

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes in New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Historic Fill at the site was likely disturbed during construction and demolishing of the plant's buildings. In addition, the excavations performed in 1985 likely disturbed the Historic Fill. A Classification Exception Area / Well Restriction Area (CEA/WRA) associated with Historic Fill was established December 18, 2018 (PAP-00373377). The CEA/WRA was identified for PAHs and metals, including lead and mercury (PAP-00373323, 26).

5. COC Pathways

Sanitary Sewer

Lucent stated in their 1997 response to an EPA information request that waste water was discharged to the municipal sewer from 1925 to 1984 (PAS-00080507). A letter documenting a telephone discussion between Western Electric and the Passaic Valley Sewerage Commissioners (PVSC) on March 8, 1972 stated that all industrial waste water was disposed into the sanitary sewer for treatment at the municipal sewerage treatment plant located in South Kearny on the Hackensack River (PAP-00126611).

An *Environmental Information Survey of 1972*, dated June 1, 1973, discussed the water flow at the facility in 1972. The Survey stated that 1,710,000 gallons of city water and 8,000,000 gallons of water from the Passaic River were used at the facility each day. The river water was stated to be used as air-conditioning cooling water. The once-though, untreated cooling water for the power house air conditioning plant was then discharged to the river, while the rest of the plant's wastewater was discharged to the sanitary sewer. The levels of oil and grease in this discharge exceeded the acceptable levels in the Kearny sewer code for 3 of 5 days. In addition, copper was detected at a "significantly high" concentration (not specified), but the Kearny sewer code did not have a standard for this metal. It was noted that copper was from various plating operations that were planned to be transferred to a new centralized plating facility with a water treatment plant (PAS-00080294).

A NPDES permit application for Western Electric Company, dated September 15, 1978, stated 320,000 gallons per day of process water and 210,000 gallons per day of sanitary water were discharged to the municipal sewer (see the diagram associated with this permit application in Section 3 [Operational History/COC Use and Presence at the Facility]) (PAS-00073226).

A Selected Substance Report dated July 1, 1980, documented the water flow at the facility in 1980. The estimated average daily volume of wastewater discharged to the sanitary sewer was 500,000 gallons. The discharge included process water, non-contact cooling water, and domestic sewage (PAS-00080319).

An undated list of chemicals regularly drained to the city sewers included paint spray booth flocculent, dyes, soap, emulphor (emulsifying agent), wire drawing compound, copper sludge, oil, phosphates, acids, and photographic chemical developers. The list stated it is exclusive of those chemicals intended for the waste treatment plant (PAP-00126613).

Storm Sewer

According to a 1996 Affidavit from former employee Mr. Bartel, who worked at the facility as a plumber, waste lines from two buildings were connected to the facility's storm sewer. Mr. Bartel stated that prior to the construction of the waste water treatment plant, treated process water was discharged to the Passaic River through storm sewers. The treatment procedures for this waste water were unknown to Mr. Bartel. In addition, Mr. Bartel noted that there were two drains to the storm sewer from the hazardous waste storage areas at the southern end of the facility (PAS-00080249-50).

Lucent's 1997 response to an EPA information request stated that air conditioning drains, water sumps and water fountain effluent were drained to storm sewer outfalls to the Passaic River. Storm sewers contained runoff oil and grease (PAS-00080507).

Direct Release

According to a 1969 *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor*, Western Electric was listed as having five pipes that discharged directly to the Passaic River (PAS-00114005). A 1972 letter documenting a telephone discussion between Western Electric and the PVSC stated the effluent discharged to the Passaic River was from storm drains and the power house. The effluent was specified to contain the power house cooling water (8 million gallons per day), boiler blowdown (25,000 gallons per day), as well as periodic regenerated water from the water softeners (4,000 gallons) (PAP-00126611-12). This was also stated by an *Environmental Information Survey of 1972,* dated June 1, 1973, which identified 8 million gallons of water from the Passaic River used at the facility each day as air-conditioning cooling water, and that the once-though, untreated cooling water for the power house air conditioning plant was discharged to the river (PAS-00080294).

In 1974, approximately one-third of the waste water flow was diverted to the new on-site industrial waste treatment plant, which discharged treated effluent to the Passaic River under a NPDES permit, according to the 1997 response to an EPA information request. The treatment plant had acid/alkali neutralization, chrome reduction, and cyanide destruction followed by solids removal. The sludge from the solids removal was stored on-site and later sent to landfills. Lucent's response states that waste was not treated on-site prior to 1974; however, some waste was sent to disposal or recycling firms (PAS-00080507).

A 1996 Affidavit from a former employee stated that the waste water treatment plant discharged treated water to the Passaic River, and prior to the construction of the waste water treatment plant, treated process water was discharged to the Passaic River through storm sewers. The treatment procedures for this waste water were unknown to the employee (PAS-00080249-50).

As discussed in Section 3 (Operational History/COC Use and Presence at the Facility) above, the facility had six permitted outfalls to the Passaic River, including the power house cooling water, industrial waste treatment plant discharge, and four "run-off, oil and grease" outfalls (PAS-00080508), shown above on diagram PK-2036 (PAS-00080516).

The four runoff discharge outfalls were primarily storm water drainage and were monitored with samples collected from manholes, except for one that was located in the 12 building basement below the old Cable Shop (PAS-00080421). The storm water drains were stated to be connected to street and parking lot runoff, roof drainage, building sumps, and emergency city water drains, according to a letter from Western Electric to EPA, dated January 15, 1976. Tide water was stated to run up the full length of these drains (PAP-00126620).

A NPDES permit renewal application dated September 15, 1978 stated three surface water outfalls began in 1925 (PAS-00073239, 48, 57), which is when operations at the plant began. Outfall 001 from the power house was noted to have been used since September 1966 (PAS-00073229). The 1978 NPDES application stated that 190,000 gallons per day were discharged to the Passaic River through Outfall 002 (PAS-00073226).

A Selected Substance Report dated July 1, 1980, documented the water flow at the facility in 1980. The estimated average daily volume of treated wastewater discharged to the Passaic River was 250,000 gallons and included process water, contact cooling water, and scrubber water. The form stated the water was treated by destroying cyanide, reducing chrome, neutralizing acid-alkalis, and precipitating metals (PAS-00080319).

According to a 1981 Wastewater Treatment Plant survey, the average flow through the plant was approximately 56,000 gallons per day during the period of October 1 through 28, 1981 (PAS-00080368).

During remediation of the site, eleven drains from the former concrete drum storage pad were found (PAS-00129850). Remediation of the concrete pad stated catch basins associated with the pad were cleaned (PAS-00129860).

6. Regulatory History/Enforcement Actions

Permits

The NPDES permit NJ 002 0443 had an effective date April 30, 1974 and expired April 30, 1979. Discharge limits for temperature and pH were specified for the five outfalls to the Passaic River, and it was stated that the poundage of metals in the effluent should equal the poundage in the intake water. Daily and maximum limits for outfall 002 from the treatment plant were specified for metals (see table below), and a maximum volume of 1.1 MGD was identified.

Contaminant	Daily Maximum per 0.1 MGD (pounds/day)	Maximum (mg/L)
Total Copper	1.00	1.2
Soluble Copper	0.167	0.2
Total Lead	0.876	1.05
Soluble Lead	0.042	0.05

(PAP-00126620; PAP-00127219, 22-23)

A NPDES permit renewal application for Western Electric Company was dated September 15, 1978 (PAS-00073224).

NPDES permit number 0020443 for the facility was effective August 1, 1979 through June 30, 1981. In addition to a maximum flow limit of 1.1 MGD, the following limits were specified for outfall 002:

Contaminant	Daily Maximum Load Limit per 0.1 MGD (pounds/day)	Daily Maximum Concentration (mg/L)
Total Copper	0.834	1.0
Soluble Copper	0.167	0.2
Total Lead	0.834	1.0
Soluble Lead	0.042	0.05

(PAP-00127237-39)

According to an Affidavit of Exemption from the New Jersey Pollutant Discharge Elimination System, dated June 28, 1985, Permit NJPDES 0020443 was administratively extended past June 30, 1981 and allowed the discharge of industrial surface water to the waters of the State of New Jersey through December 31, 1985 (PAS-00080494-95).

In March 1981, a permit from the NJDEP authorized discharge from the Western Electric Co to the Passaic River in accordance with the New Jersey Discharge Elimination System Regulations (PAP-000127252). It is not clear what discharge was authorized by this permit.

According to the 1997 response to an EPA information request, the facility was an authorized hazardous waste generator and storage facility under EPA ID No. N.J.D. 002139053 (PAS-00080504). In addition, waste materials were accumulated in an authorized waste yard prior to disposal in accordance with the Resource Conservation and Recovery Act (RCRA). Prior to the issue of RCRA regulations, the facility followed the various company instructions for storage, transfer, use, and disposal of hazardous substances (PAS-00080505). A 1961 Hazards-Toxic, Corrosive, and Flammable Materials instruction defined the hazardous materials and handling requirements used to minimize hazards at the plant (PAS-00080278). However, only the first two pages of this plan were available in the file material.

Inspections

An inspection of the waste water treatment plant was performed in October 1981. The average water flow through the plant was approximately 56,000 gallons per day. The inspection report stated that the printed wiring board operations in the 170 building had been discontinued, so the majority of the treated water was from the 185 building. The waste water treatment plant contained acid-alkali neutralization, chrome reduction, cyanide destruction, solids removal, and sludge dewatering systems. One sludge pump had leaked and was being replaced (PAS-00080368-70).

A RCRA and PCB Inspection was performed October 27, 1981. The RCRA inspection concluded that Kearny Works satisfactorily met the RCRA requirements for a hazardous waste generator and storage location. However, weaknesses were identified in the hazardous waste storage area. The area had a large drain at the center that could be opened with a valve to drain rainwater to the river within four hours after a heavy rain. The inspection noted that the collection system for spills could allow hazardous waste into the storm drain. Roofing was recommended to keep rainwater off the drums. In addition, the drain system valve could be a problem in freezing weather, and the asphalt pad was cracked but should be impervious (PAS-00080394-95). The PCB inspection found several areas of non-compliance, including unlabeled transformers and drums, inadequate roofing over two transformers, a storage area below the 100-year flood level, and transformers and storage areas without dikes (PAS-00080396). A December 8, 1981, memorandum stated these issues were resolved with a new storage area located on the fifth floor of Building 25 (PAS-00080397).

NJDEP inspected the Kearny Works facility on November 19, 1981. A *Memorandum for Record* stated that the inspection concluded that the facility was in compliance with the existing water pollution laws and the facility spill plans were satisfactory. One request was made to address the potential for spills from acid carboys stored on pavement south of Building 185 to reach groundwater (PAS-00080373).

A *Compliance Monitoring Repor*t dated October 1, 1982 documented a Preliminary Inspection performed February 3, 1982 and an Effluent Survey performed April 28-29, 1982. The inspection reviewed the facility's self-monitoring results and found outfall 002 out of compliance for soluble copper one time in the previous year (PAP-00127263). The report concluded that the facility was in compliance with the terms and conditions of the NPDES permit (PAP-00127254-63).

A RCRA and PCB Survey was performed June 20 and 23, 1983. The RCRA survey identified minor issues with the storage facility (valves in the curbing around the storage pad were left open), but concluded the RCRA program was satisfactory. The PCB survey noted 11 transformers in use. The two transformers in outside storage at the south side of Building 170 were removed and disposed in Emelle, Alabama, on September 29, 1982. The storage area on the fifth floor of Building 25 had ten 30-gallon drums and two partial drums of virgin PCB liquid. The PCB program was concluded to be in compliance with applicable TSCA regulations (PAS-00080455-6).
A waste treatment plant survey was conducted June 21 and 23, 1983. The plant treated 120,000 gallons of water each day. The clarifier effluent was noted to be very clear, and no violations of the NPDES permit levels had occurred since the previous inspection in 1981 (PAS-00080457-9).

Violations

An *Environmental Information Survey of 1972*, dated June 1, 1973, stated the levels of oil and grease in the discharge to the sanitary sewer exceeded the acceptable levels in the Kearny sewer code for 3 of 5 days. In addition, copper was detected at a "significantly high" concentration (not specified) in 1972, but the Kearny sewer code did not have a standard for this metal (PAS-00080294).

A letter dated September 12, 1977, to Western Electric Company from EPA stated the results presented in the previous Discharge Monitoring Report exceeded the NPDES effluent limitations (PAS-00073276). A response letter from Western Electric Company addressed the exceedances, indicating the oil and grease and cyanide concentrations were reported as not detected (less than the reporting limits), and stated that the dissolved lead concentration was reported as 0.02 minimum to 0.03 maximum (no unit specified), which did not exceed the permit limit of 0.05 (PAP-00127236).

An inspection report noted that there were two instances in 1981 when the NPDES permit levels were not met, but the exceeding parameters and concentrations were not specified. The average concentrations over the first nine months of 1981 for lead and copper were at or below the permit levels. The maximum permit limits for total and soluble lead were identified as 1.0 and 0.05 mg/L, respectively, and total and soluble copper were 1.0 and 0.2 mg/L, respectively (PAS-00080369).

A *Compliance Monitoring Report* dated October 1, 1982 stated outfall 002 was out of compliance for soluble copper one time in the previous year. The concentration of soluble copper that exceeded the criterion in the previous year was not specified. A sample collected at this outfall point detected soluble copper at 0.08 mg/L, which was less than the permit daily maximum limit of 0.2 mg/L. Total copper was 0.09 mg/L in the sample from this outfall, which was less than the permit daily maximum of 1.0 mg/L, and lead was not detected (PAP-00127263, 65).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- Environmental Evaluation Measurement Plan, dated May 1984 (PAP-00371663)
- Environmental Cleanup Plan, dated October 1984 (PAP-00371683)
- Environmental Cleanup Plan, dated November 1984 (PAP-00371772)
- Amended Environmental Cleanup Plan, dated July 1985 (PAS-00129806)
- Addendum to Amended Environmental Cleanup Plan, dated June 21, 1985 (PAS-00129820)
- Certification of ECRA Soil Cleanup, dated January 1986 (PAP-00372057)
- Certification of ECRA Soil Cleanup, dated February 1986 (PAP-00372075)
- Supplemental Preliminary Assessment/Site Investigation/Remedial Investigation Report (PA/SI/RI Report), dated May 2016 (PAP-00367644)

Soil

Remediation under NJDEP began in 1985 (PAS-00080506), when the site was owned by RTC. Cleanup was part of the New Jersey's Environmental Cleanup Responsibility Act (ECRA) Program due to the cessation of operations and sale of the property (PAS-00129775).

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According to the 2016 PA/SI/RI Report, excavations were performed in 1985 and included the removal of 31,915 cubic yards of soil from a total area of 477,775 square feet, as well as cleaning out 18 catch basins (PAP-00367667). Completion of these excavations was reported in the *Certification of ECRA Soil Cleanup*, dated January 1986 (PAP-00372057). The planned excavation areas were determined in the *Amended Environmental Cleanup Plan*, dated July 1985 using action criteria for several parameters, including copper (170 mg/kg), lead (400 mg/kg), and PCBs (5 mg/kg) (PAP-00371881-2). This Plan attributed PCB contamination in soil at Areas 11, 12, 21, and 22 to the transformers at Buildings 21 and 170, and the surface soil PCB contamination at Areas 4, 5, and 6 to a concrete pad that was formerly used for storage of chemicals and petroleum products (PAP-00371886-89).

The following table shows the maximum concentrations of each COC, if analyzed, for each area identified for excavation, as well as the volumes of soil planned for excavation based on the action criteria. The table is adapted from Tables 2-2, A-1, A-6, A-7, and A-12 from the Amended Environmental Cleanup Plan, dated July 1985 (clean-up locations and volumes and results for contaminants sampled in each area; PAP-00371884, 931-47, 963-65, 976).

Excavations Planned in 1985				
AOC	**Volume removed (cubic yards)**	**Maximum Lead (ppm)**	**Maximum Copper (ppm)**	**Maximum PCBs (ppm)**
1	1,667	790	620	
2	463	760	600	
3	630	610	270	
4,5,6	7,424 (7,320 +104)	1,200	1,110	3,800
7	167	710	210	
8A,8B	974 (830+144)	360	450	
9	93	290	250	
11A,11B	1,068 (370+698)			89,000
14	89	1,200	240	
15*	889			
16,17	1,333	3,000	2,300	
21,22A	511 (459+52)	700	160	32.3
25	556	1,100	150	
26	89	290	170	
31	93	510	230	
33	6,963	2,000	12,000	
34	6,074	1,200	1,800	
37,38	796	1,400	600	
39	203	350	130	
44-2	36	520	130	
45-1,45-5*	904 (830+74)			
47	889	460	68	

Excavations Planned in 1985				
AOC	**Volume removed (cubic yards)**	**Maximum Lead (ppm)**	**Maximum Copper (ppm)**	**Maximum PCBs (ppm)**
Historic Fill Averages		*574*	*11.2*	
Historic Fill Maximums		*10,700*	*92.9*	

Blank cells indicate no analyses were performed for the contaminant.
*These AOCs did not have samples analyzed for COCs (PAP-00371931-47, 63-65, 76).
Note: the 2016 PA/SI/RI Report attributed metals contamination in site soil to historic fill (PAP-00367723). The maximum concentrations of lead in soil are all less than the maximum concentrations in historic fill. With the exception of AOC 47, copper concentrations at each area exceed the historic fill maximum concentration.

As documented in the 2016 PA/SI/RI Report, the site received No Further Action (NFA) status from NJDEP for all of the ECRA Areas of Concern (AOCs) identified in 1985 (AOCs 1 through 47), with the exception of the Former Drum Storage Area (AOC 4, 5, 6). The 2016 PA/SI/RI Report provided four closure letters from NJDEP in Appendix G, including the following:

- June 26, 1987; NJDEP states that Section 2 (Soil Cleanup) of the approved Cleanup Plan is complete (PAP-00372094).

- June 23, 1994; NJDEP states that NFA is acceptable for all soil areas of concern except Area 4-6 and ATT11 (PAP-00372095).

- July 8, 1997; NJDEP states that NFA is approved for the 20,000-gallon No. 6 fuel oil UST at Building 80 (PAP-00372098). The PA/SI/RI Report identifies this as AOC 8A (PAP-00367773).

- March 26, 1999; NJDEP states that NFA is approved for one 4,000-gallon gasoline UST and one 4,000 gallon diesel fuel UST (PAP-00372099). The PA/SI/RI Report identifies this as AOC 15 (PAP-00367774).

The 2016 PA/SI/RI Report identified additional AOCs at the site, and conducted investigations at several ECRA AOCs to confirm that remediation was performed to current standards (PAP-00367654, 70-73). It was concluded that the PAHs and metals detected in soils across the site could be attributed to Historic Fill (see discussion above), and most sites did not require further action. The following table defines the AOCs investigated in the PA/SI/RI, as well as the COCs for which further action was proposed.

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Status of Soil at AOCs after 2016 PA/SI/RI			
AOCs	**Description**	**AOCs with NFA Proposed**	**AOCs with Further Action Proposed (COCs)***
1, 2, 3, 19, 20, 24, 25, 26, 27, 28, 29, 30, 31	Exposed, disturbed soils containing demolition rubble or other materials	1, 2, 3, 19, 20, 24, 25, 26, 27, 28, 29, 30	31 (PCBs)
4/5/6, 16/17, 37/38, 39, 58	Former Drum Storage Areas	37/38, 39	4/5/6 (PCBs-as part of AOC 75) 16/17 58 (PCBs-as part of AOC 31)
7, 12, 15, 71	USTs	15, 71	7 (naphthalene) 12
8A/8B	Building 80 & 81 Powerhouse Day Tank and Drum Storage Area	8A/8B	
11A/B, 21/22A, 21/22B, 50, 62	Transformers	21/22A, 21/22B, 50, 62	11A/B (PCBs)
14	Undisturbed background; area never subject to development or site operations	14	
18	Liquid Chemical Transfer Location	18	
43, 44, 45, 47	ECRA Unoccupied Areas	43, 44, 45, 47	
48/49	ECRA (unknown concern)	48/49	
51	Former Chilled Water System	51	
52	Powerhouse Coal Fines	52	
53	Building 170 Plating Operations	53	
54	Building 170 Outdoor Waste Tanks	54	
55	Subsurface Plating Waste Lines	55	
56A, 56B	Liquefied Petroleum Gas ASTs	56A, 56B	
57	Former Pond	57	
59	Fuel Oil Tanks	59	
61	Building 185 Plating Standby Tanks	61	
63	Historic Rail Lines, Loading/ Unloading Areas	63	
64	Historic Fill	64	
65, 66, 67	Manufacturing Buildings	65, 66, 67	
68	Lumber Storage Shed	68	
70	Powerhouse Buildings 80, 80A, & 81	70	
74	Waste Water Treatment Plant	74	
75	Historical Release		75 (PCBs)
76	Historic Pesticide Use		76
AOC Ford-1	Machine/Paint/Varnish/Body Assembly Buildings	AOC Ford-1	
AOC Ford-2	Print Shop, Chemical Storage – Assembly Plant East	AOC Ford-2	
AOC Ford-3	Chemical Storage - Assembly Plant East	AOC Ford-3	

Status of Soil at AOCs after 2016 PA/SI/RI			
AOCs	**Description**	**AOCs with NFA Proposed**	**AOCs with Further Action Proposed (COCs)***
AOC Ford-4	Automobile Assembly Building and Boiler Room	AOC Ford-4	
AOC Ford-5	Chemical Storage	AOC Ford-5	
AOC Ford-6	Boiler Room and Coal Storage	AOC Ford-6	
AOC Ford-7	Ford Assembly Building/Western Electric Company Building 170		AOC Ford-7 (PAHs, PCBs, metals)
AOC Ford-8, -9	Storage Buildings	AOC Ford-8, -9	
AOC Ford-10	Ford Warehouse Building	AOC Ford-10	
AOC Ford-11	Ford Rail Lines, Load/Unloading Operations	AOC Ford-11	

*No contaminants are identified if additional investigation is proposed for non-COCs. (PAP-00367772-791, 800-801)

At AOC 4/5/6, Former Drum Storage Area, ongoing investigations have been performed since it was initially excavated in 1985, including additional source area excavation and soil vapor extraction through 1993. The PA/SI/RI Report collected additional soil samples and concluded that the metals and PAHs detections were related to Historic Fill. Total PCBs detected at Area B9-6-1 are proposed to be addressed as part of AOC 75 (PAP-00367739-42).

AOC 7 included three 10,000-gallon No. 4 oil and diesel fuel USTs located south of Building 17 and below a paved parking area and roadway adjacent to recently constructed Building 19. Tanks 0001 and 0002 were abandoned in place around 1970, while Tank 0003 was abandoned in place on August 22, 2000. Results reported in the PA/SI/RI Report show naphthalene was detected in soil at a maximum concentration of 40 mg/kg (PAP-00367743-744, 837).

AOC 11 A/B was the location of an historical release of PCB-containing transformer fluids. Excavation was performed in 1985 to a depth exceeding 10 feet below ground surface (ft bgs) immediately adjacent to the Building 21 loading dock and along a former railroad line. The PA/SI/RI Report collected additional soil samples and PCBs were detected up to a concentration of 0.42 mg/kg (PAP-00367747-48, 990).

AOC 31 was an area of demolition rubble or other materials near former Building 170 and was previously excavated to 0.5 ft bgs under ECRA. The PA/SI/RI Report collected additional soil samples and concluded that the metals and PAHs detections were related to Historic Fill. Total PCBs were detected up to a concentration of 3.6 mg/kg (PAP-00367757-758, 998).

AOC 58 is the former Building 161 Drum Storage Area located south of Building 161 and an Oil Heater formerly located inside of Building 161. The function of the oil heater and contents of the drums were not known, but assumed to be related. The PA/SI/RI Report collected soil samples and concluded that the metals and PAHs detections were related to Historic Fill. PCBs detected AOC 58 were proposed to be addressed as part of AOC 31 (PAP-00367759-60, 64).

AOC 75 is comprised of several separate areas where PCBs were detected in areas located away from any likely historical operation and at concentrations that are not consistent with Historic Fill. At Area A5-2-1, total PCBs were detected up to 8.18 mg/kg; at Area B9-6-1, PCBs were detected up to 0.71 mg/kg; at Area C10-4-1, total PCBs were detected up to 3.9 mg/kg; at Area D7-5-1, total PCBs were detected up to 41.4 mg/kg; and at Area 17-2-1, PCBs were detected up to 0.671 mg/kg (PAP-00367764-69, 8003-8005).

AOC 76 refers to the past use of pesticides at the site. The following maximum concentrations were detected in site soil: DDT at 1.6 mg/kg, DDE at 0.72 mg/kg, and DDD at 0.4 mg/kg. Dieldrin was detected in one sample at a concentration of 0.0075 mg/kg (PAP-00367769, 887-889).

AOC Ford-7 is the location of the former Ford Assembly Building and Western Electric Building 170. It was the site of numerous historical manufacturing and assembly operations prior to its demolition in 1981. The PA/SI/RI Report attributed the detections of PAH, metals, and PCBs in soil to demolition materials related to Building 170. Maximum detections of COCs included PCBs at 1.39 mg/kg, copper at 201 mg/kg, lead at 1,000 mg/kg, mercury at 2.6 mg/kg, and PAHs up to 20 mg/kg (benzo(a)anthracene). (PAP-00367769-7771, 7850, 7869-70, 8006).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Occidental Chemical Corporation

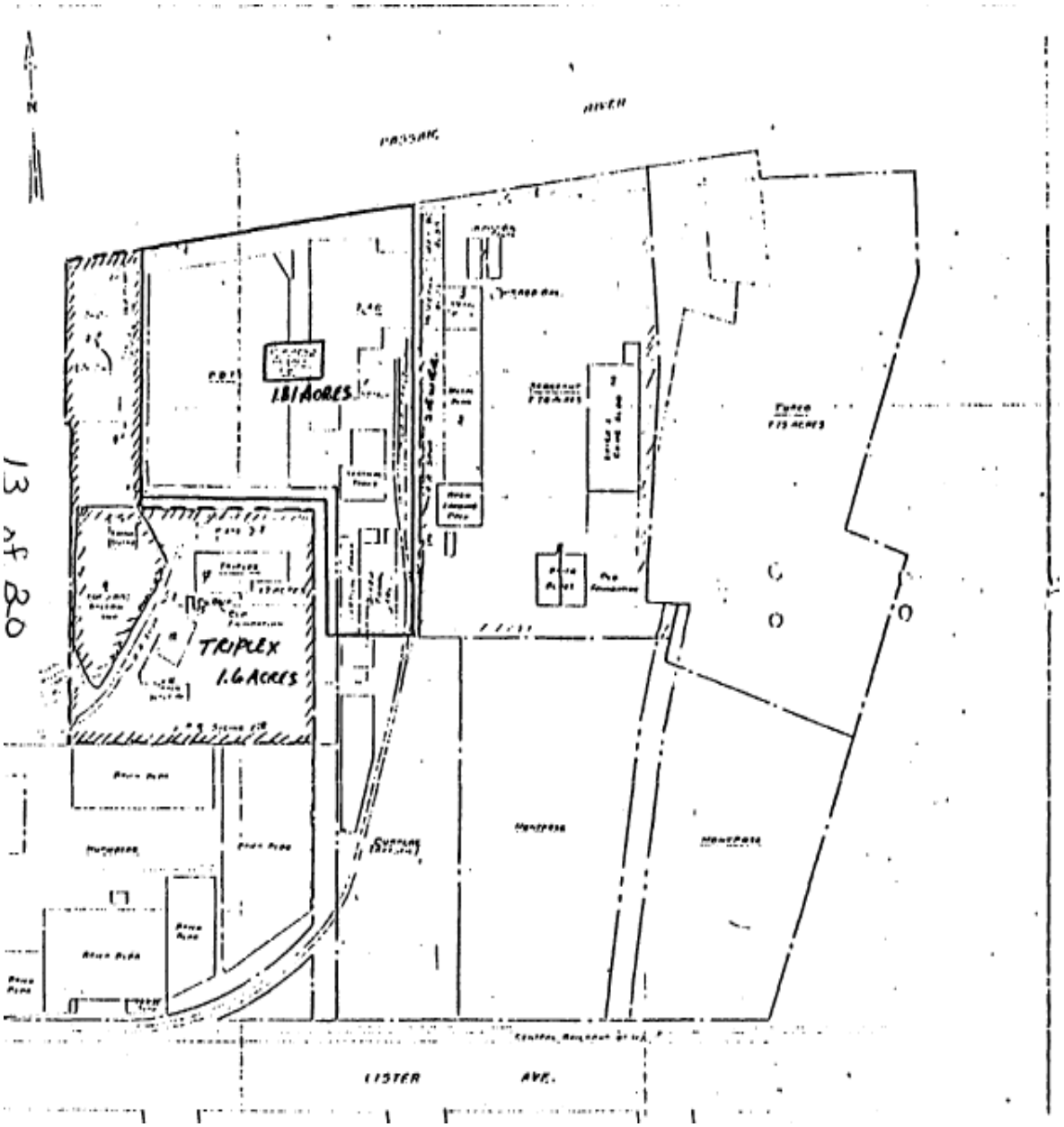
Diamond Alkali OU2 Allocation

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Facility Data Report

OCCIDENTAL CHEMICAL CORPORATION

Facility Name, Address and Size: Occidental Chemical Corporation (OCC), 80 and 120 Lister Avenue, Newark, NJ. The 80 Lister Avenue property is comprised of approximately 3.4 acres on the north side of Lister Avenue consisting of an approximately 1.81-acre parcel and an approximately 1.6-acre parcel (PAS-00126895, PAS-00126915). See the map below. The 120 Lister Avenue portion consists of an additional 2.2 acres (PAS-00091776) (80 and 120 Lister Avenue are collectively referred to herein as the Lister facility).



(PAS-00128481)

Occidental Chemical Corporation

Diamond Alkali OU2 Allocation

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Facility Data Report

1. **Business Type:** Chemical Manufacturing

2. **Time Period of Ownership/Operations**

Operator:	February 1946–August 1969
Owner 80 Lister 1.81-acre parcel:	February 1946–March 1971; January 27, 1986–August 1986
Lessor 80 Lister 1.6-acre parcel:	August 1957–March 1971
Owner 80 Lister 1.6-acre parcel:	January 27, 1986–August 1986
Owner 120 Lister 2.2-acre parcel:	April 19, 1984–August 1986

In 1946, American Agricultural Chemical Company subdivided the 80 and 120 Lister Avenue properties along the present property boundaries and sold the parcels. The 1.8-acre parcel (the northeast portion of the present site) was acquired by the Kolker Chemical Works, Inc. (Kolker), which operated it as an agricultural chemicals plant (PAS-00126895-96: PAP-00026393). Kolker operated the facility at 80 Lister Ave. from February 1946 until March 1951 (PAP-00159316; PAS-00126897). Diamond Alkali Company (later Diamond Shamrock Chemicals Company) operated the facility from March 1951 to March 1971 (PAP-00143159; PAS-00126897).

According to a Memorandum of Lease, starting July 29, 1957, Diamond Alkali Company leased the 80 Lister 1.6-acre parcel from Triplex Oil Refining Company, Inc. (PAP-00403492-94). Manufacturing ceased August 1969 (PAP-00143159). In March 1971, the 1.8-acre parcel was purchased by Chemicaland Corporation (PAS-00126899). Also in March 1971, the 1.6-acre parcel was sold to Walter Ray Holding Company and the lease for the parcel was assigned to Chemicaland Corporation (PAS-00128470; PAS-00126899).

A *1983 Overview of the History and Operations of the Site* prepared by Diamond and provided to the New Jersey Department of Environmental Protection (*1983 History and Operations Overview of Lister Avenue Facility*), states that after the plant and property were sold to Chemicaland "[i]t appears the plant was involved in the production of benzoic acid, with a small amount of 2,4,-D being manufactured for Diamond Shamrock for a limited time." (PAS-00128470; PAS-00126899–900).

According to the *February 1985 Site Evaluation for 80 Lister Avenue* prepared by Diamond Shamrock Chemicals Company for the New Jersey Department of Environmental Protection (*1985 80 Lister Avenue Site Evaluation*), "[i]n November 1976, while [Occidental Chemical Company was] considering acquisition of Chemicaland, [it] assumed control of the management of the plant and continued to manage the plant until February 24, 1977, when [it] returned control of the plant to Chemicaland. Because Chemicaland did not have the resources to continue operating without the support of Occidental, they laid off all plant personnel and shut down the plant as it was on the morning of February 24, 1977." (PAS-00126900).

William Leckie (the successor to Walter Ray Holding Company) purchased the plant and 1.8-acre property at a tax sale in 1980 and held the premises until 1981. Walter Ray Holding Company sold the property in early 1981 to Marisol, Inc. (PAS-00128470; PAS-00126900). According to the 1985 80 Lister Avenue Site Evaluation "[l]ittle is known of the use of the property by Marisol, but eventually this company started cleaning and clearing the site." (PAS-00126901). Regarding the cleanup, the 1985 80 Lister Avenue Site Evaluation states: "[t]he product left in the equipment when the plant was shut down on February 24, 1977, was removed and placed in drums, of which 570 remain on site today"; [s]ome equipment known to be on site following the site was removed"; "[w]arehouse space and tankage was leased to SCA Corporation which used it in conjunction with waste disposal operations at their neighboring plant." (PAS-00126901).

As documented by a deed dated April 19, 1984, Diamond Shamrock Chemicals Company acquired the property located at 120 Lister Avenue from E. M. Sergeant Pulp and Chemical Co., Inc. to assist with the cleanup of the Site (PAP-00403442; PAS-00091776**)**. Similarly, according to a deed, Diamond Shamrock Chemicals Company acquired the plant and property at 80 Lister Avenue from Marisol, Inc. on January 27, 1986 (PAP-00403433).

According to the Administrative Settlement Agreement and Order on Consent for Removal Action between EPA and Occidental Chemical Corporation and Tierra Solutions, Inc., the entity which operated the Diamond Alkali Facility from 1951 to 1969 was Diamond Alkali Company. It changed its name in 1967 to Diamond Shamrock Corporation, and again in 1983, to Diamond Shamrock Chemicals Company. Also in 1983 a corporation named Maxus Energy Corporation ("Maxus") became the owner of Diamond Shamrock Chemicals Company's stock (PAS-00033288; 296).

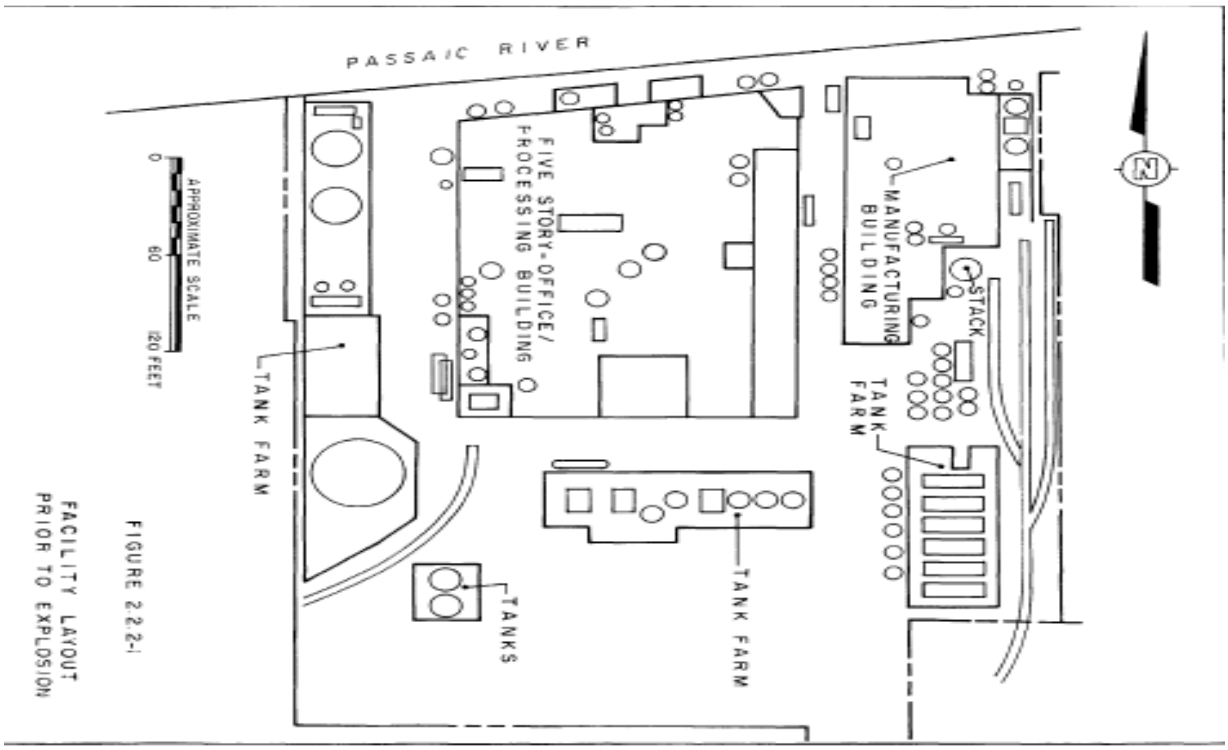
A 1989 signed Consent Decree between the United States, the State of New Jersey, Occidental Chemical Corporation, and Chemical Land Holdings, Inc. (1989 Consent Decree) states that on "September 4, 1986, Diamond Shamrock Corporation sold all the outstanding stock in Diamond Shamrock Chemicals Company to Oxy-Diamond Alkali Corporation, a wholly-owned indirect subsidiary of Occidental Petroleum Corporation. Diamond Shamrock Chemicals Company was then renamed Occidental Electrochemicals Corporation. Title to the Site had previously been transferred by way of an intra-holding company transaction to Diamond Shamrock Chemical Land Holdings, Inc., a wholly-owned indirect subsidiary of Diamond Shamrock Corporation. Effective November 30, 1987, Occidental Electrochemicals Corporation was merged into Occidental Chemical Corporation, a wholly-owned indirect subsidiary of Occidental Petroleum Corporation. On December 4, 1987, the name of Diamond Shamrock Chemical Land Holdings, Inc. was changed to Chemical Land Holdings, Inc." The 1989 Consent Decree also notes that Chemical Land Holdings, Inc., was a subsidiary of Maxus Energy Corporation (PAS-00091776-77).

3. Operational History/COC Use and Presence at the Facility

According to the *1985 80 Lister Avenue Site Evaluation*, industrial development on the site is reported to date from the 1870s. Drawings from 1914, revised in 1922, show the site to be part of the former Lister Agricultural Chemical Company (Lister) property that

extended for some distance along the Passaic River. The report states that "During the period of ownership by Lister, the site reached its present dimensions following filling along the south shore of the Passaic River to form the northernmost 30 percent of the property. Much of the remainder of the site is also filled with the granular material reportedly used to fill the marshland that existed in the natural state. Several buildings were on the site, including the Lister power plant, which was later the chemical manufacturing building. The report also notes that when Lister ceased operations, the property was subdivided along the present property boundaries and sold. The 1.81-acre parcel was acquired by Kolker, which, by the mid-1940's, was operating an agricultural chemicals plant on the site (PAS-00126895-96).

According to the deposition of James Burke, an electrician that worked at the 80 Lister facility starting in January 1946, there were two buildings on-site during Kolker's operations--a 3-story brick building used to manufacture DDT (referred to in other documents as a 5-story building) and a 1-story brick building used to produce 2,4-dichlorophenoxy acetic acid (2,4-D) and 2,4,5-trichlorophenoxy acetic acid (2,4,5-T). He stated that these buildings had a common wall but maps from pre-1960 show two separate buildings as shown in the map below (PAP-00168275; PAP-00168285-88; PAS-00128471-72).



Pre-1960 Site Layout
(PAS-00126918).

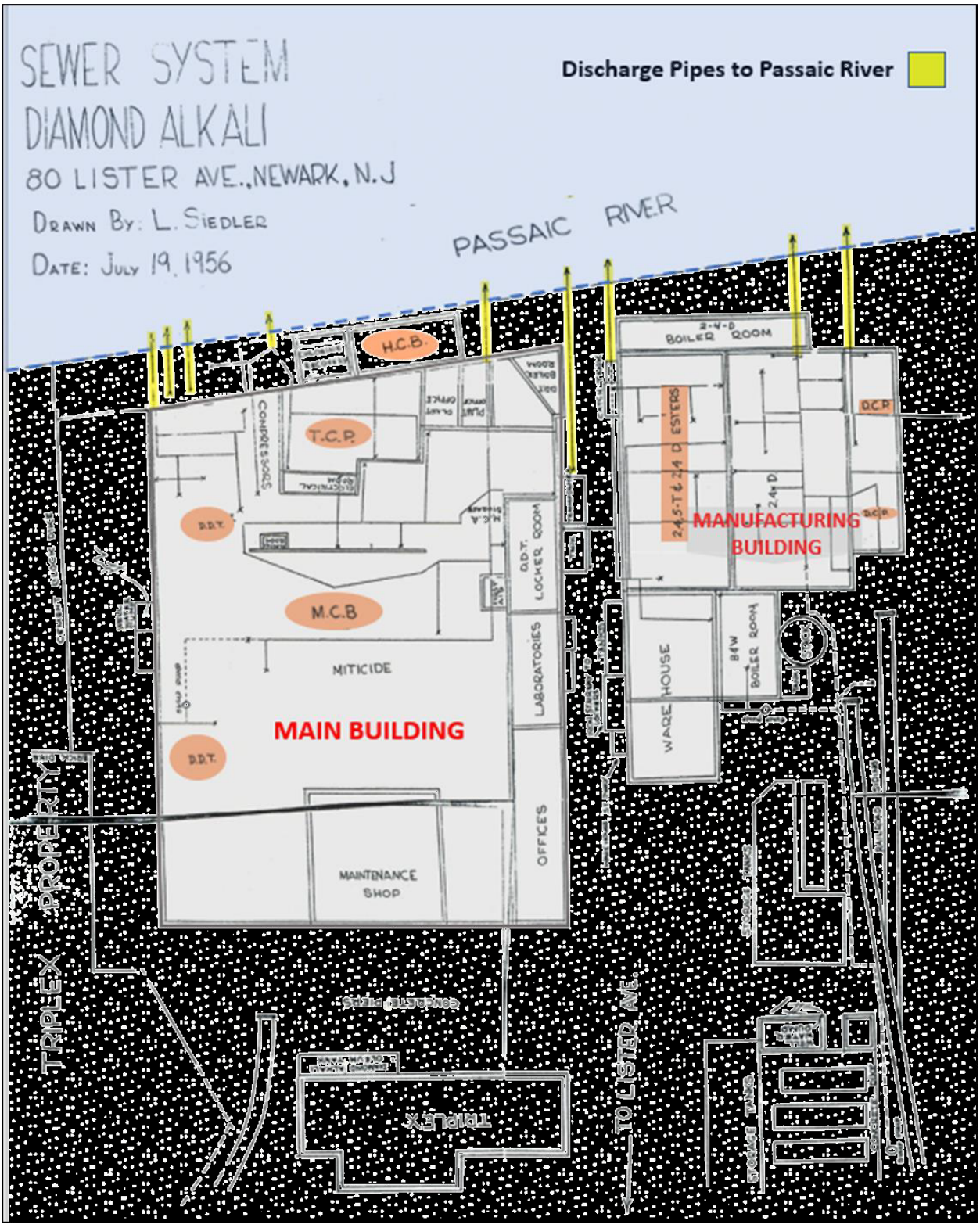
A 1956 map of the "Diamond Alkali 80 Lister Ave Sewer System," shows 9 sewer lines to the Passaic River. A copy of the map from the Parette expert report is presented below with the sewer line highlighted in yellow.

Occidental Chemical Corporation

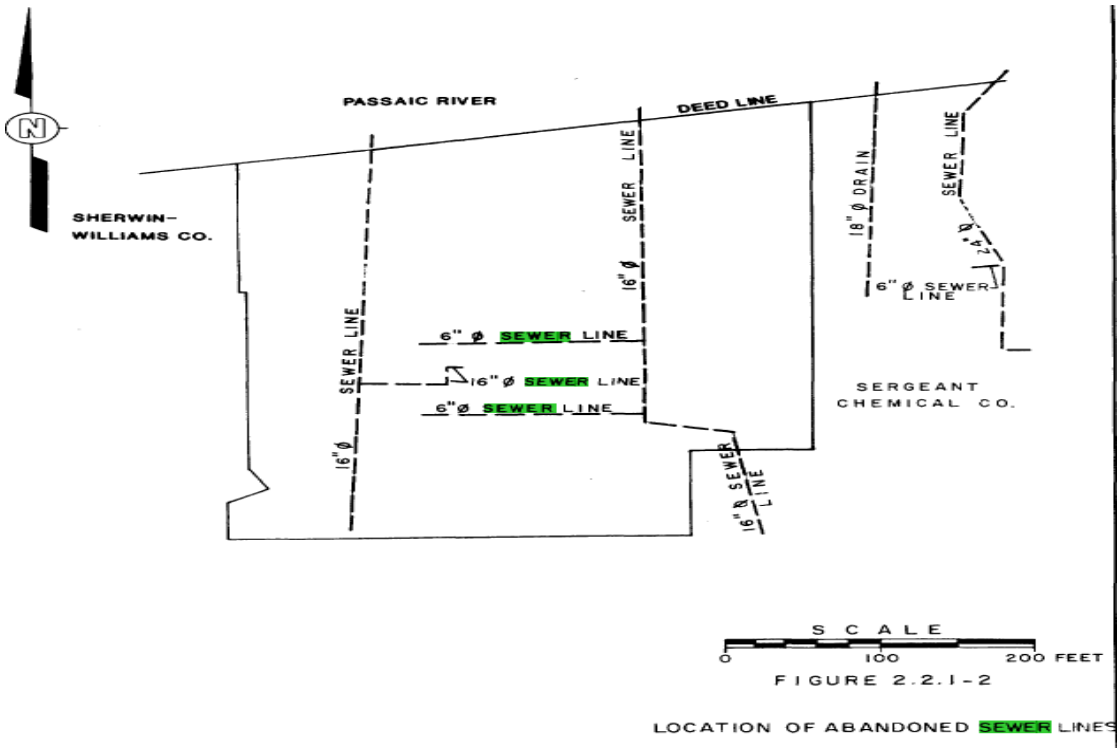
Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



For at least a portion of time, the site and adjacent property were traversed by a system of 16- to 24-inch sewers and drains leading to the Passaic River (PAS-00126895-96). See the map below showing abandoned sewer lines in 1984.



Abandoned Sewer Lines in 1984
(PAS-00126917)

According to an October 23, 2015, *Expert Report by Cynthia Moomaw*, PE, of Geomega, Inc., prepared for Archer and Greiner, PC (legal counsel for OCC) (the Moomaw Report), Diamond occupied the facility from March 1951 to March 1971. Manufacturing ceased August 1969. Chemicaland operated at the site from March 1971 to February 1977, pursuant to toll manufacturing agreements[1] with Diamond from September 1973 to September 1974, and Occidental Chemical Corporation (OCC) from September 1975 to February 1977 (PAP-00143159-60).

Kolker and Diamond Production History

According to a 1983 *Report Prepared by Review of Documents Received from Diamond Shamrock Company* by Marilyn Fingerhut and David Marlow at the National Institute for Occupational Safety and Health (Fingerhut and Marlow Report), Kolker operated the 80 Lister facility from “February 1946 until Diamond Shamrock acquired it by an exchange

[1] In a toll manufacturing arrangement, a company provides its raw materials or semi-finished goods to a third-party service provider. The service provider, who often has specialized equipment or infrastructure, provides a subset of manufacturing processes on behalf of the company using those materials or goods for a fee (Practical Law Company, Toll Manufacturing Transactions: Trade Secret and IP Protection, Bruce Goldner and Jonathan Hillel, Skadden, Arps, Slate, Meagher & Flom LLP, with Intellectual Property & Technology, 2013).

of stock in August 1951" (PAP-00159313; PAP-00159316). The *1985 80 Lister Avenue Site Evaluation* states that ownership by Kolker ceased in March 1951 when Kolker was acquired by Diamond Alkali Company (later Diamond Shamrock Chemicals Company) (PAS-00126867; PAS-00126897). As stated above, the Kolker and Diamond Escrow Agreement states that Diamond acquired all of the issued and outstanding shares of the capital stock of Kolker in August 1951 (PAP-00402324).

Kolker produced both dichlorodiphenyltrichloroethane (DDT) and phenoxy herbicides. Manufacture started with readily available raw materials and the principal intermediates were made on the site (PAS-00126896). The raw materials and finished products reported to have been handled during the time that Kolker and Diamond operated the plant are as follows (PAS-00126908):

Raw Material and Finished Products During Kolker and Diamond Ownership	
Raw Materials	**Finished Products**
Acetic acid	2,4,5-trichlorophenoxy acetic acid (2,4,5-T)
Acetic anhydride	2,4,5-trichlorophenol
Acetaldehyde*	2,4,6-trichlorophenol
Benzene*	2,4-dichlorophenol
Monochlorobenzene*	Monochloroacetic acid (MCA)
Tetrachlorobenzene	Hexachlorobenzene (HCB)*
Chlorosulfonic acid*	Dichlorodiphenyltrichloroethane (DDT)*
Methanol	p-chlorophenyl-p-chlorobenzene sulfonate (ovex)*
Oleum (20%)*	1,1,1-trichloroacetaldehyde*
Phenol	Benzensulfonyl chloride*
Sulfuric acid	p-chlorobenzenesulfonyl chloride*
Dimethylamine (DMA) (40%)	p-chlorobenzenesulfonamide*
Triethylamine	4,4' -dichlorodiphenylsulfone*
Chlorine	p-acetylaminobenzene sulfonyl chloride*
2-Ethylhexanol	p-methoxybenzene sulfonyl chloride*
Butyl alcohol	1,2,4,5-tetrachlorobenzene*
Isopropyl alcohol	Amine salts of 2,4-D (dimethyl and triethyl amines)
Butoxyethoxypropanol	Amine salts of 2,4,5-T (dimethyl and triethyl amines)
Nicotine*	Esters of 2,4-D (butyl, 2-ethylhexyl, isopropyl, butoxyethoxypropyl)
Sodium Hydroxide	Esters of 2,4,5-T (butyl, 2-ethylhexyl, isopropyl, butoxyethoxypropyl)
	Amine salts of Noleyl-1,3-propylenediamine
	Nicotine sulfates*
	Muriatic Acid
	2,5-dichlorophenyl-p-chlorobenzene sulfonate*

* = raw materials and products not used or made after an explosion in February 1960

Other chemicals produced and/or utilized at the site include pentachlorophenol, Velsicol AR-50G, kerosene, and heavy aromatic naphtha (PAP-00399355; PAP-00142894; PAP-00402810).

Diamond's 1983 History and Operations Overview of Lister Avenue Facility states that all of the manufacturing took place on the 1.8-acre parcel. Additionally, in April 1960, 1.6 acres of property were leased from Triplex Oil and Refining Company (subsequently Walter Kay Holding Company and eventually William Leckie) and this property accommodated storage facilities and warehouses. Other property associated with the plant was a parking lot leased in 1963 from Sergeant Chemical Company (PAS-00128468; PAS-00128470).

In March 1971, the 1.6-acre site was sold and the associated lease was assigned to Chemicaland Corporation. Principals of Chemicaland were George W. Mitchell and Raymond A. Guidi, a former plant manager of the facility. The plant was involved in the production of benzoic acid, with 2,4-D being manufactured for Diamond Shamrock for a limited time. In 1980, the 1.8 acre site was purchased in a tax sale by Mr. William Leckie (Ray Holding Company) and was subsequently sold to Marisol Company in early 1981 (PAS-00128470).

According to the *1985 80 Lister Avenue Site* Evaluation, "The production units were cleaned out as they were shut down, and between September and December 1969 the remaining raw materials and products were sold and shipped" (PAS-00126899). However, as described in Section 7, equipment left on site was found to be contaminated with dioxins (PAP-00164662).

Volume

According to the *1985 80 Lister Avenue Site Evalu*ation "[t]he principal products made on site by Kolker were DDT and the phenoxy herbicides with estimated total output of 100 and 110 million pounds, respectively. Production of other products is not believed to have significantly exceeded 10 million pounds." (PAS-00126896). A 1985 internal Diamond memo regarding production volume from the Lister Plant states that "DDT was the most important product of the plant prior to the transfer of its manufacture to Texas in 1958–59. Annual production reached 8–10 MM lbs. at one time and total output was near 100 MM lbs." (PAP-00402822-23). As noted above, Diamond began operating the plant in 1951 (PAP-00143159; PAS-00126897).

Estimated output of the major products reportedly produced by Kolker and Diamond is presented in the following table from the 1985 80 Lister Avenue Site Evaluation (PAS-00126909). While the 1985 80 Lister Avenue Site Evaluation states that these production numbers are for Kolker, it is believed these amounts include Kolker and Diamond operations combined, as indicated in the following tables.

Chemical Produced By Kolker and Diamond	
Product	**Estimated Total Production**
2,4-D	85 million pounds
2,4,5-T	25 million pounds
DDT	100 million pounds
HCB	10 million pounds
Ovex	10 million pounds
Lindane	Unknown
Low y-BHC	<10 million pounds

Note that, while Lindane and BHC are listed in the *1985 80 Lister Avenue Site Evaluation*, the deposition testimony from Stanley B. Honour, a Kolker/Diamond employee from December 1951 to February 1979, states that the Lindane process "was not used at Newark," but rather "was used at the plant at Greens Bayou" (PAP-00403321; PAP-00403316-17; PAP-00403400).

When operated by Kolker and Diamond, the production capacity of TCP and 2,4,5-T acid was as follows (PAS-00128479):

Date	TCP (MM lb/yr-approximate)	2,4,5-T Acid (MM lb/yr-approximate)
January 1951	0.5	0.65
February-March 1953	1.5	2.0
February 1961	1.9	2.5
November 1967	2.3	3.0

Lister site production data for the major phenoxy herbicides is as follows:

YEAR	2,4,5-T (lb/yr)	2,4-D (lb/yr)
1951	NA	NA
1952	342,132	NA
1953	305,868	NA
1954	244,704	NA
1955	526,488	NA
1956	508,032	NA
1957	747,612	NA
1958	762,492	NA
1959	912,840	NA
1960	564,972	5,200,000
1961	1,206,222	4,400,000
1962	1,301,754	5,400,000
1963	1,472,813	5,000,000
1964	1,343,877	6,200,000
1965	685,427	6,300,000
1966	678,674	7,900,000
1967	1,456,692	6,300,000
1968	2,864,487	10,000,000
1969	84,207*	571,126*
1970	0	--
1971	0	0
1972	0	0
1973	0	NA
1974	0	Limited quantities
1975	0	4,077,500 toll period (year) 300,000 (April-June total) 409,500 (October 1-December 5 total)

NA=data not available; Lb/yr = pounds per year unless otherwise noted; * = Average monthly value (pounds per month from 11/68 to 1/69) (PAP-00143186; PAP-00394457; PAP-00400518; PAP-00142922).

According to Maxus Energy Corporation's original complaint against the United States in *Maxus Energy Corporation v. United Sates*, Case Number 3:92CV1655-X (Maxus Complaint), commencing in 1961 and continuing through 1968, Diamond produced and delivered to the United States over 820,000 gallons of Agent Orange pursuant to contracts with the Defense General Supply Center, the Defense Fuel Supply Center, the U.S. Army, or the U.S. Air Force (PAS-00058776).

According to correspondence from an attorney representing the United States Army in the litigation brought against it by Maxus, the United States entered into contracts with Diamond for the production of Agent Pink, Purple and Orange as follows:[2]

DATE	CONTRACT NO.	PRODUCT
11/21/1961	DA30-070-CML-1635 (also identified as NY-2-612)	Agent Pink
02/12/1963	NY-3-1237	Agent Purple
05/22/1963	NY-3-1695	Agent Purple and Pink
03/1964	08-635-64-194	Agent Orange
06/22/1964	DSA-6-6790	Agent Purple
08/18/1966	DSA-400-67-C-1297	Agent Orange
10/18/1966	DSA-400-67-C-2893	Agent Orange
05/08/1967	DSA-400-67-C-8642	Agent Orange
02/29/1968	DSA-400-68-C-4708	Agent Orange
05/09/1968	DSA-400-68-C-5898	Agent Orange

(PAS-00075269-71).

The correspondence also noted that between November and December 1966, the Department of Commerce advised Diamond that the United States would require all T-acid to be produced at Newark. In connection with the United States' consideration of whether to build its own facility for the production of Agent Orange, representatives of Edgewood Arsenal visited Newark in December 1966. The United States, simultaneous with its directive requiring Diamond to accelerate delivery of Agent Orange, acted to increase Diamond's Agent Orange production capacity. In February 1967, the Department of Commerce authorized Diamond to apply a DO-D4 priority rating to obtain equipment and material needed for the Newark Plant expansion. On September 8, 1968, the Department of Commerce's Business and Defense Services Administration (BDSA) notified Diamond that it was no longer required to deliver Agent Orange at a monthly rate of 55,000 gallons as previously required (PAS-00075269, 71).

[2] According to a *Plaintiff's [Maxus Energy Corporation] Proposed Findings of Fact and Conclusions of Law (Annotated)* Civil Action No. 3:92CV1655-X, the term "Agent Orange" means the phenoxy herbicide formulations "Agent Orange" (approximately 50% the n-butyl ester of 2,4-D and 50% the n-butyl ester of 2,4,5-T), "Agent Pink" (approximately 60% the n-butyl ester of 2,4,5-T and 40% the iso-butyl ester of 2,4,5-T), and "Agent Purple" (approximately 50% the n-butyl ester of 2,4-D, 30% the nbutyl ester of 2,4,5-T, and 20% the iso-octyl ester of 2,4,5-T) (PAP-00182624).

A 1983 letter from Diamond to EPA, states that 702,185 gallons of Agent Orange were manufactured from October 1966 to October 1968; and 9,775 gallons of Agent Orange were manufactured in April 1964. It presents the following data regarding sales of product in pounds from 1960 to 1967:

Sales of Product in Pounds (Technical Equivalent)							
	July-June 1960-1961	July-June 1961-1962	July-June 1962-1963	July-June 1963-1964	July-June 1964-1965	July-June 1965-1966	July-June 1966-1967
T-Acid	156,908	250,342	430,355	484,705	145,854	302,569	---
Isopropyl T	22,049	45,253	38,529	84,769	141,803	8,708	31,856
Butyl-T	34,447	403,947	484,640	258,712	241,171	71,923	1,139,271
EH-T	580,343	885,688	996,687	738,791	510,523	459,344	431,788

(PAS-00075501).

An April 1960 Diamond memorandum states that the Lister facility was producing approximately 2,000 tons of 2,4-D per year with a yield slightly less than 60%. According to the memorandum, they were discarding approximately 400 tons of 2,4-D per year with at least three quarters in the form of 2,6-dichlorophenol, 2,4-dichlorophenol, and 2,4,6-trichlorophenol, consisting of about 110 tons of chlorophenols. The memorandum also estimated that they lost 50 tons of 2,4-D acid, 2,4-D sodium salt and 2,4-D esters. The 2,4,5-T effluent was noted to be generally similar to 2,4-D, but only approximately one quarter the amount. The effluent consisted mostly of trichlorophenols with some 2,4,5-T acid and 2,4,5-T esters (PAP-00155169-70). At the *Aetna* trial (PAP-00145100), John Burton testified to corrected discharge calculations of 852 tons of 2,4-D acid equivalent, 471 tons of chlorophenols, and 213 tons of 2,4-D acid, 2,4-D sodium salt and 2,4-D esters (PAP-00145135-38).

DDT Production (1946-1958)

Kolker and Diamond produced DDT in the five-story, approximately 50 year-old main building located adjacent to the Passaic River[3] (PAP-00167643-4; PAS-00128471). DDT was produced from February 1946 until August 1958. A table in the 1983 Fingerhut and Marlow report states Kolker had yearly production capacity of 100 MM pounds (PAP-00142913). This is contradicted by a 1985 Diamond memo that states "annual production reached 8-10 MM lbs. at one time and total output was near 100 MM lbs." (PAP-00402823). The 1985 80 Lister Avenue Site Evaluation also reports a total output of 100 MM lbs. (as opposed to an annual output of 100 MM lbs.) (PAS-00126896), and that DDT production was then subsequently moved from Newark to Texas in late 1958 or early 1959 (PAS-00126897).

[3] According to Diamond's 1983 History and Operations Overview of Lister Avenue Facility, during the 1951-1960 period "[m]anufacture of starting and intermediate chemicals was" also conducted in the main building (PAS-00128471-72).

As described in Section 5 below, DDT was directly discharged to the Passaic River in multiple ways including:

- As a result of the discharges of spent oleum (used in the manufacture of DDT) to the LPR. (1) Some amount of the liquid DDT/chlorobenzene mixture in the reactor was directly discharged to the Lower Passaic River with the spent oleum as operators relied upon a color change in a sight glass (red oleum to hazy to white) to determine when to close the valve. (2) Some amount of DDx would also be dissolved in the spent oleum which was directly discharged to the Lower Passaic River (PAP-00399543-57; PAP-00399561-2; PAP-00143633-9; PAP-00158345).

- Direct release through sewers (i.e., floor trenches in manufacturing buildings) from floor washing and DDT material spills (PAP-00167786-88; PAP-00155385-86; PAP-00155405; PAP-00155436; PAP-00160985; PAP-00394773-74).

- Dumping of good and bad batches of DDT in the river (PAP-00160328-29; PAP-00145264-65). Nicholas Centanni, who worked for Kolker and Diamond at the Lister Plant from 1948 to 1969, testified that "[s]ometimes . . .an operator . . . instead of letting just the acid go to the river, something would distract them or he'd put the valve in the wrong position and he would send DDT, acid and everything to the river." (PAP-00145264).

These DDT discharges from the site resulted in the formation of a large pile of DDT wastes in the LPR (PAP-00145264-65; PAP-00155439). Employees were sent into the river in boats and with rope harnesses to chop the DDT pile down below the water line (PAP-00143643-47; PAP- 00159660; PAP-00160322–23).

2, 4-D and 2,4,5-T Production (1949-1969)

Kolker and Diamond produced 2,4-D and its derivatives in a second building. Production of 2,4-D was carried out in batches by the alkaline condensation of the 2,4-DCP and monochloroacetic acid (MCA) in the presence of caustic soda. The resulting sodium 2,4-D slurry was filtered and washed to remove unwanted sodium 2,6-D which was discarded. The sodium 2,4-D was then continuously acidified with sulfuric acid, washed to remove sodium sulfate, and dried in an evaporator. The resulting anhydrous, molten 2,4-D was stored for later flaking or for use in the preparation of the various 2,4-D esters or Dacamines (a proprietary line of oil-soluble amines) (PAS-00126903).

A November 22, 1949 Kolker memo with the subject "Preparation of 2,4,5-Trichlorophenol" describes "work done to date on the preparation of 2,4,5-Trichlorophenol as a basis for plant production." The temperatures used in the laboratory ranged from 160 to 180 °C (PAP-00167168-72).

A 1951 Diamond document indicated that Kolker had sales of 2,4,5-T esters amounting to $278,997 for the fiscal year which ended January 31, 1950. A May 1950 article states that Kolker was producing 2,4,5-T at the site (PAP-00400305). One of the raw materials, tetrachlorobenzene (TCB or T4CB) was also produced on site because it could not be purchased at that time (PAP-00167644-47; PAP-00167658).

After acquiring Kolker in 1951 until July 1969, Diamond manufactured the phenoxy herbicides 2,4-D and 2,4,5-T, at the 80 Lister facility (PAS-00058771). Production of 2,4,5-T was carried out by an analogous process to that used for the manufacture of the 2,4-D. All components of the process for manufacture of 2,4,5-T were operated in the same manner as those for 2,4-T, although at slightly different temperatures and pressures (PAS-00126903).

In a 1987 deposition, John Burton, a plant manager at the Lister facility for both Kolker and Diamond, stated that, from approximately 1951 to 1953, Diamond used the same equipment to produce both 2,4-D and 2,4,5-T (PAP-00167686-87). The Moomaw Report states that "Diamond's use of the same process equipment to manufacture 2,4,5-T and 2,4-D would have likely introduced dioxin into this 2,4-D equipment and any 2,4-D equipment used in the process downstream of this equipment." In addition, Diamond produced 2,4-D and 2,4,5-T esters and amines in the same reactor. The Dacamine reactor, which was used to produce both 2,4-D and 2,4,5-T Dacamines by Diamond was later used by Chemicaland in their 2,4-D production (PAP-00143149; PAP-00143160).

TCP

TCP production was started in 1950 in the main building. A 500-gallon autoclave was purchased for the production of TCP. One of the raw materials, tetrachlorobenzene (TCB) was also produced on site, as it could not be purchased at that time (PAP-00167643-47; PAP-00167658; PAP-00167666). Laboratory work pertaining to the production process of TCP was also conducted on the first floor of the main building beginning in 1949 (PAP-00167645).

According to the Maxus Complaint, Diamond prepared the TCP, the intermediate used to produce 2,4,5-T, in a heated autoclave using the starting ingredient TCB. During that step, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)[4] was formed in trace amounts as a result of side reactions that occurred in the autoclave (PAS-00058771). A second autoclave with a volume of 1,000 gallons was added in 1953 (PAP-00167666).

TCP was produced at the site from 1,2,4,5-tetrachlorobenzene (T4CB), sodium hydroxide (NaOH), and methanol in the autoclave. NaOH and methanol would combine to form sodium methoxide, which reacted with T4CB to form the intermediate product 2,4,5-trichloroanisole (TCA). TCA would then react with another molecule of sodium methoxide to form TCP. In the autoclave and TCP storage tanks, the TCP would

[4] Note that "**dioxins**" are referred to in this report using the various terms consistent with that presented in the document cited. These terms include dioxin; tetrachlorodibenzo-p-dioxin (TCDD); 2,3,7,8-TCDD; polychlorinated dibenzo-p-dioxins (PCDD); and polychlorinated dibenzofurans (PCDF). Also note that 2,4-D (2,4-dichlorophenoxy acetic acid), 2,4,5-T (2,4,5-trichlorophenoxy acetic acid), and 2,4,6-TCP (2,4,6-trichlorophenol) are products that can result in the generation of dioxins as discussed in this report.

actually be present as its sodium salt (Na-TCP) which was soluble in water. TCP produced at the site was combined with NaOH and monochloroacetic acid to produce the herbicide 2,4,5-T. 2,3,7,8-TCDD contained in the TCP was carried through to the 2,4,5-T process (PAS-00126901–02; PAP-00210489-90). Esters and amine salts of 2,4,5-T were also made (PAS-00126903).

As reported by Diamond in its 1985 80 Lister Avenue Site Evaluation, NaTCP was made in a batch reaction by the alkaline hydrolysis with caustic soda of T4CB in the presence of methanol at temperatures and pressures near 165 °C and 350 psig, respectively. Methanol was distilled from the reaction mass and recycled (PAS-00126901-2). However, plant operating instructions called for use from 180 °C to 186 °C, and this temperature range was maintained from June 1954 to September 1954 (PAP-00159096). Temperatures in Diamond's autoclave ranged from 164 °C to 180 °C in 1966 to 1969 (PAP-00143163). John Burton states that the autoclave was run at temperatures from 160 °C to 172 °C (PAP-00167737).

According to *Parette, et al. (2018)*, from 1949 until 1954, a "dilution-filtration" process was employed at the site to purify TCP for approximately five years until September 1954 (PAP-00210172). In this process, "2,4,5-TCP (coming from the autoclave following methanol removal) was diluted with water to a concentration of 5-10%. As 2,4,5-TCP was present as its sodium salt (Na-TCP), it was soluble in this added water. However, the unreacted organics, the raw material 1,2,4,5-tetrachlorobenzene (TCB) and the intermediate product 2,4,5-trichloroanisole (2,4,5-TCA), were dense and relatively insoluble. In the dilution-filtration process, the unreacted organics were allowed to settle out for a period of one hour, forming a sludge in the bottom of the dilution tank. . . . 2,3,7,8-TCDD is also a dense, relatively insoluble organic with a high octanol/water partition coefficient . . . , suggesting that it would have preferentially partitioned to, or concentrated in this organic sludge phase. The operating instructions for the dilution-filtration process indicated that the settled waste organic sludge was discharged to the LPR . . . .(PAP-00210172; PAP-00168381-5; PAP- 00149641-51; PAP-00159145-49; PAP-00155450-52.)

According to Diamond's *1983 History and Operations Overview of Lister Avenue Facility*, "all processing equipment for the manufacture of sodium NaTCP and other primary chemicals were located within the main building. Little information is available as to the exact location of the NaTCP equipment within the building . . ." Wastes produced in this process included a filter cake which contained water insoluble materials, such as T4CB, 2,4,5-trichloroanisole (TCA), and would likely trap any dioxin present in the reaction product. This process was replaced in 1954 with a steam distillation to remove TCB and TCA. Any dioxin present, because of its volatility, would also be removed either partially or totally. The distillate (organics) from this process step were stored for recycling in the future, subject to development of a process for their use. The first recycle of recovered organics from the steam distillation was made in December 1956 and was then made a routine operation (PAS-00128471-72).

Diamond's *1983 History and Operations Overview of Lister Avenue Facility* also states that liquid wastes from the process consisted of aqueous solutions of sodium chloride and sodium sulfate. Prior to October 1954, the aqueous solutions of sodium chloride

and sodium sulfate were separate. After this date, the process was modified such that the sodium chloride and sodium sulfate were discharged as a single solution from the 2,4,5-T acid process. Condensate (aqueous layer) from the steam distillation was the other liquid waste from the process. Muriatic acid was also produced as a by-product in the main process building from the hydrogen chloride produced in the chlorination of acetic acid/anhydride to monochloroacetic acid (MCA) and the chlorination of phenol to 2,4-dichlorophenol. This acid was produced in processes not related to the production of TCP and was generally sold to re-claimers (PAS-00128472).

An April 4, 1960 memo from John Burton, states that "[a]ll of our unsold muriatic acid is dumped in the Passaic. . . . In 1958 we dumped 2000 tons; in 1959 we dumped 4400 tons." (PAP-00155170.)

Beginning in October 1954 (one month after the switch from dilution-filtration to steam stripping to purify the Na-TCP), the plant discontinued the practice of acidifying the Na-TCP to remove the NaCl, and the NaCl was carried through to the Na-TCP storage tank and ultimately to the 2,4,5-T process (PAP-00159095-6).

During the late 1950's several process changes were instituted to improve the operating efficiency of the plant. Among these was a change instituted around 1956 to the TCP process to recycle TCA. A change in the handling of process effluent also occurred in 1956 with the installation of an industrial sewer connecting to the PVSC Lister Avenue line (PAS-00126897). See below for additional disposal information.

In 1967, "the basic process for preparation of NaTCP was not changed but provision was made for the removal of sodium chloride by filtration from the stream-stripped solution of NaTCP and the removal of dioxin 2,3,7,8-TCDD by adsorption on activated carbon . . . . The sodium chloride recovered in the filter was dissolved in water for disposal by the industrial sewer. The activated carbon in the adsorption column was treated with muriatic acid and hot water washes to remove iron hydroxide. These treatment solutions were then disposed of in the industrial sewer. Spent carbon was removed from the unit and handled by a disposal firm. The basic processes for manufacturing the 2,4,5-T acid, esters or amine salts were not changed." (PAS-00128473.)

The resulting NaTCP solution was then steam distilled to remove by-product TCA that also was recycled to the reactor. Following steam distillation, the NaTCP solution was diluted with water, and then passed through a carbon bed to remove dioxin. The purified but dilute NaTCP solution was then reconcentrated for use in the 2,4,5-T process by acidifying two-thirds of the stream, then separating the TCP from the water to raise the TCP content to 93 percent. This concentrated TCP was neutralized with caustic soda to reform the NaTCP and then mixed with the remaining third of the diluted NaTCP, yielding NaTCP of the correct concentration for use in the manufacture of 2,4,5-T (PAS-00126901-902).

Phenoxy Acids, Esters, Amine Salts and Formulations

The phenoxy acids, esters, amine salts and formulations were prepared in the separate smaller building located to the east of the main manufacturing building (PAS-00128471-72).

Esters of 2,4-D and 2,4,5-T

The production of 2,4,5-T esters involved the following steps:

- production of sodium trichlorophenol (NaTCP)
- reaction with sodium monochloroacetate to yield a sodium salt of trichlorophenocxyacetic acid
- trichlorophenocxyacetic acid was reacted with sulfuric acid to yield the 2,4,5-T with a suitable alcohol at the proper reaction conditions to give the corresponding ester or with a suitable amine to give the corresponding amine salt (PAS-00128470).

According to the *1985 80 Lister Avenue Site Evaluation*, the esters of both 2,4-D and 2,4,5-T were formed by batch reaction with the appropriate alcohol in the presence of sulfuric acid which acted as a catalyst. The alcohol and by-product water were distilled throughout the reaction and the alcohol was held for later reuse in the process. On completion of the reaction, the last traces of water were removed under vacuum, and the ester was then transferred to storage to await sale (PAS-00126903).

Amines of 2,4-D and 2,4,5-T

The *1985 80 Lister Avenue Site Evaluat*ion states that the water-soluble dimethylamine (DMA) salts of 2,4-D or 2,4,5-T were formed by the reaction of a water solution of DMA with either wet or dry 2,4-D or 2,4,5-T. The resulting amine salt solutions were adjusted for concentration and then stored for later sale. A proprietary line of oil-soluble amines (the Dacamines) was prepared by the reaction of N-oleyl-1,3 propylenediamine with either dry, molten D or T acids or the flaked acids (PAS-00126903).

2,4-DCP

According to the *1985 80 Lister Avenue Site Evaluation*, the direct chlorination of phenol in the presence of a ferric chloride catalyst was used to make 2,4-DCP. The reaction was carried out in batches at atmospheric pressure. Detailed chromatographic studies of the process to optimize the 2,4 content were correlated with the freezing point of the reaction mass, and the results were used as the routine means of process control. The 2,4-DCP was stored and handled as produced in the molten state (PAS-00126902).

MCA

The *1985 80 Lister Avenue Site Evaluation* states that MCA was made by the chlorination of a mixture of acetic acid and acetic anhydride in batches. Routine process control was again effected by measuring the freezing point of the product. MCA, similar to the 2,4-DCP, was stored and used in the molten state without dilution or purification (PAS-00126902).

MCB/T3CB/T4CB/DCB

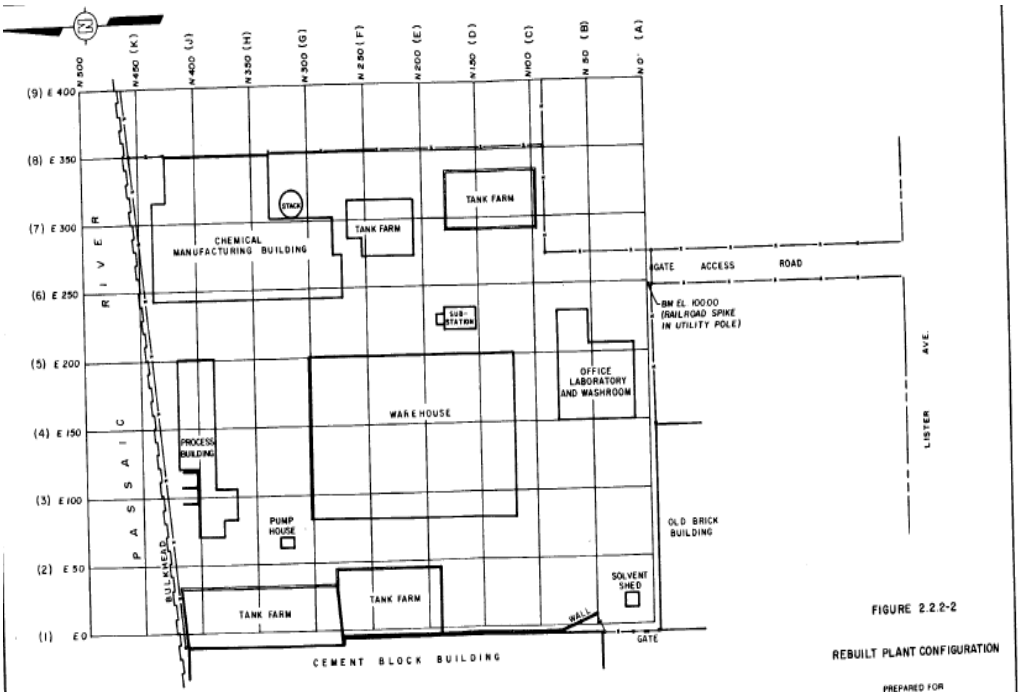
Monochlorobenzene (MCB) was used as a solvent and as an intermediate in the manufacture of DDT and other organic products (PAP-00398133). MCB was also produced at the site. In the production of MCB, dichlorobenzene (DCB) was produced, corresponding to ~10% of MCB. The DCB byproduct was utilized as a raw material in the manufacture of T4CB during the Kolker period of plant ownership. 1,2,4-trichlorobenzene (T3CB) was utilized as a raw material in the manufacture of 2,5-dichlorophenol, and 1,2,4-T3CB was also an impurity in the 1,2,4,5-T4CB that was utilized as the raw material in the production of TCP. A mixture of 1,2,4-T3CB and 1,2,3-T3CB was used at the site as a raw material in the production of HCB (PAP-00403438; PAP-00403533; PAP-00403534; PAP-00400425).

HCl

According to the *1985 80 Lister Avenue Site Evaluation*, HCl, produced as a by-product of the 2,4-DCP and MCA processes, was absorbed in water to form 32-percent muriatic acid, which was sold in the local area (PAS-00126901-903). This conflicts with the 1960 memo from Diamond plant manager Burton, which said “All of our unsold muriatic acid is dumped in the Passaic. . . .In 1958 we dumped 2000 tons; in 1959 we dumped 4400 tons.” (PAP-00155170).

1960 Explosion

The *1985 80 Lister Avenue Site Evaluation* states that during the period of operation of Diamond the manufacture of several products was either transferred to other locations or discontinued, leaving the phenoxy herbicides as the only products of the plant. A major impetus for this change was an explosion in February 1960 which destroyed several plant processes. When rebuilt the plant only included processes for the manufacture of the phenoxy herbicides and their intermediates. The layout of the plant site after it was rebuilt is shown below. Modernization and expansions continued during the 1960’s, which saw total phenoxy capacity more than double to 15 million pounds per year (PAS-00126897).



(PAS-00126919).

The February 1960 explosion occurred in the TCP unit and destroyed the large five-story building in which it and several other plant processes had been located. Following the explosion, a decision was made to limit future production of phenoxy herbicides, ending output of HCB, ovex and the benzene sulfonyl chloride derivatives (PAS-00126897-98).

According the *1985 80 Lister Avenue Site Evaluation*, since a larger site was required for rebuilding the plant, the adjacent 1.6-acre parcel was leased. This property, which had been used for reclaiming oil, contained several buildings and large tanks which were razed to permit installation of a new laboratory and office building, a maintenance shop/warehouse building, and a tank farm for flammable raw materials along the west side of the property (PAS-00126898).

Following demolition of the remains of the damaged building, a new process building devoted to the manufacture of sodium trichlorophenol (NaTCP), 2,4-dichlorophenol (2,4-DCP), MCA, and by-product hydrochloric acid (HC1) was erected along the river near what had been the north end of the old building. Following this construction, the manufacture of the intermediates was carried out in the new buildings, leaving the old undamaged chemical manufacturing building for the production of 2,4-D; 2,4,5-T and their esters and amines (PAS-00126898).

Diamond's *1983 History and Operations Overview of Lister Avenue Facility states*: "Two additional buildings separate from the process building were also provided. The largest of these housed the maintenance shop, production and shipping offices, and an area for materials storage. The smaller building housed the general plant offices, the quality control laboratory, and the dressing room. . . . Other improvements related to bulk

materials storage were also made at this time. The new process building was designed to have all drainage trenches discharge through a sump into the industrial sewer. The plant was expanded in 1967 by the addition of a new 2,4-D acid unit and conversion of the old 2,4-D acid unit to 2,4,5-T acid manufacture. The warehouse was expanded and an extension added to the Process Building to house the NaTCP purification process" (PAS-00128472).

The *1985 80 Lister Avenue Site Evaluation* described changes in the process and manufacturing buildings from 1963-1967 as follows:

> The process building remained largely unchanged—the only addition was equipment installed in 1967 to purify the NaTCP by removing dioxin. The period 1963 to 1967 saw several major projects in the 2,4-D and 2,4,5-T manufacturing areas including:
>
> 1963: The 2,4-D acid process was rehabilitated. The roof was raised permitting installation of new ventilating ducts to carry process fumes to a new and larger caustic scrubber.
>
> 1965: The melt, washing, and drying process for the production of dry, flaked 2,4-D was installed, with a 40 percent increase in capacity. These changes also reduced personnel contact with the 2,4-D.
>
> 1967: The final plant expansion saw the construction of a new and larger 2,4-D unit and the conversion of the former 2,4-D unit to the manufacture of 2,4,5-T. The TCP purification process for dioxin removal via carbon filtration was added as part of this same expansion. Capacity increased by 54 percent for 2,4-D and 67 percent for 2,4,5-T (PAS-00126898-99; PAS-00126910-11).

In August 1969, Diamond discontinued operation at the plant. The plant was listed for sale and remained idle throughout 1970 until it was purchased by Chemicaland Corporation in March 1971. Chemicaland purchased the 1.8 acres and improvements owned by Diamond, which then assigned rights to the 1.6 acres it had leased from Walter Ray Holding Company to Chemicaland (PAS-00126899).

According to the *Moomaw Report*, after unsuccessfully operating on their own, Chemicaland entered into a tolling agreement with Diamond from September 1973 to September 1974 to produce 2,4-D. The plant required repairs to bring it online, including replacement of missing equipment (e.g., flaker), repairs to piping in the dichlorophenol (DCP) and MCA areas, and replacement of tankage that was in poor condition (e.g., TCP storage tank may have been used to replace the sulfuric acid storage tank). Several pieces of equipment previously used to manufacture 2,4,5-T were repurposed by Chemicaland and used in the 2,4-D process. This repurposing of equipment and the potential cross-contamination of dioxin from the 2,4,5-T to the 2,4-D process was recognized by Diamond personnel who commented that "*We should be sure to assay the 2,4-D that is produced for any levels of Dioxin that might show up from use of the 'T' equipment . . . ."* (PAP-00143161- italics in original).

The *Moomaw Report* states that Chemicaland entered into a second tolling agreement with OCC to produce 2,4-D from September 1975 to February 1977, when manufacturing at the Lister Site ceased. The property remained idle through 1980 and eventually was sold to Marisol Inc. in March 1981. Marisol filled 570 drums with solid and liquid waste left in equipment when the plant was shut down in February 1977 (PAP-00143161).

Dioxin Producing Processes

The following table shows the chemicals for which the manufacturing process resulted in the production of dioxin (PAP-00208962):

Dioxin in Chemicals Manufactured at the 80 Lister Avenue Site	
Chemicals	**Component/Byproducts**
Agent Orange	2,4,5-T
2,4,5-T	NaTCP
NaTCP	TCA and TCB

According to *Parette, et. al. (2018)*, the 2,4,5-T "dilution-filtration" purification process used for approximately five years until September 1954 was a significant source of 2,3,7,8-TCDD to the Passaic River. This purification process generated a dioxin-rich sludge that was discharged to the river (PAP-00210169). Operating instructions for the 2,4,5-TCP process at the site for 1951 through 1954 indicated that 2,4,5-TCP (coming from the autoclave reactor following methanol removal) was diluted with water to a concentration of 5-10%. As 2,4,5-TCP was present as its sodium salt (Na-TCP), it was soluble in this added water. According to the article, the raw material 1,2,4,5-tetrachlorobenzene (TCB) and the intermediate product 2,4,5-trichloroanisole (2,4,5-TCA), are dense and relatively insoluble. In the dilution-filtration process, the unreacted organics were allowed to settle out for a period of one hour, forming a sludge in the bottom of the dilution tank. 2,3,7,8-TCDD is also a dense, relatively insoluble organic, suggesting that it would have preferentially partitioned to, or concentrated in this organic sludge phase. The operating instructions for the dilution-filtration process indicated that the settled waste organic sludge was discharged to the river. In the process, settled unreacted organics sludge was left in the dilution tanks. When sufficient sludge had accumulated to overflow, any remaining 2,4,5-TCP was extracted from this organic sludge by adding water and raising the pH. Following extraction of the 2,4,5-TCP, the unreacted organic sludge was discarded to the "sewer". In this context, "sewer" referred to a series of drain pipes leading from the buildings at the site to the river. In September of 1954, the dilution-filtration process was replaced by a steam stripping purification process to remove 2,4,5-TCA from the crude 2,4,5-TCP (PAP-00210172; PAP-00168381-5; PAP-00149641-51; PAP-00159145-49; PAP-00155445-52).

A report by Neil M. Ram, an expert retained by Repsol, S.A. in 2015 (Ram Report), states that 2,3,7,8-TCDD was present in both the NaTCP and 2,4,5-T that Diamond produced. In 1965, analysis of an unspecified number of samples of dilute TCP solution and 2,4,5-T (acid) yielded 2,3,7,8-TCDD concentrations up to 40 ppm. Samples of TCA (a recovered byproduct of NaTCP manufacturing) also exhibited measureable levels of

2,3,7,8-TCDD. Tests on an unspecified number of samples of undiluted (100%) TCP assayed later in 1965 yielded 2,3,7,8-TCDD concentrations ranging from 80 ppm to 140 ppm, while 2,4,5-T samples assayed later in 1965 yielded 2,3,7,8-TCDD concentrations ranging from 7 ppm to 26 ppm (PAP-00208934; PAP-00208962-63).

The *Ram Report* further states that in September 1967, Diamond Shamrock began treating all NaTCP produced, using an activated carbon adsorption column to remove 2,3,7,8-TCDD. As a result, 2,3,7,8-TCDD concentrations in the NaTCP and 2,4,5-T that Diamond produced from September 1967 to August 1969 (when plant operations were suspended) were reduced from those experienced prior to treatment. Six samples of NaTCP assayed in 1968 and 1969 (one per quarter) exhibited 2,3,7,8-TCDD concentrations ranging from 0.2 ppm to 9.0 ppm (PAP-00208962-63).

According to the *Ram Report*, although literature indicates that dioxin is not present in T4CB, dioxin was detected in samples collected from the former T4CB storage tank and from the T4CB rail car unloading line (PAP-00208962). The Ram Report states that documents indicate the presence of 2,3,7,8-TCDD in the TCB that Diamond used to manufacture NaTCP. Hooker Chemical Company (Hooker) supplied the T4CB and shipped it to the 80 Lister Avenue site via railcars, where it was subsequently unloaded into a T4CB storage tank at the facility via a dedicated unloading line. In or around 1991, 2,3,7,8-TCDD was detected at a concentration of 4,200 ppb, in a sample of residue collected from the T4CB storage tank (PAP-00208961-63; PAP-00208935).

The *Ram Report* also states that a second sample of the T4CB tank residue, collected in 1992, contained 13,000 ppb of 2,3,7,8-TCDD; another sample collected in 1992 from the T4CB unloading line contained 6.7 ppb of 2,3,7,8-TCDD. The lower 2,3,7,8-TCDD concentration in the unloading line (6.7 ppb) compared to that those in the storage tank (4,200 ppb and 13,000 ppb) was attributed to the absence of visible residue in the line (the sample “consisted primarily of pipe rust”) (PAP-00208961-63; PAP-00208935).

Dioxin in TCP and 2,4,5-T

A July 25, 1988 *Statement of Factual Premises* submitted on behalf of Diamond Shamrock Chemicals Company in *Diamond Shamrock Chemicals Company v. Aetna Casualty & Surety Co.*, Docket No. C-3939-84 (“DSCC’s *Statement of Factual Premises*”),states that all of the 2,4,5-T manufactured at the 80 Lister Avenue plant from approximately January 1951, when production began, through mid-1969, when production ended, contained dioxin (PAP-00149735-36).

Dioxin formation has been identified to occur in the production of TCP by the caustic hydrolysis of TCB. At the Diamond plant, this reaction was carried out in the autoclave reactor, a closed high-pressure vessel operated at a high temperature. The autoclave was located inside the process building before the 1960 explosion in the TCP unit, and outside of the new building after the explosion on the north side in concrete bunkers along the river (PAP-00143163).

According to a Diamond Interoffice memorandum, a survey of 31 autoclave batches from 12/28/53 to 6/7/54 indicated a plant practice of operating about 170°c with some batches as low as 160 c. Operating instructions called for 180-186 c. so this temperature range was maintained from 6/54 to 9/54 (PAP-00159096). Temperatures in Diamond's autoclave ranged from 164 to 180°C in 1966 to 1969 (PAP-00143163). John Burton states that the autoclave was run at temperatures from 160 to 172 degrees (PAP-00167737).

According to an internal Diamond memorandum dated September 18, 1957, a representative from C.H. Boehringer Sohn visited the Lister Plant in September 1957 and identified 2,3,7,8-TCDD as the likely chloracnegen and higher autoclave temperatures as the cause of dioxin generation in TCP production (PAP-00155172).

According to the *Moomaw Report*, Diamond started to look for ways to reduce dioxin in TCP and 2,4,5-T starting in approximately1965. Dilution and filtration of the TCP solution was tested from 1965 to 1967 with some success, but better results were obtained using activated carbon, which was pilot tested starting in September 1967. A permanent carbon column was installed in July of 1968. Testing that took place during the dilution and filtration period showed dioxin concentrations in TCP ranging from 6,500 to 140,000 ppb in the unfiltered samples, and from <1,000 to 90,000 ppb in the filtered samples. The majority of the data during this period ranged from ~5,000 to 60,000 ppb. During testing with the pilot and permanent carbon column, dioxin concentrations in unfiltered samples ranged from <1,000 to 19,000 ppb, and dioxin concentrations in the carbon filtered samples ranged from 200 to 9,600 ppb. Less data were collected for the final product 2,4,5-T, but the dioxin concentrations were generally within the same range for the filtered and unknown filtration categories. Dioxin concentrations in Diamond's Agent Orange, a ~50/50 mixture of 2,4,5-T and 2,4-D ranged from 50 to 17,000 ppb (PAP-00142931; PAP-00143163-64).

According to the *Moomaw Report*, dioxin was detected in samples taken in the process downstream of the autoclave, with 73,000 ppb detected in recovered TCA in 1965 and 75,000 ppb detected in waste from a sump north of the process building where TCP was produced in 1968 (PAP-00143164).

Agent Orange

According to the DSCC's *Statement of Factual Premises*, Agents Orange, Purple and Pink each contained the ester 2,4,5-T, which in turn contained the contaminant, dioxin (PAP-00149723). The statement notes that during manufacturing operations at the 80 Lister Avenue plant small quantities of dioxin were created as an unintended impurity in the manufacture of TCP, an intermediate chemical used to manufacture 2,4,5-T acid and other products (esters and amines) derived from 2,4,5-T acid. This resulted in dioxin being present as an impurity in all the 2,4,5-T acid and its derivatives which Diamond manufactured and sold and at the plant site and its immediate environment. Agent Orange and other Agents consisted of either mixtures of 2,4,5-T esters or mixtures of 2,4,5-T esters and an ester of another product, 2,4-D (PAP-00149735).

Dioxin and 2,4-D

According to the *Moomaw Report*, the EPA has identified the manufacture of 2,4-DCP and 2,4-D as having a possibility of being associated with halogenated dibenzo-p-dioxins (PCDD) because of the reaction of an orthohalogenated phenol at high temperature (≥145°C) and alkaline conditions. However, the direct chlorination process used by Diamond and Chemicaland to produce DCP was carried out at a low temperature and low pressure. Temperatures in Diamond's DCP reactor and 2,4-D reactor ranged from 73 to 110°C and 99 to 109°C, respectively, from 1966 to 1969. These temperatures were lower than the temperature postulated by the EPA and, therefore, not conducive to dioxin formation. Dioxin was not expected to be associated with and was not tested for in DCP or 2,4-D during Diamond's "p-dioxin" testing in 1960 (PAP-00143165).

The *Moomaw Report* states that in a review of literature, dioxin was not found in samples of 2,4-D, 2,4-DCP, or 2,6-DCP from the 1960s or 1970s with detection limits ranging from 10 to 1,000 ppb. By the 1990s, with improved method detection limits, dioxin was detected in a subset of 2,4-D samples of unknown origin at a maximum of 0.13 ppb, and was not detected in 2,4-DCP at a detection limit of 0.1 ppb (PAP-00143165). As noted above, however, the use of the same equipment for 2,4,5-T and 2,4-D resulted in dioxin in the 2,4-D.

Other COCs

An August 2004 *Pre-assessment Screen and Determination for the Diamond Alkali Superfund Site* issued by the NJDEP and the Natural Resource Trustees, concludes that PAHs, PCBs and metals present on the Diamond Alkali property are also a legacy of manufacturing operations. The report notes that the total PCB maximum concentration was 47.7 ppm in a Passaic River core slightly downstream of the Lister facility. It did not discuss PCB contamination at the Lister facility (PAP-00210437; PAP-00210452).

An analysis of a soil sample from the site, appearing in a 1987 paper published in the scientific literature, found pentachlorophenol (PCP) in a site soil sample at a concentration five to six times greater than measured for either TCP or 2,4-dichlorophenol (DCP) (PAP-00399864-9). OCDF and OCDD were measured in this same site soil sample at concentrations greater than that measured for 2,3,7,8-TCDD (PAP-00399864-9).

Dieldrin

It is possible that dieldrin was present at the facility as a plant drawing dated February 14, 1959, shows four vessels labeled "Black Leaf 40" (a nicotine-based insecticide) (PAP-00402810). In March 1955, Diamond formed Diamond Black Leaf Corp. with Virginia-Carolina Chemical Corp. (PAP-00397571)**.** The Diamond Black Leaf formulating plants were located in Richmond, Va., Louisville, KY, Montgomery, AL, and Waco, TX. (PAP-00397571). Black Leaf advertisement shows a pesticide with 5% dieldrin; however, there is also a Black Leaf 40 product next to this product that does not state that it includes dieldrin (PAP-00400429).

PCBs

According to a ChemRisk 1990 Progress Report, MCB, DCB, T3CB, T4CB, HCB, and chlorinated pesticides are "rated as having high or very high potential for PCB contamination" (PAP-00184827). MCB, DCB, T4CB, and HCB were manufactured at the site via the chlorination of benzene (or lesser chlorinated benzenes), and MCB, DCB, 1,2,4-T3CB, 1,2,3-T3CB, and T4CB were utilized at the site as raw materials in various chemical processes (PAP-00399570-72; PAP-00399606-07; PAP-00402886; PAP-00403437-39). A Diamond Process Memorandum shows that Diamond knew that PCBs were a "possible byproduct" in the manufacture of HCB (PAP-00403454). PCBs were detected in soils, sumps and tanks on site. In 2015, contaminated soil samples from the site were collected and analyzed for contaminants including PCB congeners. In two of the five soil samples from this study (designated as DWC-3-0608 and DWC-3-0406), PCB-209 was the dominant PCB congener, with its concentration estimated at 58 percent and 49 percent of the total PCBs respectively in these samples. In these same two samples, PCB-12/13 was the PCB congener with the second greatest concentration (PAP-00398173-88.)

Therefore, PCBs were generated at the site as byproducts during chemical production. As discussed below, the autoclave sump overflowed to the Passaic River and the main building where HCB was manufactured and sumps were never connected to the industrial sewer.

In addition, Monsanto sales records show the purchase of 5,000 pounds of 16 1050 200 transformer inerteen PPO by Diamond Alkali in 1967 (PAP-00207137). Inerteen coolant contained PCBs.

PAHs

Kolker is listed as a producer of naphthaleneacetic acid in a 1948 article in *Chemical Industries (*PAP-00401714; PAP-00401717)**.** According to a 1950 article in the Journal of the American Chemical Society, the direct condensation of naphthalene with MCA was a synthesis pathway that was used to produce α-naphthaleneacetic acid (PAP-00400430**).** As described above, MCA was produced at the Diamond facility as it was a raw material in the manufacture of 2,4-D and 2,4,5-T. The production of α-naphthaleneacetic acid occurred during the pre-1956 time period when the site was not connected to the industrial sewer and all effluents were discharged to the Passaic River.

A Diamond Chlorinated Products Division – Newark January 1, 1962 Standard Cost document, lists Velsicol AR-50G as a raw material for a brush killer formulation (PAP-00399447). According to a 1947 advertisement, Velsicol AR-50G, contained methylnaphthalenes and provided co-toxicant properties for DDT and other insecticide solutions (PAP-00401702). A 1959 plant drawing of the facility showed a tank designated "Solvent AR50G" next to a "DDT solution" tank (PAP-00402810).

According to a 1968 Diamond Interoffice Memorandum regarding Dacamine History, with new laboratory facilities in 1961, a Dacamine formula was developed containing 880 Solvent. This solvent was blended at the Newark facility and was a blend of kerosene

and heavy aromatic naphtha (HAN). In 1965, the 880 solvent was replaced by an all-aromatic HAN (PAP-00396638-39). The use of kerosene and 880 solvent is documented earlier also as a kerosene storage tank and an 880 solvent storage tank appeared in the 1959 plant drawing (PAP-00402810). Kerosene contains a number of PAHs.

120 Lister

According to a May 1985 *Site Evaluation, 120 Lister Avenue,* the 2.2-acre property located at 120 Lister Avenue is a former chemical storage and shipping facility. An investigation by the NJDEP and EPA in the spring of 1983 established that portions of the property were contaminated with 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), as was the adjoining property at 80 Lister Avenue (PAS-00125770; PAS-00125781).

During the period of ownership by Diamond of the adjoining 80 Lister Avenue property, Sergeant Chemical Company owned the 120 Lister Avenue property. The site was comprised of several major structures, including a brick building, a block building, and a tile building. The site was used by Sergeant to store, repackage, and distribute a variety of small-lot-quantity organic and inorganic chemicals (PAS-00125787-88). In November 1963, Diamond leased the parking lot from Sergeant. The lease was terminated when Diamond ceased production operations on the 80 Lister Avenue site in 1969 (PAS-00125787-88).

Recalcitrant Activities

In 1984, Diamond sued a number of its insurers in New Jersey Superior Court seeking coverage for environmental costs and property damage and personal injury claims (hereinafter referred to as the "*Aetna* litigation" or "*Aetna* trial") (PAS-00128423-24). Judge Stanton found that Diamond, as a matter of corporate policy, intentionally and continuously discharged dioxin, DDT, and other hazardous substances from the Lister Plant into the Passaic River during the entire period of its plant operations (PAS-00128449). Specifically, the trial court found that:

- "From 1951 to 1956, Diamond intentionally discharged all of its waste chemical effluent into the Passaic River." (PAS-00128425).

- In 1956, the Passaic Valley Sewerage District insisted that DSCC discontinue their discharges into the Passaic River and, in response, DSCC "purportedly tied its entire complex at the (Lister Plant) into an industrial sewer constructed by the Passaic Valley Sewerage Commission." (PAS-00128426).

- However, "(a)lthough Diamond purported to tie the whole (Lister Plant) into the sewer in 1956, it actually tied only the 2,4-D building into the sewer. The chemical effluent from the main building continued to be discharged directly into the Passaic River." (PAS-00128426).

- Those discharges "were intentional, planned discharges from processing equipment through pipes or ditches." (PAS-00128426).

- "In addition, from 1951 through 1969, spills onto floors and ground surfaces drained mostly into the Passaic River. These spills were constant, and, collectively, they were substantial in volume." (PAS- 00128426).

- "Diamond was conscious that its discharges into the (Passaic) (R)iver were illegal. It deliberately concealed them, and over a period of many years employed an alarm system to warn employees to stop the discharges when Passaic Valley inspectors were on the premises." (PAS- 00128426).

- "Over the years, discharges from the (Lister Plant) into the Passaic River included 2,4,5-T acid (and dioxin), caustic soda, DDT, sulfuric acid, TCP (and dioxin), muriatic acid and monochlorobenzene." (PAS- 00128426).

- "Housekeeping at the (Lister Plant) ranged from inadequate to poor throughout the entire period of its operation by (DSCC). . . . Spills of liquid and solid chemical products and wastes were literally continuous during every day of the plant's operations. Some pipes were always leaking." (PAS-00128427).

Walter Klosowski, who worked as a chemical operator at the Lister facility from July 1947 until 1953, stated in a deposition that "they would only clean up when they had an inspection" and that Mr. Kolker would notify the employees when there was going to be an inspection. According to Mr. Klosowski, "you faked everything" for an inspection and basically stopped working while the inspector was there so they did not see any materials get on the floor (PAP-00143640-42).

Mr. Burton noted in his 1987 deposition that "we didn't want to be caught violating the regulations" (PAP-00393948). In his 1988 deposition he explained that when an inspector checked in the receptionist would sound "I think it *was* three buzzes" on the inter-plant communication system which would alert the foreman and the operators that an inspector was at the plant. They would then take steps to see that anything going into the river at that moment was stopped (PAP-00159724-25). Mr. Burton also stated at the *Aetna* trial that he thought the alarm system was "a clever strategy" that he was "proud of" and it was a "joke within one echelon of the division" (PAP-00145115).

A deposition of Aldo Andreini who worked at the 80 Lister Avenue facility from 1955 to 1969 states that they were told not to "drop anything out to the river" when an inspector was there on a boat (PAP-00149596-98, 604, 607).

Arthur Scureman, a Lister Plant employee from 1951 until 1969, noted the following activities:

- He conducted early morning overtime work, which meant "put(ting) some stuff away in the river." He testified, "(a)nd I used to come in early, work overtime to drop it in the river because they didn't want the barges and everything going up and down see us dropping anything in the river."

- He further testified about the dumping of contents of barrels of waste material from the 2,4-D or 2,4,5-T Building into the Passaic River early in the morning while it was dark. Dumping occurred at night because Diamond management didn't want anybody along the river to see them dumping it. Employees were instructed to dump the unwanted product and waste slowly so that it would not later be visible in the water. He said that if a batch fouled up they would move it from the kettles that were maybe 500-1,000 gallons into drums and then get rid of it.

- Mr. Scureman also described his orders upon seeing the company's guard come in with inspectors, which was to "try and stop them so they don't go to the river front; and run in the building and the ester room and 2,4-D building and tell them to stop dropping all their stuff to the sewer, close off the valves." (PAP-00159632, 657-660, 670, 672).

In a July 10, 1956 memorandum regarding the "Newark Effluent Problem," Plant Manager Mr. Burton explained to B.D. Gleissner, an officer in Diamond's corporate office, prior to 1956 the Lister Plant had "rerouted our lines containing HCl to underneath the surface of the water so that they were never detected as a source of acid effluent." The memorandum continues:

> (PVSC) particularly specified that the 2,4-D alkaline filtrate would be satisfactory to go into the sanitary sewer, although at the time at least, they did not know about its high phenolic content. In general, I feel that if we clean up some of the materials which have some noticeable content of solids that we are not appreciably contaminating the river which has a tremendous flow at this point. The proof of this is our own planned river pump installation. The high phenolic content of our effluent however might some day be a serious problem if they try to make this an area where fish would live, but on the other hand they would first have to clean up the oil scum from the river which to date they have not been able to do. Nevertheless, in view of their strict rules which these various agencies have, we will have to continue to out-wit them as we have in the past or spend a substantial amount of money for neutralizing our effluent and for construction of a larger sanitary sewer out to Lister Avenue. Every year that we can stall this off we are saving ourselves a substantial amount of money and increasing the likelihood that we may have more land at that time to give us room to install some type of neutralization system. . . . Therefore, I think our fundamental position is safe at this location, although we may have to spend some capital and operating money to keep out of trouble if we are not able to continue to outwit the various agencies concerned with the Passaic River. In view of the recent activity of the (PVSC), we are going to study our effluent problem as much as time permits . . . and determine what we might do in the event that we are subject to really strict inspection and control (PAP-00143565-67).

A July 31, 1956 memorandum regarding the Newark Effluent Problem from Diamond's Central Engineering Department in Cleveland to John Burton states that "[e]vasive tactics are fine as long as they work, but discovery of such action by the Commission can lead to a change of attitude which could be serious" (PAP-00143600).

In addition, instead of tying the whole Lister Plant to the sanitary sewer as he told the PVSC, Plant Manager Burton informed his superiors of his plan to tie the 2,4-D process building to the sanitary sewer, but not the main building: "I think our best hope at this time is that we can keep out of serious trouble until we get our 2,4-D filtrate diverted to the local sewer and to hope that we will be able to get by with our various acidic effluents from the DDT, HCB and Miticide operations in our main building." (PAP-00396608).

In an October 16, 1957, Interoffice Correspondence from W. R. Taylor of Diamond's corporate office in Cleveland, OH to J. Burton, Mr. Taylor offered to talk to Mr. Burton prior to a meeting of the Water Pollution Committee of the Manufacturing Chemists Association about any problems or questions he wanted to bring up at the meeting. He offered to do this to reduce the possibility of "information leaking out that you and the company would rather not have outside our organization" (PAP-00143599).

A deposition of Chester Mysko, an employee at Diamond Shamrock, noted that he saw bad and good batches of product dumped into the Passaic River from the Lister plant and that this happened better than once a month. He also stated, "Anything could have been going on at night. That's when it usually went down in there anyway. They saved it until nighttime" (PAP-00161237). When asked if he noticed any difference between how much DDT was dumped into the river on different shifts he stated in trial testimony that it was done mostly at night. "If they had a bad batch it was at night. That's when there -- they clean their -- what do you call it on the boiler, the stack. They used to blow that. Everything was done at night." (PAP-00160328).

Health-Related Issues

Mr. Burton recalled that as early as 1950, Diamond's employees contracted a skin condition known as chloracne (PAP-00393911-12, PAP-00209828-29). According to the *Parette et. al. (2018)* article, not long after the dilution-filtration process was replaced by a steam stripping purification process in September of 1954, to remove 2,4,5-TCA from the crude 2,4,5-TCP, a chloracne outbreak occurred among the operators of the 2,4,5-TCP process at the facility (PAP-00210172).

At least by 1954, Diamond was aware that the chloracne was associated with the operation of the TCP production unit, specifically the autoclave (PAP-00144048). In his March 18, 1987 deposition, John Burton stated that they realized that the chloracne trouble was centered in the TCP unit. The individuals that operated the TCP unit were the first to get chloracne. He also noted that they had chloracne trouble in the 1950 to 1951 time period, which they blamed on making their own tetrachlorobenzene because of impure materials. However, the workers involved with the tetrachlorobenzene manufacturing would have also worked in the TCP unit (PAP-00167625; PAP-00167669).

According to *Supplemental Answers from Interrogatories*, from October 3, 1952 through October 24, 1968, 60 Diamond employees filed New Jersey Department of Labor (NJDOL) incident reports with respect to various dermatological conditions including chloracne experienced while employed at 80 Lister Avenue (PAP-00144040; PAP-00144046-47).

Nicholas Centanni, who worked for Kolker and Diamond at the Lister plant from 1948 to 1969, testified that he developed chloracne "around" 1955 (PAP-00149589); according to interrogatory responses, he was one of the individuals that filed a New Jersey Dept. of Labor incident report on April 29, 1953 for "various dermatological conditions, including chloracne" (PAP-00144046). Mr. Klosowski estimated that, 90 percent of the employees at the plant were experienced these conditions (PAP-00143679-80).

The *Supplemental Answers from Interrogatories* also states that after the 1955 chloracne outbreak, Diamond "installed improved ventilation in the production facilities and renovated the floors to facilitate cleaning and to improve housekeeping. Employees were informed of the necessity to be scrupulously careful to avoid contact with material within the process stream. TCP workers were issued fresh uniforms daily and were afforded an opportunity for a daily shower at 80 Lister Avenue on company time" (PAP-00144049).

Maintaining temperatures below 155°C to minimize the formation of dioxin was recommended by a German company producing TCP (PAP-00155172). A September 18, 1957 Diamond memorandum, regarding pentachlorophenol and chloracne, states that an individual from the company Boehringer visited the plant and stated that the production of TCP produced a very toxic chemical, 2,3,7,8-TCDD, linked to chloracne if the autoclave temperatures were above 155°C (PAP-00155172). The same memo states that "[i]t is quite likely that by dropping our reaction temperature 15° or more from . . . our current level of operation of 170° C, we may suffer a significant decrease in reaction rate and prolongation of our reaction cycle time. (PAP-00155172).

A Diamond employee in 1957 also diagrammed 2,3,7,8-TCDD and identified it as the cause of chloracne (PAP-00155172). A 1959 Diamond memo recognized that Diamond understood temperature to be the primary factor in the incidence of chloracne, but the memo did not indicate any plan to lower autoclave temperatures (PAP-00159618). Diamond found that higher autoclave temperatures created faster chemical reactions in the autoclave, which in turn lowered costs. However, the higher temperature also generated more 2,3,7,8-TCDD. In former Diamond plant manager Gordon Steward's testimony as a witness for Diamond in the *Aetna* litigation by Diamond against its insurers, he acknowledged that if Diamond had reduced the temperature in the autoclave, it would have reduced the production of dioxin, but also reduced the amount of product that was made (PAP-00144510, 523-526). Dr. T. W. Fraser Russell, Diamond's expert in the personal injury litigation by former Diamond employees and neighbors, opined that adopting Boehringer Sohn's suggestions "would have resulted in a far less productive and significantly less economic operation of the plant." (PAP-00455678-80).

A 1963 Diamond memo states that "[a]s long as [the Lister P]lant has been in operation, there has been a chronic problem in the employees hired of an acne condition which is referred to as chloracne. At one time, some 40 of these 72 workers in the plant were so affected with the chloracne." (PAP-00143596). In March 1963, a doctor from the United States Department of Health, Education, and Welfare investigated the plant and found "breaks in the process, evidenced by contamination of equipment, ceilings, floors, stairs, and hand railings, particularly in the old building." (PAP-00154191). The doctor recommended that every man in the plant be subject to testing due to chloracne (PAP-00210167). Harry Weiner of Diamond's corporate office rejected this recommendation due to his concern that a "disorganized group from a government agency entering the plant . . . might well result in very wide and unfair newspaper publicity as is usually done to sensationalize." (PAP-00143541).

According to DSCC's *Statement of Factual Premises*, Dow identified dioxin as the chloracnegen in 1965 and provided Diamond and others in the industry with a method to measure the very small quantities of dioxin present in the "T" process stream (PAP-00149741). According to DSCC's *Statement of Factual Premises*, thereafter Diamond attempted to devise a method to reduce or eliminate the dioxin present in its process stream. After other unsuccessful efforts, Diamond installed a carbon adsorption tower in 1967. Thereafter, the amount of dioxin present in the 2,4,5-T process stream at the 80 Lister Avenue plant was substantially reduced, although the amount that did remain was above the "action level" for dioxin that regulatory authorities eventually adopted in the 1980's (PAP-00149741).

4. Identified COCs

- PCBs (used, released, detected)
- Dioxins and furans (used, released, detected)
- PAHs (used, detected)
- DDT (used, released, detected)
- Dieldrin (detected)
- Mercury (detected)
- Copper (detected)
- Lead (detected)

5. COC Pathways

Effluents to Passaic River

On June 28, 1949, an inspector with the PVSC found Kolker was discharging "rusty scale and soda wash water" into the Passaic through floor drains. This was noted to be due to cleaning out of condenser tubes which was done once every 6 months. The report of this inspection notes that the owner "promised that he would divert the discharge into the sanitary sewer" going forward (PAP-00394464-65). A deposition of John Burton stated that the USACE also informed Kolker that its discharges were illegal (PAP-00167643; PAP-00167779).

An April 1960 Diamond memorandum from John Burton states that until approximately 1956 Diamond disposed of all of its plant effluents in the Passaic River. According to the memorandum, in approximately 1956, the PVSC officially objected to Diamond's pollution of the river and the company spent about $15,000 for a sewer connection to the Newark city sewer. The memorandum further states that "[s]ince that time, we run some of our effluents to each of these outlets." (PAP-00155169).

According to Mr. Burton in his October 17, 1988 deposition, there were several pipes projecting out from the river bulkhead and he believed that most of the individual sources of effluent each had its individual pipe that was connected to it that led to the river (PAP-00159710). Walter Blair, who worked as a pipefitter and mechanic at the Lister Plant from 1953 to 1969, stated that there were a "half dozen or so" pipes leading to the river (PAP-00160987).

According to the *1985 80 Lister Avenue Site Evaluation*, an easement was obtained to construct a 10-inch sewer under the Central Railroad of New Jersey tracks in January 1956. A sewer connecting the plant to the PVSC sewer was subsequently installed. The report notes that following construction, most process wastes were diverted from the river to the PVSC treatment plant (PAS-00126867**;** PAS-00126910). However, as stated in the 1960 memorandum referenced above only some of the effluent was sent to the PVSC (PAP-00155169).

Mr. Burton stated in his March 18, 1987, deposition that in 1956, the sewer line was connected only to the 2,4-D building. He noted that it would have been possible for us to have pumped some waste material from the main building to the sewer connection in the 2,4-D building, but he did not recollect doing that and said it was very probably they did not do it. In other words, the effluents from the trichlorophenol, DDT and monochloroacetic areas continued to go directly to the river after 1956 (PAP-00167625; PAP-00167786-88). The Lister plants post-1956 discharges were from its ongoing production of DDT and dioxin-generating chemicals in the Main Building as follows:

Chemical	Building	Years
DDT	Main Building	1956-1957
TCP TCP	Main Building Reconstructed Main Building	1956-1960 1960-1969
2,4,5-T	2,4-D Building (partially connected to PVSC)	1956-1969
2,4-D	2,4-D Building (partially connected to PVSC)	1956-1969

(PAP-00167625; PAP-00167786-88).

Diamond discharged TCP and 2,4,5-T contaminated wastewaters directly into the Passaic River until its operations ceased in 1969. Based on the record presented at trial, the Appellate Division concluded: "A number of former plant employees testified concerning Diamond's waste disposal policy which essentially amounted to 'dumping everything' into the Passaic River." Former plant manager John Burton reported that as of 1959, Diamond discharged about 100 tons of 2,4,5-T effluents to the river. According to Mr. Burton, the effluent "would consist of mostly trichlorophenols…" (PAP-00155170).

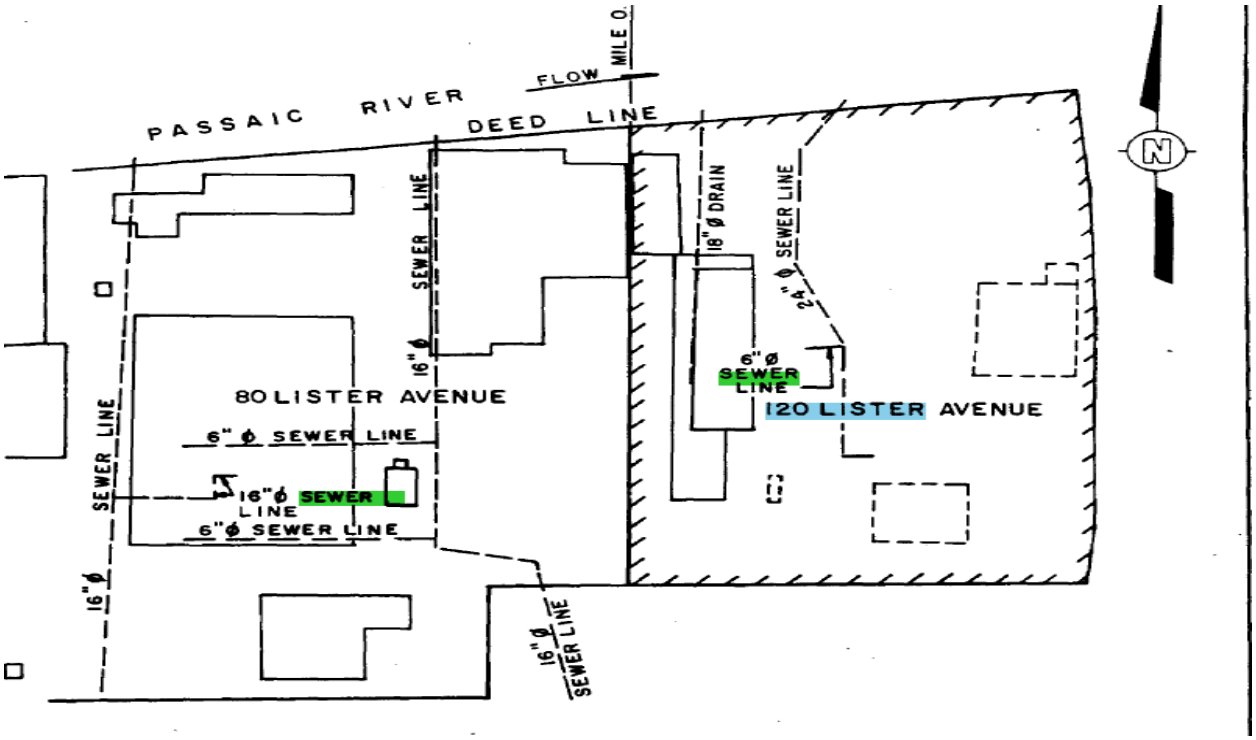
At the *Aetna* trial, Burton revised his earlier estimates and stated that 471 tons of chlorophenols would have been discharged in waste each year (PAP-00145137). An engineering firm retained by the insurance companies in the *Aetna* litigation estimated that 100 tons of 2,4,5-T containing a 1 ppm dioxin concentration would have resulted in a single-year discharge to the river of four pounds of dioxin. Diamond's 2,4,5-T streams contained 2,3,7,8-TCDD as high as 140 ppm (PAP-00143526).

The discharges included wastewater from the operation of the anisole still from September of 1954 through February 1960. The Na-TCP solution (coming from the autoclave following distillation of methanol) was steam stripped to remove the unreacted TCA. The water (condensed from steam) and TCA were condensed and separated in the anisole still. The water from the anisole still, approximately 4 pounds for every pound of TCP produced, was discarded to the Lower Passaic River (PAP-00399786; PAP-00144997; PAP-00145089–90). In 1965, recovered trichloroanisole was measured to contain 73 ppm of 2,3,7,8-TCDD (PAP-00167096).

A reconstruction by *Parette et al. (2018)* of the chemical processes at the site "identified dilution-filtration, a 2,4,5-TCP purification process [that was utilized prior to September 1954], as the major pathway by which 2,3,7,8-TCDD was discharged to the [Passaic River] from the Lister Avenue site." (PAP-00210175).

In 1960, Diamond stated that it was discharging 30,000 gallons of process wastewaters per day, one-third of which "could have contained some dioxins." (PAS-00128474). Diamond also estimated that in 1960 the plant was generating up to 15,000 gallons per day of waste water from the 2,4-D and 2,4,5-T esters alone (PAP-00162277). Later in a confidential report on water pollution control to the Manufacturing Chemists Association in 1967, Diamond reported that it had three water-borne waste discharges to surface waters, and a fourth that discharged both to the sewer and to the river. In the report, Diamond acknowledged that it discharged to the river 8,700 pounds of dissolved inorganics and 1,780 pounds of dissolved organics each day (PAP-00154809). In 1969, Diamond completed another confidential MCA survey concerning its waste practices. In it, Diamond disclosed it was discharging 8,540 gallons per day of untreated effluent to the River (PAP-00399044).

According to the March 1986 *Passaic River Sediment Study* prepared by International Technology Corporation, in 1960, during work required to stabilize the river bank at 80 Lister Avenue, several sewer pipe discharge lines to the river were discovered. All of the uncovered conduits were plugged with concrete when the new bulkheads were constructed. Information available at the time of the report indicated that there were no conduits open to the river remaining at this installation. The figure below shows the locations of several lines at the 80 and 120 Lister Avenue sites (PAP-00151172; PAP-00151185).



(PAP-00151199)

Mr. Centanni testified that sulfuric acid from the plant was “riverized” (sent to the river through aboveground lines). These lines could be seen at the river, particularly at low tide (PAP-00149554, 559-564). He said that all of the buildings had trenches going to the river (PAP-00149574; PAP-00145255). Mr. Burton also described trenches in the TCP and 2,4-D/2,4,5-T buildings that released to the river (PAP-00167674-77).

Arthur Scureman also testified about Diamond’s discharges to the Passaic River. He described dumping the contents of drums into the River following the 1960 explosion (PAP-00145048). He described the trench system outside the building in which 2,4-T and 2,4,5-T was made, which led to the Passaic River and that before Diamond installed a catch basin, “everything used to go . . . to the river.” (PAP-00159632, 657-659, 670, 721). Mr. Centanni stated that liquids in the sump were pumped out into catch basins that went to the river or they would send it out through the city line (PAP-00144132-33).

Mr. Blair testified that in the mid-1950’s a pit was constructed to hold the wash waters from the D and T acid building and any overflows were rerouted so they no longer flowed into the river. When they first put the pit in they did clean it and put the wastes into drums and then they stopped doing that and started pumping to the river; when the pit filled, Diamond heated the pit contents and sent those to the Passaic River (PAP-00155385-86; PAP-00155426-28; PAP-00155411-12). Diamond was cited by the USACE on two occasions in 1965 for spillage of overflow to the Passaic River from the TCP acidification unit in mother liquor recovery (PAP-00403309; PAP-00144701-02). In 1966 the overflow from the T sodium sulfate tank was diverted from the river to the sewer (PAP-00403431).

Former employee, Mr. Papciak, stated that there were two 10,000-gallon TCP storage tanks alongside the process building. Sometime after 1960 he cleaned the tanks when necessary. He emptied the product and filled it up about two-thirds with water, draining to the river (PAP-00394595-96).

A Diamond internal March 26, 1960, memorandum, states that the "waste disposal problem" pertained to muriatic acid, the 2,4,5-T acid process, the 2,4-D acid process, the caustic scrubber (2,000 gallons to the river daily), wash waters from 2,4-D and 2,4,5-T esters, and sulfuric acid from the scrubbing towers. The plant was noted to have a 10" clay pipe sewer line which connected to the "City Industrial sewer." This line was principally used for dumping wastes from the D and T acid units (PAP-00394422-24).

Sludge and Residue to Passaic River

February 5, 1954, Operating Instructions for 2,4,5-Trichlorophenol, state that sludge and acid waters were discarded (PAP-00155445; PAP-00155450). Following extraction of the 2,4,5-TCP, the unreacted organic sludge was discarded to the "sewer." In this context, "sewer" referred to a series of drain pipes leading from the buildings at the site to the Passaic River as, all plant effluents, including sludges, were discharged into the river prior to connecting to the PVSC in 1956 (PAP-00210172).

Mr. Centanni testified that sometimes, an "operator would follow up and instead of letting just the acid go to the river, something would distract them or he'd put the valve in the wrong position and he would send DDT, acid and everything to the river and there was a time they had a mountain of DDT and I mean a mountain of it because [it] solidifies when it hits [the] water (PAP-00145264). He also testified that [w]hen it got real cold, the Passaic River would stay at low tide and then you would see it" (PAP-00145265). Mr. Blair also testified that there was a pile of DDT in the river (PAP-00155439). Mr. Mysko testified that he "was sent in the river at low tide to chop what we used to refer to as the mountain of DDT" and his supervisor told him "[t]o get this DDT out of the river because it was too obvious for boats going by." (PAP-09160322–23).

According to Arthur Scureman, when the tide would go down, there was like an island of DDT in the river. He said they would put a rope around him and he would go down in there and watch the tide and chop the DDT with an ice chopper and put it in drums (PAP-00159626; PAP-00159660661).

In his deposition, Mr. Klosowski also described being hired by Mr. Kolker in around 1951 to go out into the river on his day off on a boat with his father to hoe down a big mound of residues in the Passaic that had come from the 2,4-D plant because the mound was sticking out of the water. They would chop it down and spread it out in the river so it was not visible. He said the same thing happened in 1954 but he was not the one who went out as the first time the paint on his boat was damaged (PAP-00143643-46).

2,3,7,8-TCDD was discharged to the Lower Passaic River with the disposal of waste salt (NaCl) from the cleaning of the Na-TCP storage tanks. The reactions to manufacture TCP resulted in the formation of approximately 800 pounds of NaCl in each batch of TCP (large autoclave), of which approximately half would precipitate (PAP-00159095-6;

PAP-00399789-92). A 1960 Diamond memo stated that the NaCl precipitated in the Na-TCP storage tank, requiring cleaning approximately every 6 months (PAP-00399789-92). The Na-TCP solution retained in the precipitated NaCl was discharged to the River in this cleaning process (PAP-00167697-700). Plant manager Burton testified that the Na-TCP storage tank was cleaned by pumping it as empty as possible, washing the tank with water, physically shoveling the contents (primarily NaCl), and disposing the shoveled-out contents and the wash water into the river (PAP-00144997; PAP-00145091–92). The residue from the cleaning of the Na-TCP storage tank was recognized in a 1987 site report prepared for Defense Steering Committee in the *Aetna* litigation as a source of "dioxin-containing materials." (PAP-00160071; PAP-00160077).

After the 1960 explosion which destroyed the Main Building, but prior to the 1961 start-up in the new Process Building, the two 15,000 gallon "[Na-]TCP storage tanks were washed out, repaired, and relocated." (PAP-00399797). In 1965 Diamond estimated that the TCP in the Na-TCP storage tanks contained approximately 12 pounds of 2,3,7,8-TCDD (PAP-00399568-69).

According to Diamond's *1983 History and Operations Overview of Lister Avenue Facility*, process wastes included filter cake from product filtration, spent carbon from the carbon column and sludge removed from the process area waste sump. In 1967, these wastes totaled eight tons per year. In 1969, the wastes totaled three and a half tons per year. A carbon column was installed to remove dioxin from the TCP production in September 1967. The first column was a "pilot" unit and was 12" in diameter. This unit was used from September 8, 1967, until the installation of a full-scale column in July 1968 during the plant's annual shutdown. In January 1969, the carbon in the "new" column was replaced. This carbon was in use when production of 2,4,5-T was discontinued in July 1969. The carbon bed was washed with acid when the dioxin level of the TCP could not be maintained at an acceptable level, or the column plugged. The dioxin was bonded to the carbon. The spent carbon was drummed and disposed of off-site by a waste disposal contractor. This appeared to be done in January 1969. After the process was shut down, the column was reportedly included in the sale to Chemicaland Corporation (PAS-00128475).

Spills and Leaks

DSCC's *Statement of Factual Premises* notes that contamination of the Lister facility from Diamond's 2,4,5-T production process resulted from numerous small, largely unidentifiable, leaks and spills (PAP-00149742).

However, the trial Court's Opinion in the *Aetna* litigation, decided April 12, 1989, stated that there were constant spills and leaks onto the factory floors and the outdoor ground surfaces of the "Newark plant." According to the Opinion, considered one at a time and in isolation from each other, many of those spills and leaks might qualify as accidental. However, considered in their totality, as they must be in order to do justice to the realities of this situation, the spills and leaks establish a definite pattern of operation. Toleration of substantial and continuous spilling and leaking was the way of life at the "Newark plant." The Opinion also states that factory floors at the "Newark plant" were so badly corroded by acid spills that they had to be replaced nearly every summer. Trenches and

sumps frequently backed up and overflowed onto ground surfaces. Chemical stains and deposits on ground surfaces throughout the site were clearly visible to the naked eye. Visitors to the plant had to wear overshoes and slickers to protect their clothing. Floors were replaced so that people could walk without falling and hand trucks could be wheeled where needed, but nothing was done to mitigate the polluting effect the spills and leaks had upon the physical environment (PAS-00128449-50).

According to the documents and deposition testimony, the Aetna defendants' engineering consultants estimated that the process spills and leaks resulted in 96 pounds of 2,3,7,8-TCDD in the soil at 80 Lister Avenue. The consultants did not estimate how much 2,3,7,8-TCDD the Lister facility discharged to the Passaic River (PAP-00160078).

According to the *Moomaw Report*, after the explosion in 1960, the new process building was equipped with a concrete-lined trench that ran its full length and serviced the tank farm on the east end of the building and collected floor spills and leaks from the MCA and DCP chlorinator and TCP methanol areas and process discharges (e.g., spent acid from the carbon column). The trench led to a sump that overflowed to the industrial sewer and then to PVSC. Two additional concrete-lined sumps were located outside of the process building on the north side by the autoclaves and the hydrochloric acid process. Overflows from these sumps were connected to the river and received dioxin wastes from autoclave upsets, TCP vents routed through the air scrubber, and the anisole still (PAP-00143166). As stated above, in 1968, dioxin was found at 75,000 ppb in the sump receiving anisole waste.

Information from depositions regarding spills and leaks include the following:

- **Scureman**: In the 2,4,5-T and 2,4-D Building, material was all over the floor and the pumps and centrifuges leaked (PAP-00159649-51). Every summer they would shut everything down and fix the floor and sewers. After a year the sewers used to fall apart and the acid running on the floor ate up the concrete (PAP-00145044).

  Mysko: In later years when I was a mechanic, I used to drain pumps and drain piping right on the ground. I was told to do it. Drain it, fix it, hose everything down into the river (PAP-00160310). Mr. Mysko also stated that if you walked in the 2,4,5-T area you went sliding. You had to be very careful because it was all over the place, it was like an oily substance, and the water did not even wash it down. Therefore, what they used to do was wash it down with sulfuric acid. They used to soak the whole floor with sulfuric acid, let it sit for an hour or two and hose it down and everything went into the river, sulfuric acid and 2,4,5-T and everything that was on that floor (PAP-00161238). When employee Mr. Mysko was asked if his supervisor knew spills were being washed into the River, he responded, "[i]t was company procedure." (PAP-00161212-13).

- **Centanni**: Sump pits would overflow and go all over the land (PAP-00144130).

- **Blair**: When the floors at the Lister Plant were washed down, the wash water went directly into the Passaic River. He also stated that there were open trenches in the

floor of the DDT Building and the 2,4-D Building that released to the Passaic River (PAP-00155385-86; PAP-00155436; PAP-00155405; PAP-00160985).

- **Centanni**: Sulfuric acid was used to clean the concrete floors of the 2,4-D and 2,4,5-T plants and warehouse, “cause we’d get all that gum, you know, from a spill, from a spill of chemicals.” He noted the floors where the DDT was made were dirt (PAP-00149565-66; PAP-00145246). When cleaning the concrete floors they scraped the material from the floors and put the “hard stuff” in drums for disposal at the dump and whatever else was left would go into an open sewer that released to the river. When asked what chemicals were spilled he said 2,4-D and 2,4,5-T (PAP-00149568-70; PAP-00145249).

- **Andreini:** Worked in the formulations area from 1955 to 1969, which had trenches so that if there was a spill, which occurred if a drum had a leak, the discharge would go on the floor and it would be washed down into the trench and go out into the river. He noted that this occurred through 1969 when the operations ceased. He also stated that he had seen wastewater being discharged to the river from the ester unit and possibly from the 2,4-D unit and the warehouse. He did not know what was being discharged specifically. In addition, drums leaked when being filled and this material would go into the trenches to the river (PAP-00149596-98, 604, 607).

- **Papciak**: The old building was a dump (PAP-00394782). The railings had about half an inch of DDT all over. There was DDT hanging all over the place, up on the ceilings. Like somebody blew a batch and wasn't finished. In the dryer they would shoot up the vent and DDT would come up the vent, hit the ceiling and it would just stick up there. . . . All the dust would be all over the place. The walls, everything, got DDT on it. The floor was always white with DDT (PAP-00394773-74).

Autoclave Blowdown Sump Discharges

After the reconstruction of the Lister facility in 1960, the two (2) new 1,000-gallon autoclaves for TCP manufacturing were located outside the Process Building between the building and the LPR (PAP-00403468-69). A sump, referred to as the autoclave blowdown sump, was located between these autoclaves and the river (PAP-00403441). Pressure relief valves from the autoclaves (where 2,3,7,8-TCDD was formed) were directed to pipes which were submerged in this sump so that methanol released from the autoclaves could be adsorbed by the water for additional safety (PAP-00403469). The sump was maintained full of water by passing process cooling water through the sump before the water overflowed to the river (PAP-00403469; PAP-00144430). Sediments in this sump were analyzed in 1968 and showed 2,3,7,8-TCDD levels of 75 ppm (PAP-00167212).

Air Dispersion

According to DSCC’s *Statement of Factual Premises*, the contamination of "offsite" locations by dioxin that migrated from the 80 Lister Avenue plant site appears to have been the result of windblown and personal and vehicular tracking. The major concern of

the USEPA and the NJDEP in 1983 was "wind blown spread of dust" and tracking by persons or vehicles. In addition, during the time the plant was operating small amounts of dioxin may have escaped into the environment through vents or even through the scrubber system. Vents and scrubbers operated continuously while TCP and 2,4,5-T was being manufactured. On occasion safety discs on the TCP autoclave ruptured, releasing some of the autoclave's contents to the atmosphere in whatever stage the TCP reaction was in at the time of rupture (PAP-00149743). Numerous rupture disc releases occurred at the site (PAP-00403308; PAP-00143619-20; PAP-00159095-6; PAP-00399842-4; PAP-00159874-80).

Prior to the 1960 explosion in the main building, rupture disc releases were directed towards the river (PAP-00167812–13). Releases from the rupture disc also went onto the cement adjacent to the river and the residue was washed with hot water to the river (PAP-00143667–68). Following the plant rebuild, rupture disc releases were directed to atmosphere above the roof (PAP-00154262-63).

A former employee, Mr. Blair, recalled one incident when a disc in the autoclave ruptured and material was found on the cars in the parking lot. He testified that the plant manager at the time “told us to get them cleaned up” (PAP-00155397-98). Mr. Blair did not recall the date this happened (PAP-00155397). Mr. Homer Smith also recalled gasses being released to the atmosphere when a disc ruptured in the TCP autoclave (PAP-00159874-75). Mr. Centanni stated that material from the scrubber would settle on the cars in the parking lot and “pit the paint jobs” (PAP-00144140-41).

In his deposition, Mr. Michael Catania, former Deputy Commissioner of NJDEP, stated that dioxin had been found in an eight to ten square block area around the 80 Lister plant. He noted the source of the dioxin to be dioxin particles on soil that was blown around by the wind, mud in vehicle tires and on shoes, as well as rain washing sediments around (PAP-00394121-22).

1960 Explosion

On February 20, 1960, an explosion and fire occurred in the NaTCP autoclave reactor in the Main Building. The pressure and temperature rose rapidly in the reactor first causing a rupture disc on the reactor to blow and venting the reactor material to the Passaic River (PAP-00142884). The explosion knocked the northwest corner of the building into the river (PAP-00159643). The Aetna court concluded that “The explosion must have spread dioxin contamination throughout the plant site and onto nearby properties.” (PAS-00128438). Diamond stated that there “may have been some residual materials that entered the River system during the cleanup.” (PAP-00151185).

Flooding and Rain Runoff

DSCC’s *Statement of Factual Premises* states that other mechanisms for migration that have been identified are tidal flooding and the movement of dioxin-bearing earth particles in rain runoff (PAP-00149743). Stormwater from the site entered the LPR via storm sewers and surface runoff (PAP-00209638; PAP-00209650).

Some amount of 2,3,7,8-TCDD was discharged to the river through the Process Building roof drain as a result of precipitation. Following the construction of the new Process Building, the roof drain from this building discharged directly to the river. Discharges from the TCP process, specifically the vent from the anisole drop tank and the release point for rupture discs were directed to the roof (PAP-00154266). Wipe samples taken from the roof of the Process Building detected 2,3,7,8-TCDD (PAS-00127131). Partial inundation of the Lister facility from the Passaic River was reported in 1983. (PAS-00126928).

6. Regulatory History/Enforcement Actions

Violations

1949: On June 28, 1949, an inspector with the PVSC found Kolker was discharging "rusty scale and soda wash water" into the Passaic through floor drains. As stated above, John Burton, plant manager, testified that the USACE also informed Kolker that its discharges were illegal (PAP-00167643; PAP-00167779).

1956: On Monday July 2, 1956, Inspector Frank Capone and Mr. Burton, the Diamond Alkali Chemical Co. plant manager, inspected various pipes that were discharging cooling water. During the inspection, Inspector Capone noticed a colored discharge coming from a 6" broken cast iron pipe. A sample was taken of the pink colored fluid coming out of this pipe and was sent for analysis. On July 5, 1956, Inspector Capone, Mr. Andoline, and Mr. Goldberg made another inspection of the plant and told Mr. Burton about the violation after taking another sample. Mr. Burton promised to cooperate and make a change within one week (PAP-00147843; PAP-00168549).

A letter dated July 7, 1956 was received by the PVSC from the Diamond Alkali Chemical Co. signed by Mr. Burton stating that the 6-inch broken clay pipe that was discharging into the river was diverted into the Newark city sewer. On July 20, Inspector Frank Capone made an inspection at Diamond and found the 6-inch pipe again discharging into the river. A sample was taken from the 6-inch pipe and also from the pump with a one and half inch pipe connected to an open tee discharging on the concrete flooring and flowing into the river. Two other samples were taken, one from a wooden flume and the other from the rear of the south end building flowing over planking on the dock. Analysis of these samples indicated that all of the samples had a bad odor, oily content, pH 9 or more and were polluting the river (PAP-00147848).

On July 31, 1956, men were digging, laying pipes, and breaking concrete when PVSC Inspector Frank Capone visited the premises. Mr. Burton explained that he was rearranging the pipelines to clear up the situation (PAP-00147856).

On August 3, 1956 the Diamond Alkali Co. received a notice of violation (NOV). The provisions of a law of the State of New Jersey known as Title 58, Chapter 14, Sections 7 and 8 of the Revised Statutes of New Jersey (PAP-00143727). Section 7 of Title 58, Chapter 14 indicate that discharge of sewage or other

polluting matter into certain waters was prohibited. Section 8 of Title 58, Chapter 14 indicates that discharge of sewage or certain other matter, particles, or substances into enumerated waters was prohibited (PAP-00143728).

During the daily inspection of District No. 8 from August 13 to August 17 and from August 27 to August 31, 1956 it was found that the Diamond Alkali Co., plant was discharging to the Passaic River (PAP-00147865).

As indicated in a letter dated September 4, 1956, PVSC indicated that the Diamond Alkali Co. has been cooperating in every way. They completed a piping program, which emptied their industrial waste into the sanitary sewer. Their deck area had been thoroughly cleaned and nothing but cooling and condenser water was noted as going to the river. Additional repeated inspections showed no violations (PAP-00147936). However, as noted above, Diamond only connected one of its buildings to the PVSC system.

1964: In a letter dated October 13, 1964, during a routine inspection of the waterfront facilities along the south shore of the Passaic River, the Assistant Supervisor of the New York Harbor observed a concentration of foreign matter, which contained an acid content. The letter stated that further investigation of this matter revealed that this pollution was caused by an acid discharge from inside the Diamond Alkali plant into discharge pipes located in the east and west end of the bulkhead and emptied into the Passaic River at the foot of Lister Avenue. This violation was brought to the attention of Messrs. Homer Smith, Plant Manager, and W.C. Hill, Engineer Production Supervisor at Diamond Alkali. The Diamond Alkali plant was given 30 days to investigate this discharge, after which a reinspection of the area was to be conducted to ensure compliance with Federal regulations (PAP-00143387).

1968: On August 23, 1968, the U.S. Coast Guard reported that while on a routine antipollution inspection of the facilities along the Passaic River in the vicinity of Newark, New Jersey, it tested the liquid effluent from the Diamond plant at Lister Avenue and found it to be acidic in nature. Mr. E. Bak, Production Superintendent was contacted and made cognizant of this violation (PAP-00143378).

Diamond employee A.L. Gregoric wrote an internal memo on October 18, 1968 to W.R. Taylor of the corporate office informing him of the violation. The memo stated that Diamond typically discharged about 1,000 gallons of used sulfuric acid containing organic materials twice per week (PAP-00143604-06). Shortly after, Taylor wrote an internal memo noting that Lister has “a history of repeated violations. It seems that on every Coast Guard spot check of this plant we have a bad violation . . . .” (PAP-00143601).

As found by the New Jersey trial court in the *Aetna* litigation, Diamond “intentionally and continuously discharged highly toxic chemical effluent into the Passaic River from 1951 to 1969.” (PAS-00128449). According to the court, Diamond’s discharges were “intentional, planned discharges from processing

equipment through pipes or ditches." (PAS-00128426). On appeal, the New Jersey Appellate Division agreed with the trial court's conclusions: "We are convinced from our examination of the record that Diamond intentionally and knowingly discharged hazardous pollutants with full awareness of their inevitable migration to and devastating impact upon the environment." (PAP-00158858).

Regulatory Actions / Administrative Consent Orders

1983: On June 2, 1983 Administrative Order No. E0-40-1 was adopted, which issued a presumptive fishing advisory in certain waters pending the analysis of fish and shellfish samples. The results of the testing indicated that fish and shellfish from the Passaic River were contaminated with dioxin in excess of the safe level thereof established by the Food and Drug Administration (PAP-00142877).

On October 10, 1983 New Jersey Governor Thomas H. Kean issued Executive Order No. 40 declaring that a state of emergency exists arising from the dioxin contamination of the premises at 80 Lister Avenue, in the City of Newark, New Jersey, and authorized New Jersey Commissioner Robert E. Hughey to make any necessary emergency measures deemed necessary to protect the health, safety and welfare of the citizens of New Jersey (PAP-00142877).

Commissioner Hughey issued Administrative Order E0-40-17, prohibiting the sale or consumption of fish and shellfish taken from the Dundee Dam in Garfield/Clifton to the mouth of that River at Newark Bay (PAP-00142877).

Diamond Shamrock Chemicals Co. v. Aetna Cas. & Sur. Co., Civ. Action No. C-3939-84 (Sup. Ct. N.J, April 12, 1989) ("Aetna"); *Diamond Shamrock Chemicals Co. v. Aetna Cas. & Sur. Co., 609 A. 2d 440 (N.J. Super. A.D. 1992)*; *cert. denied*, 634 A. 2d 528 (N.J. 1993). – The Aetna court denied Diamond's claim for environmental cleanup costs. The Aetna court found that Diamond's waste disposal practices for the entire time it operated the facility were intentionally violative of both good practices and the law. The court found that despite specific statutory prohibition, Diamond intentionally discharged all of its waste chemical effluent into the Passaic River, and that the "[t]he discharges were . . . intentional, planned discharges from processing equipment through pipes or ditches." (PAP-00159460).

1984: On March 13, 1984, Diamond Shamrock entered into an administrative consent order with the NJDEP. The order required that Diamond Shamrock undertake certain actions to secure the site, prevent exposure to contaminants, and determine the vertical and horizontal extent of chemical contamination. The initial phase of the order required the preparation of a work plan, the completion of a site evaluation, and a feasibility study of remedial alternatives (PAP-00149705).

Diamond Shamrock submitted a Work Plan for the initial phase to the NJDEP on April 18, 1984. As a result of NJDEP review comments, the Work Plan was revised and an addendum was submitted on June 20, 1984. Subsequently,

NJDEP approved the amended Work Plan and it was implemented. Mobilization of equipment and personnel to the site along with initial remedial activities commenced August 20, 1984. The actual investigation/sampling effort was conducted from September 5, 1984 through October 26, 1984 (PAP-00149705-706).

1994: OCC signed an Administrative Order on Consent (AOC) with the EPA to investigate a 6-mile stretch of the Passaic River centered on the Diamond Alkali plant. The primary objectives of the investigation were to determine: (1) the spatial distribution and concentration of hazardous substances, both horizontally and vertically in the sediments; (2) the primary human and ecological receptors of contaminated sediments; and (3) the transport of contaminated sediment (PAS-00033297).

Sampling results from this study, as well as other earlier sampling events taken across from and immediately downstream of the Diamond Alkali Facility portion of the Site show concentrations of 2,3,7,8-TCDD that significantly exceed the levels that can produce toxic effects to biota. Recent studies have shown that 2,3,7,8-TCDD bioaccumulates in fish, to levels rendering the fish unfit for human consumption, from sediment with a much lower level of 2,3,7,8-TCDD than found in these sediments (PAS-00033335).

These sampling results demonstrated that evaluation of a larger area was necessary because sediments contaminated with hazardous substances and other potential sources of hazardous substances are present along at least the entire 17-mile stretch of the Lower Passaic River and were further dispersed by the tidal nature of the river. As a result, in January 2001, EPA directed OCC to suspend certain work under the 1994 AOC (PAS-00033297).

2004:

EPA and a partnership of federal and State of New Jersey agencies have undertaken a joint CERCLA-Water Resources Development Act (WRDA) study of the 17-mile tidal stretch of the Passaic River. During the course of the 17-mile study, the sediments of the lower 8 miles of the Passaic River were found to be a major source of on-going contamination to the tidal river and Newark Bay (PAS-00033334).

While the distribution of dioxin is being studied in these investigations, based on data gathered by EPA and by other entities, including OCC, the most concentrated inventory of 2,3,7,8-TCDD, appears to be in the sediments immediately adjacent to the Diamond Alkali Facility portion of the Site (PAS-00033298).

2008: In 2008, OCC and EPA signed an Administrative Order on Consent (AOC) to remove approximately 200,000 cubic yards of contaminated sediment in two phases from the Passaic River in the vicinity of the Lister Avenue facility (PAP-00143281, 327)). Phase I removed 40,000 cubic yards of sediment and was

completed in 2012. Phase II removal and disposal of 160,000 cubic yards of sediment has not yet been completed (PAP-00360737, 77).

2012: In June 2012, the Cooperating Parties Group (CPG) entered an AOC to remove contaminated sediment and install a cap at River Mile 10.9 (PAP-00204764, 869-870).

2016: EPA and OCC entered into an Administrative Settlement Agreement and Order on Consent for Remedial Design on September 30, 2016. Under this agreement, OCC has agreed to conduct the engineering and design work needed to implement EPA's 2016 ROD for the lower 8.3 miles of the LPR (PAP-00456012).

7. Response Actions

Site characterization data and information is organized below by building/process equipment data, soil data, and groundwater data.

Buildings/Process Equipment Data

As discussed in the *1985 80 Lister Avenue Site Evaluation* and a September 1987 *Record of Decision* (1987 ROD) prepared by EPA, the following data were obtained as a result of an investigation that took place in 1984:

- Wipe samples were collected from coated floors, walls, fixtures, and air ducts in on-site buildings. All wipe samples were analyzed for dioxin only. Dioxin concentrations in wipe samples were as high as 41,600 nanograms per square meter (ng/m^2); the highest concentration was detected in the process building. In addition, chip samples were collected from exposed concrete floors and building exterior or brick surfaces. All chip samples were analyzed for dioxin only. Dioxin concentrations in chip samples were as high as 1,280 ppb (PAP-00150852-53).

- According to the *1985 80 Lister Avenue Site Evaluation*, dioxin contamination appeared to be greatest in the process building, where all 29 samples collected yielded positive dioxin levels. The chemical manufacturing building (with 26 out of 28 samples producing positive results) also had "significant levels" of contamination. The report goes on to state that contamination in the warehouse was significantly less than that determined in the process and chemical manufacturing buildings with some "high levels" detected in the concrete slab floor and in the dust collected from flat elevated surfaces inside the building (PAS-00127250-51). Samples collected from the outside (exterior) walls and roofs of buildings contained lower 2,3,7,8-TCDD concentrations. Chip samples of the outside wall of the warehouse had 2,3,7,8-TCDD concentrations up to 16.5 ppb. A wipe sample from the roof had a 2,3,7,8-TCDD concentration of 13 ng/m^2 (PAP-0015641).

- According to the *Moomaw Report*, the highest concentrations were generally found near process vessels, trenches, drains, vents, and on floors near entrances leading outdoors. Concentrations of dioxin were found in all samples from the interior of the manufacturing, laboratory/office, and warehouse buildings. Contamination detected

in wipe and chip samples "was consistent with, and was caused by, releases from Diamond's TCP and 2,4,5-T manufacturing operations" (PAP-00164659). The highest concentration detected in a sample collected from a chemical process vessel was 60,800 ppb (PAS-00127123, 134-135).

- According to the *Moomaw Report*, solid and liquid waste that remained in process vessels after operations ceased were removed sometime during or after 1981 and placed in 570 drums that were stored on-site in the manufacturing and process buildings (PAP-00164662).

- The *Moomaw Report* states that "[d]ioxin analysis was performed on 22 selected drum samples. Drums to be tested were selected using one of two criteria – either the drum was representative of a major group of drums or it had some particular association with the manufacturing process. Of the 22 drums analyzed, 15 indicated positive results, ranging from 1.5 ppb to 12,200 ppb" (PAP-00150858; PAS-00127185).

- According to the *Moomaw Report*, the "testing confirms that Diamond left dioxin on-site in 1969 because process waste containing dioxin was found in drums that originated from equipment used to produce Diamond's TCP (anisole receiver) and 2,4,5-T (2,4,5-T press filter). The highest concentration was found in the TCP equipment (12,220 ppb) and an 'intermediate level' was found in 2,4,5-T equipment (476 ppb)". The report also notes the dioxin concentration found in drummed waste from the TCP unit was within the range found in the Diamond TCP unit in the 1960s (PAP-00164662).

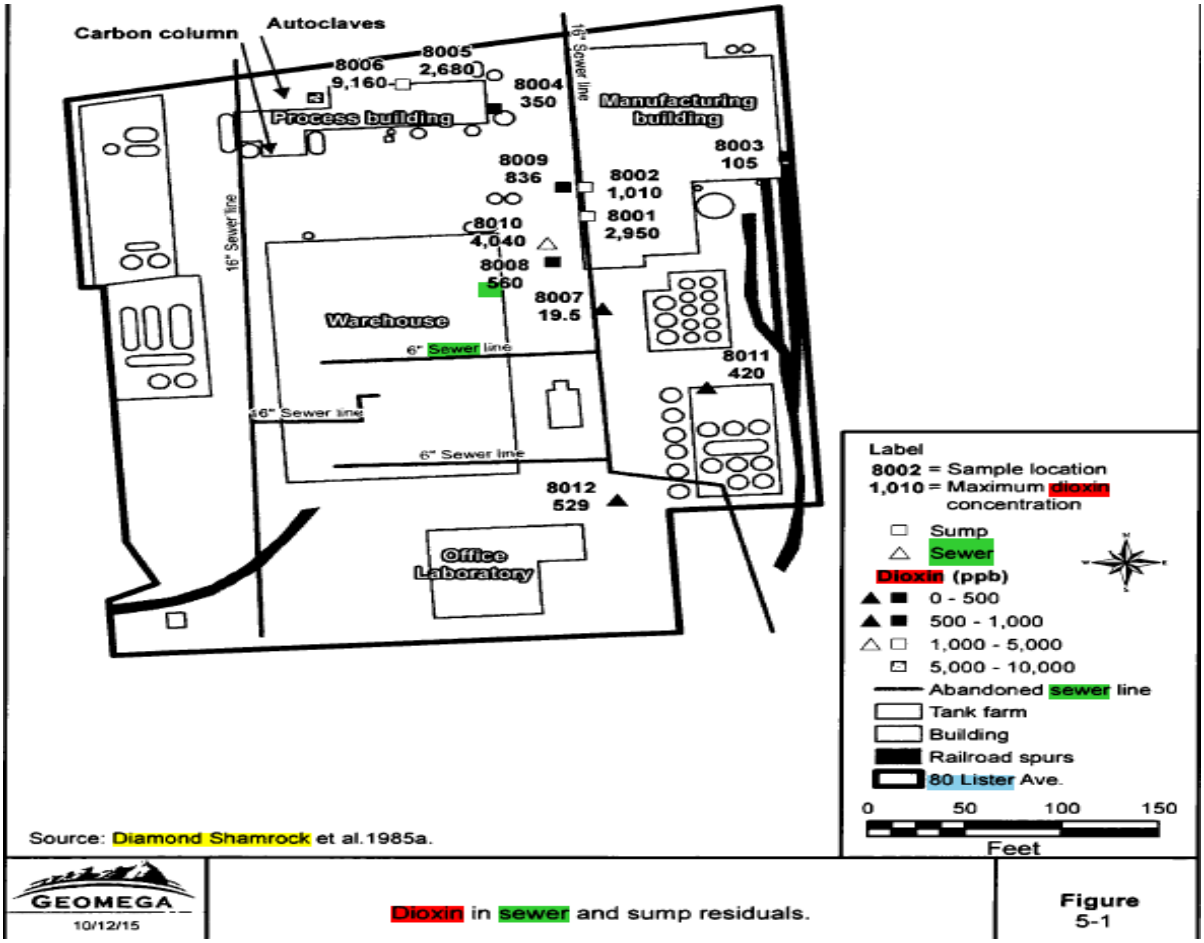
In addition, four sewer and eight manufacturing and process building sump bulk samples were collected for dioxin analysis as part of the 1984 investigation. Of the 12 samples collected, all indicated positive dioxin results, with concentrations ranging from 105 ppb to 9,160 ppb (PAP-00150853; PAS-00127137). The highest concentration was detected in a process building sump sample (PAP-00151034; PAS-00127137).

It is reported that the sumps generally had higher levels of dioxin contamination than sewers, especially those near the process building, and that contamination levels decreased with increasing distance from the process area (PAS-00127251-52, 73). Solids collected from a "Pit 3" had the second highest dioxin concentration (8,750 ppb). It is reported that these solids were likely collected from one of the sumps in the process building that received waste from the TCP process (PAP-00164663). Coplanar PCBs were also detected in three sump samples collected adjacent to the Process Building, with concentrations as high as 180 ppb (maximum concentration measured for PCB-118). Coplanar PCBs were measured in a sump residue sample collected adjacent to the Manufacturing Building in 1992, with concentrations as high as 27 ppb (maximum concentration measured for PCB-77) (PAP-00210621-41).

According to the *Moomaw Report*, the highest dioxin concentration measured in 1984 (9,160 ppb) was found in the sump by the autoclaves in a cement bunker along the river where TCP was produced. The report notes that this concentration was lower than that measured in 1968 from the same area, but still within the range of concentrations found

in tests of Diamond's TCP in the late 1960s. The report goes on to note that "high" concentrations (> 1,000 ppb) were also found in the other sump along the process building and in two sumps located along the formulations area in the manufacturing building, and that all three of these sumps were in locations where materials and wastes containing dioxin from TCP, 2,4,5-T, or, their derivatives were handled or discharged during Diamond's operations (PAP-00164659). The report concludes that the dioxin contamination detected in sumps and sewers "is consistent with, and was caused by releases from Diamond's TCP and 2,4,5-T manufacturing operations" (PAP-00164659).

A figure depicting the sewer and sump data is presented below (PAP-00164687):



The *1985 80 Lister Avenue Site Evaluation* concludes that due to the biased sample location strategy used to sample the buildings and process equipment, extrapolation of the results to quantify a total amount of dioxin in the 80 Lister Avenue structures was not feasible. However, an estimate of the volume of various types of materials in each of the major buildings that was potentially contaminated with dioxin was made. The total volume of material from all four major site buildings was estimated to be 3,180 cubic yards (PAS-00127251).

As discussed in the *1985 120 Lister Avenue Site Evaluation*, prepared by Diamond Shamrock for NJDEP, and the 1987 ROD, chip and wipe samples also were collected from the 120 Lister Avenue buildings and structures to evaluate potential contamination as part of the 1984 investigation. Chip samples were collected from the interior walls, exterior walls, floor, and roof of each of the three buildings. Wipe samples were collected from the tanks, trailers, equipment, and assorted hardware and supplies. Of the 18 chip samples collected from the three buildings on the 120 Lister Avenue site, positive dioxin results were obtained for nine of these samples; however, none of the results exceeded the NJDEP "action level" of 7.0 ppb. Dioxin concentration in the nine chip samples ranged from 0.13 ppb to 6.3 ppm. Sixteen wipe samples were collected from the tanks, trailers, and equipment located at the 120 Lister Avenue site. Two of the 16 samples were positive for dioxin with concentrations of 7.9 ng/m^2 and 11.0 ng/m^2 (PAP-00150859; PAS-00125849-50).

Soil Data

According to *Priority Pollutant Analytical Results from 80 Lister Avenue Study Area, Newark, New Jersey*, prepared for EPA, dated March 30, 1984, in April 1983, NJDEP collected two soil samples from the 80 Lister Avenue property. One sample had a 2,3,7,8-TCDD concentration of 1,220 ppb. Data were not reported for the other sample. In addition, on May 27, 1983, EPA sampled soil at nine on-site locations and verified 2,3,7,8-TCDD contamination. Concentrations ranged from 60 ppb to greater than 50,000 ppb. On June 2, 1983, the NJDEP collected nine off-site soil samples. The results indicated that contamination existed off-site. Concentrations ranged from non-detected to 15 ppb (PAS-00125540).

According to *A Proposal for Integrated Engineering Investigation/Remedial Action Program for Diamond Alkali*, prepared for Diamond Shamrock Corp., dated July 20, 1983, as a result of the sampling discussed above, EPA and NJDEP requested that a stabilization fabric be placed over the site and security fencing be placed along the northern property limits adjacent to the Passaic River to control potential fugitive dust transport and erosion of TCDD soil-bound particles (PAP-00152285; PAP-00150817).

To further define the extent of contamination, Diamond Shamrock's consultant REACT collected four surface soil samples from the adjacent Sergeant's property under the supervision of the NJDEP and an additional 30 samples from the Diamond Shamrock property, including samples in the office building, warehouse, process buildings, sumps, and core borings along the northern property limits. According to the report, detected concentrations of TCDD reduced with depth; however, near the former location of the activated carbon column, concentrations remained as high as 531 ppb five feet below the surface. Preliminary estimates of contaminated materials were reported to be 14,000 cubic yards or 19,000 tons of subsurface materials contaminated with TCDD (PAP-00152285).

According to *Priority Pollutant Analytical Results from 80 Lister Avenue Study Area, Newark, New Jersey*, prepared for EPA, dated March 30, 1984, in December 1983, 35 soil samples were collected from the neighborhood surrounding 80 Lister Avenue. Significant results are summarized below:

- 2,3,7,8-TCDD was detected at all 35 samples. Concentrations ranged from 0.07 ppb to 4.1 ppb (PAS-00125547).
- PAHs were detected in all 35 samples. Concentrations ranged from non-detect to 87 milligrams per kilogram (mg/kg) (PAS-0125548).
- Dieldrin was detected in 5 samples. Concentrations ranged from 0.02 mg/kg to 0.09 mg/kg (PAS-00125549).
- 4,4-DDT, 4,4-DDE and 4,4-DDD were detected in 23 samples. Concentrations ranged from 0.01 mg/kg to 7.7 mg/kg. (PAS-00125549).
- Copper was detected in all 35 samples. Concentrations ranged from 12 mg/kg to 1,200 mg/kg (PAS-00125550).
- Lead was detected in all 35 samples. Concentrations ranged from 71 mg/kg to 1,600 mg/kg (PAS-00125550).
- Mercury was detected in 32 samples. Concentrations ranged from 0.054 mg/kg to 1.7 mg/kg (PAS-00125551).

According to the 1985 80 Lister Avenue Site Evaluation and the 1987 ROD, as part of the investigation that took place in 1984, near-surface soil samples were collected to a depth of 60 inches (PAP-00150854; PAS-00127074). In addition, 39 samples from soil borings were collected from the silt layer (PAS-00126998; PAS-00127074). The following is summary of the maximum detected concentrations of COCs (PAS-00127141-58):

Maximum Detected Concentrations of COCs in Soil		
80 Lister Avenue Site Evaluation - February 1985		
COC	**Maximum Detected Concentration (ppb)**	**Depth (in inches below ground surface)**
Concentrations in ppb		
2,3,7,8,-TCDD	19,500	12-24
2,4,6-Trichlorophenol	1,700,000	12-24
2,4-D	85,000	12-24
2,4,5-T	86,000	12-24
Benzo (a) pyrene	44,000	12-24
Benzo (b) fluoranthene	71,000	12-24
Chrysene	120,000	12-24
Acenaphthylene	860	12-24
Benzo (g,h,i) perylene	32,000	12-24
Fluorene	320	0-6
Phenanthrene	61,000	12-24
Indeno (1,2,3,CD) pyrene	21,000	12-24
Pyrene	78,000	12-24
2- Methylnaphthalene	21,000	12-24
4,4-DDT	5,090,000	12-24
4,4-DDE	297,000	12-24
4,4-DDD	182,000	12-24
Concentrations in ppm		
Copper	6,600	“Above Silt”
Lead	11,000	“Above Silt”
Mercury	95	“Above Silt”

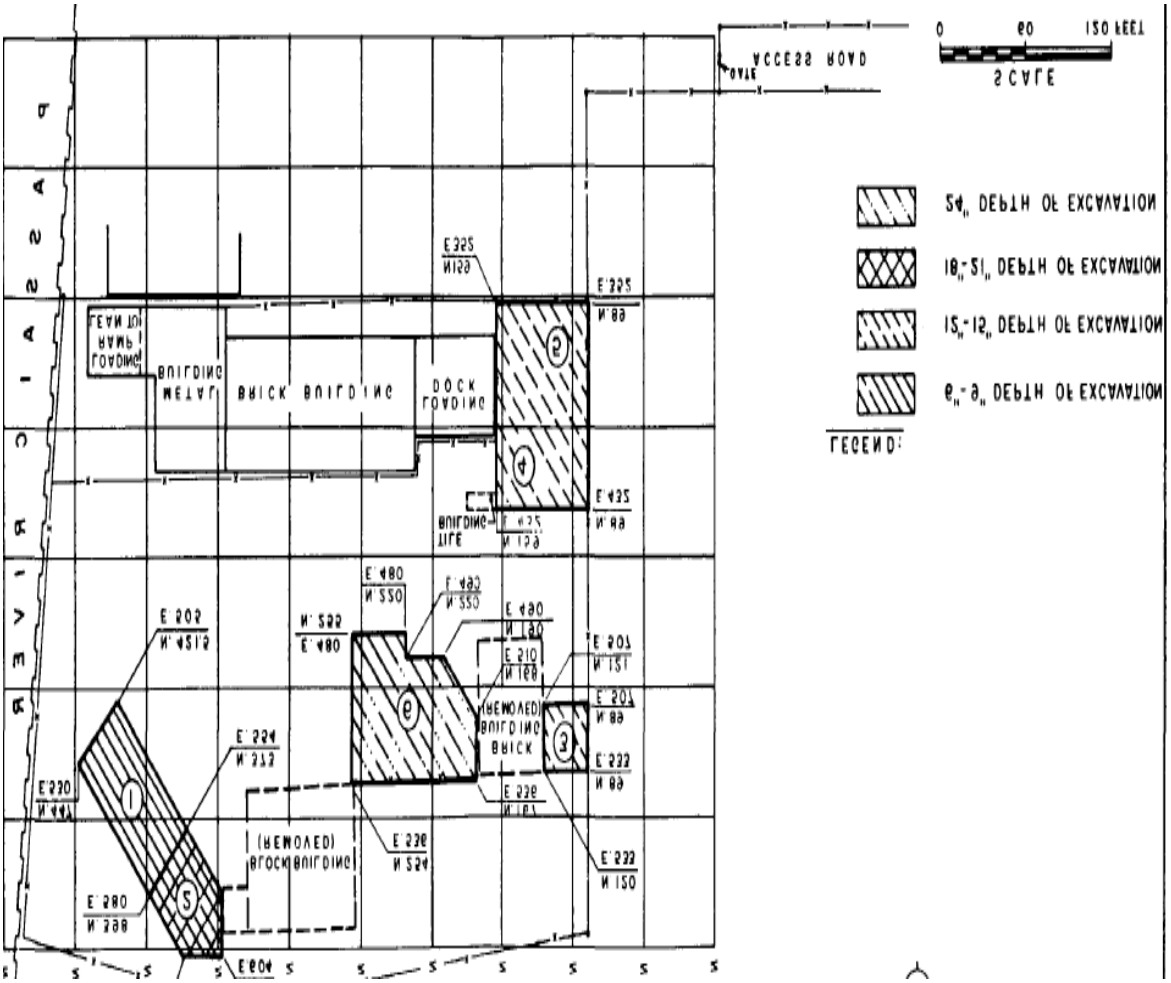
The *1985 80 Lister Avenue Site Evaluation* concludes that the soil data indicated that the surficial fill layer was contaminated, and the contamination extended to the greatest depths on the northern boundary of the site adjacent to the Passaic River where the fill is thickest (PAS-00127273).

According to the *1985 120 Lister Avenue Evaluation* and the 1987 ROD, of 72 soil samples collected to a depth of 60 inches and analyzed for TCDD, 54 had identifiable concentrations ranging from 0.19 to 490 ppb. Of 15 samples analyzed for TCDD from 60 to 132 inches, 10 had identifiable concentrations of TCDD ranging from 0.23 to 93.7 ppb (PAP-00150859). The following is summary of the maximum detected concentrations of COCs (PAS-00125867-72):

Maximum Detected Concentrations of COCs in Soil		
120 Lister Avenue Site Evaluation - May 1985		
COC	**Maximum Detected Concentration (ppb)**	**Depth (in inches below ground surface)**
Concentrations in ppb		
2,3,7,8,-TCDD	>490	6-12
2,4-D	280	6-12
2,4,5-T	400	6-12
Acenaphthene	2,400	6-12
Fluoranthene	15,000	12-24
Napthalene	1,800	12-24
Benzo(a) anthracene	16,000	12-24
Benzo(a)pyrene	16,000	12-24
Benzo (b) fluoranthene	4,100	6-12
Benzo (k) fluoranthene	5,400	0-6
Chrysene	12,000	12-24
Acenaphthylene	2,000	6-12
Anthracene	3,900	6-12
Benzo (g,h,i) perylene	3,800	6-12
Fluorene	2,500	6-12
Phenanthrene	15,000	12-24
Indeno (1,2,3,CD) pyrene	4,000	12-24
Pyrene	39,000	12-24
2- Methylnaphthalene	15,000	12-24
4,4-DDT	480,000	0-6
4,4-DDE	7,500	6-12
4,4-DDD	17,100	0-6
Concentrations in ppm		
Copper	350	0-6
Lead	880	12-24
Mercury	10.3	0-6

The *1985 120 Lister Avenue Evaluation* also notes that six soil samples were collected for dioxin analysis after excavation of five "hot spots" that were identified. Samples from excavation Nos. 1 and 3 were below the “acceptable level” of 7.0 ppb after the removal of 6 and 12 inches of soil, respectively. Excavation No. 2 required removal of 18 inches of soil before the dioxin level dropped to less than 7.0 ppb. Both excavations Nos. 4 and 5 showed “high levels” of dioxin (19.1 and 31.0 ppb, respectively) after 12 inches of soil was removed; no further testing was performed on samples from these locations (PAS-00125853).

A figure depicting the locations of the “hot spots” is presented below (PAS-00125843):



According to a *Review of Certain Information Related to the 80 Lister Avenue Site, Newark, New Jersey*, prepared by Woodward-Clyde Consultants, dated May 1987 (the document does not state for whom the report was prepared), “concentrations of dioxin on and in the vicinity of the 80 Lister Avenue property correspond generally with the locations of the manufacturing and handling of compounds found to contain dioxin; are consistent with accidental releases, spillages, and leakage over time; and appear to be inconsistent with deposits of such compounds as the result of dumping or other incidents . . .” (PAP-00154203).

According to the 1987 ROD, the 1984 investigation indicated that hazardous substances were being released from the site to the Passaic River through the routes of groundwater migration and surface runoff of stormwater. The 1987 ROD also notes that the investigation identified TCDD and other hazardous substance in Passaic River sediments, that a separate study of the contamination of Passaic River sediments was being conducted by Diamond at the time, and that results of that study showed that the more recent sediments contained relatively little TCDD compared to older sediments.

The 1987 ROD concludes that the data suggested that releases of TCDD to the Passaic River were much greater in the past during the period of pesticide production at the site than at the present (PAP-00150861).

An *Assessment of Potential Sources of Release of Dioxin to the Environment from Reported Manufacturing Operations and Activities at the Diamond Shamrock Facility, 80 Lister Avenue, Newark, New Jersey* (related to Diamond Shamrock v. Aetna, et al, prepared for the Defense Steering Committee) dated May 29, 1987, states that according to the 1985 80 Lister Avenue Site Evaluation, an estimated 96.2 pounds of dioxin were present in soil at the 80 Lister Avenue site (PAP-00160133). The report also notes that a dioxin concentration of 75 ppm "reported in the pit near the river was likely the result of autoclave discharges, scrubber effluent discharge, or anisole still releases." (PAP-00160135). The report also notes that "estimated quantities of dioxin released, based on particular discharges that have been documented, fall short of the 96.2 pounds reported by I.T." (Diamond's consultant) (PAP-00160135). The report describes the following sources of dioxin from the Lister facility:

- "Airborne emissions (particulates, fumes) were likely a source of dioxin migration. . . . [d]uring the 1950's, emissions from the TCP building were discharged to the atmosphere by exhaust fans. . . . [f]ume exposure was present in TCP production . . . . According to John Burton, the plant manager in the 1950's, the pressure from the autoclave was relieved by venting to the atmosphere after each autoclave batch reaction, indicating gaseous and likely vapor releases to the atmosphere. Based on Diamond Shamrock operating reports from the period November 1966 to July 1969, about 58 autoclave batch reactions occurred per month . . . . The venting system reportedly posed 'problems of contamination' as noted in a November 1968 operating report." (PAP-00160076).

- "Reportedly, organic particulates were controlled to 10 pounds per day by a scrubber by the late 1960's, with sodium trichlorophenate (NaTCP) "mist" emissions controlled to 0.06 pounds per hour from the 1.2 pounds per hour that would have been emitted on an uncontrolled system. Scrubber effluents in which dioxin was likely present would have been discharged to the sewer, to a pit near the river, or to the river. Sources to the scrubber included losses from the T reactor, vapor losses from acidification and dust formed in the flaking process." (PAP-00160076).

- "The 1960 explosion in the autoclave where NaTCP was being manufactured could have released as much as one-third of a pound of dioxin. The explosion may also have indirectly caused dioxin discharge by disturbing "concrete slabs" and "drums" in the area." (PAP-00160076).

- "Other incidental discharges may have resulted from at least five rupture disc releases, . . . causing releases of material to the atmosphere, to the river, and possibly to a pit." (PAP-00160076).

- "Discharges also occurred from reported leaks in the autoclave, from the TCP recovery tank that "burped over" on at least one occasion, from reported leakage in the acidification tank, and possibly from the TCP intermediate storage tank which reportedly presented a 'pollution and safety hazard'. According to a 1968 operating report, TCP was also lost due to its limited solubility in acid-water and, when wastewaters were discharged, the solubilized TCP possibly carried some dioxin with it. In addition, NaTCP storage tank residue flushing would have likely caused the release of dioxin-containing materials into the environment." (PAP-00160077).

- "Also suspected for their potential to release dioxin are the stripping unit, which separated anisole from NaTCP, and filter units, which separated product streams from impurities. According to former Diamond Shamrock employees, the stripper residues were flushed into the river or to a sewer sump, while a small amount of spillage occurred at the unit's sample tap. The condenser tubes in the unit also had leakage problems, while process wastewaters from the stripper were routed to the river. With respect to filters, dioxin would likely have accumulated in filter cakes. Dioxin also was likely carried over into product or with filter washwaters, which, in turn, were sometimes discarded. In addition, the sewering of acid used to regenerate the carbon purification column was another means for the release of dioxin into the environment." (PAP-00160077).

- "The T area was also a likely source of release of dioxin containing materials. The T centrifuge and a manhole on the T reactor were reportedly sources of fume exposure, while odor problems and evidence of material discharge reportedly existed during the process of flaking T acid. Particulate releases from this flaking operation were a likely source of release of dioxin-containing materials." (PAP-00160077).

- "Plugging problems in lines and pumps were reported in depositions and operating reports. Disassembling and flushing of pipes, as well as reported leakage in transfer and product lines, would have contributed to further releases of dioxin." (PAP-00160077).

- "Process wastewaters were discharged in large volumes to the Passaic River before 1956. These discharges continued after 1956 with some of the wastewaters going to the sewer. Reportedly, 100 tons of unrecycled 2,4,5-T effluents per year were discharged into the Passaic River in 1959. Sources of these wastes include filter and ester wash water. Sewer and sump samples reported in a 1985 report prepared for Diamond Shamrock by I.T. Corp., et al, titled 'Site Evaluation, 80 Lister Avenue' noted eight sumps that were sampled. All samples contained dioxin ranging from 19.5 to 9,160 parts per billion (ppb) (PAP-00160077-78).

- "Materials that were discharged to the sumps reportedly included discharges from the TCP area, sulfuric acid from the scrubbers, process streams related to the anisole stripper, and chlorophenolic wastes. Process wastewaters were routed to a sump in the area of the manufacturing building (2,4-dichlorophenoxyacetic acid (D) and T), with the overflow discharging to a sewer. Cleaning of accumulated residues from the sumps was reportedly a 'dirty, messy operation' which might have resulted in the discharge of dioxin-containing materials." (PAP-00160078).

- "According to depositions, there are indications that general maintenance and housekeeping practices also contributed to dioxin releases. Maintenance would have included flushing of residue from process vessels and discarding of old pipes and debris. "Gunk from tanks' was reportedly discarded during plant shutdown. Some evidence of 'poor housekeeping' was also noted at the riverfront, where drums and equipment were reportedly stored on a concrete pad. In addition, spillage in quality control sampling procedures and disposal of unused or wasted samples would have resulted in further discharge of dioxin into the environment." (PAP-00160078).

- "Packaging and transport would likely have contributed to some release of dioxin-containing materials. The 'bagging' area reportedly had a certain amount of dust, and any spillage in loading and transport for shipping may have gone into the ground since depositions did not indicate any special practices of isolating or cleaning up spills. Furthermore, truck traffic likely provided an additional means for dioxin-contaminated dust migration in the vicinity of the site." (PAP-00160078).

- "The aforementioned 1985 report projected that 96.2 pounds of dioxin are contained in the soil at the 80 Lister Avenue site. Based on an assessment of potential dioxin (2,3,7,8-TCDD) content in documented releases, the total projected amount of dioxin would appear to be far less than the 96.2 pounds reported. This assessment suggests that the bulk of the dioxin on site arose from routine process emissions through leaks and operations that allowed for material to be lost. Based on available discovery documents, such as depositions and operating reports from the late 1960's, it appears that these discharges were likely persistent throughout the period of operation of the Diamond Shamrock plant." (PAP-00160078).

According to an undated *Remedial Design Investigation Report*, which states it was prepared pursuant to the Consent Decree entered into by the State of New Jersey and OCC, soil sampling occurred at the site in June 1994 "to confirm and delineate the dioxin concentrations in some areas of the Site and to measure the concentration of dioxin in areas of the Site where there are no data." (PAP-00160409).

TCDD was detected at concentrations as high as 50,000 ppb in a sample collected from zero to six inches below ground surface (PAP-00160413). The location of this sample is not described in the text of the report, but appears to be located northwest of the warehouse and west of a debris pile (PAP-00160400).

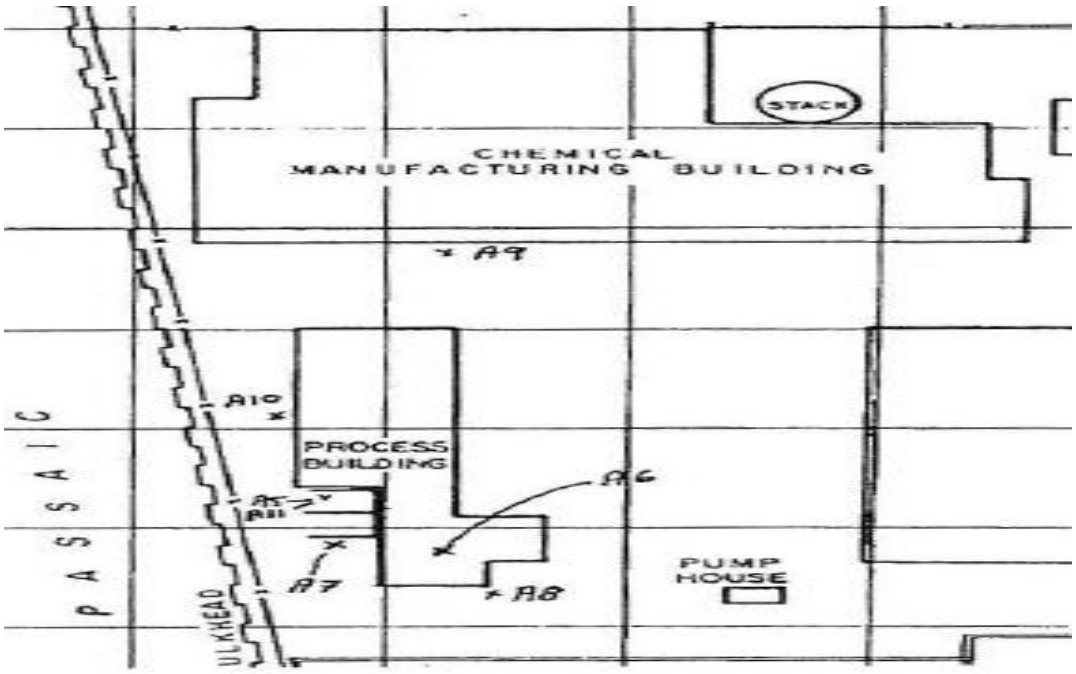
According to the *Moomaw Report*, soil samples were collected in 1984, 1994, and 1997. The 1984 and 1994 data also are discussed in previous paragraphs above. According to the report, for all three datasets, dioxin was detected at all locations in at least one depth interval sampled. "The highest concentration, at 50,000 ppb, was found in 1994 on the west side of the process building near the autoclave and carbon column . . . . For the other years sampled, the highest concentrations were 19,500 ppb in 1984 and 4,790 ppb in 1997 in the area between the process, manufacturing, and warehouse buildings." (PAP-00164660).

The report states that many of the areas sampled around the process and manufacturing buildings had concentrations comparable to that found in Diamond's TCP in the 1960s. The report goes on to state that "'[m]uch lower' concentrations (50 ppb) were found in areas away from the process and manufacturing buildings, likely originating from occasional spills, process emissions, the 1960 explosion, or subsequent construction." The report concludes that the "dioxin contamination detected in these soil samples is consistent with, and was caused by, releases from Diamond's TCP and 2,4,5-T manufacturing operations." (PAP-00164660).

Sampling at the 80 Lister facility in 1992 showed PCBs in sumps and tanks as follows (see map below for location of samples):

80 Lister Sampling					
Sample	**PCB-77 (ng/g)**	**PCB-105 (ng/g)**	**PCB-118 (ng/g)**	**PCB-126 (ng/g)**	**PCB-169 (ng/g)**
A5-Sump Residue-Mixed Soil/Liquid Matrix	4.3	4.0	6.5	--	0.77
A6-T4CB Tank Residue	1.4	0.36	0.5	--	0.12
A7-T4CB Unloading Line	0.38	0.81	5.0	--	0.24
A8-Anisole Still Soil	4.1	7.7	19.0	1.4	0.43
A9-Sump Residue	27	11	18	1.0	--
A10- Sump Residue--Mixed Soil/Liquid Matrix	2.5	23	33	0.23	0.084
A11-Adjacent to Sump	2.2	53	180	0.37	0.038

(PAP-00210639)



(PAP-00210629)

As reported by a *Draft Focused Feasibility Study for Comparison of the Consent Decree Remedy and Hypothetical Excavation and Incineration Alternatives, Diamond Alkali Superfund Site, Newark, New Jersey*, prepared for Chemical Land Holdings, Inc., dated August 11, 1997 (1997 FFS), soil sampling data were collected for dioxin during the Site Evaluation and the Remedial Design Investigation, both discussed in previous above. The following is a summary of the data as presented in the 1997 FFS:

- At 80 Lister Avenue, the data in the upper two feet of soil indicated "widespread" dioxin concentrations above preliminary remediation goals (PRGs).[5] "The dioxin concentration exceeds 7 ppb in 101 of 117 samples (86 percent) collected within the upper two feet of soils and exceeds 1 ppb in 114 of 117 samples (97 percent)." (PAP-00160672) The maximum concentration detected was 50,000 ppb (PAP-00160682).

- At 80 Lister Avenue, "[t]he next data set available was at the interface between the Fill and the underlying Silt layer, which was encountered at approximately 8 feet below grade across most of the Site and as deep as 16 feet below grade near the existing bulkhead along the Passaic River. Samples collected directly above the Silt layer also indicate the presence of dioxin above PRGs. The dioxin concentration exceeds 7 ppb in three of eight samples (38 percent) collected directly above the Silt layer, and exceeds 1 ppb in five of eight samples (62 percent)" (PAP-00160673). The maximum concentration detected was 71.8 ppb (PAP-00160684).

- The majority of the samples collected from the 120 Lister Avenue property during the Site Evaluation were within the upper two feet of soil. Dioxin concentrations exceeded 7 ppb in 18 of 81 samples (22 percent) collected within the upper two feet of soil, and exceeded 1 ppb in 45 of 81 samples (56 percent) (PAP-00160673). The maximum concentration detected was 520 ppb (PAP-00160686).

- At 120 Lister Avenue, at depths greater than two feet, samples were collected in 1.5-foot increments. The number of samples for each depth interval within the fill varied from one to seven. The dioxin concentrations exceeded 7 ppb in five of 26 samples (19 percent), and exceeded 1 ppb in eight of 26 samples (30 percent) (PAP-00160673). The maximum concentration detected was 155 ppb (PAP-00160687).

The 1997 FFS notes that for dioxin, two PRGs were considered: 1) a soil cleanup standard of 1 ppb listed in Appendix II of the Judicial Consent Decree, and 2) a PRG of 7 ppb that was considered in a 1985 Feasibility Study. As noted in the 1987 ROD and the Judicial Consent Decree, the 1 ppb PRG for dioxin is a soil concentration that was developed by the Center for Disease Control and had been applied at cleanups throughout New Jersey. The 7 ppb PRG was used for interim remedial activities on the 120 Lister Avenue property, which were performed during 1984-85 (PAP-00160698):

[5] The PRGs were taken from the 1985 FS (a dioxin PRG of 7 ppb), from the Judicial Consent Decree, and from soil cleanup criteria published by NJDEP (1996) if no soil cleanup standard is listed in the Judicial Consent Decree for a hazardous substance (PAP-00160672).

The following is a summary of maximum detected concentrations of COCs detected above the PRGs as listed in the 1997 FFS (PAP-00160682-88):

Exceedances of Preliminary Remediation Goals at 80 Lister Ave			
Contaminant of Concern	**Preliminary Remediation Goal**	**Maximum concentration 0-2 feet**	**Maximum Concentration >2 feet**
Concentrations in ppb			
2,4,6-Trichlorophenol	10,000	1,700,000	360,000
2,4,5-Trichlorophenol	50,000	7,500,000	270,000
Fluoranthene	10,00	64,000	None reported
Naphthalene	10,00	11,000	16,000
Benzo (a) anthracene	10,000	47,000	None reported
Benzo (a) pyrene	660	44,000	None reported
Benzo (k) fluoranthene	4,000	71,000	None reported
Chrysene	40,000	120,000	None reported
Phenanthrene	10,000	61,000	None reported
Indeno (1,2,3,CD) pyrene	4,000	21,000	None reported
Pyrene	10,000	78,000	None reported
2-Methylnaphthalene	10,000	21,000	14,000
4,4'-DDT	9,000	5,090,000	None reported
4,4'-DDE	9,000	297,000	None reported
4,4'-DDD	12,000	182,000	370,000
Concentrations in ppm			
Copper	170	730	6,600
Lead	400	2,300	11,000
Mercury	1	39	95

Exceedances of Preliminary Remediation Goals at 120 Lister Ave			
Contaminant of Concern	**Preliminary Remediation Goal**	**Maximum concentration 0-2 feet**	**Maximum Concentration > 2 feet**
Concentrations in ppb			
2,3,7,8-TCDD	7	520	155
Fluoranthene	10,000	15,000	None reported
Benzo (a) anthracene	10,000	16,000	None reported
Benzo(a)pyrene	660	16,000	None reported
Benzo (k) fluoranthene	4,000	4,100	None reported
Phenanthrene	10,000	39,000	None reported
Pyrene	10,000	39,000	None reported

Exceedances of Preliminary Remediation Goals at 120 Lister Ave			
Contaminant of Concern	**Preliminary Remediation Goal**	**Maximum concentration 0-2 feet**	**Maximum Concentration > 2 feet**
2-Methylnaphthalene	10,000	15,000	None reported
4,4'-DDT	9,000	480,000	None reported
4,4'-DDD	12,000	17,100	None reported
Concentrations in ppm			
Copper	170	350	690
Lead	400	880	530
Mercury	1	1.9	None reported

According to a the 1997 FFS, an estimated 38,122 cubic yards of soil were present at 80 Lister Avenue with dioxin concentrations greater than 7 ppb, and 50,246 cubic yards of soil were present at 80 Lister Avenue with dioxin concentrations greater than 1 ppb (PAP-00160689-90).

Groundwater Data

According to the 1985 80 Lister Avenue Site Evaluation and the 1987 ROD, as part of the investigation that took place in 1984, 17 groundwater samples were collected. The following table identifies the maximum detected concentrations of COCs in groundwater (PAP-00150855; PAS-00127164-68):

Maximum Detected Concentrations of COCs in Groundwater 80 Lister Avenue Site Evaluation - February 1985	
COC	**Maximum Detected Concentration (ppb)**
Concentrations in ppb	
2,3,7,8,-TCDD	10.4
2,4,6-Trichlorophenol	11,000
Acenaphthene	30
Fluoranthene	120
Napthalene	480
Benzo (a) anthracene	8
Anthracene	4
Fluorene	32
Phenanthrene	110
Pyrene	46
2- Methylnaphthalene	900
2,4-D	27,000
2,4,5-T	5,600
4,4-DDT	22,000
4,4-DDE	54

Maximum Detected Concentrations of COCs in Groundwater	
80 Lister Avenue Site Evaluation - February 1985	
COC	**Maximum Detected Concentration (ppb)**
Concentrations in ppb	
4,4-DDD	13,000
Copper	2.9
Lead	47
Mercury	0.16

The *1985 80 Lister Avenue Site Evaluation* concludes that analysis of samples collected from eight on-site wells confirmed the presence of dioxin in groundwater, and that contamination was present in 15 of 17 water samples collected, ranging from 0.0059 ppb to 10.4 ppb. The report also concludes that the results indicated that "contamination is greatest at the north end of the site along the river, near the process and chemical manufacturing buildings" (PAS-00127261).

According to the May 1985 *Site Evaluation for 120 Lister Avenue* and the 1987 ROD, dioxin was not detected in any of the five ground water samples collected from the 120 Lister Avenue site (PAP-00150860; PAS-00125854). 4,4-DDT, 4,4-DDE, and 4,4-DDD were detected at maximum concentrations of 2.5 ppb, 3.2 ppb, and 1.8 ppb, respectively (PAS-00125875). Copper, lead, and mercury were detected at maximum concentrations of 1.46 ppb, 6.6 ppb, and 0.062 ppb, respectively (PAS-00125876).

According to an undated *Remedial Design Investigation Report*, which states it was prepared pursuant to the Consent Decree entered into by the State of New Jersey and OCC, groundwater was sampled in 1994. The following table identifies the maximum detected concentrations of COCs in groundwater (PAP-00160507-08).

Maximum Detected Concentrations of COCs in Groundwater	
Remedial Design Investigation - 1994	
COC	**Maximum Detected Concentration**
Concentrations in ppb	
2,3,7,8,-TCDD	28,000
Napthalene	17
Fluoranthene	99
Phenanthrene	61
Concentrations in ppb	
4,4-DDT	87.7
4,4-DDE	32
4,4-DDD	47.4
Copper	715
Lead	2,200
Mercury	12.7

According to an August 29, 2019 *Site Evaluation Work Plan Addendum* for the Diamond Alkali Superfund Site, findings presented in a March 29, 2019 Site Evaluation Report confirmed the presence of dense non-aqueous phase liquid (DNAPL) on the Site. EPA has directed OCC to conduct "additional investigation activities . . . to delineate the vertical extent of [DNAPL] that was previously identified below the organic silt layer underlying the Site." (PAP-00422963).

Fate and Transport

A 2014 paper *Fate and Transport of Hydrophobic Organic Chemicals in the Lower Passaic River: Insights from 2,3,7,8-Tetrachlorodibenzo-p-Dioxin* by Israelsson, et. al. concludes the following:

- "H[ydrophobic] O[rganic] C[hemicals (HOCs)}] trapping processes within the LPR have been highly effective in the past; approximately ¾ of the LPR/Newark Bay 2,3,7,8-TCDD inventory was estimated to reside in the lower six miles and more than half within approximately 1 mile of the dominant 2,3,7,8-TCDD source location (not accounting for recent removal actions).

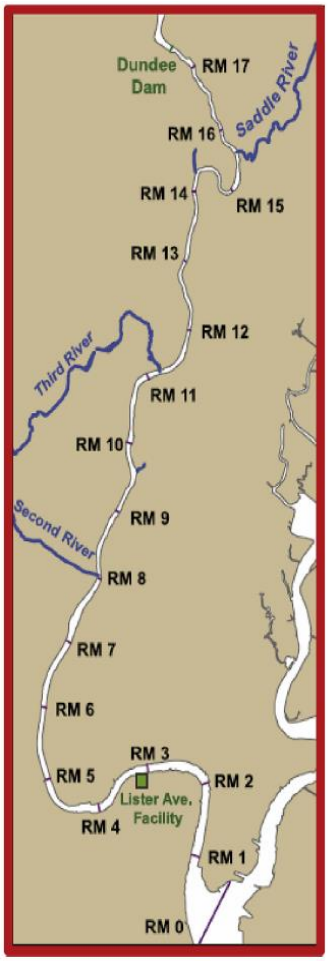
- Upstream transport processes (tidal pumping and gravitational circulation) have distributed HOCs as far upstream as approximately RM 14.

- Trapping of 2,3,7,8-TCDD downstream of RM 2 has likely been more effective than trapping upstream of RM 4, consistent with expectations based on system geomorphology, the strong influence of freshwater discharge on net sediment transport, and HOC-specific transport processes.

- Although the LPR 2,3,7,8-TCDD signal declines moving away from the LPR mouth (based on concentrations and the ratio of 2,3,7,8-TCDD to total TCDD), the signal remains visible in lower Newark Bay" (PAP-00149637).

A 2015 paper regarding fingerprinting by Quadrini, et. al., states that peak 2,3,7,8-TCDD concentrations in the lower Passaic River cores 'date to the 1950s, as evidenced by the horizontal shaded bands established through radioisotope age dating . . . . This peak date is consistent with the known 2,3,7,8-TCDD discharge history from the site [Diamond facility]. Also evident in the cores are secondary 2,3,7,8-TCDD peaks, roughly at 80 inches . . . and 55 inches . . . below the sediment surface. The timing of these secondary peaks generally coincides with the February 1960 trichlorophenol autoclave explosion at the site that released 2,3,7,8-TCDD and other compounds to the surrounding area . . . . The decline in 2,3,7,8-TCDD concentrations after this explosion presumably reflects smaller mass discharge from the site after the replacement of the main processing facility in 1961 and the end of 2,4,5-trichlorophenoxyacetic acid production in 1969 . . . , as well as a natural recovery of surface sediments. Surface 2,3,7,8-TCDD concentrations in the 3 cores range from 418 ng/kg to 776 ng/kg, roughly 3.0 to 4.5 orders of magnitude lower than the peak 2,3,7,8-TCDD concentrations." (PAP-00162747).

In conclusion, "[t]he sediments of the lower 14 miles of the lower Passaic River contain a relatively uniform PCDD/F composition that resembles the composition of sediments adjacent to the Lister Avenue site, which in turn matches the composition of samples taken on the upland site. The match has been demonstrated using several fingerprints: 15-congener PCDD/F composition, PCDD/F homolog composition, 1,3,7,8-TCDD to 2,3,7,8-TCDD ratios, and 2,3,7,8-TCDD to total TCDD ratios. The match strongly indicates that the Lister Avenue site is the dominant source of the examined PCDD/Fs over this region. The upstream influence of the site, which extends to approximately RM 14 (congener ratios indicate a gradually declining influence over the RM 13–15 interval in particular), is consistent with upstream contaminant transport and salinity intrusion considerations, particularly during the peak site discharge period" (PAP-00162754).



According to *Parette, et. al. (2018)*, the 80 Lister facility is the major source of TCDD in the sediments of the Passaic River. A reconstruction of the chemical processes at the site identified dilutionfiltration, a TCP purification process that was utilized prior to September 1954, as the major pathway by which TCDD was discharged to the Passaic River from the Lister Avenue site. This process concentrated TCDD in a waste organic sludge that was subsequently discharged to the river. Annual TCP production, coupled with modeling to predict concentrations of TCDD, indicate that TCDD discharges to the LPR from this one process (20-80 kg) are consistent with mass estimates of TCDD in the river (30-50 kg). TCDD and cesium-137 data from nearby sediment cores support this purification process as a major pathway by which TCDD entered the river (PAP-00210169-176). The paper also states that the highest concentrations of TCDD in the LPR were found in sediments directly adjacent to the Lister Avenue site, and approximately 70% of the estimated TCDD in the LPR is contained within one RM of this site. The bulk of the TCDD is concentrated between RM 2 and RM 4, with only 10% above RM 6 (PAP-00210170).

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

OKONITE COMPANY

Facility Name, Address and Size: Okonite Company, Inc., (Okonite) Canal and Jefferson Streets, Passaic, NJ, 07055 (PAS-00108491). The current site address is 220 Passaic Street, Passaic, NJ 07055 (PAS-00123415). However, Okonite sold this property in February 1993 and has not operated this site since July 5, 1989 (PAP-00240078). The current acreage of the site is 13 acres (PAP-00256257). The available references did not include information on the number of site employees and typical work shifts.

1. **Business Type:** The Okonite Company was founded in 1878 making it one of the original insulators of electrical wire and cable in the United States. Okonite is the premier manufacturer of high quality insulated electric wire and cable, specializing in high voltage cable (up to 345kV), medium voltage cables (from 5 to 35kV) and low voltage power, control and instrumentation cables. The cables are manufactured with a variety of materials including laminated polypropylene paper, thermosetting and thermoplastic insulation and jacketing compounds. Many products feature Okonite's Okoguard all EPR insulation system. These constructions are further complemented by a wide selection of metallic and nonmetallic coverings to provide added mechanical protection to the wire and cable for various environments (PAS-00102060).

   The basic raw materials were copper, aluminum, rubber, and plastic. Okonite also manufactured the rubber compounds used to insulate the electrical conductors. This process involved the mixing and extruding of solid and liquid raw materials. Raw materials included clay, paraffin, carbon black, lead, and zinc oxide (PAP-00256284, PAP-00242981-82, 90).

2. **Time Period of Ownership/Operations**

   Operator: 1885 to 1989 (PAP-00240078)
   Owner: 1885 to 1993 (PAP-00240078)

3. **Operational History/COC Use and Presence at the Facility**

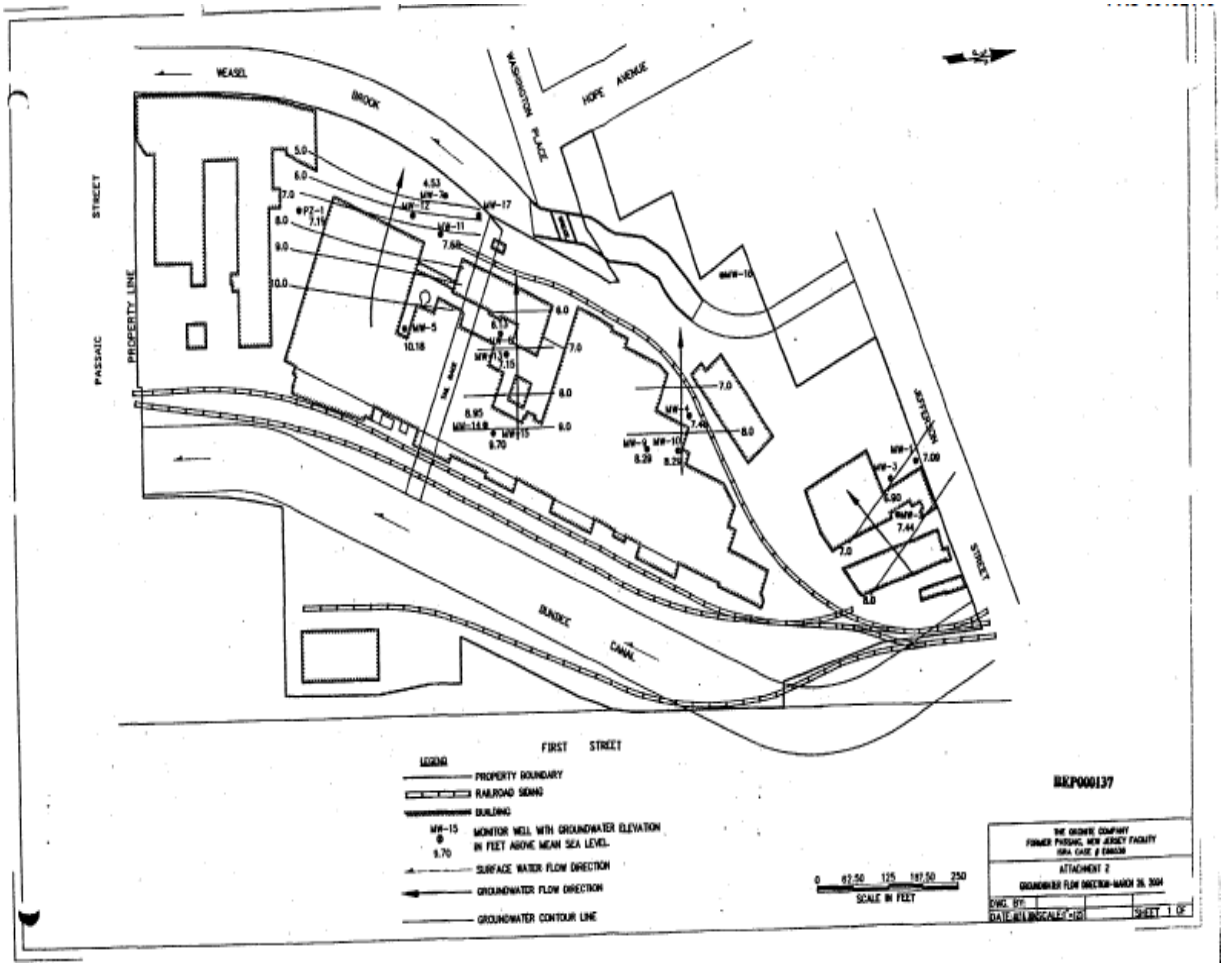
   As mentioned in Section 1 above, the Okonite facility manufactured electrical power cables at its Passaic Plant. Processes included wire drawing, stranding, taping shielding, insulating, jacketing, and testing. Basic raw materials used were copper, aluminum, rubber, and plastic. Okonite also manufactured the rubber compounds used to insulate the electrical conductors. Raw materials used in these processes included clay, paraffin, carbon black, lead and zinc oxide (PAP-00256284, PAP-00242981-82, 90).

Okonite Company

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



(PAS-00102115)

Based on review of available documents, the following Areas of Concern (AOCs) were identified in a February 1991 *Result of Sampling Plan Implementation and Supplemental At-Peril Activities* report prepared by Environmental and Energy Consultants, Inc. (ECC) on behalf of Okonite:

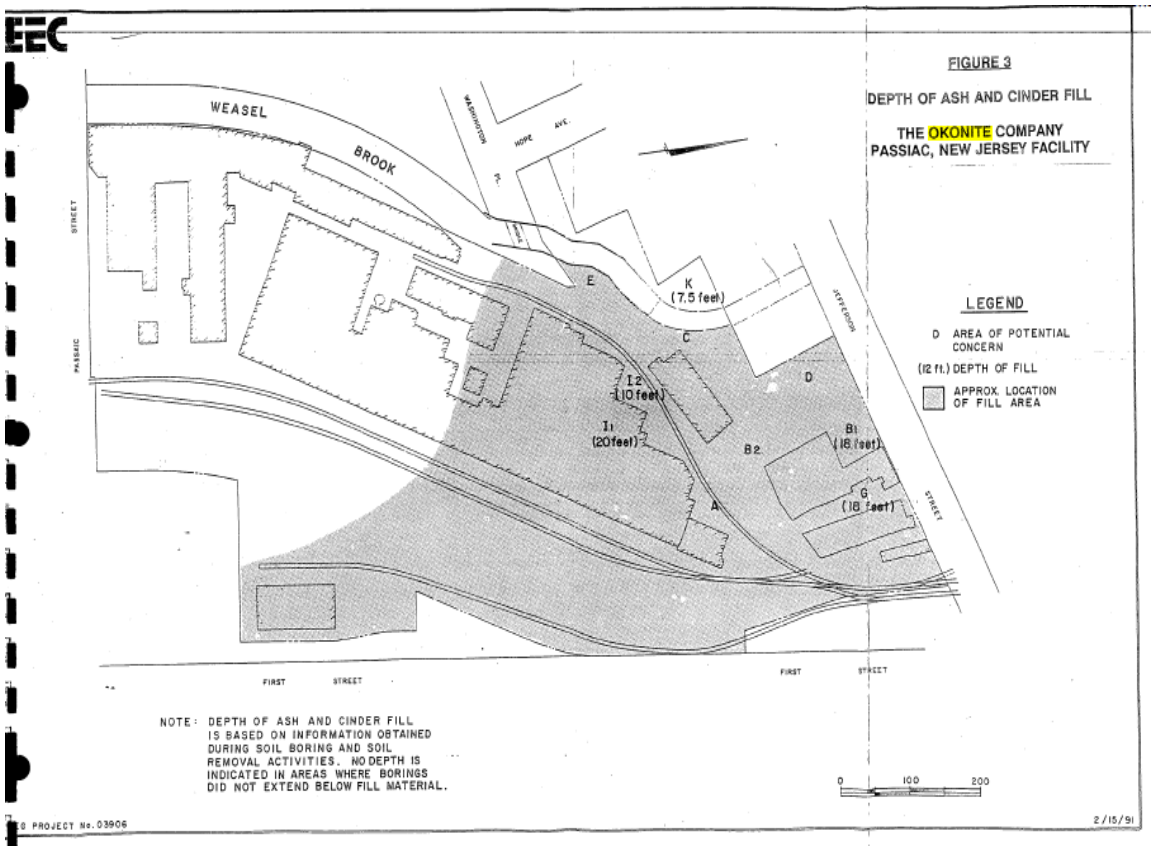
Okonite AOCs	
Area A – Facility drummed hazardous waste storage area	Area F2 – Piping trench in Engine Room and nearby area
Area B1 – Drummed raw material storage area	Area G – 8000-gallon steel gasoline Underground Storage Tank (UST) and abandoned 1,000-gallon UST of uncertain usage
Area B2 – Unpaved empty drum storage area	Area I1 – 9,000-gallon concrete drawing fluid pit
Area C – Paved empty drum storage area	Area I2 – Exterior area west of drawing fluid pit, location of historic boring I-2

Okonite AOCs	
Area D – Historic drummed raw material storage area	Area K – Unpaved area of oil-stained soils with water softener resin beads and tar-like material
Area E – 300-gallon, concrete encased, steel underground storage tank (UST) historically used to store waste kerosene, oil, and solvents	Area M – Banbury mixer area
Area F1 – 76,000-gallon concrete No. 6 fuel oil UST	Various drainage structures – Catch basins, drains, troughs and machinery pits, most with permitted outfalls to Weasel Brook

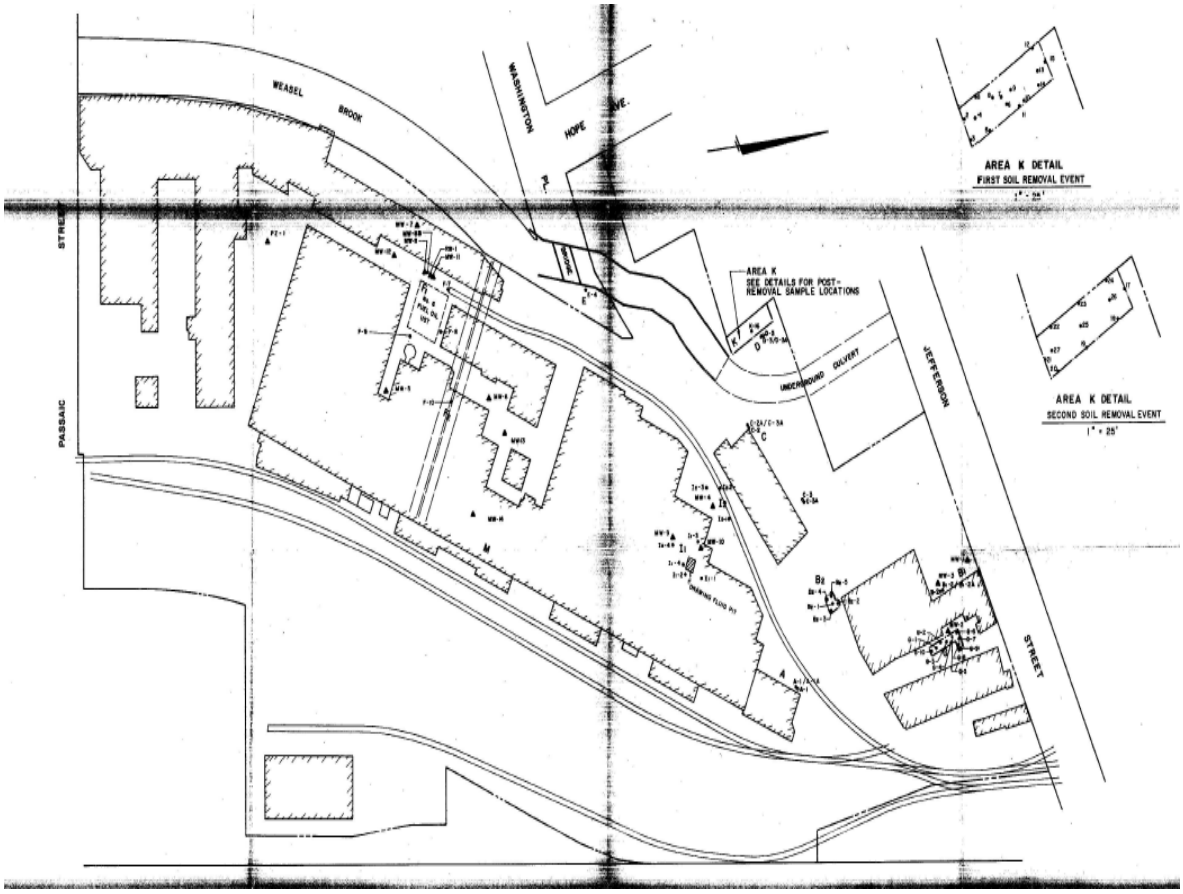
(PAP-00244643-84, 725)

Of the AOCs identified at the Site, Historic Fill was identified at Area 16 (PAP-00260097). Several other AOCs were determined to be located within areas of historic fill material, as discussed further in the following sections. The AOCs discussed in the above table are generally co-located with historic fill material (including ash and cinder), as determined by extensive subsurface investigations at the Site.

The AOCs identified in the 1991 report are depicted on the figures below:



(PAP-00244638)



(PAP-00244631)

Presented below is a summary of findings at the different AOCs as reported by the *Results of Sampling Plan Implementation and Supplemental At-Peril Activities* dated February 1991.

Areas A, B1, and D

Area A is the facility hazardous waste drum storage area. The area is controlled by a concrete spill control system. Waste chlorinated and non-chlorinated solvents and oils were stored in this area.

Areas B1 and D are recent and historic drummed material storage areas, respectively. Materials stored in these areas include all liquid materials used in facility processes. All three areas are asphalt paved. No evidence of contamination (i.e., oil staining, odor and/or elevated monitoring instrument response) was observed in any of these areas during the historic sampling events (PAP-00244643).

The New Jersey Department of Environmental Protection (NJDEP) approved No Further Action (NFA) for these AOCs A, B1 and D in their letter dated April 11, 1994 (PAP-00240168-70).

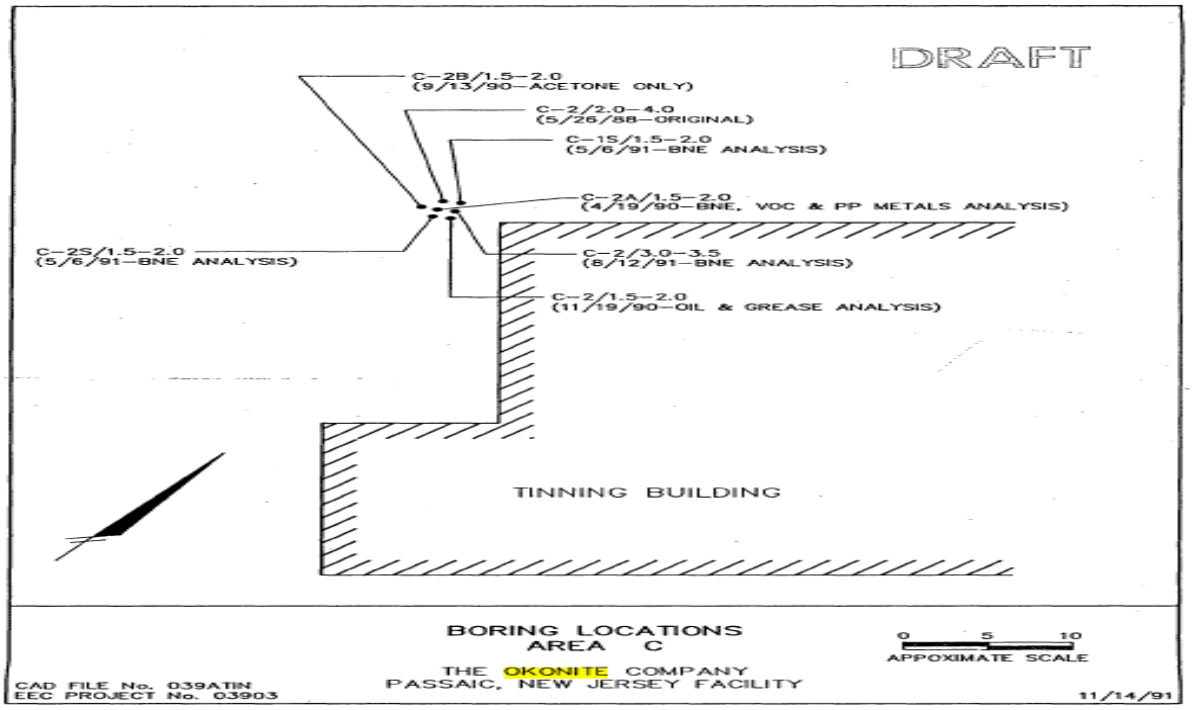
Area B2

This area is a small unpaved area that was used for storage of empty drums that were previously used for liquid raw materials used in the facility processes.

The NJDEP approved NFA for AOC B2 in their letter dated April 11, 1994 (PAP-00240168-70).

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials.



(PAP-00244335)

Area E

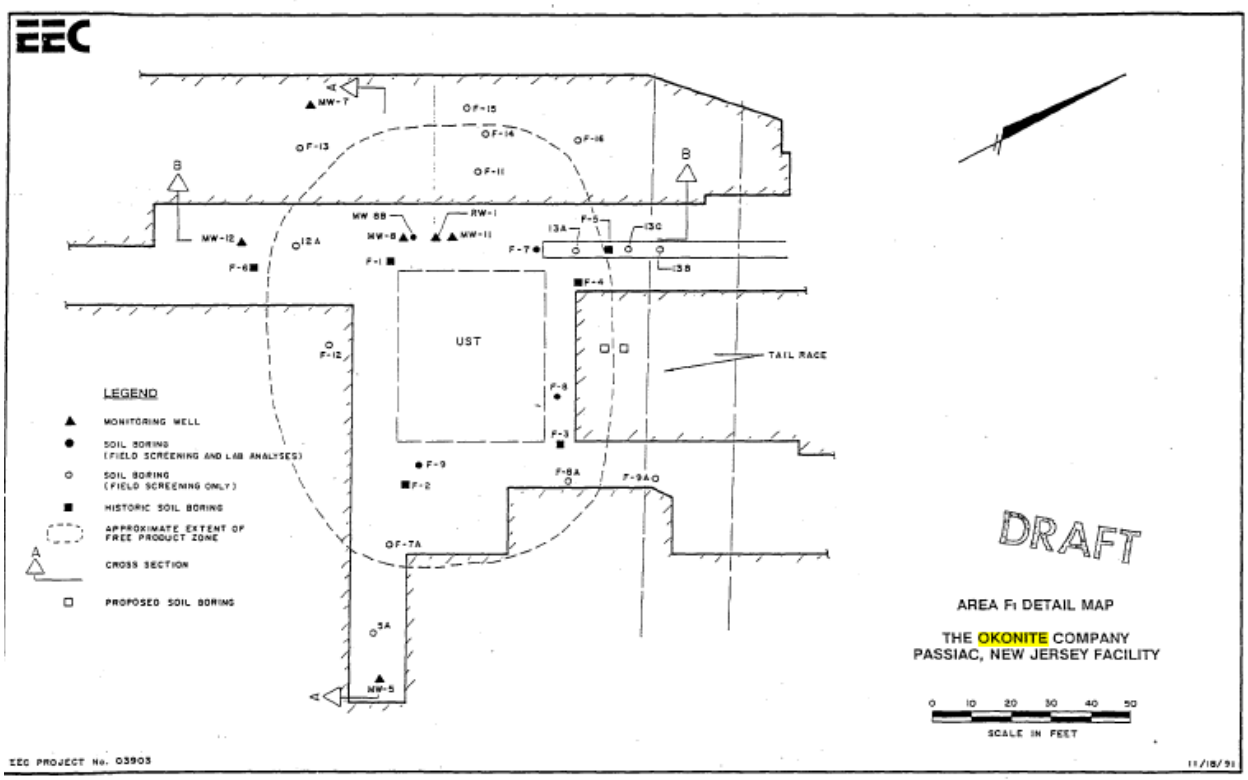
This area was the location of an abandoned approximately 300-gallon steel UST encased in concrete that was historically used to store waste kerosene and other compounds that may have been used as degreasers at the facility. The UST was properly decommissioned through removal in accordance with facility Decontamination/ Decommissioning Plan. The UST was disposed as scrap metal along with the USTs from Area G. No evidence of a release was found in the removal of the USTs (PAP-00244653). The NJDEP approved NFA for Area E in their letter dated April 11, 1994 (PAP-00240168-70).

Area F1

This area is the location of a 76,000-gallon concrete UST that was used to store No. 6 fuel oil. The UST was installed in approximately 1922. The UST was emptied and cleaned in 1991 (PAP-00244655).

Area F2

This area consists of a piping trench located beneath a metal plate in the floor of the facility engine room, which houses the facility air compressors. This area was identified as an area of potential concern subsequent to conditional sampling plan approval during implementation of decontamination/decommissioning activities for machinery pits and other subgrade structures at the facility. Condensate from the air compressors was determined to have been historically discharged to the trench, which was earthen-bottomed (PAP-00244657).



(PAP-00244342)

Area G

Area G is the location of an 8,000-gallon gasoline UST. In addition, a small, approximately 1,000-gallon, abandoned UST that contained sand and a small amount of water, was discovered immediately adjacent to the gasoline UST during removal of the gasoline UST. Both USTs were properly closed (PAP-00244657-8). The NJDEP approved NFA for Area G in their letter dated April 11, 1994 (PAP-00240168).

Okonite Company

Diamond Alkali OU2 Allocation

ADR Confidential

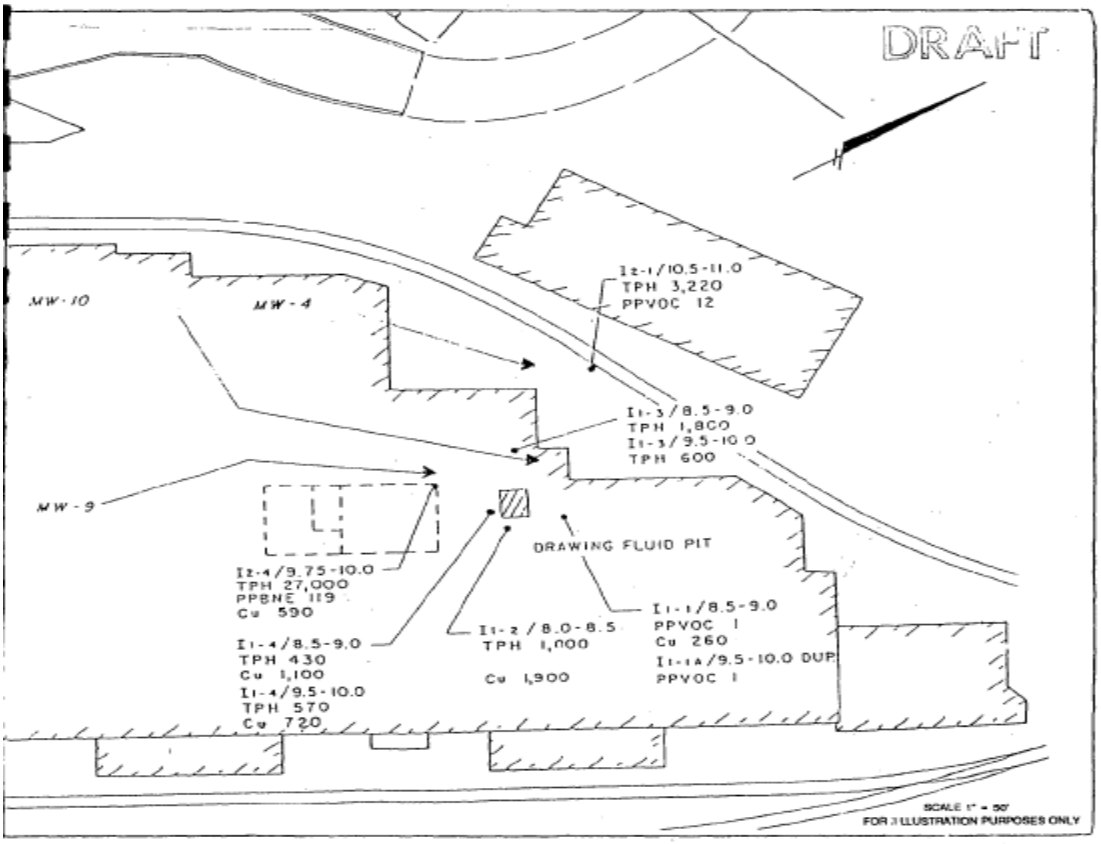
Facility Data Report

Area I1

This area is the location of a 9,000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976. No evidence of contamination was encountered above the water table (PAP-00244661). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located (PAP-00244664).



LOCATIONS OF SOIL BORINGS AND MONITORING WELLS IN AREA I AND BUILDING 25 BASEMENT

(PAP-00244344)

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area (PAP-00244665).

Area M

This area was identified as an area of potential environmental concern during facility decontamination/decommissioning activities when the Banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size and, the bottom of the pit is approximately 3 feet below grade, and consisted of several concrete sub-chambers (PAP-00244684). The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present) (PAP-00244684).

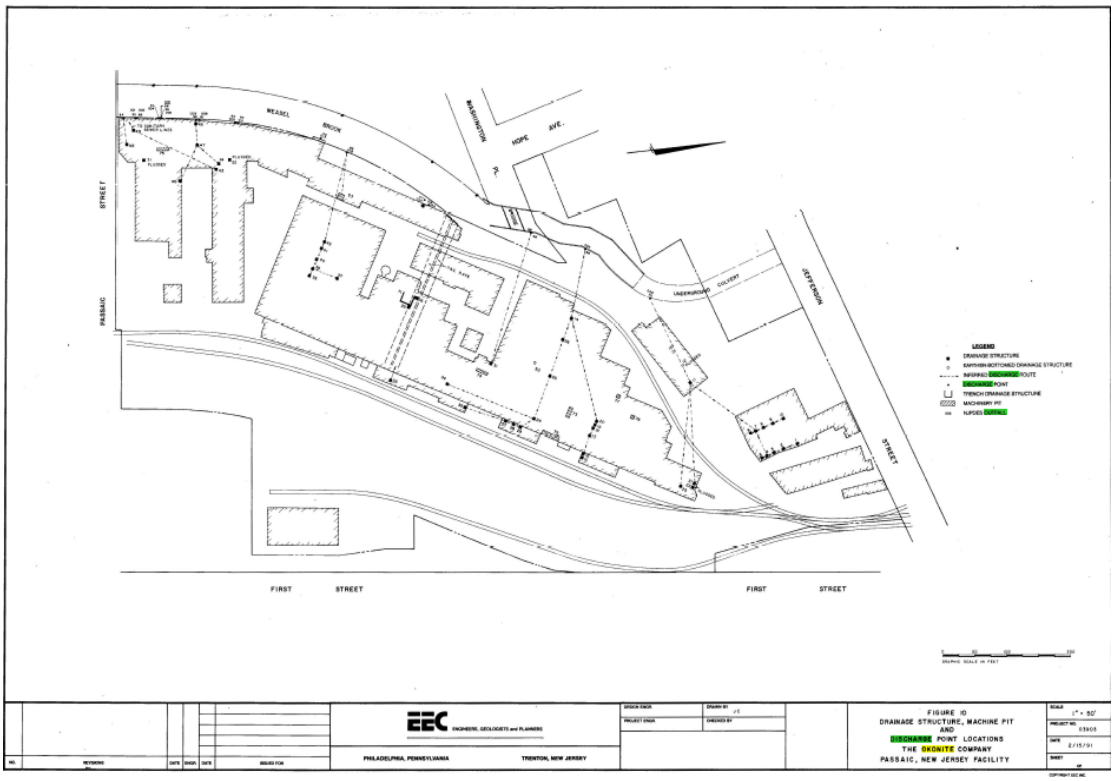
This Area was subsequently divided into Areas M1 and M2. Area M1 was described as the pit beneath the former Banbury mixer inside the main building and Area M2 was the groundwater in the vicinity of the former Banbury mixer. Area M2 contained different COCs than those found in Area M1. Based on the distribution of impacted soils and field observations, the impacts at Area M1 were attributed to not only the Banbury pit but also fill material in the area or historical operations through the former wooden floor in the area of that building (PAP-00245788-93).

Drainage Structures and Machinery Pits

Several drainage structure, machinery pits, and discharge points to Weasel Brook were identified at Okonite (PAP-00244725). Detailed information on the discharge points to Weasel Brook is summarized in Sections 4 and 5 below.

Most of the interior drainage structures in the facility were identified as access-ways to storm drain lines. These structures were covered with metal plates and were not located near machinery except for one structure 15 (which fed into 16-20). In addition, most of the facility contact and non-contact cooling water was discharged directly to Weasel Brook, via underground piping under the New Jersey Pollution Discharge Elimination System (NJPDES) permit (PAP-00244720).

In addition to drains 13, 18-20, 30, 53, and 54, and the Weasel Brook discharge points, three areas of potential environmental concern were identified in the course of decontamination and decommissioning activities. These were the stream bank adjacent to Building 37, where lead strips were found; the baghouse area, an unpaved area beneath the Banbury mixer where oil-stained soils were observed; and the hydraulic lift pit, the location of lift equipment for the loading dock, where oil-stained soils were also found (PAP-00245798-802).



(PAP-00244375)

According to the December 17, 2003 *Remedial Action Report (RAR)*, no sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615 (PAP-00259165).

4. Identified COCs

- PCBs (used)
- PAHs (used, detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (detected)

PCBs

According to a December 14, 1992 Administrative Consent Order Affidavit, PCBs were present in exterior transformers (PAP-00240541)..

PAHs

The International Carbon Black Association states that PAHs can only be extracted from the surface of industrially manufactured Carbon Black under vigorous laboratory conditions, and that the risks to human health associated with presence of PAHs originating from carbon black in its final product form is extremely low (PAP-00264260). Based on review of the *Result of Sampling Plan Implementation and Supplemental At-*

Peril Activities dated February 1991 and *Results of Supplemental Sampling Plan Implementation and Additional At-Peril Activities*, dated October 1992, PAHs were detected in soil samples collected from the various AOCs. Presented below are the PAH concentrations detected at the various AOCs:

Max PAH Concentrations detected at AOCs (mg/kg)						
PAH	**Area A**	**Area B1**	**Area B2**	**Area C**	**Area D**	**Area E**
Acenaphthylene			0.029 J	0.23 J		0.031 J
Acenapthene				5.8		0.026 J
Anthracene				9.4		0.065
Benzo(a)anthracene		0.45	1	23	0.019	0.36
Benzo(a)pyrene		0.23 J		16	0.012	0.3 J
Benzo(b)fluoranthene			0.25 J	1.5	0.014	1.1
Benzo(g,h,i)perylene				17		0.36 J
Benzo(k)fluoranthene			0.2 J	15	0.012	
Chrysene		0.47	3.7	22	0.024	0.45
Fluoranthene	0.061 J	0.66	1.7 J	42	0.037	0.74
Fluorene				0.23 J		0.034 J
Indeno(1,2,3-cd)pyrene			0.73	17	0.003	0.44
Naphthalene				1.8		
Phenanthrene	0.027 J	0.54	0.84	43	0.014	0.57
Pyrene	0.095 J	1.1	1.9	46	0.024	0.73

J: Estimated
(PAP-00244645-56, PAP-0245810-1)

Areas A, B1 and D

Soil sampling conducted at Areas A and B1 in 1990 showed carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were below 10 milligrams per kilogram (mg/kg) (PAP-00244643-44).

The following PAHs: phenanthrene, fluoranthene, and pyrene were detected at estimated concentrations of 0.027 mg/kg, 0.061 mg/kg, and 0.095 mg/kg collected from sample A-1 at a depth of 2.5-3.0 feet below ground surface (ft bgs) (PAP-00244645).

The following PAHs: phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene were detected at concentrations of 0.54 mg/kg, 0.66 mg/kg, 1.1 mg/kg, 0.45 mg/kg, and 0.23 mg/kg from sample B-2B at a depth of 1-1.5 ft bgs (PAP-00244646).

The following PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected at concentrations of 0.019 J mg/kg, 0.012 J mg/kg, 0.014 J mg/kg, 0.012 J mg/kg, 0.024 J mg/kg, 0.037 mg/kg, 0.003 J mg/kg, 0.014 J mg/kg, and 0.024 J mg/kg collected from sample D-3A at a depth of 1.5-2.0 ft bgs (PAP-00245811).

Historical soil sampling data from Areas A, B1, and D complied with applicable RDCSCC and were subsequently granted NFA by the NJDEP on April 11, 1994 (PAP-00240168-70).

Area B2

Soil sampling conducted in 1990 at Area B2 showedconcentrations of PAHs to be below 10 mg/kg. The following PAHs; acenaphthylene, phenanthrene, anthracene, fluoranthene, pyrene, and benzo(a)anthracene were detected at maximum concentrations of 0.0029 J mg/kg, 0.84 mg/kg, 0.17 J mg/kg, 1.7 mg/kg, 1.9 mg/kg, 1 mg/kg (from sample B2-4 at a depth of 4.5-5 ft bgs); chrysene was detected at 3.7 mg/kg in sample B2-3 at a depth of 4.5-5 ft bgs; and, benzo(b)fluoranthene and benzo(k)fluoranthene were detected at estimated concentrations of 0.25 J mg/kg and 0.2 J mg/kg (from sample B2-2 at a depth of 4.5-5 ft bgs) (PAP-00244648-49). The soil was disposed at the American Landfill in Youngstown, Ohio and the excavation was backfilled with offsite fill after laboratory results revealed that contamination had been removed (PAP-00244650). The NJDEP approved NFA for AOC B2 in their letter dated April 11, 1994 (PAP-00240168-70).

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs), base neutral compounds (BNs), and priority pollutant metals. Subsequent sampling of Area C on August 12, 1991, was conducted to determine whether the previous concentrations were representative of conditions in the area or were related to the presence of coal, ash or cinder fill material. Three additional soil samples were collected and analyzed for BNs. Results of this additional sampling revealed that the previous PAH concentrations in sample C-2A/1.5-2 were not representative of conditions in Area C and other samples were compliant with applicable standards (PAP-00245760, 778-79, 804).

The maximum concentrations of PAHs detected during the two soil sampling events were as follows (PAP-00244650-52, PAP-00245810):

Okonite Area C PAH Detections	
Contaminant	**Concentration/Sample ID/Depth**
Acenaphthylene	0.23 J mg/kg / C-15 at a depth of 1.5-2 ft bgs
Acenapthene	5.8 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Anthracene	9.4 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(a)anthracene	23 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(a)pyrene	16 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(b)fluoranthene	1.5 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(g,h,i)perylene	17 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(k)fluoranthene	15 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Chrysene	22 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Fluoranthene	42 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Fluorene	0.23 J mg/kg / C-2A at a depth of 1.5-2 ft bgs
Indeno(1,2,3-cd)pyrene	17 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Naphthalene	1.8 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Phenanthrene	43 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Pyrene	46 mg/kg / C-2A at a depth of 1.5-2 ft bgs

J: estimated

Following an evaluation of the data, the NJDEP approved conditional NFA for Area C in their April 11, 1994 letter “if Okonite applies appropriate institutional and/or engineering controls” (PAP-00240168-70).

Area E

This area was the location of an abandoned approximately 300-gallon steel UST encased in concrete that was historically used to store waste kerosene and other compounds that may have been used as degreasers at the facility. The UST was properly decommissioned through removal in accordance with facility Decontamination/Decommissioning Plan. The UST was disposed as scrap metal along with the USTs from Area G. No evidence of a release was found in the removal of the USTs. Soil sampling results upon UST removal showed concentrations of phenanthrene, anthrancene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene to be 0.57 mg/kg, 0.065 mg/kg, 0.74 mg/kg, 0.73 mg/kg, 0.36 mg/kg, and 0.3 mg/kg (from sample E-4 collected at a depth of 5.5 ft bgs) (PAP-00244654). Based on the post-removal analytical results, NJDEP approved NFA for Area E in their letter dated April 11, 1994 (PAP-00240168-70).

Area F1

This area is the location of a 76,000-gallon concrete UST that was used to store No. 6 fuel oil. The UST was installed in approximately 1922. The UST was emptied and cleaned in 1991. Soil borings F-7 through F-9 were completed to the northwest, north, east, and west (immediately downgradient) of the UST respectively. These borings were

completed within ten feet of the UST and to depths of 11 ft. Oil staining and odor were observed in all four borings from depths starting from 7 to 10 ft bgs. Samples for laboratory analyses were collected from 10 to 10.5 ft bgs. Presented below in a tabular format are the concentrations of PAHs detected at Area F1 collected during a 1990 soil sampling event (PAP-00244656):

Okonite Area F1 PAH Detections	
Contaminant	**Concentration/Sample ID/Depth**
Anthracene	2.4 mg/kg / F-8 / 10-10.5 ft bgs
Benzo(a)anthracene	5.6 mg/kg / F-8 / 10-10.5 ft bgs
Benzo(a)pyrene	5.9 mg/kg / F-8 / 10-10.5 ft bgs
Chyrsene	8.8 mg/kg / F-8 / 10-10.5 ft bgs
Fluorene	5 mg/kg / F-8 / 10-10.5 ft bgs
Napthalene	16 mg/kg / F-8 / 10-10.5 ft bgs
Phenanthrene	19 mg/kg / F-8 / 10-10.5 ft bgs

Subsequent to the original sampling, a duplicate sample was collected to evaluate the previous PAH detections at Area F1, identified as sample F-10A/10.5-11. No PAHs were detected in this sample (PAP-00245760, 84).

Multiple soil excavations were conducted at Area F1 in 2002, as well as in 2007 following the demolition of former Building 37 (PAP-00259691; PAP-00264067). Post-excavation soil samples complied with applicable soil standards to the west (toward Weasel Brook) following the 2007 excavation activities (PAP-00264067).

Max PAH Concentrations detected at AOCs (mg/kg)						
PAH	**Area F1**	**Area I1**	**Area I2**	**Area K**	**Drains**	**Weasel Brook**
Acenaphthene				0.36J	1.4	0.58J
Acenaphthylene				0.3J	0.15J	0.95J
Anthracene	2.4			1.5	2.9	2.5J
Benzo(a)anthracene	5.6		0.026 J	5.1	13	14
Benzo(a)pyrene	5.9			3.1	17	24
Benzo(b)fluoranthene				5.5	17	17
Benzo(g,h,i)perylene				3.2	2.7	7.1
Benzo(k)fluoranthene				4	20	27
Chrysene	8.8	0.04 J	0.025 J	6.7	24	18
Dibenzo(a,h)anthracene				0.14 J	1.4	1.8J
Fluoranthene		0.037J	0.05 J	12	36	13
Fluorene	5			0.39 J	1.5	1.5 J
Ideno(1,2,3-cd)pyrene				3.2 J	3.4	5.6
Naphthalene	51		1.8	0.33 J	1.5	0.014J
Phenanthrene	19	0.048J	1.3	8.9	7.7	11
Pyrene		0.052J	0.55	11	21	21

J: estimated

(PAP-00244662-79, PAP-00245836-49, PAP-00259185-7)

Area I1

This area is the location of a 9,000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976. No evidence of contamination was encountered above the water table. Two samples for laboratory analyses were collected from each boring from the six-inch interval above that apparently affected by normal fluctuations of the water table (8 to 8.5 or 8.5 to 9 ft) and from the six-inch interval at the bottom of the pit (9.5 to 10 ft). Soil samples collected during a 1990 soil sampling event showed maximum detections of the following PAHs: phenanthrene (0.048 J mg/kg), fluoranthene (0.037 J mg/kg), and chrysene (0.04 J mg/kg), collected from sample I1-3 at a depth of 8.5-9 ft bgs and pyrene (0.052 J mg/kg), from sample I1-4 at a depth of 8.5-9 ft bgs (PAP-00244661-79). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664).

The following PAHs were detected: phenanthrene (0.025 J mg/kg), pyrene (0.031 J mg/kg), and naphthalene (1.8 mg/kg) from sample I2-4 at a depth of 9.75-10 ft bgs; and chrysene (0.025 J mg/kg) and benzo(a)anthracene (0.026 J mg/kg) from sample I2-1B at a depth of 9.5-10 ft bgs (PAP-00244666-67).

Further soil delineation investigations at Area I2 in 1992 were not evaluated for COCs associated with OU2 and included only petroleum hydrocarbons. Based on additional delineation conducted, and the very limited access to this Area due to its location in a building basement, Okonite proposed institutional controls for Area I2 (PAP-00260513, 524, 551). NJDEP conditionally approved institutional controls for Area I2 in 1994 (PAP-00240168, 72).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area (PAP-00244665). Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the

first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. Several PAHs were detected in this area following round 1 excavation. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill is this area contained parts of plumbing fixtures, glass vials, metals lids, etc. (PAP-00244668). Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs. The maximum concentrations of PAHs and metals detected in this area are presented below in a tabular format (PAP-00244669-77).

Okonite Area K PAH Max Detections	
Contaminant	**Concentration/Sample ID/Depth**
Acenapthene	0.36 J / K-5 / 5.5-6 ft bgs
Acenaphthylene	0.3 J mg/kg / K-4 / 5.5-6 ft bgs
Anthracene	1.5 mg/kg / K-5 / 5.5-6 ft bgs
Benzo(a)anthracene	5.1 mg/kg / K-9 / 1.5-2 ft bgs
Benzo(a)pyrene	3.1 mg/kg / K-17 / 7-7.5 ft bgs
Benzo(b)fluoranthene	5.5 mg/kg / K-17 / 7-7.5 ft bgs
Benzo(g,h,i)perylene	3.2 J mg/kg / K-5 / 5.5-6 ft bgs
Benzo(k)fluoranthene	4 mg/kg / K-17 / 7-7.5 ft bgs
Chrysene	6.7 mg/kg / K-9 / 1.5-2 ft bgs
Fluoranthene	12 mg/kg / K-5 / 5.5-6 ft bgs
Fluorene	0.39 J mg/kg / K-5 / 5.5-6 ft bgs
Ideno(1,2,3-cd)pyrene	3.2 J mg/kg / K-5 / 5.5-6 ft bgs
Naphthalene	0.33 J mg/kg / K-5 / 5.5-6 ft bgs
Phenanthrene	8.9 mg/kg / K-5 /5.5-6 ft bgs
Pyrene	11 mg/kg / K-5 / 5.5-6 ft bgs

J: estimated

In the October 1992 *Results of Supplemental Sampling Plan Implementation*, NFA was recommended (PAP-00245760, 806). The NJDEP conditionally approved NFA with the requirement that the previous data be reevaluated to the then-applicable RDCSCC (PAP-00240172-73). The data for sample K-16/9.5-10.0 met then-applicable RDCSCC for BN compounds (PAP-00260518). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240079, 81).

Area M

This area was identified as an area of potential environmental concern during on-going facility decontamination/decommissioning activities when the Banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size and, the bottom of the pit is approximately 3 feet below grade, and consisted of several concrete sub-chambers. The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill

material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present). The fill material that was removed prior to the submittal of the February 1992 *Results of Sampling Plan Implementation and Supplemental At-Peril Activities* report (approximately 15 cubic yards) was staged beside the pit. A waste classification sample was collected from this material. No PAHs were detected (PAP-00244684).

Drainage Structures

Soil samples were collected, and in some cases soils were removed from drainage structure areas. Samples were analyzed for TPH, VOCs, BNs and metals (PAP-00245793-99). Maximum PAH detections from the drainage structures and pits are presented below:

Max PAH Concentrations detected at Drainage Structures (mg/kg)						
PAH	**#13**	**#18**	**#19**	**#20**	**#30**	**#54**
Acenaphthene			1.4	1.4		0.14 J
Acenaphthylene	0.06 J			0.15 J		
Anthracene	0.21 J	0.026 J		2.6	2.9	0.38 J
Benzo(a)anthracene	1.7	0.1 J	0.18 J	13	13	2.8
Benzo(a)pyrene	2.4	0.075 J		12	17	1.1
Benzo(b)fluoranthene	2.2	0.11 J	0.23 J	14	17	4
Benzo(g,h,i)perylene	1.6	0.066 J		2.7		1.2
Benzo(k)fluoranthene	2.5	0.11 J		11	20	3.1
Chrysene	1.9	0.19 J	0.2 J	24	13	4.1
Dibenzo(a,h)anthracene	0.31 J			1.4		0.46
Fluoranthene	3.4	0.23 J	0.44 J	36	26	
Fluorene	0.019 J			1.5		0.16 J
Ideno(1,2,3-cd)pyrene	0.79			3.4		1.5
Naphthalene	0.035 J			1.5		
Phenanthrene	0.45	0.14 J	0.33 J	5.6	7.7	4
Pyrene	3	0.13 J	0.34 J	21	20	3.9

(PAP-00245836-49)

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes to Weasel Brook and at a location downstream of the facility outfall pipes. Bank and bottom sediment samples were also collected at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property boundary in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. A number of PAHs were detected in two bank sediment samples and three bottom sediment

samples, including SS-3 at a depth of 0-6 inches. According to the Remedial Action Report (RAR), dated December 17, 2003, the source of these PAHs was unknown. However, a possible source was the historic fill in the area, which also contained PAHs (PAP-00259165). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478).

Presented below are the maximum detected concentrations of PAHs in sediment samples collected from Weasel Brook (PAP-00259185-91):

Okonite Weasel Brook PAH Detections (mg/kg)	
Contaminant	**Concentration/Sample ID/Depth**
Acenaphthene	0.58 J / SS-4 / 0-6"
Acenaphthylene	0.95 J / SS-7 / 0-6"
Anthracene	2.5 J / SS-7 / 0-6"
Benzo(a)anthracene	14 / SS-4 / 0-6"
Benzo(a)pyrene	24 / SS-4 / 0-6"
Benzo(b)fluoranthene	17 / SS-4 / 0-6"
Benzo(g,h,i)perylene	7.1 / SS-4 / 0-6"
Benzo(k)fluoranthene	27 / SS-4 / 0-6"
Chrysene	18 / SS-4 / 0-6"
Dibenzo(a,h)anthracene	1.8 J / SS-4 / 0-6"
Fluoranthene	13 / SS-2 / 0-6"
Fluorene	1.5 J / SS-7 / 0-6"
Ideno(1,2,3-cd)pyrene	5.6 / SS-4 / 0-6"
Naphthalene	0.014 J / SS-3 / 0-6"
Phenanthrene	11 / SS-2 / 0-6"
Pyrene	21 / SS-4 / 0-6"

J: estimated

On May 5, 2004, additional sediment samples were collected from Weasel Brook at a previous location of SS-3/0-6" collected in 1992 for total organic carbon, TPH, and BNs. During the 2004 sampling event, waste automotive parts were observed in Weasel Brook and had been dumped from the bank opposite of Okonite . (PAP-00258638).

Copper

Based on review of the *Result of Sampling Plan Implementation and Supplemental At-Peril Activities* dated February 1991; copper was only detected in soil samples collected from the following AOCs. Presented below are the copper concentrations at the various AOCs:

Max Copper Concentrations detected at AOCs (mg/kg)						
Metal	**Area C 1.5-2 ft bgs**	**Area I1 8-8.5 ft bgs**	**Area I2 9.75-10 ft bgs**	**Area K 7.5-8 ft bgs**	**Drain 20**	**Weasel Brook 0-6" bgs**
Copper	95	1,900	590	260	12,000	430

(PAP-00244652, 662, 667, 679; PAP-00245845, PAP-00259186)

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals. Copper was detected at a maximum concentration of 95 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area I1

This area is the location of a 9000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976 and was approximately 9.5 ft bgs. Soil borings were completed on all four sides of the pit. Soil borings could not be completed adjacent to the pit on the north and west sides due to numerous subsurface obstructions such as metal plates, subsurface concrete slabs, etc., that were historically located in this area. A total of nine borings were installed. No evidence of contamination was encountered above the water table in any of the soil borings. Two samples for laboratory analyses were collected from each boring from the six-inch interval above the water table (8 to 8.5-9 ft bgs) and from a six-inch interval at the bottom of the pit (9.5-10 ft. bgs). All samples were analyzed for VOC and copper. Copper was detected at a maximum concentration of 1,900 mg/kg from sample I1-2B at a depth of 8-8.5 ft bgs (PAP-00244662). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

In their comment letter dated April 11, 1994, NJDEP noted that the concentration of 1,900 mg/kg copper did not meet the then-applicable Residential Direct Contact Soil Cleanup Criteria (RDCSCC) (PAP-00240168, 70). Although elevated metal concentrations were detected in downgradient wells in one round of samples, the concentrations were attributed to incomplete field filtering and not to dissolved metals. As the soil sample was collected at 8 feet below grade and beneath the building, this did not require remediation. NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was

completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Copper was detected at a concentration of 590 mg/kg in sample I2-4 at a depth of 9.75-10 ft bgs (PAP-00244667).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed during the first soil removal event. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill is this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of copper in this area during the second soil sampling event was 260 mg/kg collected from sample K-25 at a depth of 7.5-8 ft bgs (PAP-00244679). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240081).

Drainage Structures

Soil borings were advanced and samples were collected from the drainage structures. Maximum detected copper concentrations are presented in the following table:

Max Copper Concentrations detected at Drainage Structures (mg/kg)			
Drain #	**Sample**	**Depth**	**Concentration**
13	DR-3	0-6”	4,300
18	DR-2	0-6”	870
19	19	4.5-5 ft	300
20	DR-1	0-6"	12,000
30	30	2-2.5 ft	260
53	DR53	0.5 ft	100
54	DR54	2.5-3 ft	860

(PAP-00245837, 41, 43, 45, 47, 49)

The highest copper concentration was located at Drain 20. Soil was removed in the vicinity of Drains 18-20 to a depth of 5 ft bgs. Copper was not detected in the Drain 20 post-removal sample. The removed soil was sample and classified as non-hazardous but was disposed in bulk with other waste as hazardous waste D008 (PAP-00245795).

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615 (PAP-00259165). As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, copper was found at a concentration of 27 J micrograms per liter (µg/L) in the raw influent water. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of copper, at 12 J and 15 J µg/L, indicating that the manufacturing process did not introduce a measurable quantity of copper to the waste stream (PAP-00264228, 55). As required by NJEDP, Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property boundary because the brook enters the property in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling (PAP-00243477). The most downstream sample location (SS-8, located adjacent to the former facilities southwest corner) had a copper concentration of 48 mg/kg (PAP-00243537). However, the most upstream sample (SS-3) had a copper concentration of 57 mg/kg (PAP-00243535). However, sample SS-4 at a depth of 0-6 inches had a concentration of 430 mg/kg (PAP-00243535).

Lead

Based on review of the RAR, dated December 17, 2003, lead was detected only at the following AOCs:

Max Lead Concentrations detected at AOCs (mg/kg)							
Metal	**Area C 1.5-2 ft bgs**	**Area G 6.5-7 ft bgs**	**Area I2 9-9.5 ft bgs**	**Area K 1.5-2 ft bgs**	**Area M 3.5-4 ft bgs**	**Drain 13**	**Weasel Brook 0-6" bgs**
Lead	270	370	106	87,500	6,700	110,000	8,200

(PAP-00244652, 659, 667, 672; PAP-00245837; PAP-00259186)

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for

volatile organic compounds (VOCs) and priority pollutant metals. Lead was detected at a maximum concentration of 270 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area G

Area G is the location of a former gasoline 8,000-gallon UST. In addition, a small, approximately 1,000-gallon, abandoned UST that contained sand and a small amount of water, was discovered immediately adjacent to the gasoline UST during removal of the gasoline UST. Both USTs were properly closed (PAP-00244657-58). Following removal of the two USTs, field observations and monitoring instrument responses showed that a small amount of contaminated soil remained in place at the west end of the excavation. Analytical results showed that lead was detected at a concentration of 370 mg/kg from sample G-3 at a depth of 6.5-7 ft bgs (PAP-00244659). The NJDEP approved NFA for Area G in their letter dated April 11, 1994 (PAP-00240168-9).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which aboveground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 feet to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 feet bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Lead was detected at a concentration of 106 mg/kg in sample I2-1B at a depth of 9-9.5 ft bgs (PAP-00244667).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc.. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill is this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of

lead in this area during the second soil sampling event was 87,500 mg/kg collected from sample K-9 at a depth of 1.5-2 ft bgs (PAP-00244672).

In the October 1992 Results of Supplemental Sampling Plan Implementation, NFA was recommended (PAP-00245806). The NJDEP conditionally approved NFA with the requirement that the previous data be reevaluated to the then-applicable RDCSCC (PAP-00240168, 72-3). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240081).

Area M

This area was subsequently divided into Areas M1 and M2. Area M1 was described as the pit beneath the former Banbury mixer inside the main building and Area M2 was the groundwater in the vicinity of the former Banbury mixer. Area M2 contained different COCs than those found in Area M1. Soil sampling conducted in late 1991-early 1992 consisted of the installation of 36 soil borings and collection of 22 soil samples for TPH, BN, VOC, lead and zinc analysis. Lead concentrations ranged from not detected to 6,700 mg/kg; the concentration was below 400 mg/kg in all but one sample, M-16-3.5-4. The average lead concentration in Area M1 was approximately 400 ppm. Based on the distribution of impacted soils and field observations, the impacts at Area M1 were attributed to not only the Banbury pit but also fill material in the area or historical operations through the former wooden floor in the area of that building (PAP-002457 88-91).

Drainage Structures and Machinery Pits

Soil borings were advanced and samples were collected from the drainage structures. Maximum detected lead concentrations are presented in the following table:

Max Lead Concentrations detected at Drainage Structures and Pits (mg/kg)			
Drain # / Location	**Sample**	**Depth**	**Concentration**
13	DR-3	0-6”	110,000
18	DR-2	0-6”	17,000
19	DRX-2	6-6.5 ft	2,700
20	DR-1	0-6"	9,800
30	30	2-2.5 ft	990
53	DR53	0.5 ft	1,100
54	DR54	2.5-3 ft	490
Stream Bank	SB-1	1-1.5 ft	1,800
Baghouse	BH-3N	0-0.5 ft	2,200

(PAP-00245837, 41, 43, 45, 47, 49, 60, 62)

The highest lead concentration was located at Drain 13. Soil was removed in the vicinity of the drain to a depth of 4.5 ft bgs. Lead was detected in a post-removal sample at a concentration of 37 mg/kg, which was below the action level at the time. The excavation was backfilled with stone and capped with concrete (PAP-00245794).

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615. As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, lead was found at a concentration of 2,200 J micrograms per liter (µg/L) in the raw influent water originating from the PVWC. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of lead, at 49 J and 700 J µg/L, indicating that the manufacturing process did not introduce a measurable quantity of lead to the waste stream (PAP-00264228, 55). As required by NJDEP, Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property boundary because the brook enters the property in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. Lead was detected in two bank samples. According to the RAR, dated December 17, 2003, lead was detected at a maximum concentration of 8,200 mg/kg from sample SS-2 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478). In addition, there was evidence of others dumping into this section of the river as evidenced by observations of industrial discharges from a number of outfall pipes directly across the brook from Okonite (PAP-00243478), and waste automotive parts that had been dumped from the bank of Weasel Brook opposite of Okonite(PAP-00258638).

Mercury

Based on review of the *Result of Sampling Plan Implementation and Supplemental At-Peril Activities* dated February 1991; mercury was only detected in soil samples collected from the following AOCs. Presented below are the mercury concentrations at the various AOCs:

Max Mercury Concentrations detected at AOCs (mg/kg)					
Metal	**Area C 1.5-2 ft bgs**	**Area I2 9.0-9.5 ft bgs**	**Area K 7-7.5 ft bgs**	**Drain 19 6-6.5 ft bgs**	**Weasel Brook 0-6" bgs**
Mercury	0.56	0.8	430	40	18

(PAP-00244652, 662, 667, 679; PAP-00245843, PAP-00259186)

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and

C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals. Mercury was detected at a maximum concentration of 0.56 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Mercury was detected at a maximum concentration of 0.8 mg/kg from sample I2-1B at a depth of 9.09.5 ft bgs (PAP-00244667).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill is this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls. These samples were analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of mercury in this area during the second soil sampling event was 430 mg/kg collected from sample K-24 at a depth of 7-7.5 ft bgs (PAP-00244679). Mercury was remediated at Area K to the satisfaction of the NJDEP (PAP-00240079, 81).

Area M

Mercury was not detected in the soil samples collected from Area M (PAP-00244684).

Drainage Structures

Soil borings were advanced and samples were collected from the drainage structures. Maximum detected mercury concentrations are presented in the following table:

Max Mercury Concentrations detected at Drainage Structures (mg/kg)			
Drain #	**Sample**	**Depth**	**Concentration**
13	DR-3	0-6”	1.4
18	DRX-1	6-6.5 ft	11
19	DRX-2	6-6.5 ft	40
20	DR-1	30-36"	24
30	30	2-2.5 ft	0.9
53	DR53	0.5 ft	0.06 J
54	DR54	2.5-3 ft	12

(PAP-00245837, 41, 43, 45, 47, 49)

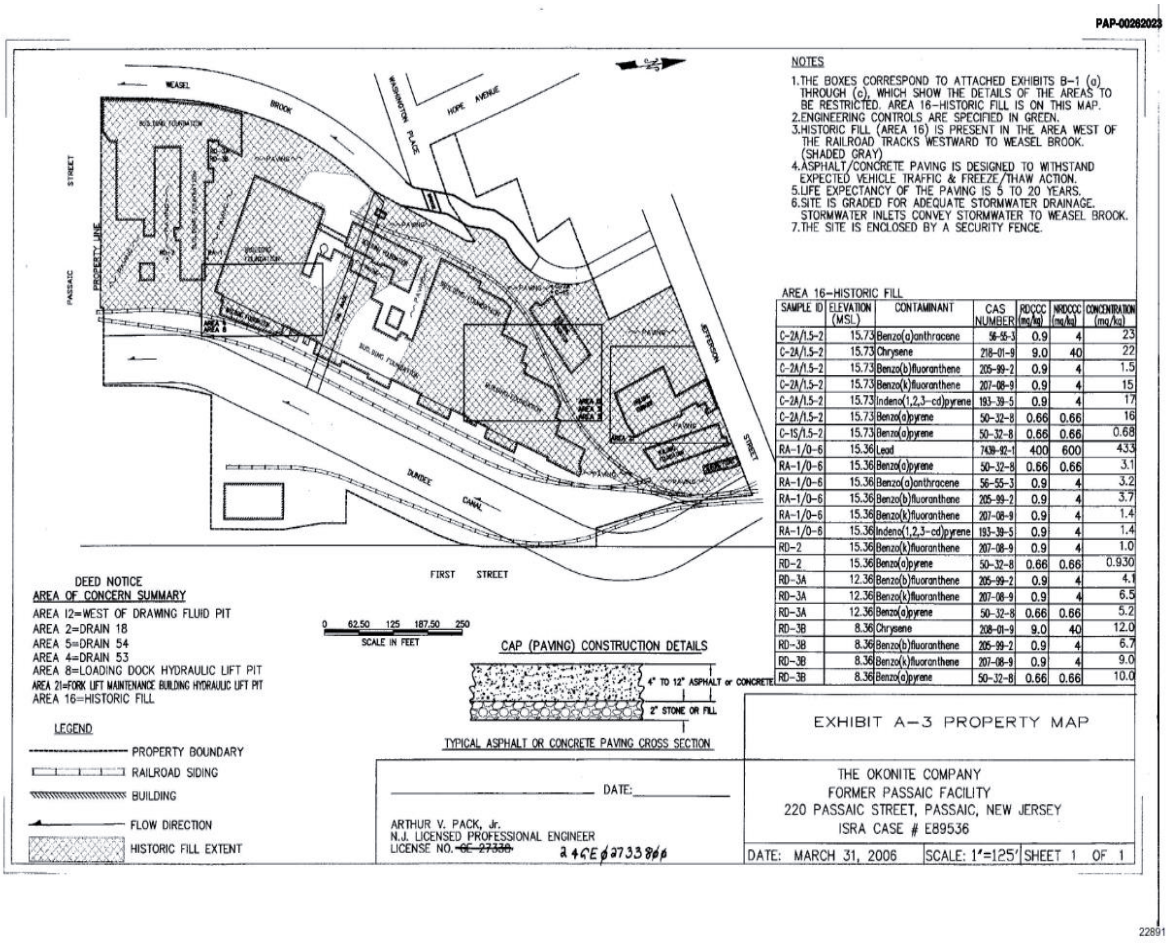
The highest mercury concentration was located in a post-removal sample at Drain 19. Soil had been removed in the vicinity of the Drains 18-20 to a depth of 5 ft bgs. The removed soil was sample and classified as non-hazardous but was disposed in bulk with other waste as hazardous waste D008 (PAP-00245795-6).

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes , at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property boundary in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. According to the RAR, dated December 17, 2003, mercury was detected at a maximum concentration of 18 mg/kg from sample SS-4 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite’s industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite’s operations may have had (PAP-0024378). In addition, during the May 2004 sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

Historic Fill

The Allocation Team has not determined whether the site is located on regional Historic Fill as designated by the NJDEP.[1]

However, historical documents including a historical site plan establishes historic fill on two thirds of the property based on soil investigations conducted at the Site (PAP-00264490). Of the AOCs identified at the Site, Historic Fill was identified as Area 16 (PAP-00260097). The AOCs discussed above are generally collocated with historic fill material (including ash and cinder), as determined by extensive subsurface investigations at the Site. The following figure depicts the extent of historic fill material encountered at the Site:



(PAP-00262023)

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00244645-67).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	110,000 mg/kg
Copper	12,000 mg/kg
Mercury	430 mg/kg
Benzo(a)anthracene	23 mg/kg
Benzo(a)pyrene	24 mg/kg
Benzo(b)fluoranthene	17 mg/kg
Benzo(k)fluoranthene	27 mg/kg
Dibenzo(a,h)anthracene	0.14J mg/kg
Indeno(1,2,3-cd)pyrene	17 mg/kg

J: estimated

5. COC Pathways

Storm Sewer

There were 22 discharge outfalls from the facility to Weasel Brook. The discharge consisted of contact cooling water, non-contact cooling water, and storm water run-off (PAP-00242102, 48-49).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1998), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Okonite Company

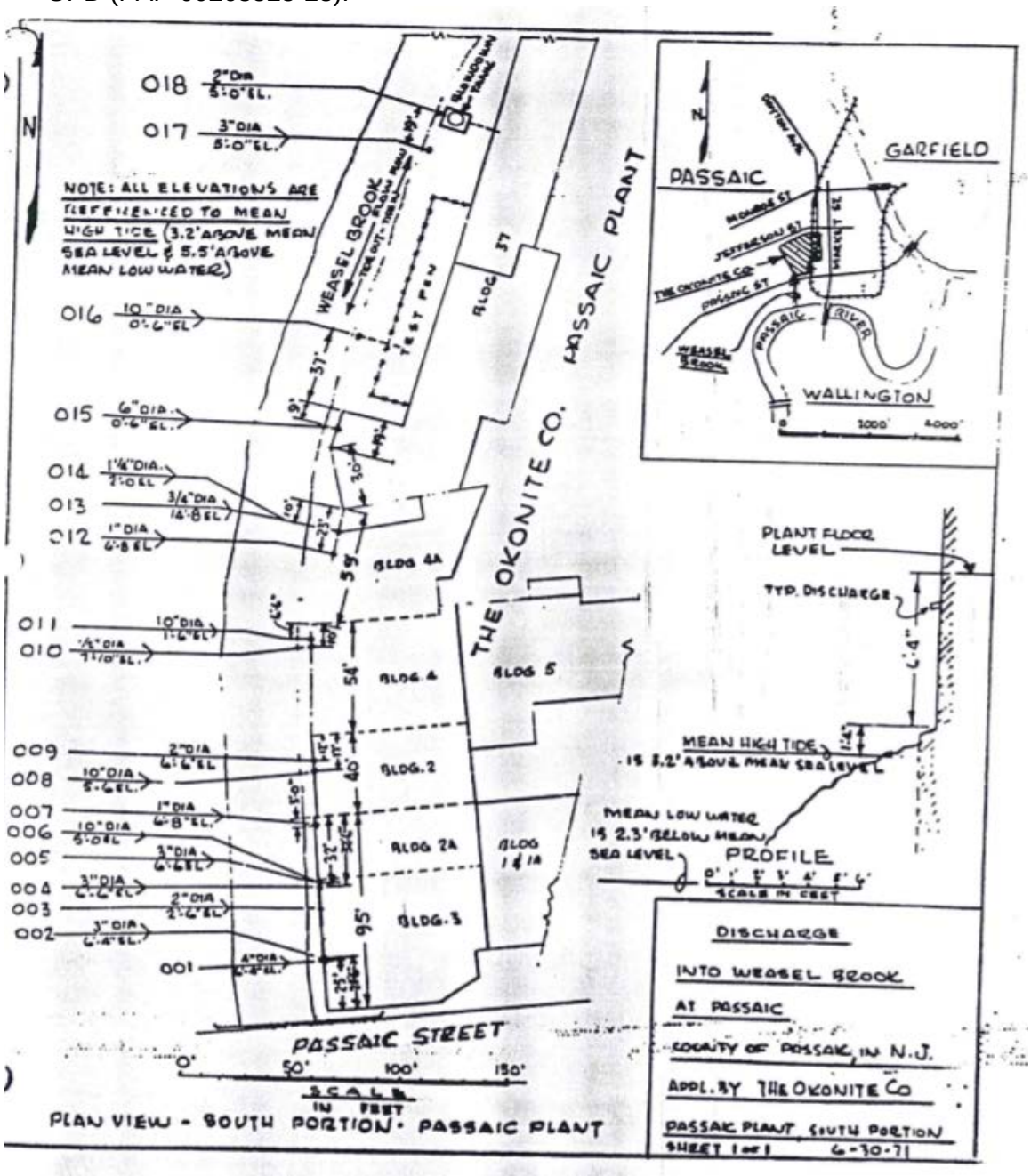
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ADR Confidential

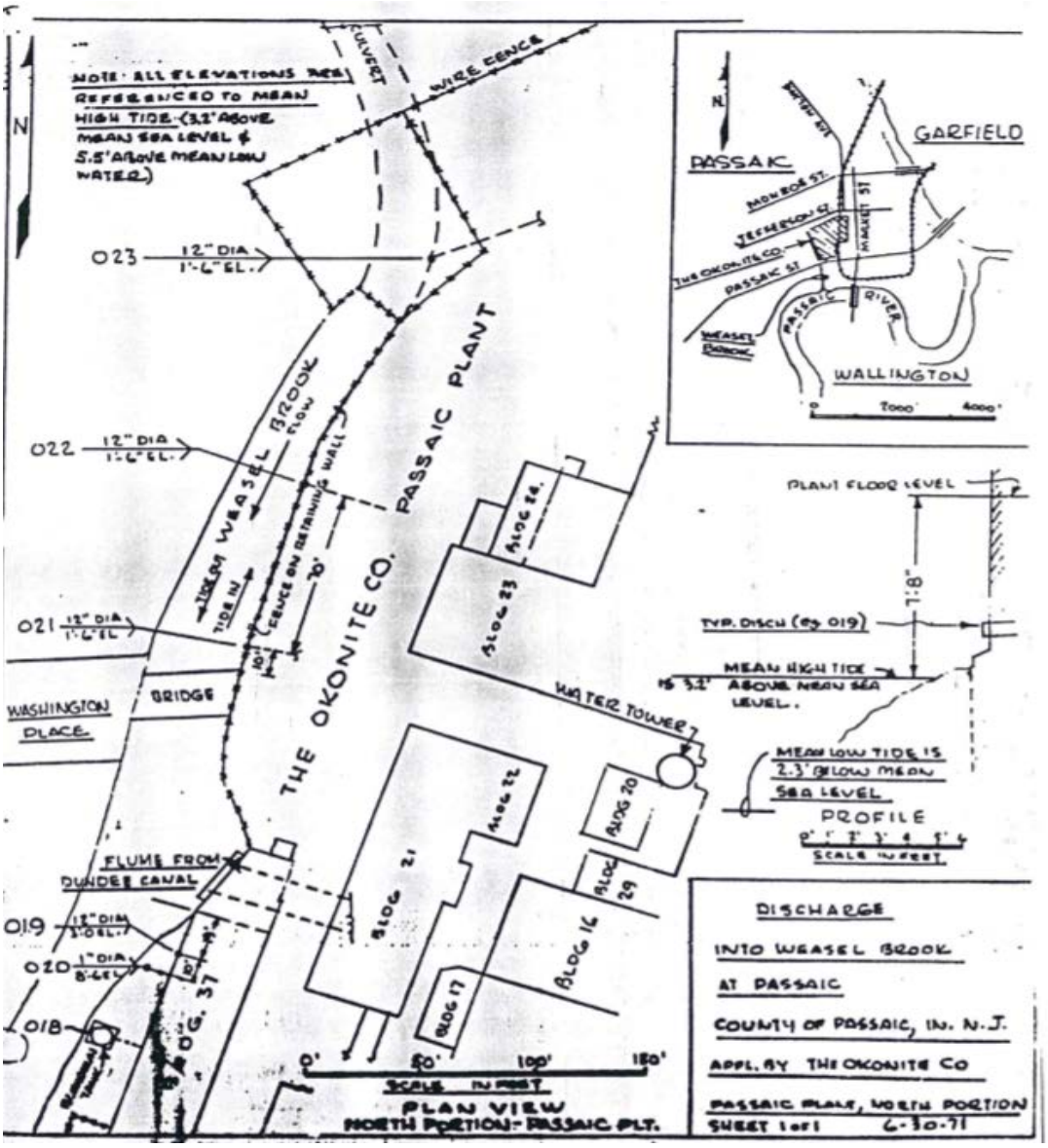
Facility Data Report

According to an Application for Permit to Discharge Wastewaters dated March 28, 1988 Outfalls 006, 008, 011, 016, 019, 020, and 022 had an average flow of 50,000 GPD of stormwater discharge into Weasel Brook (PAP-00263525-28).

The same application reported Outfalls 001, 002 004, 005, 006, 008, 011, 015, and 021 were outfalls for contact cooling water, non-contact seal water, and steam condensate. The average flow of contact cooling water at the facility ranged from 6200 GPD to 12500 GPD (PAP-00263525-28).



(PAP-00263524)



(PAP-00263523)

Direct Discharge

According to a 2005 PRP Data Extraction Form for the Lower Passaic River Study Area, PVSC reported on the discharge of “polluting” boiler blowdown from the Okonite facility in 1973. PVSC did not indicate if the facility boiler blowdown outlet was discharged to the river or sewer. The company was directed to halt the pollution and discharge the boiler blowdown to the sanitary sewer. The 1973 PVSC Annual report noted that Mr. Strandberg, Plant Manager, replied that they had studied the situation and that it was feasible to install a boiler blowdown tank, with a discharge into the sanitary sewer. He further stated that this could only be done when the boilers were shut down, and they intended to do this during their summer shutdown in 1974. Since the pollution was not

great, the PVSC believed this to be reasonable. (PAS-00034781; PAS-00102011). PVSC documentation stated the polluting discharge continued from November 1973 through August 1974 (PAS-00123419). Note: The 1973 PVSC Annual Report did not specify COCs analyzed and there is no indication that any of the eight specific COCs at issue herein formed a part of the boiler blowdown discussed.

Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615. As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, copper was found at a concentration of 27 J µg/L in the raw influent water. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of copper, at 12 J and 15 J µg/L. Similarly, lead was found at a concentration of 2,200 J micrograms per liter (µg/L) in the raw influent water originating from the PVWC. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of lead, at 49 J and 700 J µg/L, indicating that the manufacturing process did not introduce a measurable quantity of copper or lead to the waste stream. (PAP-00264228, 55).

According to a 2005 PRP Data Extraction Form for the Lower Passaic River Study Area, sediment samples collected from Weasel Brook in July 1992 identified copper, lead, and mercury contamination. The samples were collected in the area of facility outfall pipes to Weasel Brook (Passaic River tributary), in the area of the stream bank, in sediments beneath three of the outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the outfall pipes (PAS-00123419). The most downstream sample location (SS-8, located adjacent to the former facilities southwest corner) had a copper concentration of 48 mg/kg. However, the most upstream sample (SS-3) had a copper concentration of 57 mg/kg.

Copper was detected at a maximum concentration of 430 mg/kg at sample location SS-4 (adjacent to the bank of the river in an area of historic fill) (PAP-00243535). Lead was detected in two bank samples (PAP-00243478). Lead was detected at a maximum concentration of 8,200 mg/kg at sample location SS-2 (on the bank of the river in an area of historic fill) (PAP-00259186). Industrial discharges from a number of outfall pipes directly across the brook from the Okonite facility were noted (PAP-00243478). Mercury was detected at a maximum concentration of 18 mg/kg at sample location SS-4 (adjacent to the bank of the river in an area of historic fill). All the maximum detected concentrations of copper, lead, and mercury were collected at a depth of 0-6 inches bgs (PAP-00259185-91). A figure showing the sediment sampling locations is available in Figure 6 of the October 1992 *Results of Supplemental Sampling Plan Implementation* (PAP-00243554). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478). In addition, during a May 2004 sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Permits

According to 2005 *PRP Data Extraction Form for the Lower Passaic River Study Area*, Okonite discharged facility wastewater to Weasel Brook via several outfall pipes and held NPDES Permit NJ0002615 (PAS-00123418).

Okonite discharged stormwater, contact, and non-contact cooling waters to Weasel Brook. Prior to issuance, a draft permit application to discharge was released for public comment; no objections to Okonite's proposed discharges to Weasel Brook were raised, and the original NJPDES permit #NJ0002615 was issued. Permit #NJ0002615 was approved to discharge to Weasel Brook from a total of 22 discharges (PAP-00244709-719):

The NJPDES permits from 1974 to 1983 required Okonite to monitor the discharges and submit Discharge Monitoring Reports quarterly. Specific analytical parameters were required by the facility, including: flow, pH, and temperature. From 1983 to 1993, the permits added monitoring of petroleum hydrocarbons, chemical oxygen demand, total suspended solids, and total copper (PAP-00242145-56).

The monitoring results from March 21, 1989 NJPDES permit application contained copper ranging from less than 0.03 milligrams per liter (mg/L) to 0.64 mg/L, which was below the permitted limit of 1 mg/L (PAP-00242145-56).

Violation

As reported by the 1973 *Passaic Valley Sewerage Commissioners Annual Report*, while reviewing the Okonite outlet permit application, Mr. Lubetkin noted that outlet #018 was a boiler blowdown outlet. Since, generally speaking, boiler blowdown is polluting, and since it was easy to correct where a sanitary sewer was available (install a blowdown tank and discharge it to the sewer), Mr. Lubetkin requested that the Inspection Department check this and get a sample. A sample was obtained, found polluting, and the company was directed by the Inspector to halt this pollution. This order was confirmed in a letter to the Okonite Company by Mr. Lubetkin dated December 13, 1973 (PAS-00034781; PAS-00102011). Note: The 1973 PVSC Annual Report did not specify COCs analyzed and there is no indication that any of the eight specific COCs at issue herein formed a part of the boiler blowdown discussed.

In addition, the 1973 *PVSC Annual Report* noted that Mr. Strandberg, Plant Manager, replied that they had studied the situation and that it was feasible to install a boiler blowdown tank, with a discharge into the sanitary sewer. He further stated that this could only be done when the boilers were shut down, and they intended to do this during

their summer shutdown in 1974. Since the pollution was not great, the PVSC believed this to be reasonable (PAS-00034781; PAS-00102011).

On August 27, 1985 NJDEP issued Okonite an Administrative Order concerning a violation of the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq and regulations promulgated thereunder, specifically N.J.A.C 7:26-7.6(f) 2 for failure to file an annual report (PAS-00102064-5). This violation was not related to any discharges from the site (PAS-00102066-8).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Results of Sampling Plan Implementation and Supplemental At-Peril Activities*, the Okonite Company, Canal and Jefferson Streets Facility, Passaic, New Jersey Facility, ECRA Case Number 89536, dated February 1991 (PAP-00244621).

- *Results of Supplemental Sampling Plan Implementation and Additional At-Peril Activities*, The Okonite Company, ECRA Case #89536, dated October 1992 (PAP-00245760).

- *Remedial Action Report*, The Okonite Company, Former Passaic Plant, ISRA Case # 89536, dated December 17, 2003 (PAP-00259153).

Sewer

There is no information regarding sewer sampling in the available file material.

Mercury

Of the Site AOCs, mercury has only been identified in soil samples at the following AOCs (Area C, Area I2, and Area K).

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs), base neutral compounds (BNs), and priority pollutant metals. Mercury was detected at a maximum concentration of 0.56 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Mercury was detected at a maximum concentration of 0.8 mg/kg from sample I2-B at a depth of 9.0-9.5 ft bgs (PAP-00244667).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993... The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, and other similar materials. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls. These samples were analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-0024462176). The maximum detected concentration of mercury in this area during the second soil sampling event was 430 mg/kg collected from sample K-24 at a depth of 7-7.5 ft bgs (PAP-00244679).

Drainage Structures

In addition to drains 13, 18-20, 30, 53, and 54, and the Weasel Brook discharge points, three areas of potential environmental concern were identified in the course of decontamination and decommissioning activities. These were the stream bank adjacent to Building 37, where lead strips were found; the baghouse area, an unpaved area beneath the Banbury mixer where oil-stained soils were observed; and the hydraulic lift pit, the location of lift equipment for the loading dock, where oil-stained soils were also found (PAP-00245798-802).

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic

carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property boundary because the brook enters the property in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. According to the RAR, dated December 17, 2003, mercury was detected at a maximum concentration of 18 mg/kg from sample SS-4 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478). In addition, during the May 2004 sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

Copper

Based on review of the RAR, dated December 17, 2003, copper was detected only at the following AOCs:

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals. Copper was detected at a maximum concentration of 95 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area I1

This area is the location of a 9000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976 and was approximately 9.5 ft bgs. Soil borings were completed on all four sides of the pit. Soil borings could not be completed adjacent to the pit on the north and west sides due to numerous subsurface obstructions such as metal plates, subsurface concrete slabs, etc., that were historically located in this area. A total of nine borings were installed. No evidence of contamination was encountered above the water table in any of the soil borings. Two samples for laboratory analyses were collected from each boring from the six-inch interval above the water table (8 to 8.5-9 ft bgs) and from a six-inch interval at the bottom of the pit (9.5-10 ft. bgs). All samples were analyzed for VOC and copper. Copper was detected at a maximum concentration of 1900 mg/kg from sample I1-2B at a depth of 8-8.5 ft bgs (PAP-00244662). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

In their comment letter dated April 11, 1994, NJDEP noted that the concentration of 1,900 mg/kg copper did not meet the then-applicable RDCSCC. Although elevated metal concentrations were detected in downgradient wells in one round of samples, the concentrations were attributed to incomplete field filtering and not to dissolved metals. As the soil sample was collected at 8 feet below grade and beneath the building, it did not require remediation. NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Copper was not in soil samples collected from this area (PAP-00244664).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill is this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of copper in this area during the second soil sampling event was 260 mg/kg collected from sample K-25 at a depth of 7.5-8 ft bgs (PAP-00244679). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240081).

Area M

This area was identified as an area of potential environmental concern during on-going facility decontamination/decommissioning activities when the banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size

and, the bottom of the pit is approximately 3 feet below grade, and consisted of several concrete sub-chambers. The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present). The fill material that was removed prior to the submittal of the February 1992 *Results of Sampling Plan Implementation and Supplemental At-Peril Activities* report (approximately 15 cubic yards) was staged beside the pit. A waste classification sample was collected from this material. Copper was not detected in the soil samples collected from Area M (PAP-00244684).

Drainage Structures

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. As mentioned above, Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615. As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, copper was found at a concentration of 27 J micrograms per liter (µg/L) in the raw influent water. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of copper, at 12 and 15 µg/L, indicating that the manufacturing process did not introduce a measurable quantity of copper to the waste stream (PAP-00264228, 55). Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property boundary in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. The most downstream sample location (SS-8, located adjacent to the former facilities southwest corner) had a copper concentration of 48 mg/kg. However, the most upstream sample (SS-3) had a copper concentration of 57 mg/kg. According to the RAR, dated December 17, 2003, copper was detected at a maximum concentration of 430 mg/kg from sample SS-4 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478).

In addition, during a May 2004 sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

Lead

Based on review of the RAR, dated December 17, 2003, lead was detected only at the following AOCs:

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals. Lead was detected at a maximum concentration of 270 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area G

Area G is the location of a former gasoline 8,000-gallon UST. In addition, a small, approximately 1,000-gallon, abandoned UST that contained sand and a small amount of water, was discovered immediately adjacent to the gasoline UST during removal of the gasoline UST. Both USTs were properly closed (PAP-00244657-58). Following removal of the two USTs, field observations and monitoring instrument responses showed that a small amount of contaminated soil remained in place at the west end of the excavation. Analytical results showed that lead was detected at a concentration of 370 mg/kg from sample G-3 at a depth of 6.5-7 ft bgs (PAP-00244659). The NJDEP approved NFA for Area G in their letter dated April 11, 1994 (PAP-00240168-70).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill is this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of lead in this area during the second soil sampling event was 2700 mg/kg collected from sample K-23 at a depth of 7-7.5 ft bgs (PAP-00244679). The remediation was completed to the satisfaction of the NJDEP and a No Further Action Letter was issued on January 20, 1995 (PAP-00240081).

Area M

This area was identified as an area of potential environmental concern during on-going facility decontamination/decommissioning activities when the Banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size and, the bottom of the pit is approximately 3 feet below grade, and consisted of several

concrete sub-chambers. The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present). The fill material that was removed prior to the submittal of the February 1992 *Results of Sampling Plan Implementation and Supplemental At-Peril Activities* report (approximately 15 cubic yards) was staged beside the pit. A waste classification sample was collected from this material. Copper was not detected in the soil samples collected from Area M (PAP-00244679).

Drainage Structures and Machinery Pits

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. As mentioned above, Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615. As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, lead was found at a concentration of 2,200 J µg/L in the raw influent water originating from the PVWC. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of lead, at 49 J and 700 J µg/L, indicating that the manufacturing process did not introduce a measurable quantity of copper or lead to the waste stream (PAP-00264228, 55). Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. Lead was detected in two bank samples. According to the RAR, dated December 17, 2003, lead was detected at a maximum concentration of 8200 mg/kg from sample SS-2 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478) In addition, there was evidence of others dumping into this section of the river as evidenced by observations of industrial discharges from a number of outfall pipes directly across the brook from Okonite (PAP-00243478), and waste automotive parts that had been dumped from the bank of Weasel Brook opposite of Okonite (PAP-00258638).

PAHs

The International Carbon Black Association states that PAHs can only be extracted from the surface of industrially-manufactured Carbon Black under vigorous laboratory conditions, and that the risks to human health associated with presence of PAHs originating from carbon black in its final product form is extremely low (PAP-00264260-1). Based on review of the RAR, dated December 2003; PAHs were detected in soil

samples collected from the various AOCs. Presented below are the PAH concentrations at the various AOCs:

Area A, B1, and D

Soil sampling conducted at Areas A and B1 in 1990 showed carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were below 10 milligrams per kilogram (mg/kg) (PAP-00244643-44).

The following PAHs; phenanthrene, fluoranthene, and pyrene were detected at concentrations of 0.027 mg/kg, 0.061 mg/kg, and 0.095 mg/kg collected from sample A-1 at a depth of 2.5-3.0 feet below ground surface (ft bgs) (PAP- 00244645).

The following PAHs; phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene were detected at concentrations of 0.54 mg/kg, 0.66 mg/kg, 1.1 mg/kg, 0.45 mg/kg, and 0.23 mg/kg from sample B-2B at a depth of 1-1.5 ft bgs (PAP-00244646).

No PAHs were detected in soil samples collected from Area D (PAP-00244647).

Historical soil sampling data for these Areas A, B1 and D complied with applicable RDCSCC. The NJDEP approved NFA in their letter dated April 11, 1994 (PAP-00240168-70).

Area B2

Soil sampling conducted in 1990 at Area B2 indicated concentrations of PAHs to be below 10 mg/kg. The following PAHs; phenanthrene, fluoranthene, pyrene, benzo(a)anthracene were detected at maximum concentrations of 0.84 mg/kg, 1.7 mg/kg, 1.9 mg/kg, 1 mg/kg (from sample B2-4 at a depth of 4.5-5 ft bgs) and benzo(b)fluoranthene and benzo(k)fluoranthene were detected at estimated concentrations of 0.25 mg/kg and 0.2 mgkg (from sample B2-2 at a depth of 4.5-5 ft bgs) (PAP-00244648-49). The soil was disposed at the American Landfill in Youngstown, Ohio and the excavation was backfilled with offsite fill after laboratory results revealed that contamination had been removed (PAP-00244650). The NJDEP approved NFA for Area B2 in their letter dated April 11, 1994 (PAP-0024016870).

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals.

Sample C-2A/1.5-2 was later determined to be non-representative, based on the presence of ash and cinder fill material in the sample (PAP-00245778). The NJDEP approved conditional NFA for Area C "if Okonite applies appropriate institutional and/or engineering controls" (PAP-00240168, 70).

Area E

This area was the location of an abandoned approximately 300-gallon steel UST encased in concrete that was historically used to store waste kerosene and other compounds that may have been used as degreasers at the facility. The UST was properly decommissioned through removal in accordance with facility Decontamination/Decommissioning Plan. The UST was disposed as scrap metal along with the USTs from Area G. No evidence of a release was found in the removal of the USTs. Soil sampling results upon UST removal indicated concentrations of phenanthrene, anthrancene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene to be 0.57 mg/kg, 0.065 mg/kg, 0.74 mg/kg, 0.73 mg/kg, 0.36 mg/kg, and 0.3 mg/kg (from sample E-4 collected at a depth of 5.5 ft bgs) (PAP-00244654). Based on the post-removal analytical results, the NJDEP approved NFA for Area E in their letter dated April 11, 1994 (PAP-00240168-70).

Area F1

This area is the location of a 76,000-gallon concrete UST that was used to store No. 6 fuel oil. The UST was installed in approximately 1922. The UST has been emptied and cleaned. Soil borings F-7 through F-9 were completed to the northwest, north, east, and west (immediately downgradient) of the UST respectively. These borings were completed within ten feet of the UST and to depths of 11 ft. Oil staining and odor were observed in all four borings from depths starting from 7 to 10 ft bgs. Samples for laboratory analyses were collected from 10 to 10.5 ft bgs.

Subsequent to the original sampling, a duplicate sample was collected to evaluate the previous PAH detections at Area F1, identified as sample F-10A/10.5-11. No PAHs were detected in this sample (PAP-00245794).

Multiple soil excavations were conducted at Area F1 in 2002, as well as in 2007 following the demolition of former Building 37 (PAP-00259691-750; PAP-00264067-227).

Area F2

This area consists of a piping trench located beneath a metal plate in the floor of the facility engine room, which houses the facility air compressors. This area was identified as an area of potential concern subsequent to conditional sampling plan approval during implementation of decontamination/decommissioning activities for machinery pits and other subgrade structures at the facility. Condensate from the air compressors was determined to have been historically discharged to the trench, which was earthen-bottomed. One soil boring was completed within the trench to the depth of the water table. Two samples were collected from this boring from the first six-inch interval of soil

within the trench and from the six-inch interval above that apparently affected by normal fluctuations of the water table. PAHs were not detected at Area F2 (PAP-00244657).

The NJDEP conditionally approved NFA for Area F2 (also identified as AOC 10), provided an institutional control be established (PAP-00240084). The institutional control was required for previous detections of Total Petroleum Hydrocarbons, and not specific to PAHs in this AOC.

Area G

Area G is the location of a former gasoline 8,000-gallon UST. In addition, a small, approximately 1,000-gallon, abandoned UST that contained sand and a small amount of water, was discovered immediately adjacent to the gasoline UST during removal of the gasoline UST. Both USTs were properly closed. No PAHs were detected at Area G (PAP-00244659-70). The NJDEP approved NFA for Area G in their letter dated April 11, 1994 (PAP-00240168-70).

Area I1

This area is the location of a 9,000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976 years ago. No evidence of contamination was encountered above the water table. Two samples for laboratory analyses were collected from each boring from the six-inch interval above that apparently affected by normal fluctuations of the water table (8 to 8.5 or 8.5 to 9 ft) and from the six-inch interval at the bottom of the pit (9.5 to 10 ft). Soil samples collected during a 1990 soil sampling event indicated maximum detections of the following PAHs: phenanthrene (0.048 mg/kg), fluoranthene (0.037 mg/kg), and pyrene (0.042 mg/kg) collected from sample I1-3 at a depth of 8.5-9 ft bgs (PAP-00244661-62). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Only the following PAHs were detected; phenanthrene (0.025 mg/kg), pyrene (0.031 mg/kg), chrysene (0.025 mg/kg), and benzo(a)anthracene (0.026 mg/kg) from sample I2-1B at a depth of 9.5-10 ft bgs.

Further soil delineation investigations at Area I2 in 1992 were not evaluated for COCs associated with OU2 and included only petroleum hydrocarbons and bis(2-ethylhexyl)phthalate. Based on additional delineation conducted, and the very limited access to this Area due to its location in a building basement, Okonite proposed institutional controls for Area I2 (PAP-00260513). NJDEP conditionally approved institutional controls for Area I2 in 1994 (PAP-00240168, 72).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. Several PAHs were detected in this area following round 1 excavation. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill is this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11~~12~~ post-removal soil samples were collected from the excavation base and the base of the sidewalls. These samples were analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs.

In the October 1992 Results of Supplemental Sampling Plan Implementation, NFA was recommended (PAP-00245806). The NJDEP conditionally approved NFA with the requirement that the previous data be reevaluated to the then-applicable RDCSCC (PAP-00240168, 72-3). The data for sample K-16/9.5-10.0 met then-applicable RDCSCC for BN compounds (PAP-00260518). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240081).

Area M

This area was identified as an area of potential environmental concern during on-going facility decontamination/decommissioning activities when the Banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size and, the bottom of the pit is approximately 3 feet below grade, and consisted of several concrete sub-chambers. The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present). The fill material that was removed prior to the submittal of the February 1992 Results of Sampling Plan Implementation and Supplemental At-Peril Activities report (approximately 15 cubic yards) was staged beside the pit. A waste classification sample was collected from this material. No PAHs were detected (PAP-00244684).

Drainage Structures

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property boundary in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. A number of PAHs were detected in two bank sediment samples and three bottom sediment samples, including SS-3 at a depth of 0-6 inches. According to the Remedial Action Report (RAR), dated December 17, 2003, the source of these PAHs was unknown (PAP-00259165). However, a possible source was the historic fill in the area, which also contained PAHs (PAP-00259165). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478).

On May 5, 2004, additional sediment samples were collected from Weasel Brook at a previous location of SS-3/0-6" collected in 1992 for total organic carbon, TPH, and BNs. During that sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

OTIS ELEVATOR COMPANY

Facility Name, Address and Size: Otis Elevator Company (Otis), 1000 First Street and 1001 South Second Street, Harrison, New Jersey, 07029. According to a February 25, 1980 Passaic Valley Sewerage Commissioners (PVSC) Sewer Connection Application the site consisted of: Block 73, Lots 1-19, Lot 20A, Lots 22-26, Blocks 74-77, Block 80, Lot 1, Lot 2, Lot 13, Block 101, Block 102, Lots 1-11, Lot 33B, and Lots 34-45) (PAS-00076743). At its peak size (during World War II), the site consisted of approximately 40 acres (PAS-00076875). Post-war, the site consisted of approximately 33 acres (PAP-00233774; PAS-00076657), and then decreased as various and ultimately all parcels were sold off (see below).

The original site was about six acres. The first payroll in 1910 covered about 90 employees. There were approximately 850 employees in 1929, (PAS-00076851), followed by significant decreases during the Great Depression. Employment rebounded to 500 by 1941, shortly before the United States' entry into World War II, and peaked during World War II at 1,500 employees (PAP-00233755), also reported as "close to 2,000 employees" (PAP-00233755; PAS-00076871). Following a significant decrease at the end of World War II in 1945, total employment fluctuated (1,000 in 1972 (PAS-00076657), 260 in 1977 (PAS-00076856); 487 in 1979 (PAP-00233785), 430 and then 200 in early 1980 (PAS-00076743; PAS-00076856) until the facility closed in 1980 (PAS-00076854; PAS-00076856).

1. **Business Type:** The purpose of the Otis plant was to form and assemble elevator cabs, doors and platforms. The manufacturing process involved receiving sheet metal and steel beams from other sources and then bending, cutting, and stamping metal into the shapes required to form and assemble the products. Metal scrap was collected and sold to a metal scrap dealer off-site. In addition, for approximately four years, Otis manufactured airplane engine crankcases and other military equipment under direction of the U.S. government (PAS-00076817).

2. **Time Period of Ownership/Operations**

Operator: February 1, 1910 – August 31, 1980
Owner: 1910 - -– December 16, 1980
(PAS-00076732; PAS-00076854; PAS-00076828; PAS-00076834)

According to a Response from Otis Elevator Company dated August 1996, the plant began with a limited number of buildings and space, originally purchased from the Marine Engine and Machinery Company, and both increased and decreased in capacity and size during its years of operation. During those years, there were a large number of purchases and sales to and from individuals and corporations. In addition, as noted below, in the years immediately following World War II, there were various limited lease relationships for certain buildings.

1910: On January 1, 1910, Otis leased all the lands and premises bound by Railroad Avenue, Second Street, Somerset Street, and the Passaic River with all their appurtenances, including all riparian rights, machinery, tools, fixtures, materials, and generally all its property and entire manufacturing plant from Marine Realty and Improvement Company (PAP-00233843).

On February 1, 1910, an agreement was made whereby Otis took possession of a machine shop (February 1, 1910), foundry and pattern shop (April 1, 1910), and blacksmith shop and small frame building on the corner of First and Middlesex Streets, in which the plant, machinery, pattern storage building, and offices were located (September 1, 1910) (PAP-00233851).

According to an August 26, 1996 response to an Environmental Protection Agency (EPA) Request for Information, Otis began operations at 1000 First Street (the "Harrison Plant" or the "Plant") in 1910. At that time, the Plant consisted of a gray iron foundry, machine shop, a powerhouse and office, the total floor area was approximately 95,000 square feet. As the need for additional manufacturing facilities occurred, several buildings were erected between 1910 and 1929 reaching 334,750 square feet (PAP-00233776; PAS-00076817; PAS-00076850).

1928: As part of this construction, an 115,000 square feet heavy capacity general manufacturing building was constructed, and Otis opened the Central Heating Plant, which was designed for heating and to provide facilities for cold storage handling of highly explosive powdered fuel (PAS-00076733).

1941- 1942: The U.S. government acquired from Otis the large undeveloped parcels at the southern and southeastern ends of the Facility site. Under U.S. government oversight, Otis constructed and operated two new manufacturing buildings (Aeronautical Division Buildings One and Two) on these parcels to produce military parts and equipment for the government (PAP-00404016; PAS-00404038; PAS-00048611, PAS-00076724, PAS-00076870).

1946: Otis acquired the southern parcel and Aero Building One from the U.S. government (PAS-00048611).

1947: Otis leased four aisles, Nos. 1-4, in Aero Building Two at 1001 South Second Street, Harrison, New Jersey (PAP-00233766).

1957: Radio Corporation of America deeded property to Otis Elevator on November 4, 1957 and recorded on November 12, 1957 in Book 2733 at page 490 (PAP-00233793).

1958: Buildings at the facility used for manufacturing operations totaled approximately 556,000 square feet of manufacturing space, and 138,000 square feet for storage, power production, offices, and other nonmanufacturing uses (PAP-00233774).

1974: United Technologies purchased Otis making Otis a wholly owned subsidiary of United Technologies (PAS-00076819).

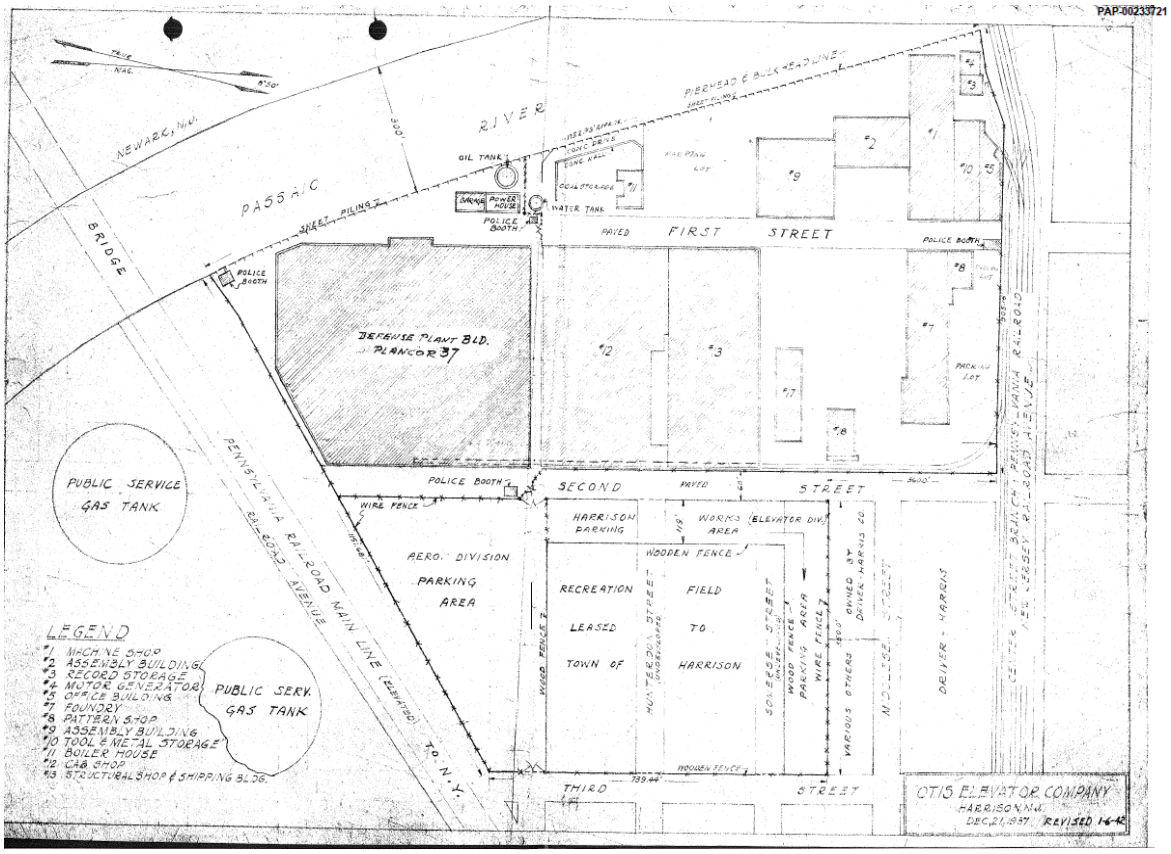
1978: Otis deeded lots 23 to 32 and part of lot 33 in Block 100, lots 13 to 32 and parts of lots 12 and 33 in Block 101, lots 13-32 and part of lots 12 and 33 in Block 102 to Pathparc Associates, a partnership (PAS-00076832).

1979: Plant area for manufacturing was 27,585.35 square meters (approximately 293,000 square feet) and for office was 3,993.20 square meters (approximately 43,000 square feet), with 241 employees for production, 146 technical and clerical, and 100 management employees for a total of 487 (PAP-000233789, PAP-00233785).

1979: Otis deeded parts of lots 1 through 11, part of lot 12A, and all of lot 46C in Block 101 to Newark Public Radio, Inc. on October 3, 1979 (PAP-00233793).

1980: The plant limited its operations to clearing out unfinished orders and reduced its total employee count from 200 to 85-90 on May 19, 1980 (PAS-00076856). The plant ended all operations on August 31, 1980 (PAS-00076854). Block 101, Lot 1-A (was sold on December 16, 1980 to Hartz Harrison Limited Partnership (PAS-00076828) and Harrison Riverside Limited Partnership (PAS-00076834).

1991: As reported in a letter from Otis to the U.S. Environmental Protection Agency (EPA) regarding EPA's Notice of Potential Liability dated January 1998, Harrison Riverside Limited Partnership leased a portion of the facility to its tenant, Intrex Corporation (PAS-00076579; PAS-00076603).



(PAP-00233721)

3. Operational History/COC Use and Presence at the Facility

According to *Otis Harrison Plant Parallels Growth of Hudson County*, dated March 8, 1971, the original Otis plant in Harrison opened for business on February 1, 1910. At that time, the plant comprised eight buildings occupied by the Marine Engine and Machinery Company, located on the east bank of the Passaic River. The original layout had a machine shop, an iron foundry, a structural steel shop (to assemble elevator car frames and safety devices), a forge shop, powerhouse, and general office building. Improvements through the years added 10 new buildings, modernized all the original structures, and spread the plant over an area of about forty acres at its peak during World War II. In 1928, a building of 115,000 square feet of heavy capacity floor space for general manufacturing was added. The same year also witnessed the opening of the Central Heating Plant, designed not only for heating, but also to provide facilities for cold storage handing of highly explosive powdered fuel (PAS-00076732-33). A May 29, 1939, booklet also reported another building entirely devoted to the company's elevator lubricants. This included oils and greases for all of the various requirements for elevator, escalator, and hoisting apparatus (PAP-00404032).

According to an August 26, 1996 response to an EPA Request for Information from Otis, the purpose of the Harrison Plant was to form elevator cabs, doors and platforms. The manufacturing process involved receiving sheet metal and steel beams from other sources and then bending, cutting and stamping metal into the shapes required to form the products. Metal scrap was collected and sold to a metal scrap dealer in Harrison (PAS-00076817). In addition, the plant manufactured airplane engine crankcases under direction of the U.S. government from August 1941 until August 14, 1945. An early production target for the first type of crankcase produced was for 2,500 units per month (PAP-00233746-48). There is no information in the documentation provided regarding actual production levels.

According to Harrison Works of Otis Elevator Company, in 1941, Otis also started war production of elevator platforms and ammunition hoists for the U.S. Navy Cruisers, and within a relatively short time it was producing machine tools, gun turrets, aircraft landing gear, steam pumps, cowl rings, parts for 27,000 welding generators, cradles for nearly 4,000 recoil mechanisms, assemblies for torpedo hoisting equipment, portions of mine handling elevators for mine layers, and more than 1,300 aluminum-alloy crankcases for airplane auxiliary power units (PAP-00233754; PAP-00233764-65).

Otis's response to the *Request for Information*, dated August 1996, reported there was a small section of the Harrison Plant that performed spray painting in enclosed booths. The excess paint was collected into 55-gallon drums, which were then sealed and stored in the parking lot until collected and taken off-site by a waste hauler (PAS-00076817; PAS-00076716).

A small incinerator was located at the site on or after 1941, within a 160-square-foot enclosure (Building 23), as depicted below (PAP-00233774).

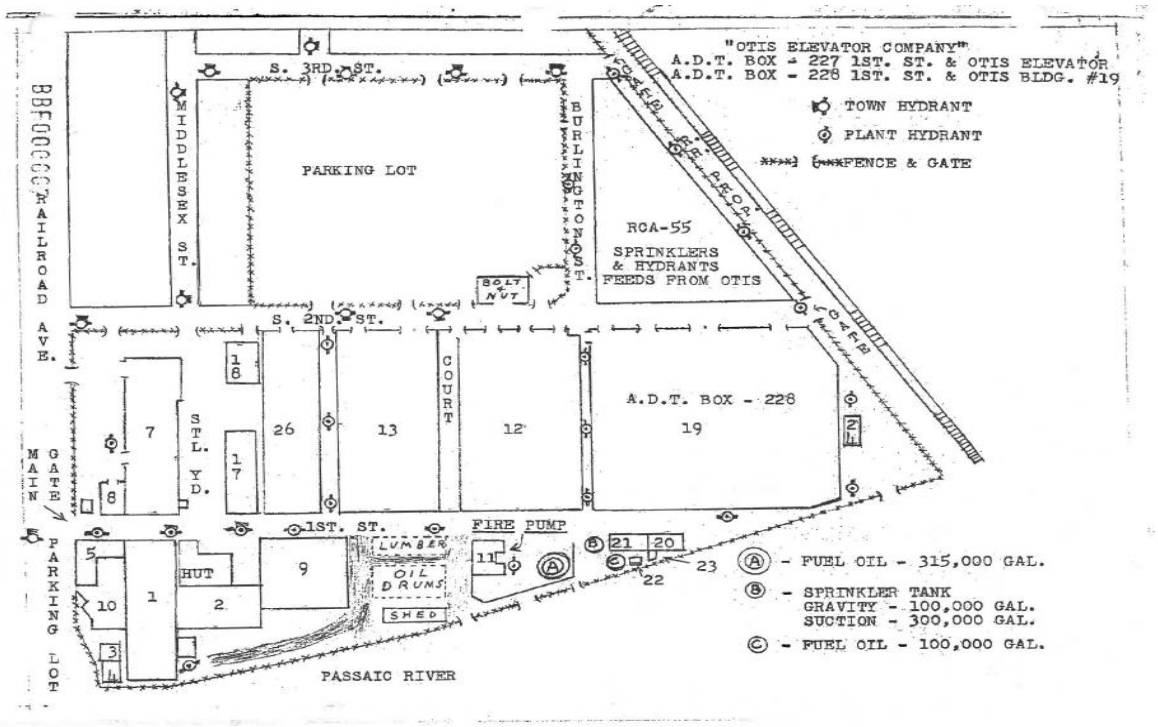
Otis Elevator Company

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

According to an inter-office correspondence letter dated Aug 14, 1929, at the time of purchase in 1910, a gray iron foundry was reported to be a part of the plant as depicted as Building 7 in the facility layout (PAS-00076850; PAP-00233721).



(PAP-00233841)

OTIS ELEVATOR CO. 1000 FIRST STREET A.D.T. BOX 227 - 228

BLDG.	RISERS	DEPT.	
1	1	13 & 27	1ST. FL. HEAVY MACH. SHOP - 2ND. FL.
2	9-9A-9B	13	MILLING MACH. SHOP
3	3	SERV.	RECORD VAULT
4		24B	MAINTENANCE
5		25 & SERV.	GEN. SHOP AREA & LOCKER ROOM
7	18-7C	19	RAIL & BEAM SHOP
8	18-7C	9	1ST. FL. GARAGE - 2ND. FL. PERSONNEL
9	9-9A-9B	23	TOOL ROOM & LIGHT MACH. SHOP (18)
10	10	4	1ST. FL. STORES & 2ND. FL. STORES
11		24	POWER HOUSE
12	12-A,C,D,E,F,	15	FREIGHT ELEVATORS - 2ND. FL. LOCKER ROOM
13		15	STRUCTURAL SHOP
COURT		15	FREIGHT ELEVATORS
17		4	STORES
18		17 & 1A	1ST. FL. SHIPPING - 2ND. FL. HARR. SER.
19	1 THRU 12		OFFICES, CAFETERIA, LOCKER ROOM, METAL CAB & PAINT SHOP (A.D.T. BOX - 228
20		9A	ELECTRIC TRUCK GARAGE
21			AERO POWER HOUSE
22			BATTERY ROOM
23			INCINERATOR
24			PAINT MIXING ROOM (A.D.T. BOX - 228)
26			STORES

0

(PAP-00233842)

4. Identified COCs

- PCBs (potentially used)
- PAHs (used)
- Coper (released, detected)
- Lead (reported used, released, detected)
- Mercury (released, detected)

According to a November 21, 1996 Memorandum, processes utilized at the facility generated wastes, including metals, solvents and paint sludge. The facility also stored highly explosive powdered fuel for some period of time (PAS-00076710). According to a January 17, 1977 Industrial Waste Survey estimated quantities of paint sludge was 100 cubic yards per year (PAP-00456839).

PCBs

According to an *Environmental Due Diligence Assessment of Habitat International, Ltd.,* as of 1988, three transformers were located in the building leased by Intrex on the opposite side of First Street. Intrex leased these transformers as part of the building. The transformers were tested by the site owner at that time with the results reported as "less than 50 parts per million (ppm)" PCBs (PAS-00076788). No staining was noted in the investigation of the area (PAS-00076738).

PAHs

According to an *Environmental Due Diligence Assessment of Habitat International, Ltd.,* there was one aboveground fuel oil tank on a diked pad with a capacity of 120,000 gallons. This tank was located on the opposite side of First Street, and it reportedly contained No. 2 fuel oil used to fire the boiler (PAS-00076790). The fill location for the tank was observed and noted to be diked and clean (PAS-00076796). Available references did not include soil characterization data for PAHs.

Metals - Mercury, Copper, Lead

As reported by the *PVSC Industrial Waste Survey Results*, dated June 26-28, 1978, Otis's wastewater metal measurements contained 0.199 milligrams per liter (mg/L) copper contributing 0.159 lbs/day to PVSC; 0.141 mg/L lead contributing 0.113 lbs/day; and, 0.0057 mg/L mercury contributing 0.0046 lbs/day to PVSC (PAS-00125049, PAS-00076719).

According to the July 25, 1972 *Waste Effluent Survey Chart* of plant waste attributable to Otis, lead concentrations were 0.07 mg/L with a daily discharge of 0.11 lbs per day; copper concentrations were 0.03 mg/L with a daily discharge of 0.05 lbs per day (PAS-00076661).

According to an *Environmental Concerns Tracking Sheet for ECRA Case 91646* by Intrex Corporation, an underground storage stank (UST) was reportedly used by Otis to fuel vehicles. The tank and pump were removed in November 1986. Soil samples were

collected and contained a maximum lead concentration of 1,624 milligrams per kilogram (mg/kg) (PAS-00076739).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the New Jersey Department of Environmental Protection (NJDEP).[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH contaminants of concern COCs).[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of lead detected at the site in soils are presented in the table below (PAS-00076739).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,624 mg/kg

A Specification for Cab Manufacturing Building (Building 12) reports the previous building operation noted that the upper 6-8 feet of soil is fill (PAP-00233804). Historic mapping shows that the southern portion of the site was filled and subdivided at some point between 1905 and 1907, prior to Otis' ownership and operations beginning in 1910. Subsequent historic aerial photos and mapping also show that at least some of the shoreline of the filled area was stabilized or reinforced. Additional bulkhead was later added along the entire shoreline of the Facility (PAP-00233720; PAP-00233775; PAP-00233864; PAP-00233721). There is no indication from a review of provided documents that facility operations disturbed contamination located in historic fill; however, a Specification for Cab Manufacturing Building (Building 12) reports excavation was required for the piers and wall beams (PAP-00233806).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a May 18, 1942 Resolution by the Town of Harrison Otis was granted permission to grade, pave, curb, and install catch basins on Third Street and Burlington Street in accordance with specifications approved by the Town Engineer's Department (PAP-00456842).

5. COC Pathways

Storm Sewers

An *Environmental Due Diligence Assessment of Habitat International, Ltd.* prepared for CIT Group/Business Credit, Inc., dated May 1988, states that "[s]tormwater drains directly to the Passaic River" (PAS-00076789). The NJDEP EPCRA Environmental Concerns Tracking Sheet for Intrex states, "all storm drains to the Passaic River" (PAS-00124586). However, a site plan from the period of Otis' ownership and operation shows certain roof drains as draining to the PVSC and catch basin draining to the PVSC subject to an overflow to the river (PAS-00076750). The same undated document also stated that the northeast loading dock had a drain to the river, which was sealed in 1985 (PAS-00076736).

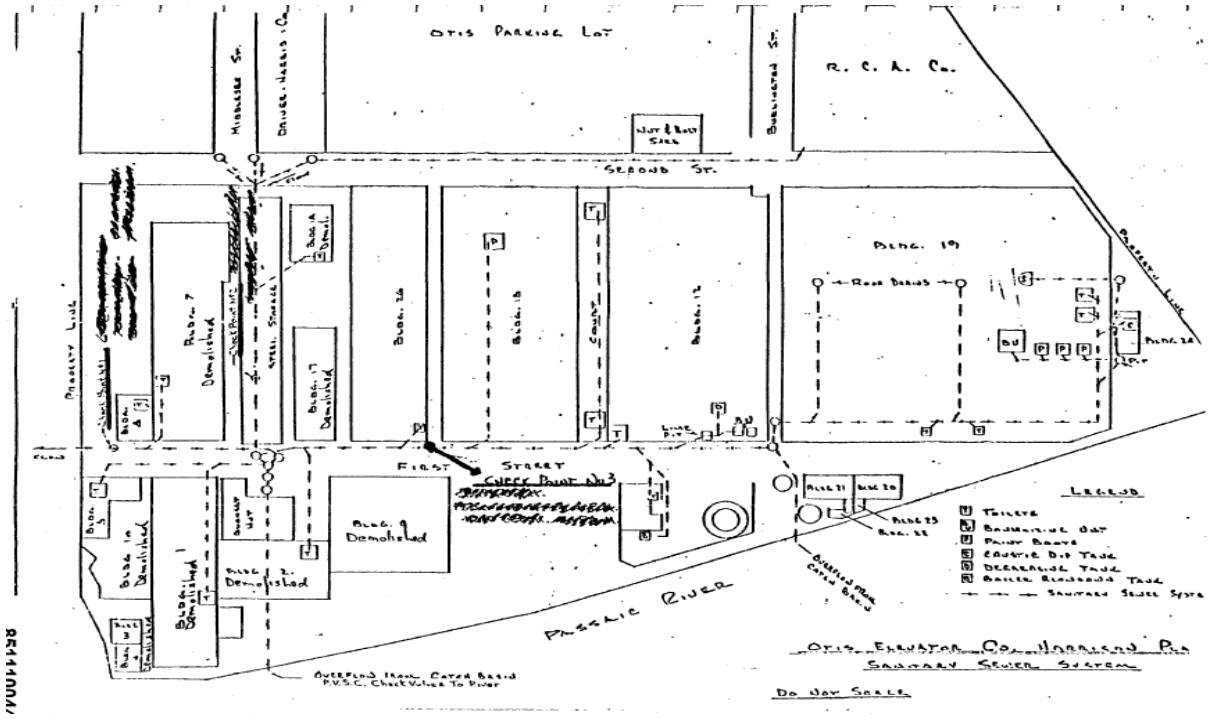
Sanitary Sewer

According to a letter to Otis from the Town of Harrison's Chief Engineer, Joseph A. Cundari, dated December 9, 1997, the Town of Harrison connected to the PVSC's sanitary sewer interceptor system in 1924. Otis connected to the Town of Harrison's combined sanitary and stormwater sewerage system prior to 1924, noting that the exact date was not available. The only discharges allowed to the River were those which were considered as non-polluting, such as non-contact cooling water or treated effluent (PAS-00076655; PAS-00076592).

According to a May 18, 1942 Resolution by the Town of Harrison Otis was granted permission to provide connection for sanitary sewage to the PVSC that was already in existence for the erection of a building to be used in the manufacture of war time equipment and to install suitable storm and surface sewers to connect to with the Passaic River (PAP-00456842-43).

According to the Affidavit of Seymour A. Lubetkin dated January 8, 1998, toward the end of the 1970s, the PVSC required each of its industrial users to obtain sewer connection permits. PVSC required this even though the users may have been previous long time dischargers to the PVSC system (PAS-00076595).

According to the February 1980 PVSC Sewer Connection Application, Otis discharged 11,784,920 gallons of sanitary sewer water and 19,100,000 gallons of water ascribed to the application form category of "separate storm sewer, river, or ditch" in 1978 (PAS-00076744). Otis stated it discharged 48,000 gallons of water containing industrial waste to the PVSC daily. The discharge of industrial waste was continuous and occurred between 7:45 A.M. to 6:15 P.M. (PAS-00076745-46).



(PAS-00076750)

According to a notebook kept by Seymour A. Lubetkin of the PVSC and prepared in approximately 1971, Otis had four storm sewer lines discharging and twelve outlets in total from its property to the Passaic River (PAS-00076711; PAS-00076741), as depicted below:

Otis Water Usage in gallons			
Reporting Year	***Discharged to Sewer***	***Discharged to River***	***Total Water Use***
1971	46,440,000	17,610,730	64,050,730
1974	27,412,720	26,174,000	53,586,720
1976	26,294,900	10,805,900	37,100,800
1978	11,784,920	19,100,000	30,884,920

(PAS-00076744; PAS-00076665; PAS-00076667; PAS-00076658)

According to a PVSC Sewer Connection Application dated February 25, 1980, Otis had one 12-inch sewer connection to the PSVC discharging 48,000 gallons of water containing industrial waste daily (PAS-00076746).

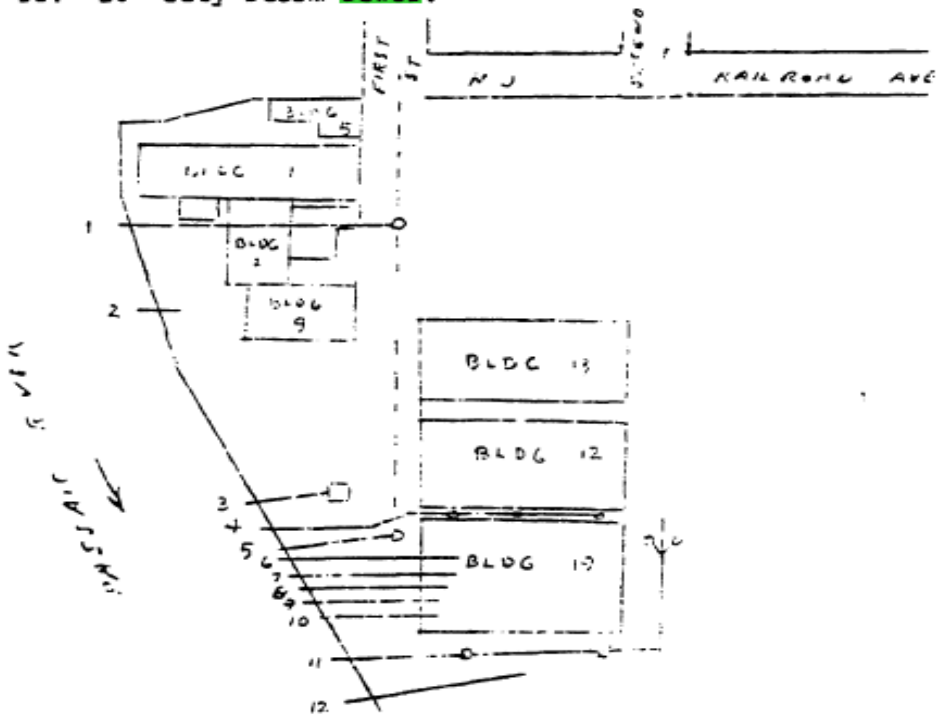
According to a June 1, 1977 Industrial Sewer Connection Application, Otis continuously discharged 101,000 gallons per day to the PVSC system (PAP-00233778).

Water bills from January 3 to February 1, 1910 show a total of 59,000 cubic feet of water being consumed (PAP-00233854; PAP-00233855).

Otis Elevator Company

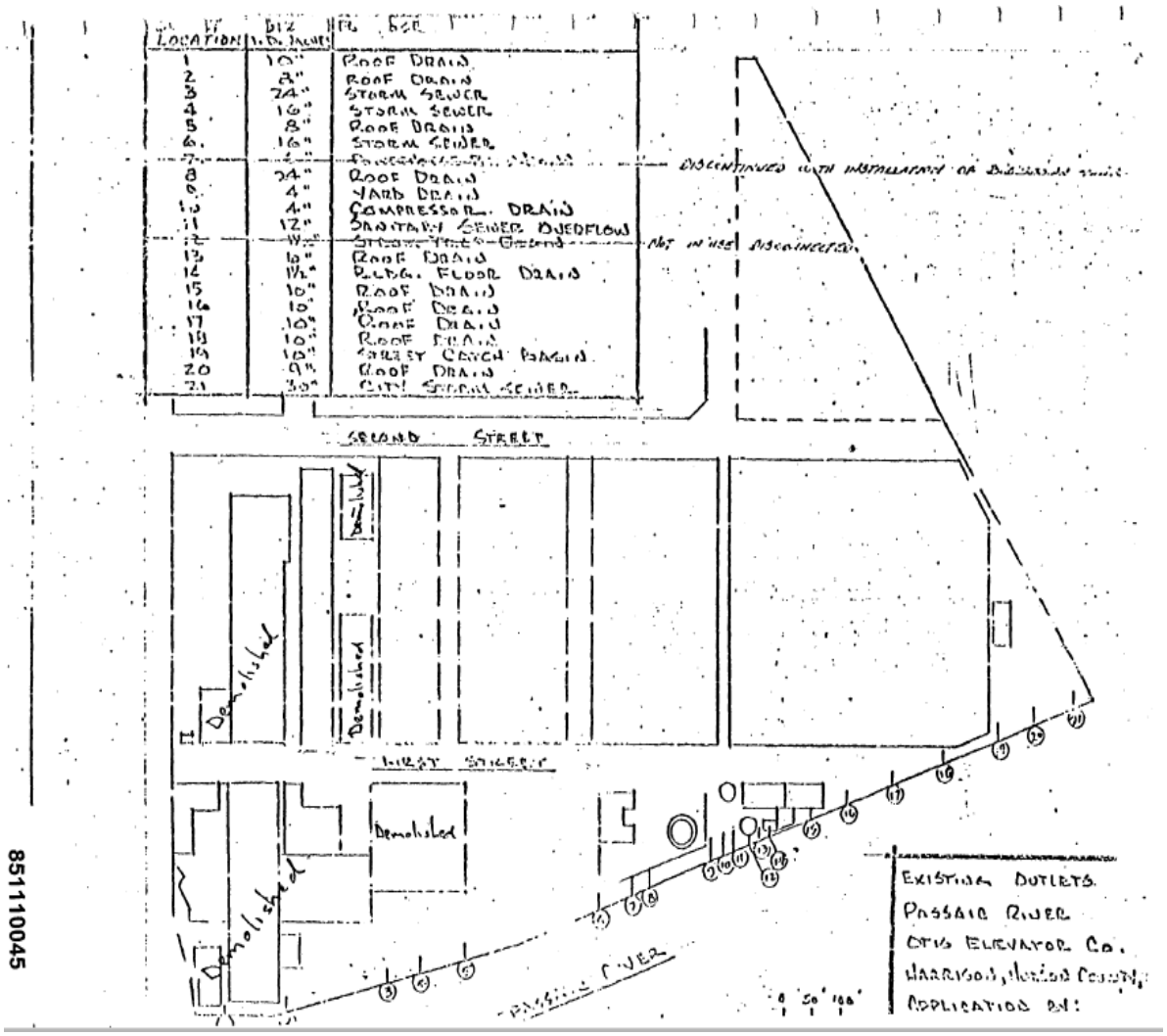
This company has twelve outlets from its property to the Passaic River, as follows:

1. 24" storm and overflow sewer;
2. 12" storm sewer;
3. 6" line from drain area;
4. 6" catch basin drain line;
5. 10" sanitary sewer overflow;
6. 12" cooling water and roof drain line;
7. 10" cooling water and roof drain line;
8.
9. 10" roof drain lines;
10.
11. 10" street catch basin line;
12. 16" city storm sewer.



(PAS-00076741)

According to a PVSC Sewer Connection Application dated February 1980, the facility reported 19 existing outfalls and 2 discontinued/disconnected outfalls to the Passaic River, as shown below (PAS-00076743-51).



(PAS-00076751)

According to a 1976 Overflow Analysis, the Middlesex Street overflow chamber was located 150 feet south of Otis's main gate and during periods of rainfall would discharge to the Passaic River instead of the PVSC (PAS-00115713).

Direct Discharge

According to a site *Description and Environmental Characterization Report,* stormwater drained directly to the Passaic River (PAS-00076789).

According to an a January 8, 1998 affidavit of Seymour A. Lubetkin, Chief Engineer of the PVSC from 1954 to 1978, prior to the completion of the PVSC treatment plant and trunk sewer in 1924, when the PVSC accepted the wastes from the municipalities (including Harrison), the municipalities discharged their wastewater into the Passaic River (PAS-00076577; PAS-00076592; PAS-00076596).

According to the *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor*, dated November 1969 and prepared by the U.S. Department of the Interior, the Federal Water Pollution Control Administration and the New Jersey State Department of Health (NJDOH) conducted an outfall study from June to November 1969 to locate wastewater discharges to the Passaic River. The report noted PVSC conducted its own survey, which was not available for inclusion. The report stated that Otis had various pipes (18-inch, 8-inch, 6-inch, and "small pipes") discharging to the river. No samples were taken (PAS-00115428; PAS-00115445; PAS-00115448).

As reported by a Memorandum to EPA from Chemical Land Holdings, Inc. on behalf of Occidental Chemical Corporation, dated November 1996, NJDOH issued a Cease and Desist Order to Otis. According to the Cease and Desist Order, dated October 3, 1969, NJDOH found after conducting an investigation that Otis was "discharging harmful, deleterious and polluting matter from a sewer or drain into the Passaic River," including, but not limited to, "industrial waste". NJDOH ordered Otis to "install and provide wastewater treatment and / or disposal facilities" and cease the discharge (PAS-00076756). According to a NJDOH memo dated January 9, 1970, on December 9, 1969, a representative of NJDOH visited the facility to determine compliance with the administrative order. The memo states company officials believed they found the source of pollutants; an overflow from the sanitary sewer. The pipe ran past a collection basin into which a generator blow down was discharged. The joints on the overflow pipe were broken, and a crack existed in the bottom of the collection basin. The company repaired the joints in the pipe, poured new concrete in the floor in the collection basin, and ceased the discharge" (PAS-00076758). According to a January 7, 1970 NJDOH letter to Otis, the December 9, 1969 inspection confirmed that the company's work was sufficient to correct the suspected source of pollution material and upon which the October 3, 1969 Order was issued (PAS-00233777).

According to the *Annual Report to the PVSC Commissioners for the Year 1972*, prepared by PVSC Chief Engineer S. A. Lubetkin, on December 20, 1971, S. A. Lubetkin directed Otis to halt pollution caused by the discharge of boiler blowdown water into the Passaic River. Work on a pipeline to re-route this discharge to the sanitary sewer was completed as of February 3, 1972 (PAS-00076762-63).

According to attorney notes associated with 1996-97 and 2006 interviews of former Otis employees, a few former employees spoke of personnel occasionally throwing poorly machined metal parts into the river, but it is not clear whether any employees actually observed any such incidents. Another former employee stated that a fellow employee had occasionally disposed of water-based coolant collected from metal cutting operations into an exterior drain or other such structure, believed to drain to the primary wastewater discharge line that ran from the facility to the PVSC sewer system. It is unclear whether any of these materials referenced by former employees contained COCs.

According to a 1976 *Report on Overflow Analysis* submitted to the Passaic Valley Sewerage Commissioners, prepared by Elson T. Killam Associates, Inc., the Middlesex Street Overflow Chamber was located 150 feet south of Otis's main gate. Under dry

flow normal conditions, the flow was diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow entered the PVSC interceptor, with the balance overflowing the stop logs and discharging through the outfall line into the Passaic River during periods of rainfall (PAS-00115713).

In early 1980, the facility reported 19 existing outfalls and 2 discontinued / disconnected outfalls to the Passaic River in a PVSC Sewer Connection Application (PAS-00076751).

The 1972 Annual Report by PVSC Chief Engineer Seymour Lubetkin stated that per PVSC direction, Otis re-routed its boiler blowdown to the sanitary sewer effective March 3, 1972 (PAS-00006172). However, according to the November 24, 1997, Affidavit of Alan Mercer, the Environmental and Safety Supervisor for Intrex from 1986 to 1991, the Site Evaluation Summary (SES) prepared by Interx in 1991 states that boiler blowdown was discharged to the Passaic River from 1940 until 1983. Mr. Mercer further states that Intrex took possession of the property in 1981 as leasee to the Harrison Riverside Limited Partnership. Mr. Mercer states that when Intrex took possession of the property in 1981, it renovated Building 21 and installed oil-gas boilers for heating the facility. For a time, boiler blowdown was discharged through a floor drain in this building to the Passaic River until approximately 1987. In 1987, NJDEP ordered Intrex to cease its discharge of boiler blowdown to the River. Intrex dug up the floor and rerouted the discharge to the PVSC. Mr. Mercer states that in completing the SES, he had assumed Otis had been operating the same way as Intrex, but did not know whether Otis had discharged any blowdown to the River (PAS-00076603-06).

According to an undated NJDEP *Environmental Concerns Tracking Sheet* for Intrex, several inactive paint drains from the paint spray room went to the Passaic River which were sealed prior to Intrex's occupancy in 1981 (PAS-00076737). Note the date of sealing was not provided in the available documents.

According to the Affidavit of Seymour A. Lubetkin dated January 8 1998, Otis's paint booths were connected to the sanitary sewer system and did not discharge to the Passaic River (PAS-00076582). However, the sewer connection map below shows the sanitary sewer connecting to a catch basin that sent overflow to the Passaic River.

According to the Affidavit of Robert J. Bodnar dated November 29, 1997, while Mr. Bodnar was employed at Otis, Building 21 housed water-cooled air compressors. The cooling water never came in contact with any of the industrial processes at the facility. The compressors' cooling water was discharged from this building to the Passaic River. In addition, Building 21 was never used for the generation of steam to heat the facility. Otis held a permit for the discharge of its compressor cooling water to the Passaic River; all samples tested were satisfactory, and Otis never had a violation because of its cooling water discharge. In the early 1970s, a governmental agency had notified Otis that a discharge of blowdown from the Otis facility to the Passaic River had occurred, and upon receiving the notice, Otis ceased the discharge (PAS-00076599-600).

Spills

A May 1998 *Environmental Due Diligence Site Assessment* by the subsequent operator Intrex, did not identify any indications of spills or releases associated with Otis and noted no major stains (PAS-00076736-38, 772).

6. Regulatory History/Enforcement Actions

Inspections and Violations

According to the January 8, 1998 Affidavit of Seymour A. Lubetkin, the PVSC had set up a river monitoring system to determine if any parties were discharging polluting material to the Passaic River. A review of the annual reports from 1969 through 1976 and the 1977 Draft Report only mention Otis in 1969, 1971, and 1972 for two minor violations (PAS-00076592-93).

According to a Cease and Desist Order from NJDOH to Otis dated October 3, 1969, Otis had been found to be in violation of RS 58:12-2. NJDOH found that Otis had been discharging harmful, deleterious and polluting matter (discussed below) from a sewer or drain into the Passaic River (PAS-00076756-58).

According to the January 8, 1998, Affidavit of Seymour A. Lubetkin, in 1969, a four-inch underground oil pipe had cracked, and oil seeped underground to an adjacent storm overflow pipe that had also cracked. The pipes were excavated and repaired by Otis as soon as Otis was notified. The pollution was discovered on November 14, 1969 and eliminated three days later on November 17, 1969 (PAS-00076593).

According to the Annual Report to the Passaic Valley Sewerage Commissioners for the Year 1972, prepared by Chief Engineer S. A. Lubetkin, Otis received a violation for samples taken on December 14, 1971 from the five outlets that were flowing (7, 8, 10, 15, and 16). The discharge from Outlet 7 had been polluting. On January 6, 1972, Otis notified the Commissioners that steps had been taken to reroute the boiler blowdown discharge to the sanitary sewer. On March 6, 1972, PVSC staff checked the work and confirmed that all work was completed and that the 6-inch pipe to the river had been sealed off, thus eliminating the pollution (PAP-00319432-33; PAS-00006171-72; PAS-00076763-64).

Permits

According to Otis's January 30, 1998 response to EPA's Notice of Liability dated July 1, 1997, Otis had not been able to obtain a copy of its NPDES permit, draft permit, or permit application (PAS-00076582-83). However, according to a Right-to-Know Network's printout obtained by Otis, NPDES permit NJ0002941 for Otis was issued on May 31, 1974 for five outfalls. The printout also states that the permit authorized discharge of "SANI COOLING" effluent, indicating sanitary wastewater and non-contact cooling water. The permit parameters included: chemical oxygen demand (COD) (daily maximum 50 mg/L), oil and grease Freon extra-grav meth (daily maximum 10 mg/L), pH (minimum pH 6, maximum pH 9, daily maximum 10 mg/L), chromium (daily maximum

500 micrograms per liter (µg/L)), zinc (daily maximum 1000 µg/L), and flow (PAS-00076669-81). According to the Affidavit of Seymor A. Lubetkin Assistant Chief Engineer of the PVSC the printout notation for "SANI" is likely an error, since (among other things) it is not consistent with the permit having no monitoring or limits for suspended solids, fecal coliform or biochemical oxygen demand (BOD) (PAS-00076595).

A June 1, 1977 Industrial Sewer Connection Application to the PVSC is signed by Otis, approved and signed by the Town of Harrison, but the PVSC approval and signature fields are blank (PAP-00233778). According to a response to EPA's Notice of Potential Liability dated 1998, Otis submitted an application to the PVSC in February of 1980 for its existing sewer connection. Otis did not receive Permit 98151-13280 because it closed its facility sometime later in 1980 (PAS-00076584; PAS-00076753).

7. Response Actions

Characterization Activities

- May 1998 Environmental Due Diligence Assessment of Habitat International, Ltd. (PAS-00076782).

The February 26, 1998 Application for ECRA Review Initial Notification filed with NJDEP stated that Otis Elevator operations did not involve spills or discharges of hazardous substances or wastes into the soil, groundwater or air (PAP-00456848). The due diligence inspection of April 20, 1988 noted the potential for impacts from fill material at the site, but did not find any indication of spills of discharges (PAS-00076784, 795, 800). An October 6, 1988 Report of Inspection for Intrex noted a stain inside alley- looks like side door was opened and unknown material dumped down storm drain (PAP-00456858). According to an October 31, 1988 Habitat Letter to NJDEP Intrex acknowledged responsibility (PAP-00456860).

A May 1998 *Environmental Due Diligence Site Assessment* by the subsequent operator Intrex of the largest manufacturing building at the sire and adjacent support buildings (leased by Intrex in 1981), did not identify any indications of spills or releases and noted no major stains caused by Intrex with lead impacts in at-depth soils at a former UST location reportedly used by Otis Elevator to fuel vehicles (PAS-00076736-39, 772, 811). The *Environmental Concerns Tracking Sheet* specifies "no staining" in various Potential Areas of Concern (PAS-0076736, PAS-0076738). For one AEC (former location of a UST), NJDEPE required two rounds of subsurface sampling. First-round sampling results for lead at 4.5 bgs were 324 ppm, 228 ppm, 181 ppm, and 887 ppm, with an average of 405 ppm. Second-round sampling results for lead, also at 4.5 bgs, were 303 ppm, 1624 ppm, 396 ppm and 218 ppm, with an average of 520 ppm (PAS-0076739).

Remedial Activities

NJDEP ECRA documents reported that Intrex cleaned the minor staining area identified in the NJDEP inspection (PAP-00456862). NJDEP then approved a Negative Declaration on January 12, 1989 (PAP-00456863).

According to the *Environmental Concerns Tracking Sheet* for Intrex, who leased a portion of the facility starting in 1981, No Further Actions (NFAs) were issued by NJDEPE in 1993 for the following areas of concern (AOCs): dust collectors and spray booths, sump in boiler house, sump in northwest corner of production building, storm drains, exterior temporary drum storage, interior of storage building, waste storage interior, oil water separator in southwest corner, floor drains from paint spray room, paint storage room, loading docks, 120,000-gallon aboveground storage tank (AST), three transformers, battery house, boiler room, dumpster area, hazardous waste from paint spray booths, discharges to Passaic River, and 1,000-gallon gasoline underground storage tank (UST) (PAS-00076735-39). Note that NFA letters were not available in the available material.

On December 7, 1993, the former Otis building located on 1000 First Street, Harrison Town, Hudson County Block 86, Lot 1 (now Intrex Corporation) was issued a No Further Action Letter (i.e., approval of Negative Declaration Affidavit). According to the letter, appropriate institutional controls are in place including, but not limited to, DER, which has been recorded with the County Clerk's Office (PAP-00233795).

8. Summary of Asserted Defenses

To the extent it is determined that a gasoline or oil release occurred at the Facility during the Relevant Time Period and impacted the Passaic River with COC(s), Otis will assert the CERCLA petroleum exclusion (42 U.S.C. §9601(14)).

To the extent it is determined that any discharge associated with another party crossed on, through or under the Facility during the Relevant Time Period and impacted the Passaic River with COC(s), Otis will assert that any liability for such a discharge falls outside the scope of Otis' potential liability under CERCLA.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

PABST BREWING COMPANY, LLC

Facility Name, Address and Size: Pabst Brewing Company/Pabst Brewing Co./E. Hoffman & Son Soda and Mineral Water Works; 400 Grove Street, Newark, New Jersey; Historically approximately 11 to 14 acres; 900 employees, 3 shifts per day, 6-7 days per week (PAS-00031808).

1. **Business Type:** Malt beverage production and distribution

2. **Time Period of Ownership/Operations**

   Operator: 1945 or 1946 to 1985
   Owner: 1945 or 1946 to 2003

   1945: A March 26, 1992 Discharge Investigation and Corrective Action Report prepared by H&GCL states that Pabst Brewing Company (Pabst) purchased the site from E. Hoffman & Son Soda and Mineral Water Works (Hoffman) on November 15, 1946, and Hoffman and Pabst shared joint tenancy and production facilities for an unreported amount of time (PAS-00031669).

   1961: In 1961, Pabst sold 100% of the stock of Hoffman to investors headed by Robert Sealfon (PAP-00286546).

   1985: According to a July 21, 2004 data monitor company profile, prepared by Factiva, Inc., Pabst Brewing Company was acquired by S&P Company in 1985, whose ownership was given over to the Kalmanovitz Charitable Trust in July 2000 (PAS-00031659). In addition, according to a *Discharge Investigation and Corrective Action Report*, prepared by H*GCL, dated March 26, 1992, the facility ceased operation in July 1985 (PAS-00031669).

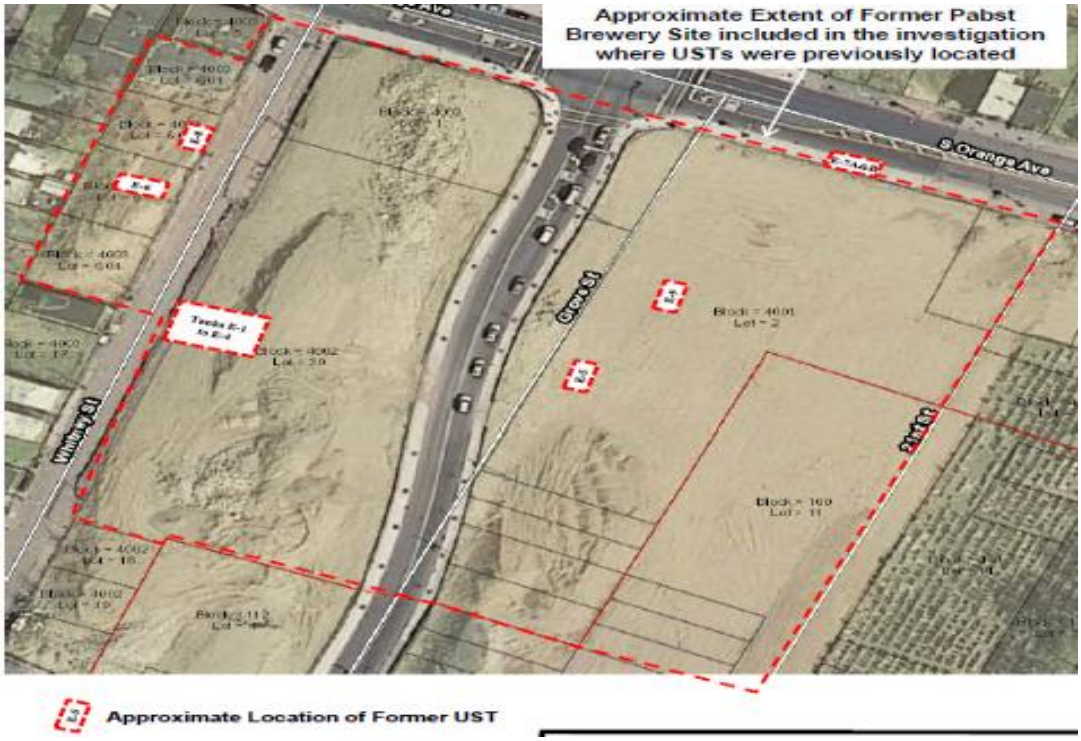
   2003: Pabst sold the facility to New West Developers, LLC pursuant to a deed made on March 26, 2003, and recorded with the Essex County Register on April 3, 2003 (PAP-00293838).

   2010: Pabst is currently a wholly-owned subsidiary of Pabst Holding, Inc., which acquired Pabst from S&P Company in 2010 (PAP-00293835).

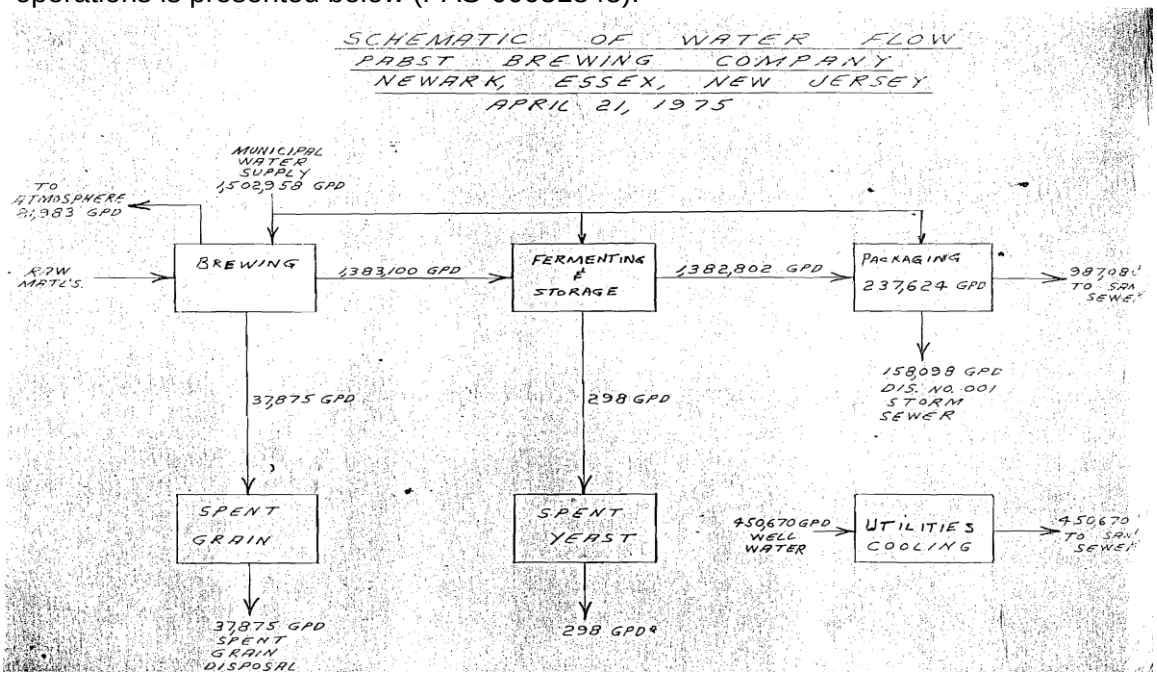
3. **Operational History/COC Use and Presence at the Facility**

   Pabst Brewing Company operations consisted of malt beverage production (PAS-00031711). Raw materials used in production did not include OU2 COCs, nor did operations include use of COCs (PAS-00031803). However, nine USTs were present at the facility that contained No.6 heating oil, No.2 diesel fuel and unleaded gasoline (PAS-00031922-23, 29).

The locations of the USTs are depicted below (PAP-00287097):



A schematic of how water was used and discharged by the facility as part of its operations is presented below (PAS-00031848):



4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

Nine USTs were present at the facility, containing No.6 heating oil, No.2 diesel fuel, and unleaded gasoline (PAS-00031922-23, 29). According to an *Underground Storage Tank Closure Summary Report*, dated March 1992, sand fill material exhibiting high petroleum odors was found inside Tanks E5, E7, and E8. Excavated soil from around those tanks also exhibited high petroleum odors. The excavated soil and sand fill material was stockpiled (Lot "D"). PCB Aroclor-1254 was detected at a maximum concentration of 2,560 parts per billion (ppb) in combined samples taken from the soil stockpile. (PAS-00031936, 56).

PAHs

Nine USTs were present at the facility, containing No.6 heating oil, No.2 diesel fuel, and unleaded gasoline (PAS-00031922-23, 29). According to an *Underground Storage Tank Closure Summary Report*, dated March 1992, and a *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, low and high molecular weight PAHs were detected in soil in the area of the USTs at the facility (PAP-00287067, 145-48; PAS-00031946). The *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, dated May 6, 2016, states that the detections of PAHs were consistent with concentrations of PAHs identified in Historic Fill (PAP-00287067, 76).

Copper

According to a *Heavy Metals Source Determination Study*, prepared by PVSC, dated August 15, 1978, copper was detected in facility wastewater in 1978 at a concentration of 0.179 mg/L, or 2.344 pounds per day (PAS-00031647; PAS-00031832).

According to a 1984 Discharge Surveillance Report, Discharge 001 was required to be monitored for copper, with a discharge limit of 1.0 (no units were listed). The sample result was listed as 0.005 (no units were listed) (PAP-00406396).

Lead

According to a *Heavy Metals Source Determination Study*, prepared by PVSC, dated August 15, 1978, lead was detected in facility wastewater in 1978 at a concentration of 0.117 mg/L, or 1.532 pounds per day (PAS-00031647; PAS-00031832).

Nine USTs were present at the facility, containing No.6 heating oil, No.2 diesel fuel, and unleaded gasoline (PAS-00031922-23, 29). According to an *Underground Storage Tank Closure Summary Report*, dated March 1992, lead was detected in soil associated with the USTs at the facility. Lead was detected at a maximum concentration of 12,000 ppb (PAS-00031918).

Mercury

Mercury was detected in facility wastewater effluent at concentrations up to 0.0063 [units were not available in the file, but it is assumed the concentrations are in milligrams per liter (mg/L)] (PAS-00031816-18).

According to a *Heavy Metals Source Determination Study*, prepared by PVSC, dated August 15, 1978, mercury was detected in facility wastewater in 1978 at a concentration of 0.0012 mg/L, or 0.0157 pounds per day (PAS-00031647; PAS-00031832).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00292425).

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[1] *Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No.52 & No.53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	610 mg/kg
Benzo(a)anthracene	7.633 mg/kg
Benzo(a)pyrene	5.94 mg/kg
Benzo(b)fluoranthene	9.733 mg/kg
Benzo(k)fluoranthene	3.82 mg/kg
Dibenzo(a,h)anthracene	0.546 mg/kg
Indeno(1,2,3-cd)pyrene	1.76 mg/kg

It is noted that according to a *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, the facility is underlain by "Urban Land" (i.e., Urban Fill). The original characteristics of the native soils at the site have been extensively reworked due to the long history of development in this area. Approximately five to ten feet of additional soil and construction type debris (up to twenty feet in certain areas) have also been placed on the site (PAP-00287062).

5. COC Pathways

Sanitary Sewer

The facility received a New Jersey Pollutant Discharge Elimination System (NJDPES) permit (No.NJ0028088) to discharge wastewater to the PVSC system on November 30, 1982 (PAS-00031712). This was designated as Discharge 002 (PAS-00031755). According to a *NJDEP Discharge Surveillance Report* dated April 3, 1985, wastewater discharged to Discharge 002 included water from wash down of vessels, piping, equipment, and sinks; and, non-contact cooling water for production equipment, air compressors, and air conditioning (PAS-00031757-58). The Clay Street CSO, which discharged to the Passaic River, was located approximately three miles from the facility, between the point at which the facility connected to the PVSC system and the PVSC treatment plant (PAS-00032016).

Documented wastewater discharge volumes are as follows:

- According to a *Waste Effluent Survey* dated June 6, 1972, 594,568,000 gallons of wastewater were discharged to the sanitary sewer, and 96,790,000 gallons of wastewater were discharged to the storm sewer in 1971 (PAS-00031804).

- According to a *Waste Effluent Survey* dated April 14, 1975, 440,507,570 gallons of wastewater were discharged to the sanitary sewer, and 49,484,560 gallons of wastewater were discharged to the storm sewer in 1974 (PAS-00031809).

- According to a *Heavy Metals Source Determination Study*, prepared by PVSC in 1978, wastewater discharge from the facility was 1.57 million gallons per day (MGD). The 1978 study also showed detection of mercury, copper and lead in facility wastewater (PAS-00031647).

- In 1978, the facility reported that 401,467,017 gallons of wastewater were discharged to the sanitary sewer, and 106,215,100 gallons of wastewater were discharged to the storm sewer (PAS-00031828).

- According to an *NJDEP Public Notice* dated September 15, 1982, the facility discharged 1.44 MGD, and no pretreatment occurred (PAS-00031714).

- According to a 1983 Facility Wastewater Report, the facility discharged a maximum of 1.3422 MGD at Discharge 002 between February 1983 and April 1983 (PAP-00406403).

- In 1984, PVSC listed the average daily wastewater flow from the facility as 1.426 MGD (PAP-00016793).

- According to a 1985 Facility Wastewater Report, the facility discharged a maximum of 1.4594 MGD at Discharge 002 between February 1985 and April 1985 (PAP-00406602).

Storm Sewer

According to an undated EPA Fact Sheet for Draft NPDES Permit to Discharge into the Waters of the United States, non-contact cooling water was discharged through Discharge 001. The receiving water body was listed as Maybaum Creek (PAS-00031709-11). It appears Maybaum Creek may be connected to the Rahway River (PAS-00031749). Maybaum Creek is a tributary of the Rahway River, which discharges to the Atlantic Ocean (PAS-00031750). Average non-contact cooling water discharges were 0.158 MGD to Discharge 001 (PAS-00031709, 11; PAP-00406427).

According to a letter prepared by Pabst Brewing Company, dated May 22, 1981, the facility had been discharging cooling water into the South Orange Avenue storm sewer since 1964 at the suggestion of the City of Newark to avoid hydraulically overloading the sanitary sewer system. According to the letter, the storm sewer discharged to the Rahway River and the Atlantic Ocean (PAS-00031750).

Direct Release

There is no information regarding direct release in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

Pabst and New West Developers, Inc. received Notices of Violation (NOV) on May 5, 2005 and April 28, 2011, for failure to conduct a remedial investigation and conduct remediation (PAP-00286348-49; PAP-00286135).

To address the May 5, 2005 NOV, New West Developers, Inc.'s consultant submitted a letter for NJDEP stating that remedial investigation activities would commence in August 2005 (PAP-00286599).

According to a *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, Pabst received two NOVs from the NJDEP dated April 28, 2011 and July 19, 2011 in a February 9, 2012 letter. The February 9, 2012 letter states that as a result of management reorganization at Pabst in 2010 and a change of address, the new management of Pabst did not immediately receive the 2011 NOVs. Therefore, Pabst's response to the NOVs was delayed. Upon receipt and review of the NOV's and discussions with the NJDEP, Pabst complied with the NOV and retained EcolSciences's Licensed Site Remediation Professional (LSRP) to oversee the investigation and remediation of the regulated USTs (PAP-00287061).

Permits

The facility first received a NPDES permit (No.NJ0028088) on May 1, 1976 (PAS-00031750).

The facility received a NPDES permit (No.NJ0028088) to discharge to Maybaum Creek on October 30, 1981 (PAS-00031722). Discharge 001 was required to be monitored quarterly for copper, with a discharge limit of 1.0 mg/L; however, the permit noted that monitoring for this parameter was not required unless a corrosion inhibitor containing this metal was used for water treatment purposes (PAP-00406523).

The facility received a NJDPES permit (No.NJ0028088) to discharge wastewater to the PVSC system on November 30, 1982 (PAS-00031712).

According to a 1984 Discharge Surveillance Report, Discharge 001 was required to be monitored for copper, with a discharge limit of 1.0 (no units were listed) (PAP-00406396).

A NJDEP memorandum, dated November 5, 1986, states it verified an Affidavit of Exemption from Pabst related to their NJPDES permit (No. NJ0028088), confirming that discharges has ceased (PAP-00406740). The NJPDES permit was cancelled in June 1986 (PAP-00406744).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Underground Storage Tank Closure Summary Report*, dated March 1992 (PAP-00293902);
- *Remedial Investigation Report Addendum*, dated August 1995 (PAP-00293902);
- *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated January 2000 (PAP-00293902);
- *Remedial Investigation Report/Remedial Action Workplan*, dated November 2002 (PAP-00293902);
- *Supplemental Remedial Investigation Report for Soils*, dated March 5, 2010 (PAP-00286143); and,
- A *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016 (PAP-00287058).

Sewer

There is no information regarding sewer sampling data in the available file material.

Soil

Nine USTs were present at the facility, containing No.6 heating oil, No.2 diesel fuel, and unleaded gasoline (PAS-00031922-23, -29). According to an *Underground Storage Tank Closure Summary Report*, dated March 1992, lead and PAHs were detected in soil at the facility (PAS-00031918, 46). Lead was detected at a maximum concentration of 12,000 ppb (PAS-00031918). In addition, PCB Aroclor-1254 was detected at a maximum concentration of 2,560 ppb in combined samples taken from a soil stockpile associated with Tanks E5, E7, and E8 at the facility (PAS-00031956). The *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, also states that lead and PAHs were detected in soil at the facility. As discussed further below, according to the report, the detections of PAHs were consistent with concentrations of PAHs identified in Historic Fill (PAP-00287067, 76).

According to a letter to NJDEP prepared on behalf of New West Developers, Inc., dated July 17, 2008, requesting a determination of No Further Action for Soil, from 1994 to 2004 Pabst conducted a multi-phase Remedial Investigation of the various former tank areas. Based on the results of the investigation there were five tank areas where regulated compounds subject to remediation provisions remained in soil at that time (PAP-00286131).

According to a *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, supplemental soil investigation in the Tank E1 through E4 area was needed to confirm that the PAH exceedances historically identified were associated with Historic Fill rather than former USTs. In every test pit conducted onsite by EcolSciences, fill material consisting of soil mixed with concrete, asphalt, demolition debris, and other household type material throughout the test pit depth (generally extending to at least ten to fifteen feet below grade). In many locations, test pits could not be completed to the native soils given the thickness of the Historic Fill and the overlying fill/construction debris. Based on these observations, EcolSciences concluded that the PAH concentrations identified in this area are the result of Historic Fill contamination and the remedial investigations for Tanks E1 through E4, as well as the remedial investigations for soil relative to all tank areas, were complete (PAP-00287076).

Groundwater

Based on the *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, groundwater data are not indicative of a plume containing OU2 COCs (PAP-00287098).

Remedial Activities

According to a *Remedial Investigation Status Report* (November 2002 – January 2003), prepared by ENSR Corporation, dated February 2003, nine USTs were removed or abandoned at the site in 1991/1992 (PAP-00293902). The *Underground Storage Tank Closure Summary Report*, dated March 1992, states that the USTs were closed under the oversight of NJDEP (PAP-00293457). According to the *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, one of the USTs received a “no further action” designation from NJDEP on January 3, 2001 (PAP-00287066); it is unclear if the remaining USTs have yet to receive “no further action” designations (PAP-00287053-55).

8. Summary of Asserted Defenses

Pabst asserts that Pabst is not liable under the CERCLA Third Party defense for heavy metals in its wastewater because the City of Newark provided all of Respondent’s water for use at the Facility. The Facility’s discharges to the PVSC system were federally permitted discharges with very limited deviations. COC releases related to underground storage tanks at the Facility are subject to the CERCLA petroleum exclusion.

There have never been any direct discharges of COCs from the Pabst Facility to the Passaic River. While the COCs lead, copper, and mercury have been identified on intermittent occasions in wastewater discharged from the Pabst Facility to the PVSC system, Pabst’s use of water from the City of Newark’s water system historically known

to contain copper and lead, along with Pabst's location almost 3 miles from the Clay Street CSO, makes it questionable that what is an extremely de minimis volume of COCs discharged from the Facility to the PVSC system would have made it 3 miles to the Clay Street CSO, into the Passaic River and settled into the sediment or is remain there today.

Records containing specific information regarding brewery operations are no longer available. The current owners of Pabst acquired the company in 2014 approximately 35 years after brewery operations ceased in 1985. In a 1997 response to a CERCLA Section 104(e) request concerning the Diamond Alkali Superfund Site, counsel for Pabst explained that "Pabst has no information or documentation at this time which is responsive in any fashion" to the Request. During a search for historic insurance information in 2013, it was disclosed that many of the records may have been destroyed by water damage.

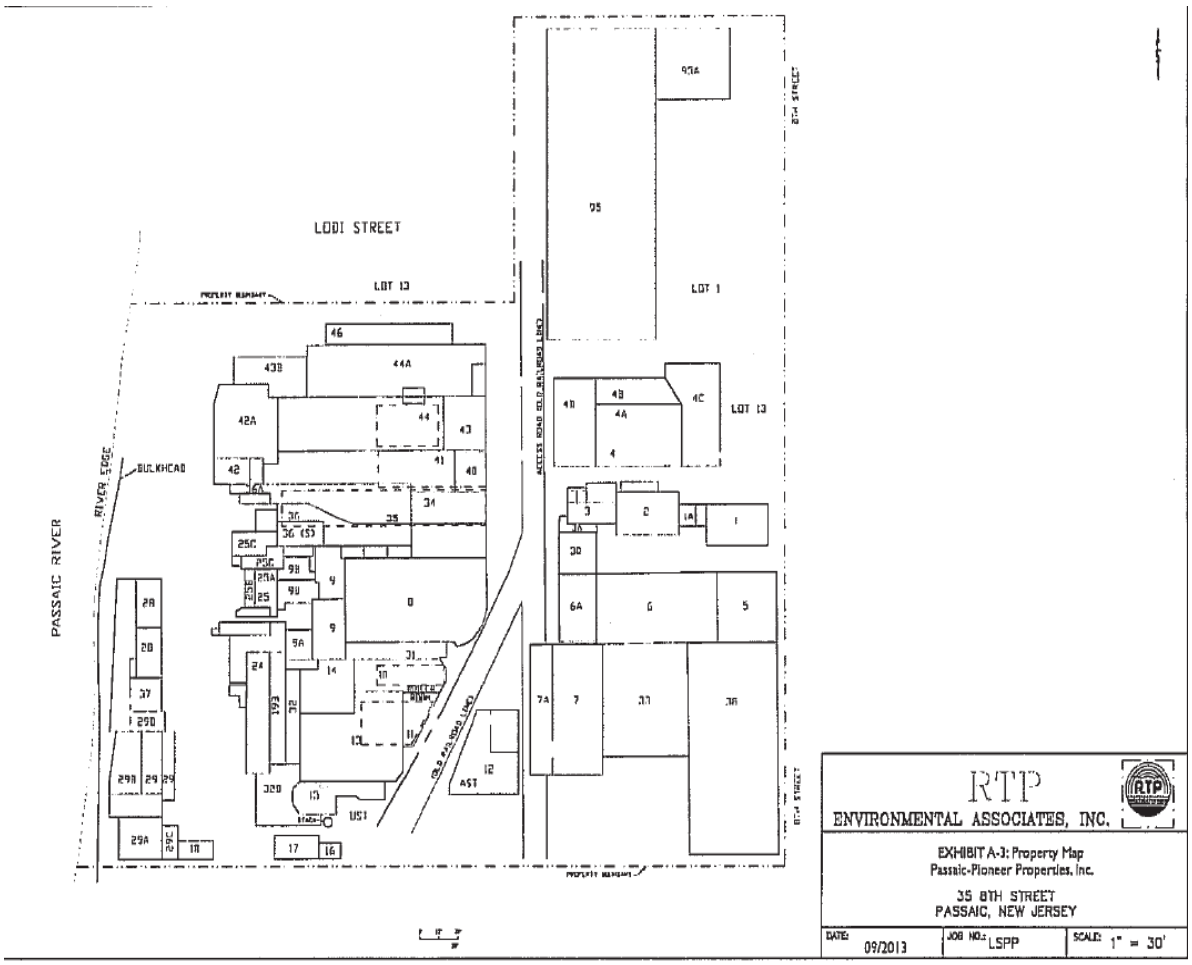
Passaic Pioneer Properties Company

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PASSAIC PIONEER PROPERTIES COMPANY

Facility Name, Address and Size: Passaic Pioneer Properties Company (PPP), 35 Eighth Street, Passaic, NJ. 9.34 acres (PAS-00115127; PAP-00047948; PAP-00194128). The property consists of two lots on Block 1029, lots 1 and 13 (facility) (PAP-00194161). This was a multi-tenant industrial/manufacturing facility. Information regarding the number of employees and hours worked was not available in the documents reviewed for this report.

1. **Business Type:** PPP was the property owner of a multi-tenant industrial building complex. There are five separate buildings at the subject property. The buildings are grouped as follows: Buildings 18, 28, 29 and 37 make up one building (contiguous and separated by walls only); Buildings 4, 4A, 4B, 4C, 4D are grouped to make up a building; Buildings 1, 2, 3, 5, 6, 7, 12, 30, 33, and 38 are grouped together; Building 95 is a standalone structure; and the remaining Building numbers make up the fifth building. Although there are separate building numbers, the majority of the buildings are contiguous and are separated by walls only (PAP-00193872) See the following schematic of property layout below.



(PAP-00047950)

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2. Time Period of Ownership/Operations

Operator: N/A
Owner: 1936/1966 to 2006

PPP owned the facility property from 1936 until February 2006 (PAP-00193845; PAP-00193848; PAS-00115312). More than fifty (50) tenants have leased buildings and other areas of the facility property from PPP for industrial, manufacturing, and storage operations during that period (PAP-00194148-50).

- The facility began operations in the late 1800s as an area of industrial and manufacturing operations.
- PPP purchased a large portion of the facility from Patterson Parchment Paper Company in 1936 and the remainder of the property in 1966 (PAP-00193868).
- PPP sold the property in February 2006 to Passaic Commercial Properties, LLC (the current owner).

3. Operational History/COC Use and Presence at the Facility

PPP leased buildings and land surface to tenants for the operation of industrial, manufacturing, and storage operations space from 1936 to 2006 (PAP-00193865-66).

The primary business type occupying the subject property since 1936 consisted of fabric dyeing, finishing, and knitting operations. This included the following companies:

- Inter-State Dyeing and Finishing (1936 to 2000)
- American Brand Textile Company (1954 to the late 1980s)
- Marijon Dyeing & Finishing Company (1954 to 1968)
- Regent Manufacturing (1959 to 1983)
- EI & EF Meyer, Inc. (1958 to 1990)
- Sunbrite Dye Company (1965 to present)
- Baltic Dyeing & Finishing (1968 to 2001)

A variety of other business types leased the property as well, including:

- Applikay Textile Processing Corp., (1958 to 1985) which consisted of printing and finishing of textile materials
- Bal-Ray (1954 to 1958), which was also a printing company with operations similar to Applikay (PAP-00193868).
- Other types of businesses included woodworking, construction, and storage (PAP-00193873-74).

Sunbrite Dye Company, Inc. (Sunbrite) is the largest tenant at the subject property. Sunbrite is the parent company to Ralon Textile Processing and East Coast Embossing, both operating on site in conjunction with Sunbrite. Sunbrite occupies Buildings 8, 9 (9, 9A, 9B), 14, 17, 18, 19B, 24, 24A, 25 (25, 25A, 25B, 25C), 28B, 28C, 29 (29, 29A, 29B, 29C, 29D), 31, 32, 32B, 34, 35, 36 (first and second floors), 36A, 37, 40, 41, 42, 42A, 43, and 44. Sunbrite also occupies Buildings 10 and 11, which are the boiler operations. Operations at Sunbrite primarily consist of dyeing, finishing, and drying of fabric material. Raw undyed material is placed in mesh bags which are closed and placed into dyeing machines. The bags containing the material are submerged in a dye bath consisting of water, steam, and aqueous-based dyes. Upon completion of dyeing the material, the mesh bags are removed from the dye bath and the dye bath was discharged into floor drains and troughs. Finishing of the dyed materials would include adding a starch-based material to the fabric prior to being dried through the frame (large capacity gas or steam dryers) (PAP-00193872).

Appendix 4 of a Hazardous Substances/Waste Inventory of a NJDEP *Site Remediation Program Preliminary Assessment Report*, dated April 14, 2006 (2006 NJDEP PAR) identifies hydraulic oil, paints, sealants, adhesives, and cutting oils as materials used by multiple PPP tenants (PAP-00193875-81). These substances can contain PCBs and lead. In addition, copper compounds were noted to be used by one tenant − Superior Dyeing Corporation (PAP-00193879). It also notes that none of the facilities on the property was identified as RCRA hazardous waste generators (PAP-00193881).

The 2006 NJDEP PAR also notes that Sanborn Fire Insurance Maps show that there was a 550-gallon naphthalene storage tank located at the western side of Building 28 (PAP- 00193885). In December 2000 and April 2008, ground-penetrating radar efforts were conducted to locate this underground storage tank (UST), neither of which showed the presence of an underground anomaly. Further, soil sampling confirmed that no COCs were detected in this location (PAP-00194174; PAP-00194211-12).

4. Identified COCs

- PCBs (possibly used and detected)
- PAHs (possibly used and detected)
- Copper (used and detected)
- Lead (detected)
- Mercury (detected)

PCBs

The *2014 RIR/RAP* report notes that there were soil samples that identified “hot spots” of PCBs. The extent of contamination was delineated for the PCBs which showed very small areas, specifically along the rail line for the PCBs (PAP-00048067-74). PCB sampling, which was conducted in March 2011, was evaluated in accordance with the Soil Remediation Standard – Impact to Groundwater Guidance, SPLP for PCBs and the results were noted as non-detect (PAP-00048074). A second round of sampling was conducted in August 2011 specific to the PCB SPLP sample locations, and these results were also noted as non-detect (PAP-00048074). PCBs identified at the facility were

attributed to non-indigenous historic fill, and therefore the proposed remedial action was an engineering control in the form of a cap for the facility in conjunction with a Deed Notice (PAP-00048082-83; PAP-00048087).

PAHs

According to the 2002 SI/RI Report, sampling conducted in November 2000 and May 2002 of the crawl space from four access points (A, B, C, and D) below Buildings 44 and 41, detected the following concentrations of PAHs.

November 2000 sampling event

- Benzo(a)anthracene 75,000 µg/kg and 35,000 µg/kg
- Benzo(a)pyrene 62,000 µg/kg and 38,000 µg/kg
- Benzo(b)fluoranthene 76,000 µg/kg and 43,000 µg/kg
- Benzo(k)fluoranthene 45,000 µg/kg and 41,000 µg/kg
- Chrysene 78,000 µg/kg and 40,000 µg/kgDibenzo(a,h)anthracene 20,000 µg/kg
- Indeno(1,2,3-cd)pyrene 39,000 µg/kg and 23,000 µg/kg (PAP-00193926-27; PAS-00115279-81).

The following PAHs were detected during the May 2002 sampling event

- Benzo(a)anthracene 46,000 µg/kg; 39,000 µg/kg; and 33,000 µg/kg
- Benzo(a)pyrene 47,000 µg/kg; 55,000 µg/kg; 20,000 µg/kg; and 1,200 µg/kg
- Benzo(b)fluoranthene 6,700 µg/kg; 97,000 µg/kg; 32,000 µg/kg; and 2,200 µg/kg
- Benzo(k)fluoranthene 12,000 µg/kg; 82,000 µg/kg; 32,000 µg/kg and 2,400 µg/kg
- Chrysene 60,000 µg/kg and 28,000 µg/kg
- Dibenzo(a,h)anthracene 6,600 µg/kg and 2,500 µg/kg
- Indeno(1,2,3-cd)pyrene 1,100 µg/kg; 1,100 µg/kg; and 4,500 mg/kg (PAP-00193927; PAS-00115281).

These compounds were noted to be identical to those identified in the “Target Contaminant Concentrations of Typical Historical Fill Material” table in the Technical Requirements for Site Remediation (PAP-00193928). A third and fourth round of sampling in April and May 2003 only identified the following PAHs above the RDCSCC in one sample location:

- Benzo(a)pyrene 1,100 µg/kg;
- Benzo(b)fluoranthene 1,000 µg/kg.

(PAP-00194094-). As previously noted, this AOC was re-designated as AOC-5B (Building 44), AOC-5C (Building 35) and AOC-5D (Building 41) during a subsequent investigation (PAP-00194218-21).

One soil sample was collected in the crawl space under Building 44 (AOC-5B) in April 2008 and the results of this sample did not detect any contaminants above the most stringent remediation standards (PAP-00194189; PAP-00194435). Sampling below the concrete layer exhibited contaminants typical of historical fill only and a no further action determination was recommended for AOC-5B (PAP-00194457).

A soil sample collected in 2008 beneath Building 41 (AOC-5D) detected benzo(a)anthracene (3.55 mg/kg), benzo(b)fluoranthene (3.21 mg/kg), benzo(a)pyrene (4.03 mg/kg), indeno(1,2,3-cd)pyrene (3.34 mg/kg), and dibenzo(a,h)anthracene (1.2 mg/kg). However, since the contaminants are consistent with those found in historical fill material, a no further action determination along with the institution of a deed notice was recommended, since the soils beneath the crawl space were already capped (PAP-00194459-60; 65-66).

Remedial investigation activities conducted in 2009 in the crawl space beneath Building 35 (AOC-5C) also detected PAHs and required further investigation. The crawl space was cleaned and in 2011 eight additional samples were taken. Analysis of the sampling concluded that the contaminants identified were not related to on-site operations and were instead consistent with those observed in historic fill material (PAP-00048081).

Copper

According to the 2002 SI/RI Report discussed above, copper was detected in two samples during the November 2000 sampling; 784 mg/kg and 647 mg/kg. Copper was detected in three of the four samples taken during the May 2002 sampling; 1,720 mg/kg, 1,730 mg/kg, and 628 mg/kg (PAP-00193926-28; PAS-00115279-82). These samples were part of the investigation of the crawl space below Buildings 44, 41 and 35, designated as AOC-1. The contaminants identified during these investigatory activities were determined to be identical to those identified in the "Target Contaminant Concentrations of Typical Historical Fill Material" table in the Technical Requirements for Site Remediation (PAS-00115279-82). A No Further Action Letter was recommended by RTP (PAS-00115261; PAP-00193909). The NJDEP required additional sampling beneath and/or outside of the area of the crawl space to verify the integrity of the sampling, which was documented in the 2003 Addendum to the SI/RIR (PAP-00194076-78; 93-95). Copper was identified under Building 44 during the 2003 sampling (2.08 mg/kg at 5.25-5.75 feet and 8.07 mg/kg at 6-6.5 feet bgs) (PAP-00194189); and was detected in sampling related to Building 41 (261 mg/kg at 5.25-5.75 feet and 351 mg/kg at 6-6.5 feet bgs) (PAP-00194191).

The following table shows the highest concentration of copper for Building 35 (AOC-1) for the subsequent sampling events in 2006, 2008, 2009 and 2011 as reported in the 2014 RIR/RAP.

Copper Concentrations		
Sample Year	**Depth (bgs)**	**Results**
2006	0.5-1 feet	999 mg/kg
2008	1-1.5 feet	279 mg/kg
2009	1.5-2 feet	173 mg/kg
2011	0.0-0.5 feet	98.5 mg/kg

(PAP-00048092)

Lead

A November 2002 Site Investigation/Remedial Investigation Report (SI/RIR) for Inter-State Dyeing and Finishing Company detected lead in three of the four samples taken during November 2000 sampling; 608 mg/kg, 1,470 mg/kg, and 692 mg/kg. Lead was detected in four samples taken during May 2002 sampling; 1.260 mg/kg, 1,690 mg/kg, 4,430 mg/kg, and 425 mg/kg (PAP-00193926-28; PAS-00115279-82). These samples were part of the investigation of the crawl space below Buildings 44, 41 and 35, designated as AOC-1. The contaminants identified during these investigatory activities were determined to be identical to those identified in the "Target Contaminant Concentrations of Typical Historical Fill Material" table in the Technical Requirements for Site Remediation (PAS-00115279-82). A No Further Action Letter was recommended (PAP-00193909; PAS-00115261). The NJDEP required additional sampling beneath and/or outside of the area of the crawl space to verify the integrity of the sampling, which was documented in an Addendum to the SI/RIR (PAP-00194076-78; PAP-00194093-95). A third and fourth round of sampling in April and May 2003 showed that there was no direct contamination from the crawl space and good crawl space integrity, therefore, No Further Action was requested (PAP-00194095). This AOC remained active and was subject to further investigation as part of the Memorandum of Agreement between PPP and the NJDEP (PAP-00193826). Ultimately, the crawl spaces under these buildings were re-designated as AOC-5B (Building 44), AOC-5C (Building 35) and AOC-5D (Building 41) (PAP-00194218-21). AOC-5B and AOC-5D warranted No Further Action as of June 2009 (PAP-00048005-07). During the 2003 sampling, lead was not detected above the Residential Direct Contact Soil Cleanup Criteria ("RDCSCC") under Building 44 (PAP-00194189) and determined by RTP to be consistent with levels found in historic fill under Building 41 (PAP-00194190-92). The contaminants identified in AOC-5C were determined by RTP to be consistent with those observed in historic fill as of the RIR/RAR completed in May 2014 (PAP-00048081).

Additional sampling for the 2014 RIR/RAP revealed the presence of lead (along the railroad line ranging from 0.202 mg/kg to 2.8 mg/kg) greater than the NJSRS and IGWSSL. It was concluded these constituents were the result of historic fill and it was proposed to cap the entire facility with registering of a deed notice regarding site conditions (PAP-00048082).

Mercury

The *2014 RIR/RAP* report notes that soil sampling was conducted and analyzed within the crawl space (sediment sample) and the crawl space exterior of Building 35, as requested by NJDEP. The contaminants detected were those noted as typical Historic Fill (PAP-00048079-83; 104). The report includes sampling information showing that the maximum concentration of mercury noted above (642 mg/kg) a crawl space soil sample (CS-5) during 2006 (PAP-00048098). During the same sampling event, 35.1 mg/kg of mercury were detected in another crawl space sample (CS-4). Both of these samples were in Building 11 Boiler Room, and designates as AOC-5A (PAP-00048066, 104).

These soil samples were further evaluated in accordance with the Soil Remediation Standard – Impact to Groundwater Guidance as using the Synthetic Precipitation Leaching Procedure ("SPLP") sampling method, and all results were noted as non-detect (PAP-00048073-74). The remedial outcome for this AOC was recommendation of no further action with engineering controls (PAP-001994431-33, 454-456).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of lead, PCBs, and PAHs detected on the facility site do not exceed the maximum concentrations levels of contamination considered by NJDEP to be typical of that found in Historic Fill. Mercury and copper levels significantly exceed Historic Fill maximum concentrations.

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00047953-55).

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 42 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	8,830 mg/kg
Copper	1,730 mg/kg
Mercury	642 mg/kg
Benzo(a)anthracene	20 mg/kg
Benzo(a)pyrene	13.1 mg/kg
Benzo(b)fluoranthene	11.3 mg/kg
Benzo(k)fluoranthene	9.56 mg/kg
Dibenzo(a,h)anthracene	2.61 mg/kg
Indeno(1,2,3-cd)pyrene	7.99 mg/kg

(PAP-00047954, PAP-00115281)

A Deed Notice with Engineering Controls was issued October 18, 2013, subject to benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, arsenic, lead, mercury, and PCBs. An attachment to the 2013 Deed Notice states that the only contaminants identified at the subject property are those contained in Historic Fill. Nonindigenous fill material consisting of grey to black soil (coal dust), coal fragments with some crushed brick, gravel, wood, and glass was identified in some areas of the property from zero to approximately nine feet below grade (PAP-00047937). The remedial action for the facility is an engineering control in the form of a cap for the site in conjunction with the deed notice (PAP-00048087).

5. COC Pathways

Sanitary and Storm Sewer

According to the 2006 Preliminary Report (PAR), all sanitary and industrial waste generated at the PPP property is discharged to the public sanitary sewer system and treated at the PVSC treatment plant located in Newark, New Jersey. According to the Passaic City Engineering Department, the subject property has been hooked up to the public sanitary sewer system since prior to 1900 (PAP-00193883). Per the 2006 PAR, tenant, Sunbrite Dye Company was issued a Sewer Use Permit by the PVSC for process wastes. Channels and floor drains were observed in the Sunbrite tenant area, predominately in the dyeing locations. The dye bath discharged to the channels and floor drains, which then discharged to reclamation tanks located in Building 14. The reclamation tanks temporarily stored process waste for the dyeing operations. Monitoring of the pH was conducted and adjusted to permitted levels before discharge to the sanitary sewer. Three former tenants, Superior Dyeing Corporation, Baltic Dyeing & Finishing Company, and Inter-State Dyeing & Finishing had similar Sewer Use Permits from PVSC. Their operations also utilized channels and floor drains that discharged to reclamation tanks for pH adjustment prior to discharging the process waste to the sanitary sewer system (PAP-00193883).

The Direct Discharge PRP Cases for the Lower Passaic River Study Area pertaining to PPP notes historical violations from PVSC. The discharges were noted generally as "dye waste". Dye waste has not been documented to contain any of the COCs (PAS-00115134-39).

The 2002 SI/RI stated that water in the crawl space beneath Buildings 35, 41, and 44 had been present on numerous occasions over the years and on a regular basis, predominately after periods of rainfall, the water was pumped out and discharged to the sanitary sewer. During a second round of SI activities conducted in May 2002, it was noted that roof leaders discharged to the crawl space. Based on the three observations made of the crawl space, it was determined that the likely source of the water found in the crawl space was from storm water, surface water runoff, and on occasion floodwater from the adjacent Passaic River (PAP-00193926-28).

The 2006 NJDEP PAR for the PPP Property notes that there have been above-ground storage tanks, underground storage tanks, piping, aboveground and belowground pumping stations, sumps, pits and storage pads including drum and/or waste storage at the facility. It notes the existence of floor drains, trenches and piping, and sumps at the facility. The local surface water body is identified as the Passaic River. Other areas of concern are noted to be transformers, hazardous material storage and handling areas, discolored or spill areas, non-contact cooling water discharges from a boiler room, and areas which receive flood or storm water from potentially contaminated areas (PAP-00193852-53).

According to the 2006 NJDEP PAR, the Passaic River is located directly adjacent to the west of the subject property. Based on mapping of flood zones and wetlands, the subject property and direct vicinity are applicable to flood zoning (100-year flood zone). According to the PAR, it was reported that the Property had been subject to flooding in the past, most recently September 1999. Reportedly, no process waste was ever discharged to the Passaic River, nor was the river used as a source of process water. Sampling of the Passaic River was not proposed relative to the facility (PAP-00193888).

According to a 2008 Baseline Ecological Evaluation for PPP, a metal bulkhead exists between the Passaic River and the facility property on the western boundary of the facility (PAP-00194174,210-11, 308). The date this bulkhead was installed was not specified.

6. Regulatory History/Enforcement Actions

Permits

Sunbrite Dye Company

NJPDES Permit No. 157157 belonged to the tenant Sunbrite Dye Company. The NJPDES permit is a General Permit for storm water discharge. The facility did not receive any violations from the NJDEP regarding this stormwater discharge permit (PAP-00194147).

Sunbrite Dye Company was also issued a Sewer Use Permit by PVSC for process wastes, which predominantly included spent dye materials from the dyeing operations. Channels and floor drains were apparent in the Sunbrite tenant area, predominantly in the dyeing locations. The dye bath discharged to the channels and floor drains, which then discharged to reclamation tanks located in Building 14. The reclamation tanks are temporary storage of process waste for the dyeing operations. Monitoring of pH was conducted, and adjusted to permitted levels before discharge to the sanitary sewer system (PAP-00193883).

Superior Dyeing Corporation

NJPDES Permit No. 157274 belonged to a former tenant Superior Dyeing Corporation. Superior Dyeing Corporation filed for bankruptcy and is no longer in existence. Specific information regarding this permit is not available. Superior Dyeing Corporation was subject to ISRA and received a No Further Action letter from the NJDEP on February 22, 2005. This permit was identified as part of that ISRA Case No. 20030290 (PAP-00194147).

Superior Dyeing Corporation also had a PVSC Sewer Use Permit and its operations also utilized channels and floor drains in the dyeing locations in which the dye bath was discharged to reclamation tanks for pH adjustment prior to discharging the process waste to the sanitary sewer system (PAP-00193883).

Inter-State Dyeing and Finishing Company

Inter-State Dyeing and Finishing Company was issued a Sewer Use Permit by the PVSC. Permit number No. 26400150 was issued June 16, 1996 with an expiration date of June 2000 (PAS-00115131; PAS-00115134). Inter-State Dyeing and Finishing Company operations also utilized channels and floor drains in the dyeing locations in which the dye bath was discharged to reclamation tanks for pH adjustment prior to discharging the process waste to the sanitary sewer system (PAP-00193883).

Baltic Dyeing and Finishing

Baltic Dyeing and Finishing Company also had a PVSC Sewer Use Permit and its operations also utilized channels and floor drains in the dyeing locations in which the dye bath was discharged to reclamation tanks for pH adjustment prior to discharging the process waste to the sanitary sewer system (PAP-00193883).

Violations

Some tenants had PVSC permits as well as NJDEP permits for storm water discharge to the Passaic River. Although there were documented instances of dye wastes being released to the Passaic River, there is no information in available documents that stated these wastes contained COCs (PAS-00115415-426).

A *PVSC Stream Contamination Report*, dated August 25, 1947 (PAS-00115125) states that on July 14, 1947, dye waste was observed discharging into the Passaic River through the storm sewer at Eclipse Piece Dye Works, a tenant at PPP. The inspector had found that the sewer system in this group of properties was in need of repairs. The tenant was noted to have made some emergency repairs, which eliminated the violation temporarily (PAS-00115396). A *PVSC Stream Contamination Report*, dated November 17, 1947, states that on October 22, 1947 (PAS-00115125), dye wastes were observed discharging into the Passaic River from PPP. A small leak in the sanitary sewer was identified under the mill buildings (PAS-00115398).

A *PVSC Stream Contamination Report*, dated January 13, 1948 (PAS-00115125), states that on November 15, 1947, dye waste was observed discharging into the Passaic River from PPP by way of a storm drain. Investigations revealed a broken pipeline form the plant of a tenant, Millbank, Inc., Textile Printers. The break was repaired and the violation eliminated (PAS-00115400).

An October 1951 letter states that there were intermittent discharges of industrial waste to the Passaic River from the PPP property. The letter notes that recollection of the original dual drainage system as put in by the previous owners (Paterson Parchment Paper Company), a single process concern, leaves the present explanation of heavy trucks frequently breaking the plant sewers underground insufficient to account for the intermittent pollution. The old dual drainage system from a single process appears to have been utilized to take care of a number of industrial wastes from various processes in a multiple tenant mill, and the careful separation of clean and dirty wastes seems to have become lost (PAS-00035373).

A PVSC Weekly Summary of Inspections by Inspectors from January 1952 states that daily inspections have not revealed any discharges of dye waste since some of the outlets to the Passaic River were blocked up the previous month. The weekly summary stated that the cessation of discharge could also be contributed to the shutting down of one of the tenant dyeing concerns. Work on the plumbing underneath the buildings was delayed due to weather but efforts were being continued (PAS-00035374).

A PVSC Weekly Summary of Inspections by Inspectors from January 1956 states that red-colored fluid was observed discharging from a 6-inch pipe into the river on the Inter-State Dyeing and Finishing Company property (PAS-00115406).

A PVSC Memorandum, dated March 31, 1970, states that PPP was an industrial terminal of approximately 46 buildings. A discharge of supposed cooling water into the Passaic River was observed between December 3, 1969 and December 17, 1969, which was sampled and found to be polluting. The constituents of the pollution were not noted, but it did state that one of the firms had boiler blow-down water connected, together with cooling water into a line and it was the boiler blow-down water that contained the compounds that were polluting the river. Upon being informed of the situation, the company had the boiler blow-down line disconnected from the river discharge and reconnected to a pipe leading to the sanitary sewer (PAS-00006216-17).

A 1971 *Violations and Eliminations Report*, states that in December 1971, Parra Print at the PPP complex had one of its outlets sampled. The results showed pollution from this company. The constituents of the pollution were not specified. An inspector found that polluting material was discharging from a 1-inch pipe to the Passaic River. The plant manager was informed and he immediately arranged to plug the line with concrete and discharge the material to the sanitary sewer. This was completed by December 10, 1971 (PAS-00115411).

A PVSC *Stream Contamination Report,* dated December 7, 1978, states that a multi colored dye was observed discharging to the Passaic River from Inter-State Dyeing and Finishing. It should be noted that analysis of samples did not include specific chemicals (PAS-00115416-21).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Site Investigation/Remedial Investigation Report for Inter-State Dyeing and Finishing Company, dated November 2002 (PAP-00193904)
- Addendum to the Site Investigation / Remedial Investigation Report for Inter-State Dyeing and Finishing Company, dated July 2003 (PAP-00194073)
- NJDEP Site Remediation Program, Preliminary Assessment Report for Passaic Pioneer Properties Company, dated April 4, 2006 (PAP-00193844)
- Addendum to the Preliminary Assessment Report for Passaic Pioneer Properties Company, dated January 10, 2007 (PAP-00194120)
- Revised Addendum to the Preliminary Assessment Report for Passaic Pioneer Properties Company, dated May 3, 2007 (PAP-00194124)
- Remedial Investigation Report, Remedial Action Workplan for Passaic Pioneer Properties Company, dated August 2008 (PAP-00194155)
- Addendum to the Remedial Investigation Report, Remedial Action Workplan for Passaic Pioneer Properties Company, dated January 2009 (PAP-00194325)
- Remedial Investigation Workplan for Passaic Pioneer Properties Company, dated May 8, 2009 (approved June 22, 2009) (PAP-00048000)
- Remedial Investigation Report, Remedial Action Workplan for Passaic Pioneer Properties Company, dated October 23, 2009 (PAP-00194412)
- Remedial Investigation Report/Remedial Action Report, dated May 2014 (PAP-00048061)

The 2002 *SI/RI Report,* dated November 2002, for the Inter-State Dyeing and Finishing Company prepared for PPP states that Inter-State was a tenant from 1936 until May 2000 when the company filed for bankruptcy and ceased operations. Two potential AOCs were investigated—crawl space/areas and historical fill. Sediment sampling in the crawl space showed that PAHs, copper and lead were detected above the Residential Direct Contact Soil Cleanup Criteria. Based on the results of the SI/RI activities

conducted at the subject facility, No Further Action was requested. The report noted that although soil sampling from within the crawl space showed base neutral and metal contamination, it is unlikely that any water or soil/sediment materials would egress to the environment below the crawl space flooring. Any water pumped out from the crawl space is discharged to the sanitary sewer. Any soil will remain in the crawl space due to the concrete flooring and wall with the impermeable layer (PAP-00193908-19).

According to the 2006 *NJDEP PAR*, various areas of the property reportedly utilized fill material, specifically in areas adjacent to the Passaic River bank. Exact locations could not be determined, and it was assumed, based on conversations with the property owner, that there is the potential for the fill to be coal ash (PAP-00193889).

In addition, the report notes that an extensive file review of surrounding properties was conducted at the NJDEP in March 2002 and that many of the facilities reviewed have encountered historical fill. The properties with noted historical fill as well as base neutral and metal contamination include 100 Eighth Street, Lodi & Eighth Street, and 27 Eighth Street, all properties directly adjacent to the facility and subject property, indicating a regional problem. It was anticipated that additional investigations would be conducted regarding the fill material (PAP-00193889).

The 2006 NJDEP PAR for the entire property identified 52 AOCs (four of which were administrative and not contaminant based). Of these, AOCs 23 were No Further Actions and 29 were investigated further between 2003 and 2008. PAHs, PCBs and metals (including copper, mercury and lead) were detected, but all of these AOCs, with the exception of two, were also deemed to require No Further Action. These two areas were the crawl spaces under the buildings at Inter-State Dyeing and Finishing and the potential Historic Fill on the property (PAP-00193845; PAP-00048065-68; PAP-00194167). The report notes that information in the report was from inspections at the property in 2000, 2001, 2002, 2003 and 2006 (PAP-00193861). The crawl space was noted to be an area that received storm water and surface runoff. Soil sampling results of this crawl space showed base neutral and priority pollutant metal contaminants, identical to those identified in the “Target Contaminant Concentrations of Typical Historical Fill Material" table in the Technical Requirements for Site Remediation. Although the soil samples were not obtained from points with direct access to the environment, it was concluded that the soil (sediment) found in the crawl space is the result of years of storm water, as well as surface runoff from the facility and floodwaters from the adjacent Passaic River (PAP-00193886-87).

Appendix 7 − Aerial Photograph Review of the 2006 NJDEP PAR Report, states that in April 1973 aerial photography, Building 95 is apparent at the northeastern portion of the parking area. An additional building group (Buildings 28, 29 and 37) was constructed along the river’s edge of the property. It appears that this area had been filled to accommodate the new buildings (PAP-00193891, 93). Only this area is not reported to have an impact of COC contamination, as only low levels of PAHs were detected in sampling in this area (between 0.274 and 0.667 mg/kg benzo(a)pyrene and 0.621 benzo(a)anthracene) (PAP-00048704; PAP-00048104). It also notes that there was no evidence of above ground storage tanks, waste dumping or burial pits, ponds, lagoons, or landfills in aerial photographs of the facility (PAP-00193893).

A 2008 *Remedial Investigation Report, Remedial Action Workplan* states that additional sampling conducted at the request of the NJDEP adjacent to the crawl spaces confirmed the presence of contaminants below the New Jersey Soil Remediation Standards ("NJSRS") and at levels much lower than those found in the crawl spaces, indicating no direct contamination from the crawl spaces and good crawl space integrity (PAP-00194217-18; PAP-00194433-39).

A May 2014, *RIR/RAP* states that PPP initially started site investigations and remediation as part of its ISRA compliance and obligation. The initial ISRA Case was for tenant, Inter-State Dyeing & Finishing Company, due to its cessation of operations, and it was given the ISRA Case No. E20000341. As stated above, site investigations were conducted at the Inter-State Dyeing & Finishing Company portion of the subject property in November 2002 and July 2003. Soil sampling was conducted and analyzed within the crawl space (sediment sample) and the crawl space exterior, as requested by NJDEP. The contaminants detected were those noted as typical Historic Fill. The Inter-State Dyeing & Finishing Company case was currently active at that time. In addition, two former tenant spaces received No Further Action determinations from the NJDEP; they are Superior Dyeing Corporation (ISRA Case No. E20030290) and Baltic Dyeing and Finishing Company (ISRA Case No. E20010450). Both of these tenants were fabric dyeing and finishing companies, similar to one of the current tenants on-site, Sunbrite Dye Company. The report includes sampling information showing that the maximum concentration of mercury noted above (642 mg/kg) was detected in crawl space soil sample (CS-5) during 2006. During the same sampling event, 35.1 mg/kg of mercury were detected in another crawl space sample (CS-4). Both of these samples were in Building 11 (PAP-00048061, 64-74, 79-83, 98, 104).

In addition, multiple General Information Notifications (GINs) were submitted to the NJDEP for the various current and past ISRA applicable tenants. Ultimately, PPP entered into a Memorandum of Agreement and Remediation Agreement with NJDEP, which combined all of the tenant areas into a single ISRA case, effective March 20, 2006 (PAP-00048065; PAP-00193827-43). PPP sold the property in February 2006 to Passaic Commercial Properties, LLC (the current owner), and ceased doing business. Starting with the ISRA Case for the Inter-State Dyeing & Finishing Company and continuing through the Memorandum of Agreement and Remediation Agreement, the ISRA Case Number for the subject property is E20000341. A Response Action Outcome was issued for the entire facility on January 5, 2015, with a Remedial Action Permit for Soils issued on October 6, 2014 (PAP-00047930-63; PAP-00047969-71).

The *2014 RIR/RAP* report also notes that soil sampling to identify the presence of Historic Fill was conducted throughout the property in 2009. Soil logs identified soils throughout the facility consisting of grey to black non-indigenous soils starting from directly below the asphalt cover and ranging from a depth of two feet to nine feet. The area with the low range of depth was located directly adjacent to the Passaic River at the southwestern boundary of the facility. The area with the higher range of depth was also located adjacent to the Passaic River at the northwestern boundary of the facility. Soil sample results identified contaminants as target contaminants of typical Historic Fill. In addition, there were soil samples that identified "hot spots" of PCBs and mercury. The extent of contamination was delineated for the PCBs and mercury, which showed very

small areas, specifically along the rail line for the PCBs and within the boiler room crawl space for the mercury (PAP-00048067-74).

Based on the remedial investigation activities conducted in 2009, further investigations were warranted for AOC 5C – Crawl Space – Building 35. It was initially proposed to remove the accumulated sediment within this crawl space area and then to institute a deed notice for the Historic Fill compounds detected below the crawl space (PAP-00048069).

In addition, only one AOC warranted a Remedial Action Workplan; Historic Fill (AOC 11). While certain AOCs exhibited contaminant concentrations greater than the current New Jersey Site Remediation Standards (NJSRS), the contaminants identified were not specific to the AOC, but specific to target compounds identified in Historic Fill (PAP-00048069).

Additional sampling revealed the presence of lead, mercury and PCBs greater than the NJSRS and IGWSSL. It was concluded these constituents were the result of historic fill and it was proposed to cap the entire facility with registering of a deed notice regarding site conditions (PAP-00048079-83).

According to the 2014 RIR/RAP report, soil Sampling and Synthetic Precipitation Leaching Procedure (SPLP) sampling showed that there was no impact to groundwater concerning any of the COCs identified in Historic Fill at the facility. Furthermore, taking guidance from the NJDEP's *Guidance from the Evaluation of Immobile Chemicals for the Impact to Ground Water Pathway (June 2008)*, those samples that were greater than the Impact to Ground Water Screening Levels and greater than two feet from ground water, were considered not likely to have impact to ground water (PAP-00048070-74; PAP-00048079-83; PAP-00048094; PAP-00048554-57; PAP-00048652-79).

Remedial Activities

The following engineering and institutional controls were completed on the facility site in three phases: July 2012, April 2013, and July 2013:

- Asphalt Cap: Building exterior − 6 inches (four inches of asphalt underlain by two inches of compacted gravel subgrade) ;
- Concrete Cap: Building interior − 8 inches (four inches of concrete underlain by four inches of dense grade aggregate); and
- Crawl Space: Locked and Signage.

(PAP-00048087-88; PAP-00048105 (Figure 4 − Capping Plan); PAP-00048680-85 (Attachment H − Photographs − Remedial Action); PAP-00048686-713 (Attachment I − Deed Notice)).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Pharmacia LLC

Diamond Alkali OU2 Allocation

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Facility Data Report

PHARMACIA LLC

Facility Name, Address and Size: The Monsanto Company Site/The Monsanto Site/Kearny, New Jersey Plant/26-Acre Former Monsanto Property; Foot of Pennsylvania Avenue/1 Pennsylvania Avenue/8 Pennsylvania Avenue, Kearny, New Jersey; 26 acres; 100 employees, 7 days per week, three shifts per day (PAS-00003876).

1. **Business Type:** Manufacturing of detergent additives and phosphorus-based products (PAS-00073343).

2. **Time Period of Ownership/Operations**

Operator: 1955 to 1991
Owner: 1954 to 1994

1954: Monsanto Company (Monsanto) constructed its Kearny, New Jersey plant in 1954. The site served as a railyard prior to Monsanto's purchase in 1954 (PAS-00073343).

1955: Process operations began in 1955 (PAS-00073344).

1988: According to a *Site Evaluation Submission*, dated October 25, 1991, approximately 8 acres of the eastern portion of the property were leased to American Presidential Intermodal Company (PAS-00073453, 84, 89).

1991: Process operations were terminated in 1991 (PAS-00073344).

1992: The process areas were demolished in 1992 (PAS-00073344).

1994: Monsanto sold the property to the Motor Carriers Service Corp. in December 1994 (PAS-00073437).

1997: According to a letter prepared by legal counsel for Pharmacia Corporation (Pharmacia), dated March 26, 2004, in 1997, pursuant to a Distribution Agreement, Monsanto (known at the time of the letter as Pharmacia, as discussed below) spun off its chemical business into a separate company, Solutia Inc. (Solutia). As part of this transaction, assets and liabilities associated with the historical chemical business were transferred to Solutia. The letter states that, “generally speaking,” responsibilities associated with the former manufacturing facility in Kearny, New Jersey, were among the liabilities transferred to and directly assumed by Solutia (PAS-00121816, 19). Solutia is a publicly held corporation with no corporate parent (PAS-00081751).

2000: According to a November 26, 2003 letter, the corporate entity that was known as Monsanto prior to March 31, 2000, is now called Pharmacia as a result of a name change filed on that date. In 2000, Pharmacia offered a portion of its ownership interest in Monsanto to the public (PAS-00081751).

2002: According to a November 26, 2003 letter, in 2002, Pharmacia distributed the rest of its ownership interest in Monsanto to its shareholders. Consequently, Monsanto is now a publicly-held corporation with no corporate parent and has no direct connection to the site (PAS-00081751).

2003: The March 26, 2004 letter, on December 17, 2003, Solutia and 14 of its United States subsidiaries filed for bankruptcy protection and reorganization under Chapter 11 of the United States Code, in the United States Bankruptcy Court for the Southern District of New York. Solutia has taken the position that the bankruptcy filing relieves Solutia of its obligations under the 1997 Distribution Agreement, which include all obligations associated with the Kearny site (PAS-00121816-17).

3. Operational History/COC Use and Presence at the Facility

A letter prepared by Roux Associates, Inc. (Roux) on behalf of Monsanto, dated March 1, 1996 (March 1, 1996 letter), states that during Monsanto's ownership, the plant primarily manufactured detergent additives used in home laundry and phosphorus-based products used in a variety of consumer applications (PAS-00073343). The site manufactured phosphoric acid and sodium tripolyphosphate from 1955 until 1985. The manufacturing of Sterox® (ethoxylated alkylphenol) began in 1956 and ended in 1990. Alkylphenol (AP) was manufactured on site from 1960 to 1991 (PAS-00073344).

According to a *Remedial Investigation Work Plan*, dated December 18, 1989, phosphoric acid, sodium tripolyphosphate, “Sterox®,” and AP were manufactured as follows:

- To manufacture phosphoric acid, phosphorous was received by railroad tank cars and unloaded into storage tanks using water displacement. From the storage tanks, phosphorous was pumped to the top of a burning tower and oxidized with air to form phosphorous pentoxide gas. The hot phosphorous pentoxide gas would pass through the bottom of the tower into a hydrator and absorber. Weak phosphoric acid was sprayed into the hydrator to cool the hot gases which then continued toward the absorber. In cooling the gases, the dilute acid was concentrated by evaporation (PAP-00035278).

- The sodium tripolyphosphate process consisted of continuously mixing soda ash and phosphoric acid in varying proportions, drying and calcining the mixture, and grinding the dried solids to produce sodium tripolyphosphate (PAP-00035278).

- Various Sterox formulations were manufactured by reacting an AP with ethylene oxide in the presence of potassium hydroxide as a catalyst. The three basic process steps were reaction, neutralization, and filtration (PAP-00035283).

- APs were manufactured by reacting an olefin with phenol in the presence of a catalyst. The three basic process steps were catalyst activation, alkylation, followed by distillation (PAP-00035280).

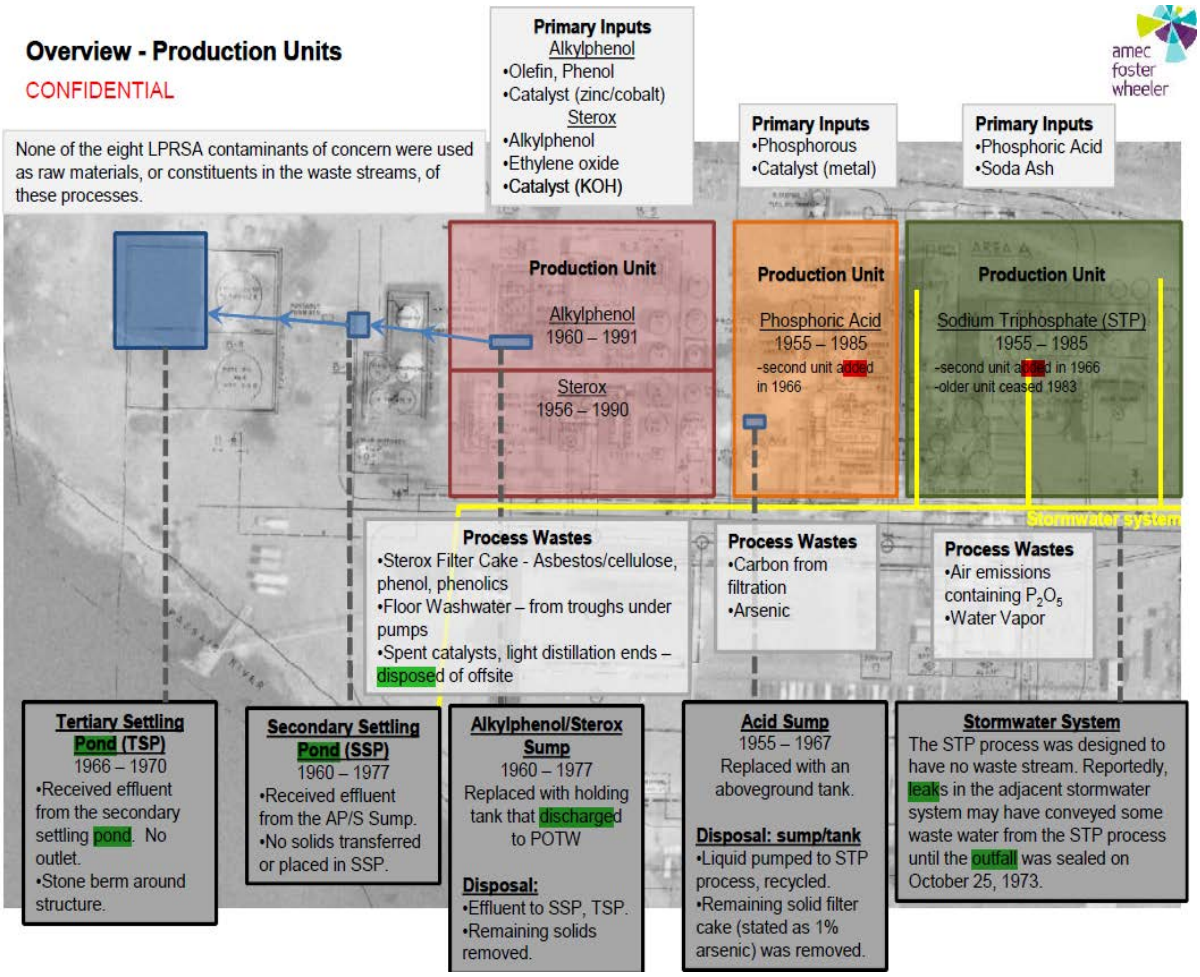
Pharmacia LLC

Diamond Alkali OU2 Allocation

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Facility Data Report

A diagram depicting the process inputs and wastes for each production unit is presented below (PAP-00036352):



In addition to home laundry and phosphorus-based products, according to the March 1, 1996 letter, vinyl siding was produced between 1967 and 1970. Monsanto imported polyvinyl chloride (PVC) pellets which were then shredded and used in the production of the vinyl siding during controlled extrusion processes (PAS-00073346).

The majority of files reviewed state that, with the exception of PCBs used for non-contact heat-transfer fluid in production equipment (as discussed below) and use of fuel oil (No. 4 and No. 6), COCs were not used or handled in production processes (PAS-00073430, 84-93, 98-99). However, the following potential exceptions were identified in the file material:

- According to an *Environmental Assessment*, dated December 1, 1982, “major” raw materials used at the site included copper sulfate (PAP-00035075). The report provides no details on how it was used or handled, and it is noted that reference to use of copper sulfate is not identified in other files reviewed.

- In addition, according to a civil complaint filed by the New Jersey Department of Environmental Protection (NJDEP) against Monsanto on November 1, 1988, Monsanto used naphthalene in its operations (PAP-00212793-94). The document provides no details on how it was used or handled, and it is noted that reference to use of naphthalene is not identified in other files reviewed.

- Finally, according to a *Site Evaluation Submission*, dated October 25, 1991, one to ten pounds of mercury in a glass bottle was present in the maintenance shop (PAS-00073501).

It is also noted that according to the March 1, 1996 letter, the Kearny plant only served as a distribution point for maleic anhydride, and that this material was not used as a raw material or produced at the plant. It states that an assertion by Maxus Energy Corporation that maleic anhydride is a "dioxin precursor" is incorrect, and that maleic anhydride converts to maleic acid upon contact with water (PAS-00073346).

According to the March 1, 1996 letter, PCBs were used at the site from 1960 to 1972 as a non-contact heat-transfer fluid in production equipment (PAS-00073344). The PCB-containing heat-transfer fluid consisted of Aroclor 1248 and was used in the thermal system for the AP process. During a process upset in 1967 to 1968, the reactants accidentally mixed into the thermal circulating system. Upon recirculating back into the storage tank, the mixture became gel-like and unusable. A disposal pit was excavated next to the control room, and approximately 2,000 gallons of PCB thermal fluid were drained from the storage tank and heater via an earthen trench to the excavated containment pit which is currently referred to as the PCB Disposal Area. The PCB Disposal Area was then covered with clean fill and trap rock. The thermal system was recharged with PCB heat transfer fluid consisting of Aroclor 1248 at that time. When the system was converted in 1972 to a non-PCB containing fluid, the tank containing 2,000 gallons of PCB thermal fluid was again drained to the PCB Disposal Area and re-covered with clean fill and trap rock (PAS-00073345). The trench and PCB Disposal Area were unlined (PAS-00073363) and was underlain by a peat layer (PAS-00074781). According to March 1, 1996 letter, the PCB Disposal Area was located approximately 560 feet from the Passaic River (PAS-00073344).

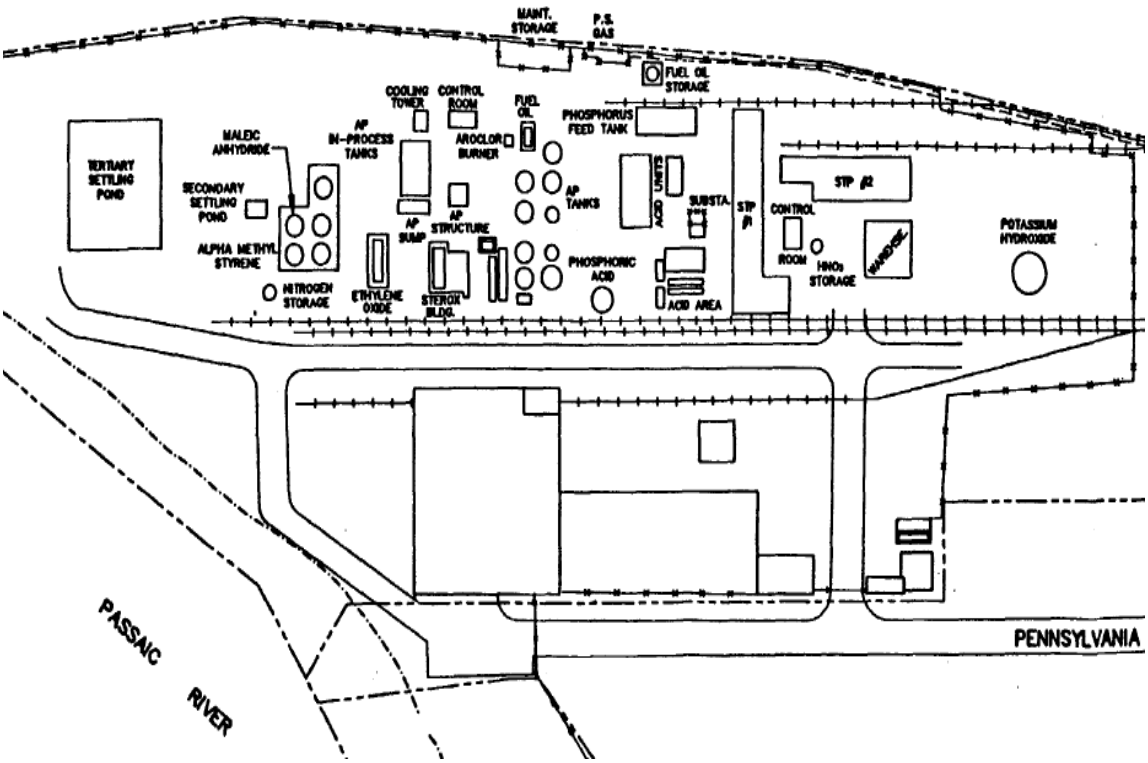
PCB-containing products were warehoused at the site pending final shipment to local customers between 1975 and 1977. The PCB-containing products were “Inerteen 70-30” and “Pyranol A13B3B-3” which both contained Aroclor 1254 (PAP-00207162). A site map is presented below (PAS-00073481):

Pharmacia LLC

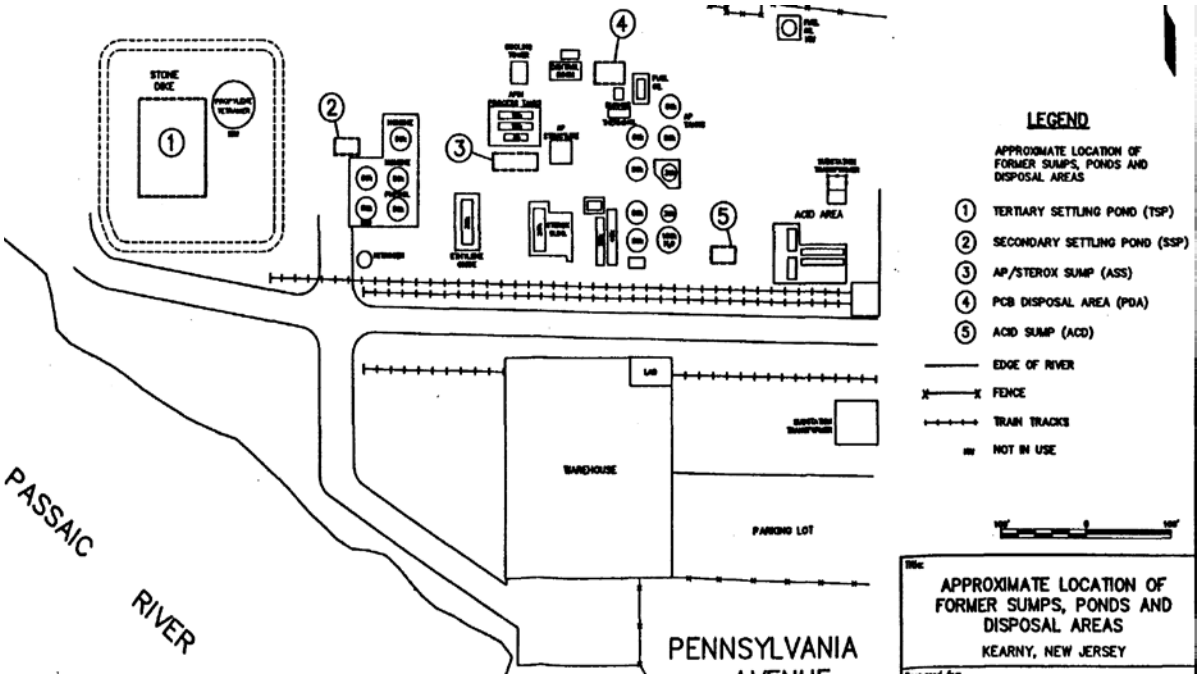
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Facility Data Report



The location of the PCB disposal area relative to the Passaic River is depicted below (PAS-00073509):



In addition to Monsanto's operations at the site, a *Site Evaluation Submission*, dated October 25, 1991, states that approximately eight acres of the site were leased for use by American Presidential Intermodal Company as a trucking terminal (PAS-00073453, 84, 89).

4. Identified COCs

- PCBs (used and detected)
- PAHs (used and detected)
- Copper (detected)
- Lead (detected)
- Mercury (used and detected)

PCBs

According to a March 1, 1996 letter, PCBs were used at the site from 1960 to 1972 as a non-contact heat-transfer fluid in production equipment. The heat-transfer fluid consisted of Aroclor 1248. On two occasions (1968 and 1972), 2,000 gallons of PCB-containing heat transfer fluids were drained into an excavated containment pit via an earthen trench next to a plant control room, located approximately 560 feet from the Passaic River (PAS-00073344). The trench and disposal area were unlined (PAS-00073363) but were covered with soil and trap rock (PAS-00073345; PAP-00035295-96) and underlain by a peat layer (PAS-00074781).

In 1983, Aroclor 1248 was detected in soil at a maximum concentration of 507,000 mg/kg (PAS-00073515). Aroclor 1260 was detected at a maximum concentration of 200 mg/kg in 1991 (PAP-00036359). According to a Memorandum re: Comments on Monsanto 104(e) Response, dated June 29, 1995 (1995 Memorandum), maximum soil concentrations measured in 1983 and 1984 in the PCB Disposal Area were 436,000 parts per million (ppm), 507,000 ppm, 195,000 ppm, and 186,000 ppm. The 1995 Memorandum also states that PCBs were detected at elevated concentrations in the Secondary Settling Ponds west of the PCB Disposal Area at concentrations as high as 280 ppm (PAS-00013251).

According to a *Remedial Investigation Work Plan*, dated December 18, 1989, the PCB disposal area was initially excavated in 1979 and 85 cubic yards of PCBs and PCB saturated soils were removed from the containment pit and transported off-site by SCA Chemical Services for disposal at Chemical Waste Management's Model City, New York facility (PAP-00035290-91, 473-475; PAP-00212803). A December 1, 1982, *Environmental Assessment Report*, prepared by Monsanto, also notes "The buried PCB material has been dug up and drummed. The material has been sent to an approved Class I chemical landfill site" (PAP-00035150). In addition to the foregoing, according to a Remedial Action Report, dated November 11, 1994, in 1994, 5,521.65 tons of PCB-contaminated soil and 308.18 tons of PCB-contaminated concrete demolition debris were removed from the site and disposed off site (PAS-00074804).

PCB-containing products were warehoused at the site pending final shipment to local customers between 1975 and 1977. The PCB-containing products were “Inerteen 70-30” and “Pyranol A13B3B-3” which both contained Aroclor 1254 (PAP-00207162).

PAHs

According to a civil complaint filed by the NJDEP against Monsanto on November 1, 1988, Monsanto used naphthalene in its operations (PAP-00212793-94). The document provides no details on how it was used or handled, and it is noted that reference to use of naphthalene is not identified in other files reviewed. According to an *Environmental Assessment*, dated December 1, 1982, naphthalene was detected in sanitary waste at a concentration of 5.4 microgram per liter (µg/L) (PAP-00035161) but not in the process wastewater (PAP-00035157, 161). High molecular weight polynuclear aromatic hydrocarbons (PAHs) were detected in site soil (PAS-00073823).

Copper

According to an *Environmental Assessment*, dated December 1, 1982, “major” raw materials used at the site included copper sulfate (PAP-00035075). The report provides no details on how it was used or handled, and it is noted that reference to use of copper sulfate is not identified in other files reviewed.

In 1976, copper was detected in site wastewater at a concentration of 0.2 milligrams per liter (mg/L) (PAP-00034841). In May 1978, copper was detected in site wastewater at a concentration of 0.3 mg/L (PAP-00034943). According to the *Environmental Assessment*, dated December 1, 1982, site wastewater was sampled in December 1978, and copper was identified in process wastewater at a concentration of 38 µg/L. In addition, copper was identified in sanitary waste at a concentrations of 240 µg/L (PAP-00035149-50, 57). It is noted that copper also was detected in the city water at the facility at a concentration of 72 µg/L (PAP-00035164).

In 1990, copper was detected in soil at a maximum concentration of 645 mg/kg (PAS-00073580).

Lead

In 1976, lead was detected in site wastewater at a concentration of 0.8 mg/L (PAP-00034841). In May 1978, lead was detected in site wastewater at a concentration of 0.28 mg/L (PAP-00034943). According to an *Environmental Assessment*, dated December 1, 1982, lead was identified in sanitary waste at a concentration of 400 µg/L in December 1978 (PAP-00035149-50, 57). It is noted that lead also was detected in the city water at the facility at a concentration of 44 µg/L (PAP-00035164).

In 1990, lead was detected in soil at a maximum concentration of 676 mg/kg (PAS-00073580).

Mercury

According to a *Site Evaluation Submission*, dated October 25, 1991, one to ten pounds of mercury in a glass bottle was present in the maintenance shop (PAS-00073501).

In 1976, mercury was detected in site wastewater at a concentration of 10 µg/L (PAP-00034841). In May 1978, mercury was detected in site wastewater at a concentration of 2.2 µg/L (PAP-00034943). According to an *Environmental Assessment*, dated December 1, 1982, mercury was identified in sanitary waste at a concentration of 43 µg/L in December 1978 (PAP-00035149-50, 57).

In 1990, mercury was detected in soil at a maximum concentration of 74 mg/kg (PAS-00073580).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to a *Draft Interim Report*, dated April 1993, solid fill material has been periodically distributed over the area of the site to sufficiently build a permanent land base above the water table, and that successive surface grading and accumulation of solid fill material provided the subbase for the current site. The report states that the origin and composition of the solid fill material is unknown, and that filling occurred prior to 1940 (PAS-00013367).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 & No. 53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Fill has been reported in the *Preliminary Remedial Investigation Report,* dated August 30, 1991, between approximately 0 to 6 feet below ground surface (bgs) (PAS-00073616).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00073580; PAS-00073823).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	645 mg/kg
Copper	676 mg/kg
Mercury	74 mg/kg
Benzo(a)anthracene	16 mg/kg
Benzo(a)pyrene	14 mg/kg
Benzo(b)fluoranthene	30 mg/kg
Dibenzo(a,h)anthracene	2.7 mg/kg
Indeno(1,2,3-cd)pyrene	9 mg/kg

5. COC Pathways

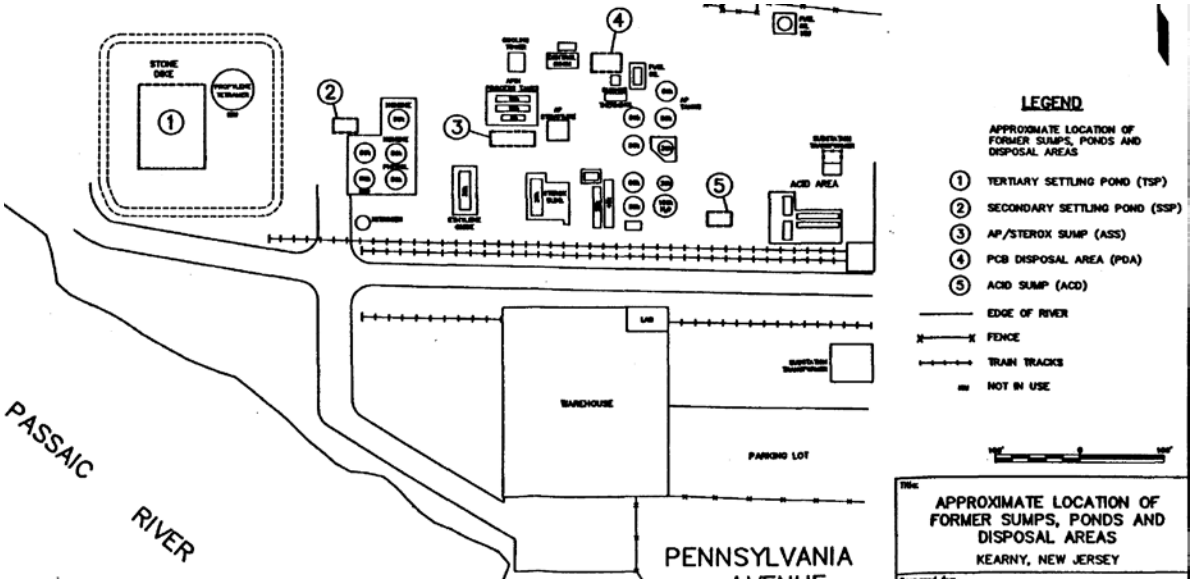
Settling Ponds

Settling ponds were used between approximately 1960 and 1977. According to a *Preliminary Remedial Investigation Report*, dated August 30, 1991, past disposal practices for the AP/Sterox production included the use of a former AP/Sterox Sump and settling ponds. The AP/Sterox Sump received Sterox filter cake and floor wash water from the AP/Sterox production area during maintenance operations. The waste wash water entered the sump through concrete troughs under the process pumps servicing the AP/Sterox structures. According to interviews with Monsanto employees, the area flooded under heavy precipitation due to shallow water table conditions and relatively low permeable soils. The AP/Sterox Sump was connected by an underground clay-tile pipe to a Secondary Settling Pond and a larger Tertiary Setting Pond to catch overflow from the sump. The AP/Sterox Sump was manually cleaned of settled solid wastes with the solids transported off site to a landfill. The AP/Sterox Sump and Secondary Settling Pond were operated from about 1960 to 1977. The larger Tertiary Setting Pond was operated from about 1966 to 1970 (PAS-00073612-13).

According to a March 1, 1996 letter, during high precipitation events, flooding in the area of the PCB Disposal Area was controlled via a system of earthen trenches, subsurface overflow piping, and ponds that linked the PCB Disposal Area, the AP/Sterox Sump, and the Secondary Settling Pond. According to the March 1, 1996 letter, in previous interviews with site personnel, the only known flood event in which substantial flooding had occurred over the last thirty years (from process area to the north of the warehouse) occurred in 1992. It goes on to state that although minor flooding occurred on occasion within small localized areas around the plant, no evidence of flood events carrying contaminated soils to the storm sewer or Passaic River have ever been documented. The approximate distance from the edge of the river to these features reportedly ranged

from 350 feet to the beginning of the process area to 560 feet to the PCB Disposal Area (PAS-00073349).

The locations of the settling ponds relative to the Passaic River are depicted below (PAS-00073509):



Sanitary Sewer

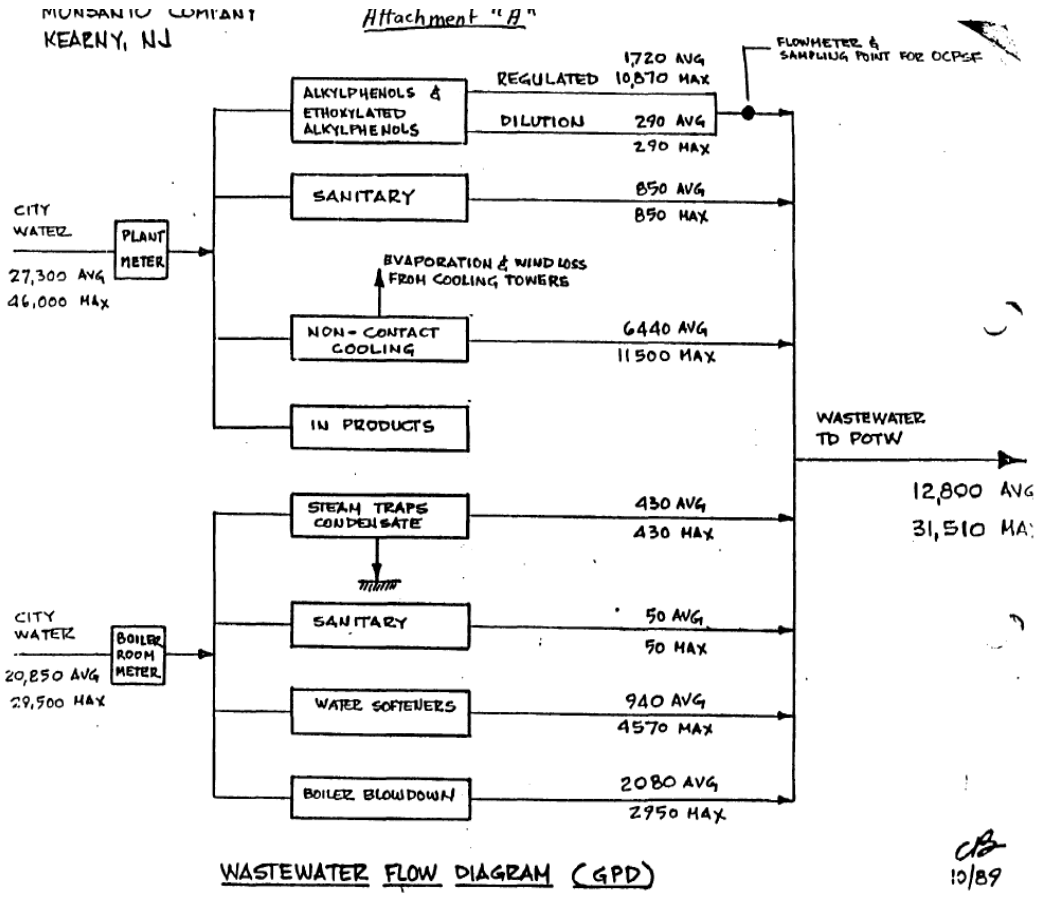
According to *Monsanto's Response to Request for Information Concerning the Diamond Alkali Superfund Site Passaic River Study Area,* dated February 3, 1995, the site was "not a direct discharger and all such sewer discharges since 1955 went to POTW [publicly owned treatment works]" (PAS-00073429).

According to a *Waste Effluent Survey,* dated April 12, 1972, Monsanto discharged 19,345,000 gallons of wastewater to the sanitary sewer and 20,805,000 gallons of wastewater to the "storm sewer, river, or ditch" in 1971. No OU2 COCs were reported in the discharge according to the form (PAS-00003878). Wastewater was not pretreated prior to discharge (PAS-00003879).

According to a July 25, 1975 letter, all wastewater discharge went to the "South Kearny treatment plant" which emptied to the "Hackensack system." The letter stated that at one time, the site had a storm drain from the property which emptied into the Passaic River, but that this drain no longer exists (PAS-00003881).

According to a December 30, 1976 Monsanto file titled *Water Quality Control,* "the only direct discharge" to the Town of Kearny sanitary sewer system is pumped from a collection sump at the east end of the site to the Kearny sewer system. It states that the flow rate averaged 35 gallons per minute, and the effluent consisted primarily of sanitary wastes plus process wastes from the Sterox/AP area. No OU2 COCs were identified as being present in the discharge (PAP-00034838).

A wastewater flow diagram dated October 1989 is presented below (PAS-00013319):



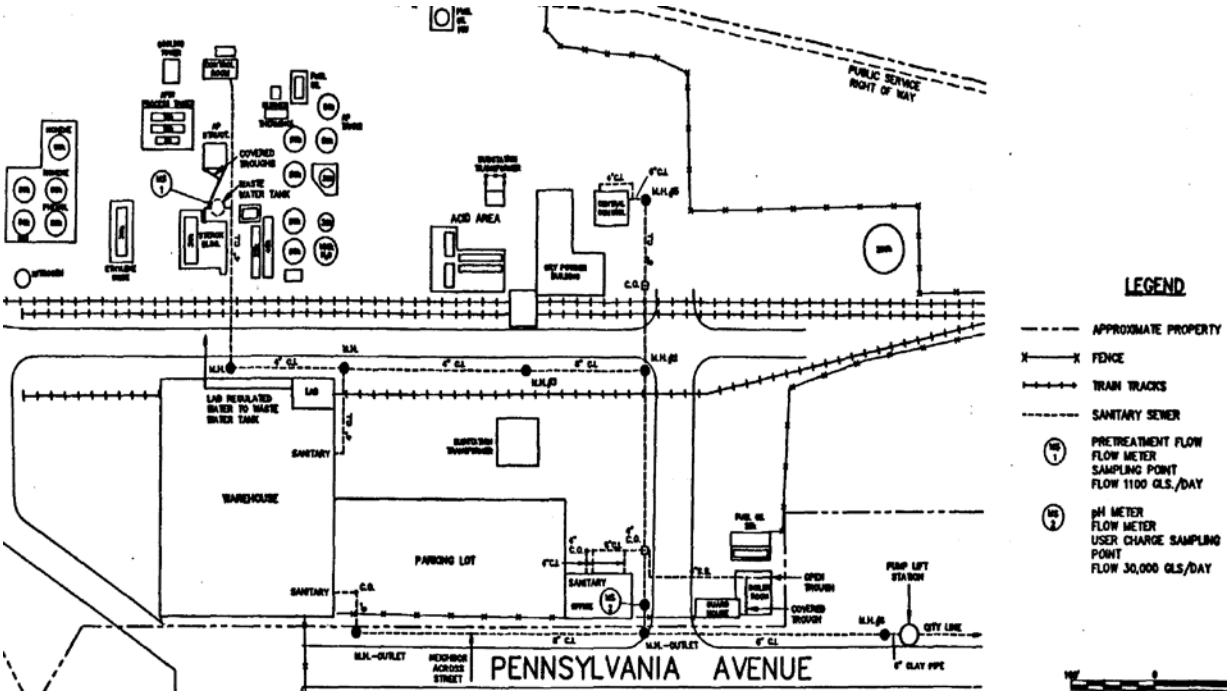
According to an *Industrial Pretreatment Inspection Report*, dated September 13, 1990, the site was connected to the Kearny POTW under a New Jersey Pollutant Discharge Elimination System (NJPDES) permit (No. 0022161). The report also states that wastewater was discharged to the public sewer only, and that the discharge volume was approximately 1,200 gallons per day. It is reported that no pretreatment of the wastewater occurred (PAS-00013312-14).

According to a *Site Evaluation Submission*, dated October 25, 1991, beginning in November 1990, wastewater was pretreated through an oil/water separator before being discharged to the PVSC system (PAS-00073446). Prior to the 1990 connection to the PVSC, the sewage system was connected to the Kearny Waste Water Treatment Plant (PAS-00073495).

This report goes on to state that industrial and sanitary wastewater was discharged to an on-site sanitary sewer, which was permitted for connection to a POTW operated by the PVSC. Two permitted sewerage connections occurred on the site. Within the process area, industrial waste streams included the laboratory, Sterox process, and the AP process. Floating organic product possibly present was skimmed and separated to a

tank for non-hazardous waste disposal. The combined water stream was sampled monthly for 32 priority pollutants. After treatment, the wastewater was piped to the on-site sanitary sewer system where it was combined with sanitary waste water from the other on-site buildings (PAS-00073495). The report also states that PVSC permitted this sewage connection under permit number 15406751-00000-0151; a second permitted sewage connection from permit number 15406752-00000-0151 was monitored by a separate meter. This discharge included only the sanitary waste from the warehouse (PAS-00073495).

A figure depicting the sanitary sewer lines at the site is presented below (PAS-00073496):



Storm Water Discharges

According to a March 1, 1996 letter, to Monsanto's knowledge, the only historical direct discharge pipe from the site to the Passaic River was a 27-inch diameter storm sewer pipe which was abandoned in October 1973. Prior to this date, the storm sewer line did not enter nor receive surface water discharge from the process area (PAS-00073348). *PVSC Annual Reports for 1972 through 1976* state that Monsanto also had an indirect discharge of storm water to the Passaic River via a 24-inch city storm sewer used by others besides Monsanto (PAS-00003885, PAP-00329967; PAS-00035315). According to the March 1, 1996 letter, the 24-inch diameter pipe was owned by the Town of Kearny, and the site discharged storm water from "an isolated portion of its plant (upgradient of the PCB Disposal Area)" through a 10-inch diameter line which tied into the 24-inch diameter Kearny storm sewer line; however, this line was also disconnected in 1973 (PAS-00073348).

In addition, according to the *PVSC Annual Report*, dated 1973, Monsanto planned to abandon the plant sewer system and plug it so that no flow would come from the site to the Passaic River; they also stated they would disconnect their connections to the 10-inch sewer line running along Pennsylvania Avenue (PAS-00034749). On October 17, 1973, Monsanto informed the United States Environmental Protection Agency (EPA) that it would abandon and seal its No. 001 outlet to the Passaic River before December 31, 1973, and it would withdraw its application for a discharge permit as of January 1, 1974. On October 25, 1973, Monsanto sealed its outlet to the Passaic River (PAS-00034750).

Groundwater Discharge

A *PVSC Annual Report,* dated 1974, states that groundwater entered the storm sewer and discharged to the Passaic River. The report states that phosphate in groundwater was entering the storm sewer, which is not an OU2 COC (PAS-00034924).

According to a March 1, 1996 letter, a downgradient recovery/interceptor trench and product recovery systems were installed in the mid-1980s as a safeguard to intercept and contain any potential discharges to the Passaic River (PAS-00073346).

Spills

According to an *Environmental Assessment*, dated December 1, 1982, a study was underway in 1982 “to evaluate and correct” wastewater discharge to the ground (PAP-00035068). It is unclear if OU2 COCs were associated with wastewater discharges to the ground.

6. Regulatory History/Enforcement Actions

Inspections

According to a *PVSC Annual Report,* dated 1972, samples collected from 24-inch municipal storm sewer and 27-inch Monsanto storm sewer discharging to the Passaic River were found to be “polluting;” however, there is no indication that COCs were the source of contamination. Rather, the document stated that ortho phosphate was the contaminant (PAS-00003885). This issue remained in 1973 but was addressed that year (PAS-00034748-50). Because no OU2 COCs were reported to be associated with the discharge, this is not discussed further herein.

Violations/Enforcement Actions

According to an Administrative Consent Order between NJDEP and Monsanto, dated July 24, 1989 (1989 ACO), on November 14, 1986, Monsanto submitted to NJDEP a report which stated that in the mid-1960s approximately 2,000 gallons of heat transfer liquid containing PCBs were landfilled on site. NJDEP filed a civil complaint against Monsanto on November 1, 1988 for failure to immediately notify NJDEP of the full nature and extent of discharges of hazardous substances which it caused to occur at the site, including the release of PCBs and petroleum hydrocarbons (PAP-00212791-801).

Monsanto entered into the 1989 ACO with the NJDEP, requiring completion of a remedial investigation and feasibility study (PAS-00075167; PAP-00212802-17). The 1989 ACO resolved the civil complaint (PAP-00212863).

Permits

According to an *Industrial Pretreatment Inspection Report*, dated September 13, 1990, the site was connected to the Kearny POTW under a NJPDES permit (No. 0022161). Prior to a 1990 connection to the PVSC, the sewage system was connected to the Kearny Waste Water Treatment Plant (PAS-00073495). According to a *Site Evaluation Submission*, dated October 25, 1991, industrial and sanitary wastewater was discharged to an on-site sanitary sewer, which was permitted for connection to a POTW operated by PVSC. Two permitted sewerage connections occurred on the site. PVSC permitted the sewage connections under permit numbers 15406751-00000-0151 and 15406752-00000-0151 (PAS-00073495).

According to an *Environmental Assessment*, dated December 1, 1982, in 1982 the site did not have a National Pollutant Discharge Elimination System (NPDES) permit, but would be required to obtain one in 1983-1984 due to “new state regulations” (PAP-00035068).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Site Evaluation Submission*, dated October 25, 1991 (PAS-00073442).
- *Preliminary Remedial Investigation Report*, dated August 30, 1991 (PAS-00073591)
- *Focused Feasibility Study and Identification of Site Specific Cleanup Standards*, dated June 18, 1993 (PAS-00104087);
- *Remedial Action Report,* dated November 11, 1994 (PAS-00074723).

Sewer

According to an *Environmental Assessment*, dated December 1, 1982, naphthalene was detected in sanitary waste at a concentration of 5.4 µg/L (PAP-00035157, 161) but not in the process wastewater (PAP-00035157, 161).

In 1976, mercury was detected in site wastewater at a concentration of 10 µg/L (PAP-00034841). In May 1978, mercury was detected in site wastewater at a concentration of 2.2 µg/L (PAP-00034943). According to an *Environmental Assessment*, dated December 1, 1982, mercury was identified in sanitary waste at a concentration of 43 µg/L in December 1978 (PAP-00035149-50, 57).

In 1976, copper was detected in site wastewater at a concentration of 0.2 milligrams per liter (mg/L) (PAP-00034841). In May 1978, copper was detected in site wastewater at a concentration of 0.3 mg/L (PAP-00034943). According to the *Environmental Assessment*, dated December 1, 1982, site wastewater was sampled in December 1978, and copper was identified in process wastewater at a concentration of 38 µg/L. In addition, copper was identified in sanitary waste at a concentrations of 240 µg/L (PAP-00035149-50, 57). It is noted that copper also was detected in the city water at the facility at a concentration of 72 µg/L (PAP-00035164).

In 1976, lead was detected in site wastewater at a concentration of 0.8 mg/L (PAP-00034841). In May 1978, lead was detected in site wastewater at a concentration of 0.28 mg/L (PAP-00034943). According to an *Environmental Assessment*, dated December 1, 1982, lead was identified in sanitary waste at a concentration of 400 µg/L in December 1978 (PAP-00035149-50, 57). It is noted that lead also was detected in the city water at the facility at a concentration of 44 µg/L (PAP-00035164).

Soil

According to a March 1, 1996 letter, PCBs were used at the site from 1960 to 1972 as a non-contact heat-transfer fluid in production equipment. On two occasions (1968 and 1972), 2,000 gallons of PCB-containing heat transfer fluids consisting of Aroclor 1248 were drained into an excavated containment pit via an earthen trench next to a plant control room, located approximately 560 feet from the Passaic River (PAS-00073344).

According to a Memorandum re: Comments on Monsanto 104(e) Response, dated June 29, 1995, maximum Aroclor 1248 soil concentrations measured in 1983 and 1984 in the PCB Disposal Area were 436,000 ppm, 507,000 ppm, 195,000 ppm, and 186,000 ppm at sample locations B-2A, B-5, B-24, and B-26, respectively. The Memorandum also states that PCBs had been detected at elevated concentrations in the Secondary Settling Ponds, west of the PCB Disposal Area. Aroclor 1248 was detected at a maximum concentration of 1,100 mg/kg at the Secondary Settling Ponds. Sample location SSP-1, located approximately 340 feet from the Passaic River, contained Aroclor 1248 at 280 ppm and Aroclor 1260 at 43 ppm. In contrast, sample location SSP-5, also just over 300 feet from the Passaic River, contained Aroclor 1260 at a maximum concentration of 200 ppm, but no Aroclor 1248 (PAP-00036357, 59; PAS-00013251; PAS-00073515).

According to the March 1, 1996 letter, the four sample locations cited above (B-2A, B-5, B-24, B-26) were the four locations with the highest PCB concentrations. The letter states that ChemRisk correctly noted that these samples were collected at a depth of 4 to 6 feet bgs; however, ChemRisk does not mention that continuous split-spoon sampling was performed in the PCB Disposal Area to a depth of 28 feet bgs and that PCB concentrations decreased from the four to six feet interval to the six to eight feet interval by one to three orders of magnitude. The March 1, 1996 letter states that this decrease illustrates the limited mobility and vertical migration of PCBs at the site (PAS-00073351). According to data presented in a *Site Evaluation Submission*, dated October 25, 1991, PCB were detected at depths at least as deep as 16 feet bgs, with a maximum Aroclor 1248 concentration of 16,500 mg/kg. The highest concentrations

were in samples collected from four to six feet bgs. Concentrations of Aroclor 1248 in surface soil were as high as 36,000 mg/kg (PAS-00073515).

In addition to the PCB Disposal Area, according to the *Focused Feasibility Study and Identification of Site Specific Cleanup Standards*, dated June 18, 1993, the AP/Sterox Sump was targeted for investigation based on its historical use as a waste wash water sump. According to plant personnel, the AP/Sterox Sump served as a collection point for wash water which collected in concrete troughs beneath the process area. The AP/Sterox Sump was manually cleaned of settled solid wastes which were disposed off-site. This unit was sampled at the four to six-foot and nine to 11-foot intervals. The concentrations of PCBs were several orders of magnitude less than the PCB Disposal Area. The higher concentrations were detected at four to six feet bgs which corresponded to the nominal depth of this unit (PAS-00104096). The Secondary Settling Pond was operated from about 1960 to 1977. As described above, waste wash water was directed to the AP/Sterox Sump; however, during heavy rainfall the AP/Sterox Sump unit could not handle the influent water and overflow was directed to the Secondary Settling Pond by an underground terra-cotta pipe. Residual materials were carried to the Secondary Settling Pond by this mechanism. The PCB concentrations in the Secondary Settling Pond were in the range, but lower than the AP/Sterox Sump, and many orders of magnitude less than the PCB Disposal Area. The highest concentration was observed at the four to six-foot interval bgs (PAS-00104096).

With respect to metals, the following maximum concentrations were detected in surface soil at the AP/Sterox Sump, Secondary Settling Pond, and Tertiary Settling Pond in 1990 (PAS-00073580-81):

Maximum Metals Concentrations in Surface Soil at the AP/Sterox Sump, Secondary Settling Pond, and Tertiary Settling Pond in 1990			
Metal	**AP/Sterox Sump**	**Secondary Settling Pond**	**Tertiary Settling Pond**
Mercury	1.2 mg/kg	0.4 mg/kg	0.6 mg/kg
Copper	645 mg/kg	95 mg/kg	76.4 mg/kg
Lead	676 mg/kg	217 mg/kg	160 mg/kg

In addition, the following maximum concentrations were detected in subsurface soil (4 to 6 feet below ground surface) at the AP/Sterox Sump, Secondary Settling Pond, and Tertiary Settling Pond in 1990 (PAS-00073561, 65, 69):

Maximum Metals Concentrations in Subsurface Soil at the AP/Sterox Sump, Secondary Settling Pond, and Tertiary Settling Pond in 1990			
Metal	**AP/Sterox Sump**	**Secondary Settling Pond**	**Tertiary Settling Pond**
Mercury	1.8 mg/kg	0.4 mg/kg	0.9 mg/kg
Copper	316 mg/kg	91.4 mg/kg	140 mg/kg
Lead	380 mg/kg	149 mg/kg	137 mg/kg

Remedial Activities

Soil

According to the 1989 ACO, on November 14, 1986, Monsanto submitted to NJDEP a report which stated that in the mid-1960s approximately 2,000 gallons of heat transfer liquid containing PCBs were landfilled on site. According to a civil complaint filed by NJDEP against Monsanto on November 1, 1988, in 1979, Monsanto attempted to resolve the discharge of the heat transfer liquid through performance of self-determined cleanup activities. It states that Monsanto "apparently removed" approximately 85 cubic yards of PCB contaminated soil which was subsequently disposed of at an undesignated, off-site hazardous waste landfill (PAP-00212791-96). According to a *Remedial Investigation Work Plan*, dated December 18, 1989, the PCB disposal area was initially excavated in 1979 and 85 cubic yards of PCBs and PCB saturated soils were removed from the containment pit and transported off-site by SCA Chemical Services for disposal at Chemical Waste Management's Model City, New York facility (PAP-00035290-91, 473-475; PAP-00212803). According to the 1989 ACO, NJDEP was supplied with copies of the associated waste manifests (PAP-00212803). The civil complaint goes on to state that Monsanto was unsuccessful in removing the entire quantity of contaminated soil as evidenced by a subsequent finding. It goes on to state that in 1984**,** without coordinating and obtaining approval from NJDEP, Monsanto installed a series of shallow and deep monitoring wells on the site to monitor the presence of hazardous substances and pollutants in groundwater. Thereafter, in October 1984, without coordinating and obtaining approval from NJDEP regarding remedial action to be taken at the property, Monsanto began sampling the wells. This sampling activity resulted in the discovery of Aroclor 1248 as well as petroleum hydrocarbons. In October 1984, without coordinating and obtaining approval from NJDEP regarding remedial action to be taken at the property, Monsanto collected soil borings which revealed quantities of Aroclor 1248 in soil surrounding the AP/Sterox Sump at concentrations up to 123,000 ppm (PAP-00212791-96).

Additionally, Monsanto discovered the presence of petroleum hydrocarbons in the site's soil and dug four "test pits" in the area of the AP/Sterox Sump. Subsequent to this, excavation revealed the presence of a floating organic layer of petroleum hydrocarbons. In September 1986, during the installation of a dike around an above-ground fuel oil tank at the property, Monsanto discovered a viscous floating substance containing No. 4 and No. 6 fuel oils (PAP-00212791-96).

According to a *Focused Feasibility Study and Identification of Site Specific Cleanup Standards*, dated June 18, 1993, in correspondence dated September 16, 1992, NJDEP identified that the areas of concern (AOCs) at the site have been fully characterized, are media- specific, and "are of limited extent." It also states that NJDEP and Monsanto agreed that the three site AOCs include the PCB Disposal Area, the AP/Sterox Sump, and the Secondary Settling Pond impacted by PCBs, and that any low-level, residuals outside of these AOCs would be managed by engineering and institutional controls (PAS-00104095).

According to a March 1, 1996 letter, PCB-impacted soils were delineated, and subsequently remediated, during two separate remedial events (1979 and 1994). These activities were documented in reports submitted to NJDEP including Roux 's *Preliminary Remedial Investigation Report,* dated August 30, 1991 and *Remedial Action Report,* dated November 11, 1994. According to the March 1, 1996 letter, “no PCBs were ever found to be discharged to the Passaic River, either directly or indirectly, by overland flow, ground-water flow, or through underground sewer pipe, conduits, or any other manner” (PAS-00073344).

According to a *Remedial Action Report*, dated November 11, 1994, the following remedial activities took place in 1994:

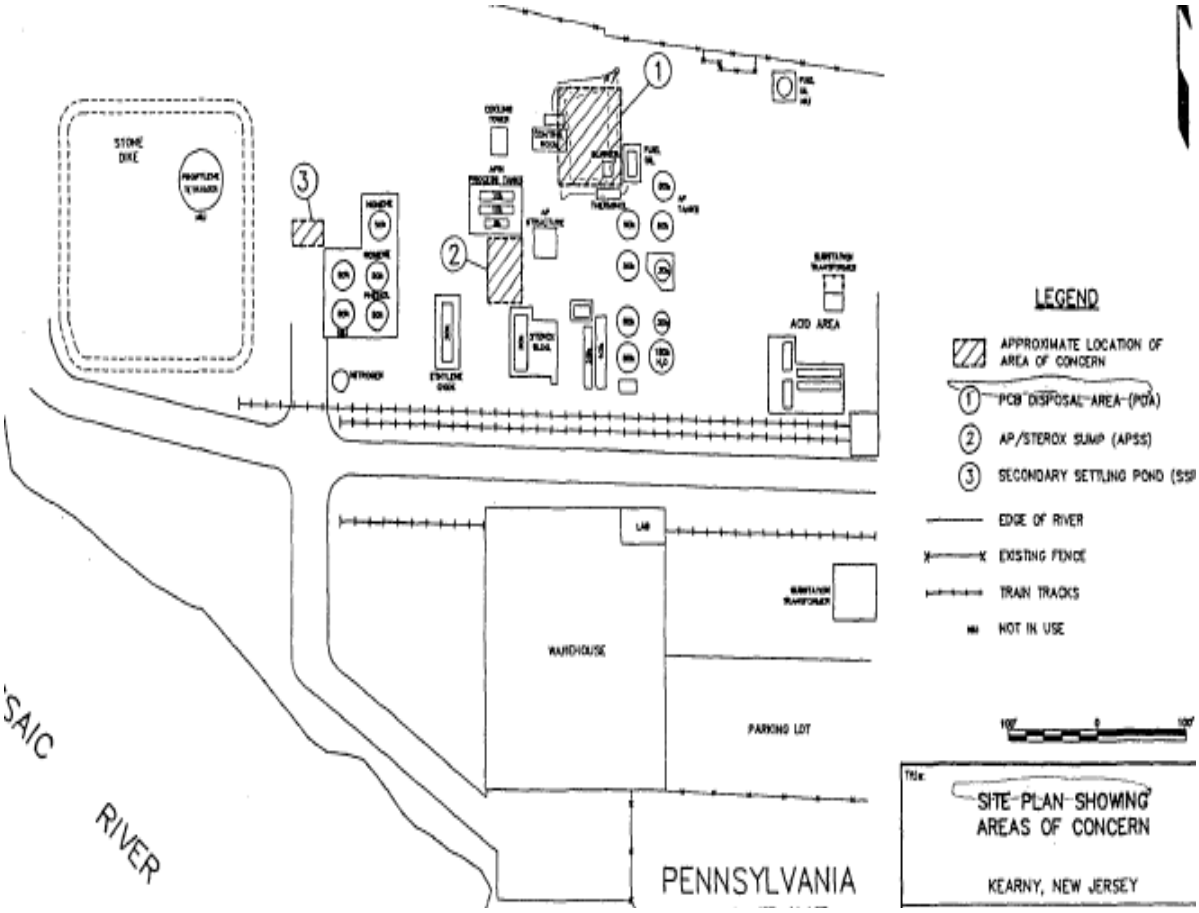
- Approximately 305 cubic yards of PCB-contaminated soil were excavated from the Secondary Settling Pond. Post-excavation soil samples in the Secondary Settling Pond showed that total PCB concentrations were less than 33 mg/kg at a depth of nine to 10.5 feet bgs following excavation activities.

- Approximately 806 cubic yards of contaminated soil were excavated from the AP/Sterox Sump. Post-excavation soil samples in AP/Sterox Sump showed that total PCB concentrations were less than 14 mg/kg at a depth of nine feet bgs following excavation activities.

- Approximately 1,718 cubic yards of contaminated soil were excavated from the inner PCB Disposal Area. Post-excavation soil samples in the inner PCB Disposal Area showed that total PCB concentrations were non-detect at 24 feet bgs following excavation activities.

- Approximately 1,157 cubic yards of contaminated soil were excavated from the outer PCB Disposal Area. Post-excavation soil samples in the outer PCB Disposal Area showed that total PCB concentrations were less than 51 mg/kg at a depth of nine feet bgs following excavation activities (PAS-00074803-04).

In addition to the 85 cubic yards of PCB-contaminated soil excavated in 1979, in 1994 5521.65 tons of PCB-contaminated soil and 308.18 tons of PCB-contaminated concrete demolition debris were removed from the site and disposed off-site (PAS-00074804). Presented below is a figuring depicting the extent of AOCs (PAS-00104121):



Monsanto received a “no further action” designation for soil from NJDEP on December 13, 1995 (PAS-00073348; PAS-00073369). Areas of the site remained which contained contaminant concentrations above NJDEP residential direct contact soil cleanup criteria, so institutional controls to restrict use of the site were implemented (PAS-00073369).

According to a *Description of the Affected Area* document, NJDEP had provided approval to obtain a Declaration of Environmental Restrictions (DER) for the "Affected Area”. The size of the "Affected Area" was estimated to be approximately 135,811 square feet. Surface and subsurface soil analytical results showed that some exceedances of the NJDEP’s residential direct contact soil cleanup criteria remained on the site following the completion of remedial activities. According to the document, the OU2 COCs that were detected at levels exceeding NJDEP guidance criteria included the following:

- Mercury
- Lead
- PCBs
- Benzo(a)pyrene
- Benzo(a)anthracene
- Indeno(l,2,3-cd)pyrene
- Benzo(k)fluoranthene
- Chrysene (PAS-00124920).

Monsanto received a Conditional No Further Action Letter from NJDEP on November 5, 2010, which states that a No Further Action Letter for soils only was issued on July 12, 1996. The Conditional No Further Action Letter required "monitoring for compliance with engineering and institutional controls" and to submit biennial certifications that the institutional and engineering control(s) are being properly maintained and continue to be protective of public health and safety and the environment (PAP-00036343-46).

Groundwater

According to the March 1, 1996 letter, the presence of clean boundary wells at the site, as demonstrated by numerous sampling events, refuted arguments by Maxus Energy Corporation regarding the discharge of PCB–contaminated groundwater from the site into the Passaic River. Both deep and shallow wells adjacent to the river were sampled by Roux between 1990 to present (1996). According to the March 1, 1996 letter, over 50 groundwater samples were collected from these wells, starting in 1985, and since the land disposal of PCBs occurred; and, to-date, PCBs have never been detected above practical quantitation limits in these downgradient monitoring wells (PAS-00073349-50). According to a *Remedial Action Work Plan*, dated December 18, 1989, PCBs were detected consistently only in a shallow and deep well cluster located in the approximate location of the former PCB Disposal Area. The maximum concentration was reported to be 131 parts per billion (ppb) (PAP-00035331).

A NJDEP Ground Water Remedial Action Permit issued on May 24, 2013, does not identify any OU2 COCs in groundwater (PAP-00212877).

8. Summary of Asserted Defenses

Pharmacia asserts that, Occidental Chemical Company (OCC) is currently the sole party implementing the Remedial Design for OU2 which is projected by EPA to cost approximately $165 million. OCC released 41 parties, including Pharmacia, from Occidental's claim for these Remedial Design Costs related to OU2. Accordingly, any allocation of OU2 costs that includes OCC and Pharmacia must reflect this release of liability by OCC for the OU2 RD [remedial design] which OCC is performing. The release was entered into in the context of the Maxus bankruptcy proceeding and is explained at paragraph 44 of Occidental's June 30, 2018 Complaint. This information was also provided to EPA on June 23, 2017. It's also noteworthy that the pleadings in the bankruptcy proceeding explained the rationale for settling these claims as against some parties, and not others. Specifically, 'The Debtors sought to eliminate those parties that (a) appeared to either be de minimis contributors or (b) had previously contributed to the investigation and remediation costs in amounts roughly proportionate to their share of liability.' Maxus Bankruptcy Docket No. 1232 at 24, filed April 19, 2017.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

PITT-CONSOL CHEMICAL COMPANY

Facility Name, Address and Size: Pitt-Consol Chemical Company (Pitt-Consol), 191 Doremus Ave, Newark, New Jersey. Approximately 37 acres (PAS-00051381). A 1972 Waste Effluent Survey states there were 80 employees, three shifts per day, seven days per week (PAS-00014143).

1. **Business Type:** Manufacturer of cresylic acids (PAS-00014143).

2. **Time Period of Ownership/Operations**

   Operator: Pitt-Consol - 1955 to May 1983
   Owner: Pitt-Consol - 1955 to present

   According to the February 27, 1995 joint response by E. I. du Pont de Nemours and Company (DuPont), Conoco, Inc., and Consol, Inc. to an EPA information request, Pitt-Consol purchased the site in 1955 from Reilly Tar & Chemical, Inc. Pitt-Consol operated at the site until 1983 when all manufacturing was discontinued. The site was then dismantled and decontaminated from 1984 to 1986 (PAS-00051359; PAS-00014550).

   A Summary of Existing Environmental Data, dated July 24, 1989, stated that chemical manufacturing had been performed at the site dating back to the late 1800s (PAP-00016417), before Pitt-Consol began operating in 1955. In a February 3, 1995 response to an EPA information request, Reilly Industries, Inc., acknowledged that they operated a coal tar refinery, a tar acid plant, and a phenolic resin plant at the site from 1932 to 1955. Pitt-Consol was not affiliated with Reilly Tar (PAS-00051618, 19-20).

   The 1995 joint response to an EPA information request also provided a summary of the corporate history of the company and facility as follows:

   1955: Pitt-Consol was a wholly-owned subsidiary of Consolidation Coal Company (Consolidation Coal).

   1966: Conoco Inc. purchased Consolidation Coal; however, Consolidation Coal continued to own all of the Pitt-Consol stock.

   1969: Pitt-Consol operations became a division of Conoco Chemicals, but Consolidation Coal continued to own the corporate stock.

   1981: DuPont purchased Conoco, Inc. Consolidation Coal continued to own all of the Pitt-Consol stock, and the profits and losses were recorded on Conoco Chemical's books as a division operation. Conoco Chemicals was de facto administratively under DuPont's Petrochemical Department.

   1983: Manufacturing at the Pitt-Consol site was discontinued. In late 1983/early 1984, the Petrochemical Department was given the responsibility for the Pitt-Consol site.

1984: Conoco Chemicals was sold to Vista Chemical Company. Pitt-Consol remained a separate corporation; however, the Board of Directors was changed to DuPont personnel. Dismantlement of the facilities at the site began in late third quarter/early fourth quarter.

1985: The Resource Conservation and Recovery Act (RCRA) facilities were closed and acknowledged as satisfactory by the New Jersey Department of Environmental Protection (NJDEP).

1986: Dismantling of all production facilities was completed.

1988: All Pitt-Consol stock owned by Consolidation Coal was transferred to DuPont (PAS-00051364-5, PAS-00051580, PAP-00016314).

It should also be noted that a letter from Pitt-Consol to the Passaic Valley Sewerage Commissioners (PSVC) dated July 22, 1977, stated that the company was a wholly owned affiliate of Continental Oil Company (PAS-00014577).

The Remedial Investigation Report, dated May 4, 2016 (2016 RIR), stated that DuPont was the current owner of the site (PAP-00009969).

3. Operational History/COC Use and Presence at the Facility

Operations

As documented in an undated description of manufacturing and synthetic processes provided with the 1995 joint response to an EPA information request, Pitt-Consol had several processing units for generating cresylics, including a synthetic unit, alkylation unit, natural extraction unit, isomerization unit, and thiophenol unit. The following describes each unit:

- The synthetic unit began operating in 1967 with an initial capacity of 10 million pounds per year, and over time was expanded to generate up to 50 million pounds per year. During manufacturing, methanol and phenol were reacted, dehydrated, and then distilled to separate the different cresols.

- The alkylation plant was a stainless steel 3,000-gallon kettle reactor and two fractionators used to upgrade phenol or cresols by alkylating them with an alcohol or olefin. It could also be used for esterification. The alkylation plant went into production in 1961 and was used until 1970 at the site (PAP-00016314).
- The natural process consisted of contacting crude cresylic acids contaminated with neutral hydrocarbons and aromatic mercaptans with aqueous methanol and hexane in a Scheibel tower. This plant was brought up to a capacity of over 33 million pounds per year, but was phased out and shut down in 1971 (PAP-00016314). A rubber reclaiming plant was also identified for the facility as a way to use one of the products (disulfide

oil) from the natural cresylic acid operation. This operation was retained using purchased disulfide after the natural plant was phased out. As the natural plant was phased out, a unit consisting of a furnace and large catalytic converter was constructed to isomerize orthocresol to meta/para cresol, but because of increased availability of imported sources and reduced demand for meta/para cresol, the plant was not operated.

- The thiophenol plant was designed to react cyclohexane with sulfur to produce thiophenol. This plant was not used to produce commercial quantities due to an odor problem at startup and the ability to obtain thiophenol elsewhere (PAS-00051391-93).

At the time of the sale of the facility to Pitt-Consol in 1955, materials used at the facility included cresols, cresylic acid, phenols, resins, and pigments/dyes (PAS-00051640-53).

The main business conducted at the facility beginning in at least 1972 was the synthetic manufacturing of cresylic acids. A Waste Effluent Survey, dated August 30, 1972 specified the plant operations as manufacturing cresylic acids in a continuous reactor with phenol and methanol, using distillation to separate the products (PAS-00014143). According to a RCRA Section 3007 Questionnaire, dated March 31, 1983, only cresol/cresylic acid by methylation of phenol was manufactured at the facility (PAS-00051396).

Storage Facilities

The 1995 response to an EPA information request stated that raw materials were stored in tank farms, while by-products, storm water, and possibly products were stored in the lagoons (PAS-00051360).

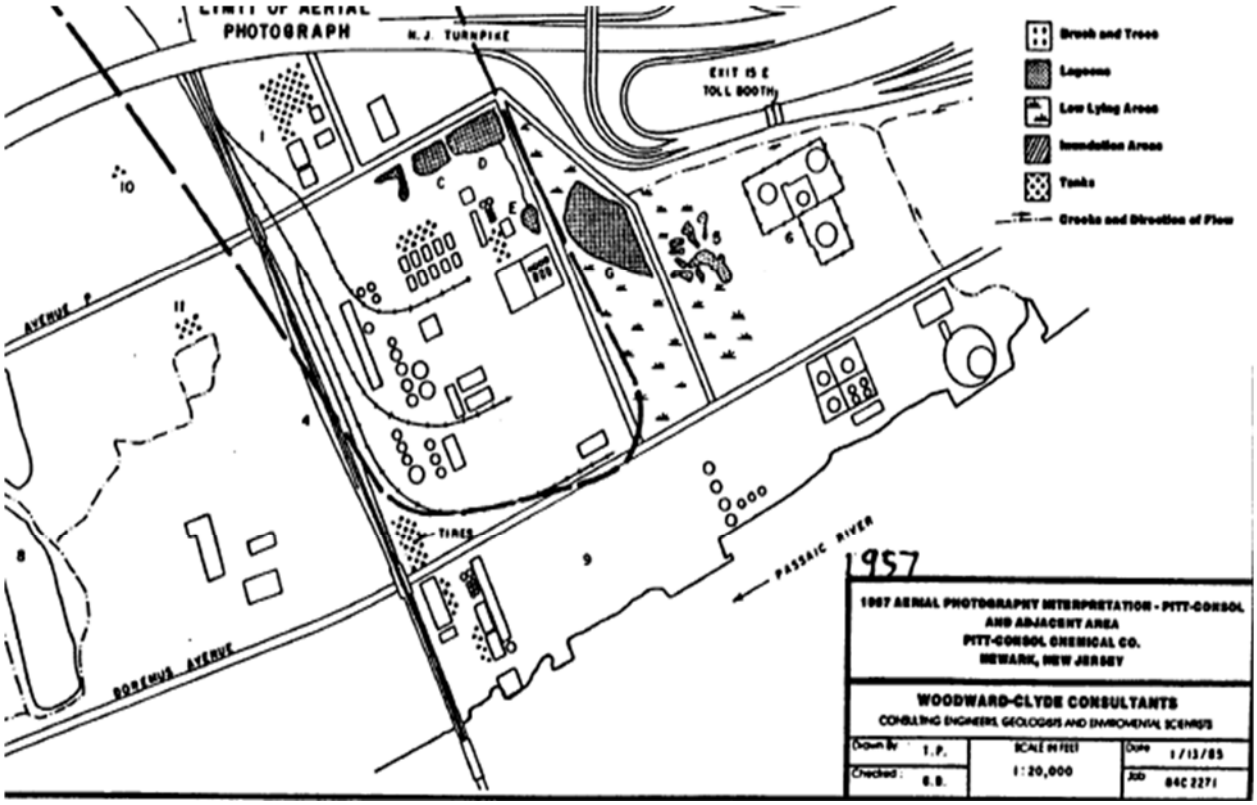
A Hazardous Waste Permit Application prepared in 1980 stated the facility was capable of storing 50,000 gallons in containers on-site, as well as a 130 cubic yard waste pile. A treatment tank was listed as having a process design capacity of 720,000 gallons per day. It was specified that a drum cleaning area included a "hot box" that could melt 50 drums at one time to allow recovery of off-spec or solidified spilled materials. The facility also had two racks capable of steaming out 12 drums each, and a 3,000 gallon agitated reactor for neutralizing spent and/or scrap acid and/or caustic (PAS-00051374-75). Waste codes for materials in these storage areas included 100,000 pounds per year combined of F004 (cresols, cresylic acid, and nitrobenzene), U052 (cresol and methylphenol), U101 (2,4-dimethylphenol), and U188 (phenol), and 100 pounds per year of D008 (lead) (PAS-00051376).

A Draft Phase I Report, Preliminary Assessment of Environmental Impacts, dated January 17, 1985 (Draft Phase I Report) prepared by Woodward Clyde Consultants, identified several lagoons and tank farms at the facility. The lagoons were reported to be approximately three feet deep. Manufacturing by-products, including tars and possibly a variety of phenolic compounds, were held in the lagoons (PAS-00051420). The seven lagoons were present in 1954, before Pitt-Consol acquired the site. Two

lagoons (Lagoons A and F) were closed and covered with fill between 1954 and 1957, four lagoons (Lagoons B, C, D, and G) were closed between 1957 and 1966, and one lagoon (Lagoon E) was closed and filled between 1966 and 1970 (PAS-00051422-23, PAP-00016314-16). A Site Inspection Report documenting an inspection performed by an EPA contractor on September 12, 1984, stated that these lagoons were unlined (PAP-00352899).

The Draft Phase I Report interpreted historical aerial photographs of the site. Based on a 1954 aerial photograph, it was stated that liquids in Lagoon G appeared to be overflowing the north bank and draining into a shallow ditch that emptied into the Passaic River. According to the document, the last lagoon to remain open was Lagoon E and was closed between 1966 and 1970 (PAS-00051422-4).

A diagram based on the 1954 aerial photo showed the locations of Lagoons A through G (see figure below). The Passaic River runs along the bottom of this figure, from north to south. The creek is represented by a dashed line running north from Lagoon G (center of the figure) to join with another creek, and then east to discharge into the Passaic River. The figure also shows the railroad tracks at the south, the locations of tank farms (circles), barrel storage, and tire storage at the site. The addition of Roanoke Avenue north of Lagoon G and along the northern and western property line occurred between 1954 and 1957 (PAS-00051422, 37-38).



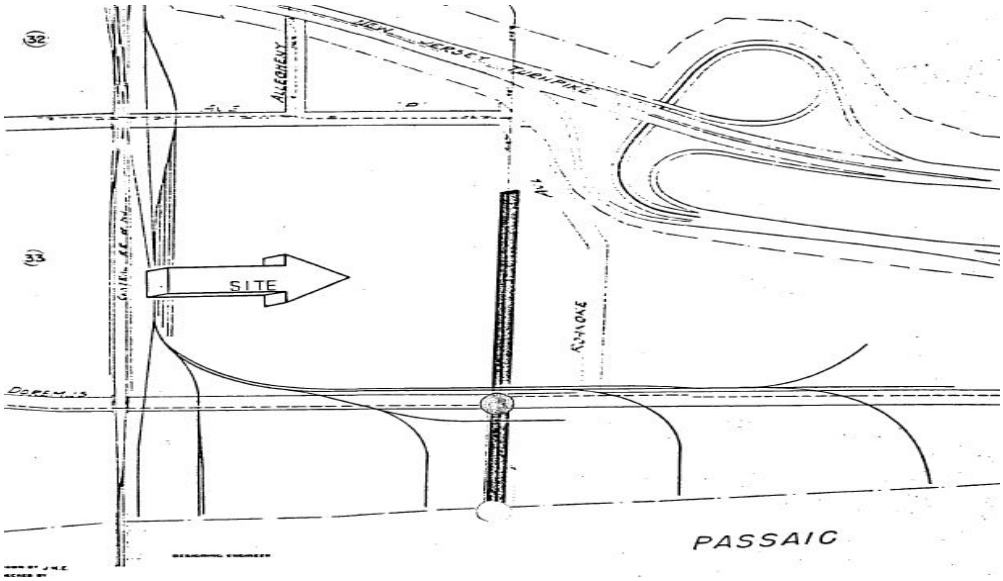
(PAS-00051437)

Disposal Practices - Liquid Waste

An internal PVSC letter dated April 1, 1958, documented the discovery of a substantial discharge of gray industrial waste from a sump on the Pitt-Consol property to the Roanoke Avenue storm sewer. An on-site interview with a Pitt-Consol chemical engineer stated that 200-300 gallons per minute were being discharged to the storm sewer and that the discharge was approved by the City of Newark. The engineer also stated that the facility's waste was usually pumped to an elevated settling pond on the north side of Roanoke Avenue, where it was then discharged into the storm sewer after a reasonable detention period. The letter stated that intermittent pollution to the Passaic River from this storm sewer had been occurring over the past few years (PAS-00044123).

A May 28, 1958, internal PVSC letter documented another investigation of the Roanoke Avenue storm sewer with another interview of the Pitt-Consol engineer that suggested the sanitary sewer would not be able to handle the flow from this discharge, which was identified as 500 gallons per minute. The letter concluded that Pitt-Consol was likely the sole polluter of the storm sewer (PAS-00044125).

A letter from PVSC to the Director of the Newark Department of Public Works dated June 3, 1958 documented that Pitt-Consol was discharging their waste directly to the Roanoke Ave storm sewer instead of the sanitary sewer (PAS-00006271). A letter from PVSC to the City of Newark, dated July 21, 1958, stated that Pitt-Consol "still discharges its industrial wastes to the Roanoke Avenue Storm Sewer, which goes into the Passaic River." A subsequent letter from PVSC to the City of Newark dated December 7, 1960 stated the Roanoke Avenue sewer was overflowing polluting matter into the Passaic River and had been for "quite a period of time" (PAS-00044129, 33). The following undated diagram shows the location of the site and the Roanoke Avenue storm sewer outfall to the Passaic River:



(PAS-00035582)

A PVSC letter dated March 31, 1970, described a court action started against the City of Newark to stop the polluted discharges from storm sewers to the Passaic River. In December 1969, the City built a dam to divert the dry weather flow into the sanitary and industrial sewers. The only discharge through the Roanoke Avenue storm sewer would be during storm events when the dam overflowed (PAS-00044141-2).

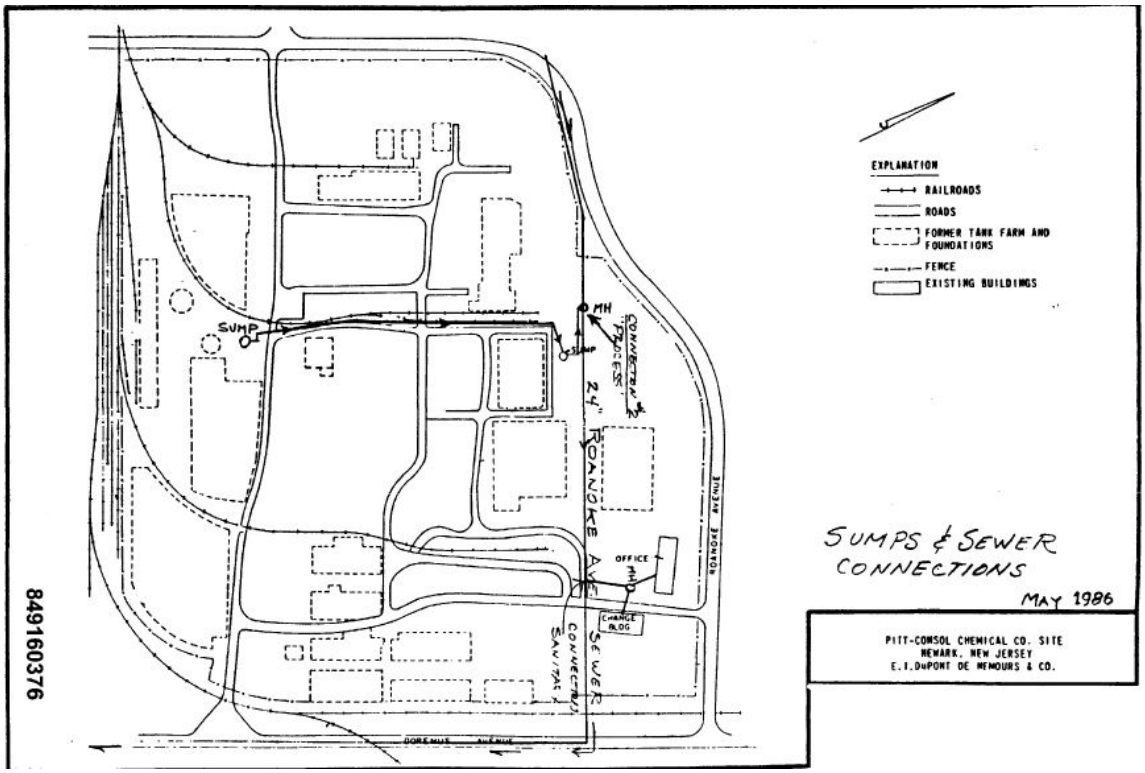
The PVSC Annual Report for 1972 stated that industrial waste was discharging to the Passaic River from the Roanoke Ave storm sewer, even though a concrete dam had been built to prevent overflow from the sanitary sewer into the storm sewer. In order to locate the source of the pollution, the Roanoke Avenue storm sewer was cleaned in late 1971. While preparing a visual inspection of the storm sewer, a manhole on the Pitt-Consol property exploded, injuring three men. Inspection of the sewer with a camera in January 1972 found a 10 inch connection discharging polluted water from the Pitt-Consol facility (PAS-00006274-5).

A 1977 letter from Pitt-Consol to the PVSC stated that the plant wished to continue to discharge industrial waste water to the City of Newark sanitary sewer and therefore the PVSC treatment plant (PAS-00014577).

A Feasibility Study for the City of Newark Pollution Abatement Program, revised January 1979, reported results from a physical inspection of the Roanoke Avenue sanitary sewer. The report stated that the sanitary sewer received flow from the Pitt-Consol facility downstream of the Avenue P Regulator, and about 0.5 feet of a black, tar-like sediment was found in the sewer downstream of the Pitt-Consol connections. The same black material was observed on the ground surface at the Pitt-Consol plant, but was not found upstream or at the Roanoke outfall. Although no connections between Pitt-Consol and the Roanoke outfall to the Passaic River were found, chemicals used at the facility were detected in outfall samples. The report attributed this contamination to groundwater contamination at the Pitt-Consol site (PAS-00006261).

The 1995 joint response to an EPA information request stated that waste water was discharged to the PVSC sewer system and that oils were decanted and neutralized prior to discharge to sewer (PAS-00051361). An Application for Permit to Construct, Install or Alter Control Apparatus or Equipment from NJDEP Bureau of Air Pollution Control stated that an oil/water phase separator for their effluent was put in use September 1, 1981 (PAS-00014138).

A fact sheet for a NJPDES permit from 1986 noted that there were two in-ground concrete sumps at the site that discharged storm water to the PVSC (PAS-00051526). The diagram below shows the sumps and sewer connections used during dismantling of the site in 1986:



(PAS-00014563)

Disposal Practices - Solid Waste

A 1981 Notification of Hazardous Waste Site from the plant to EPA stated, “Based on employee interviews, it appears that industrial wastes may have been deposited at several locations throughout the Plant. Some of this material most likely meets the definition of hazardous waste” (PAS-00051381).

According to the 1995 joint response to an EPA information request, waste materials were sent to Chem Waste Management in Newark, New Jersey in 1987. Wastes representative of the accumulation of spill cleanup materials (contaminated soil/gravel/absorbents) were collected and stored in DOT-approved drums and sent to SCA Chemical Services Company for disposal in their Pinewood, South Carolina landfill (PAS-00051360-1).

A hazardous waste manifest provided for disposal in 1992 included an entry for 1,500 pounds of lead contaminated soil (PAS-00051484).

4. Identified COCs

- PCBs (used, detected)
- PAHs (used, released)
- Copper (detected)
- Lead (used, released)
- Mercury (released)

PCBs

A letter to EPA from Pitt-Consol, dated August 25, 1983, documented PCBs at the site, including three hot oil heat transfer systems and the unexpected discovery of PCBs in a feedstock storage tank. The heaters used PCB-containing oils (Therminol FR-2) until 1968 (one heater) and 1972 (two heaters), when they were replaced with non-PCB oils and/or taken out of service. In 1978, oils from two of the heaters were analyzed, and PCBs were not detected with a reporting limit of 100 parts per million (ppm). Subsequent analyses of the drained oil from these heaters detected at most 60 ppm PCBs in oil for one heater. After all three heaters were taken out of service, residual oils in the piping from two of the drained heaters contained less than 10 ppm PCBs, while the third heater that had not been previously sampled had results as high as 148 ppm. This heater was decontaminated in 1983 (PAS-00014148-49).

According to sales records, Pitt-Consol purchased Therminol FR-1 and Therminol FR-2 in the late 1960s to early 1970s. Pitt-Consol purchased 13,800 pounds of Therminol FR-2 in 1968; 1,200 pounds of Therminol FR-1 and 7,200 pounds of Therminol FR-2 in 1970; 13,200 pounds of Therminol FR-1 and 1,800 pounds of Therminol FR-2 in 1971 (PAP-00304330-33).

In addition, as discussed in the August 25, 1983 letter from Pitt-Consol to EPA, during dismantling of the site, PCBs were detected at 1,150 ppm in liquids from one of the feedstock storage tanks. Other tanks were sampled, but did not contain more than 50 ppm PCBs. The source of the PCBs was not known (PAS-00014148-50). Soil sampling in 1991 in the vicinity of the tank did not detect PCBs as reported in the Site Investigation Summary and Report of Findings, dated April 1992 (PAP-00016403-05).

PCBs were detected in site soil during a 2015 PCB soils investigation performed at the site and reported in a Memorandum dated April 29, 2016 and included as Appendix D in the 2016 RIR. Detected PCB concentrations were stated to be distributed across the site at low levels and typically decreased with depth. Concentrations of total PCBs were above 10 milligrams/kilogram (mg/kg) at three boring locations (SW15-SC-3, SW15-SC-5, and SW15-SC-11) with concentrations ranging from 29 to 37 mg/kg and non-detect values of 46U mg/kg. PCBs had also been found in concrete that was removed in 2014. The 2016 RIR stated that a site-related source for PCBs in soil was unknown (PAP-00009988, 14723, 14727).

A Memorandum prepared by Geosyntec Consultants, Inc. dated October 23, 2017, documented the removal of 1,160 square feet of PCB-impacted soil surrounding boring SW15-SC-3. The contaminated soil had PCB concentrations above Toxic Substance Control Act (TSCA) requirements for high-occupancy site use (10 mg/kg). The highest concentration detected in soil and excavated was 418 mg/kg. Additional PCB-impacted soil with concentrations below TSCA requirements for high-occupancy site use are planned to be capped (PAP-00009382-83, 418-419, data table on p. 46 of pdf).

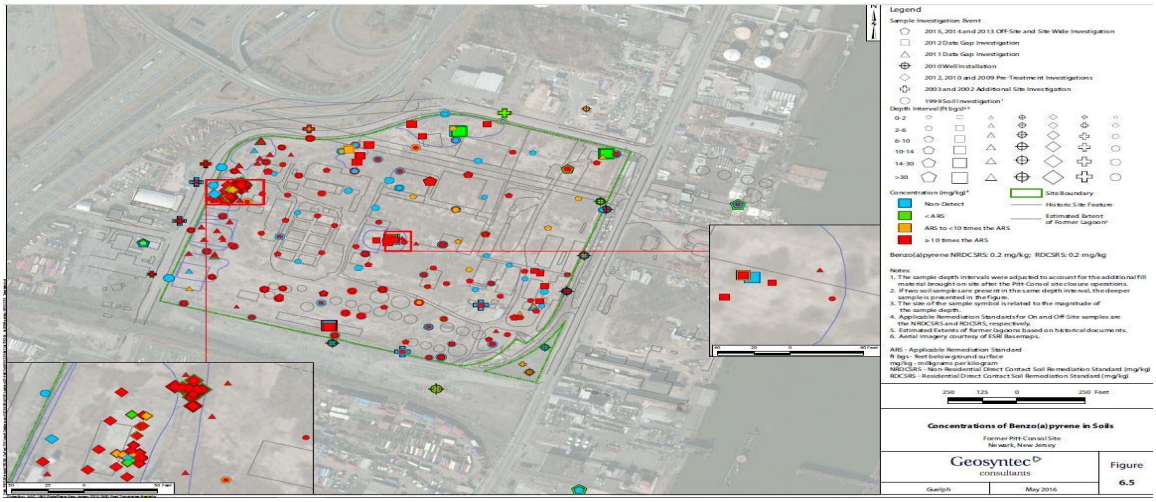
PAHs

A Waste Effluent Survey, dated August 30, 1972, stated phenol, cresols, and xylenols were identified in the effluent from the site. Although concentrations of the above-listed chemicals were documented, the units were not listed and the concentrations are unclear (PAS-00014145).

A sump sample was collected in 1984 during decontamination of the equipment at the site. The sample was analyzed for PAHs, dioxin, pesticides, PCBs, and metals. Naphthalene was detected at 390 ppb, but the other PAHs were not detected with a method detection limit of 10 ppb (PAS-00014550, 57-59).

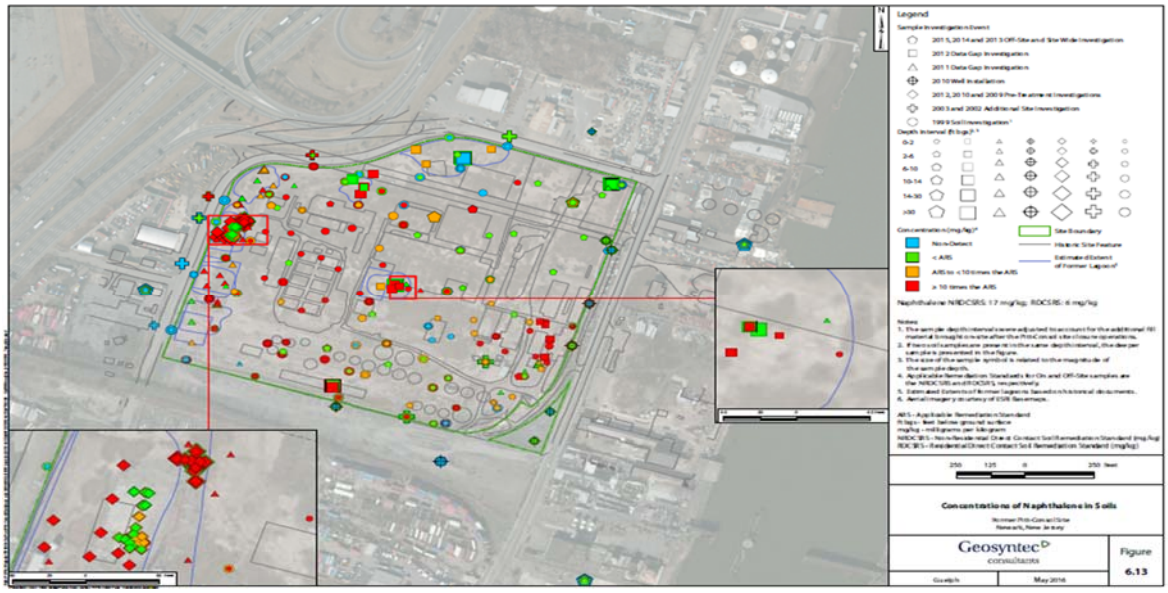
The 1995 joint response to an EPA information request provided a list of chemicals detected in a subsurface composite sample of the coal tar and sludge analyzed in 1987 when tanks were removed from the site. Results for the composite sample analysis detected PAH concentrations as follows: 2,200 mg/kg anthracene, 2,700 mg/kg benzo(a)anthracene, 3,100 mg/kg benzo(b)fluoranthene, 1,600 mg/kg benzo(a)pyrene, 2,900 mg/kg chrysene, 7,300 mg/kg fluoranthene, 130 mg/kg indene, 1,200 mg/kg 1-methylnaphthalene, 2,800 mg/kg naphthalene, 9,200 mg/kg phenanthrene, and 7,700 mg/kg pyrene (PAS-00051359-60, PAS-00051383, PAP-00016469). The sample also was leached using a TCLP procedure and the leachate analyzed for organics. The results showed that many PAHs were below detection limits in the leachate sample (PAP-00016465, 69).

The 2016 RIR reported concentrations of certain PAHs in soil that exceeded the direct contact soil remediation standards and impact to groundwater soil remediation standards. PAHs were linked to the former lagoons, tank farm, and naphthalene area, but were also noted to be ubiquitous across the site (PAP-00009986). The figure below shows the distribution of benzo(a)pyrene in site soil. Sample locations in orange exceeded 0.20 mg/kg and locations in red exceeded 2.0 mg/kg for benzo(a)pyrene.



(PAP-00010380)

According to the 2016 RIR, the former naphthalene area was dismantled in 1953 (PAP-00009972), which is before Pitt-Consol took ownership of the site. The following figure shows the distribution of naphthalene at the site. Sample locations in orange exceeded 17 mg/kg and locations in red exceeded 170 mg/kg for naphthalene.



(PAP-00010388)

The following table identifies the maximum concentration of PAHs found in soil samples collected at the site as reported in Tables 2, 3, and 4 of the 2016 RIR:

Maximum Detected PAHs in Site Soil			
PAHs (mg/kg)	**AOC 4**	**AOC 5**	**AOC 6**
acenaphthene	500	2,400	6,400
anthracene	1,700	4,100	29,000
benzo(a)anthracene	3,300	8,600	3,900
benzo(a)pyrene	3,000	7,400	3,600
benzo(b)fluoranthene	3,500	8,700	3,400
benzo(ghi)perylene	1,700	2,900	1,200
benzo(k)fluoranthene	1,500	4,100	1,400
chrysene	3,400	8,900	3,800
dibenz(a,h)anthracene	490	980	430
fluoranthene	6,100	17,000	6,000
fluorene	900	2,700	8,600
indeno(1,2,3-c,d) pyrene	2,000	3,500	1,500
naphthalene	57,000	21,000	49,000
phenanthrene	5,900	18,000	18,000
pyrene	5,200	12,000	7,800
References (pdf page)	80-81	119, 129, 143, 161-2	203-4, 206-7, 212, 218-9

Metals - Copper, Lead and Mercury

A Waste Effluent Survey dated August 30, 1972, stated copper was detected in the effluent at a concentration from 1 to 10 ppm (PAS-00014145). Other metals COCs were not reported. According to an Industrial Wastewater Questionnaire, dated August 29, 1978, wastewater from Pitt-Consol was listed as containing 0.05 milligrams per liter (mg/L) copper and less than 0.2 mg/L lead (PAS-00000577).

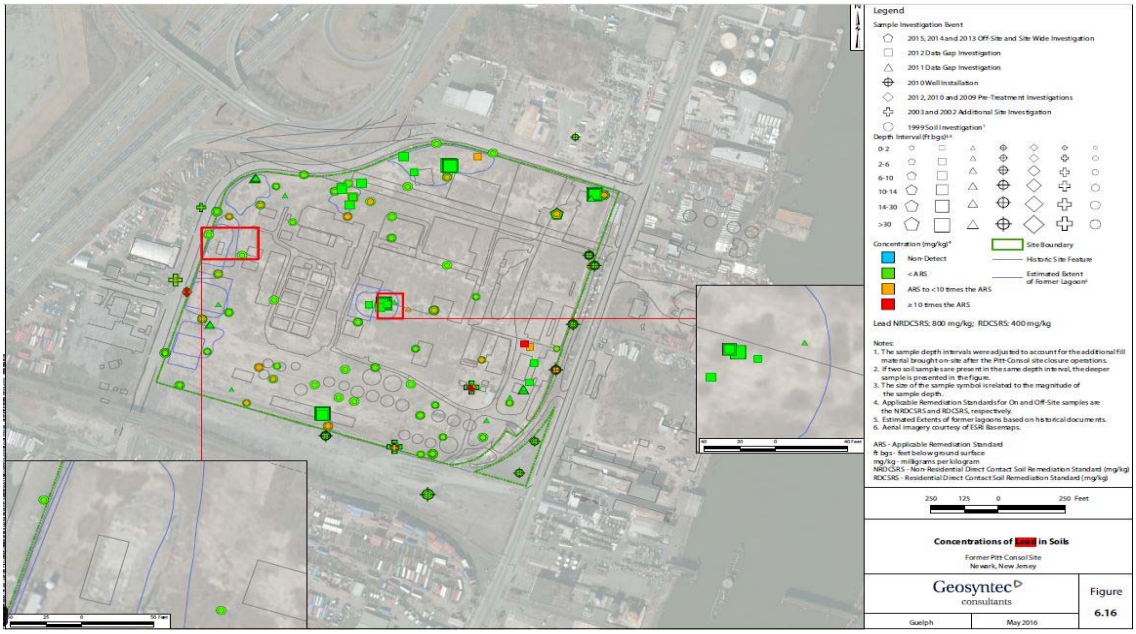
A Heavy Metal Determination completed by Elson T. Killam Associates, contractors for PVSC, determined the heavy metal concentrations in effluent from several companies in 1978. Results for the Pitt-Consol facility were 0.017 pounds per day (lbs/day) (0.048 milligrams/liter [mg/L]) copper, 0.007 lbs/day (0.021 mg/L) lead, and 0.0001 lbs/day (0.000 mg/L) mercury (PAS-00052111). A sump sample was collected in 1984 during decontamination of the equipment at the site. Only copper (63 micrograms/liter [µg/L]) and lead (103 µg/L) were detected (PAS-00014550, 57-62).

The 1995 joint response to an EPA information request provided a list of chemicals detected in a subsurface composite sample of the coal tar and sludge analyzed in 1987 when tanks were removed from the site. Results for the tar material subsurface composite sample analysis detected mercury (0.16 mg/kg) and lead (580 mg/kg) (PAP-00016465, 69-71, PAS-00051359-60, 83).

The 2016 RIR defined four Areas of Concern (AOCs) at the site, consisting of AOC 4 (Historic Fill), AOC 5 (Historic Fill with solid crystalline tar pieces and soil lightly impacted with staining), AOC 6 (soil impacted to heavily impacted with free product [liquid tar/non-aqueous phase liquid (NAPL)]), and AOC 7 (Groundwater impacted by AOCs 4, 5, and 6) (PAP-00009961). Lead detected in soil was shown to be distributed across the site, while mercury was only detected above criteria in a limited number of soil samples. The distribution of metals was shown to be random and related to the historic fill at the site (PAP-00009988). Maximum concentrations of metals detected in soil at each AOC are as follows (note that the data tables do not have Bates reference numbers, so the number listed is the pdf page in the 2016 RIR document):

Metals in Site Soil		
Metal (mg/kg)	**Max Detected**	**Reference**
AOC 4 (Table 2 of 2016 RIR)*		
Lead	18,900	76
Copper	2,770	91
Mercury	11.1	79
AOC 5 (Table 3 of 2016 RIR)		
Lead	21,100	163
Copper	1,010	109
Mercury	111	133
AOC 6 (Table 4 of 2016 RIR)		
Lead	2,560	226
Copper	280	184
Mercury	270	181

The figure below from the 2016 RIR shows the distribution of lead concentrations at the site. Locations in orange exceeded the remediation standard of 800 mg/kg, and sample locations in red exceeded 10 times the standard (8,000 mg/kg).



(PAP-00010391)

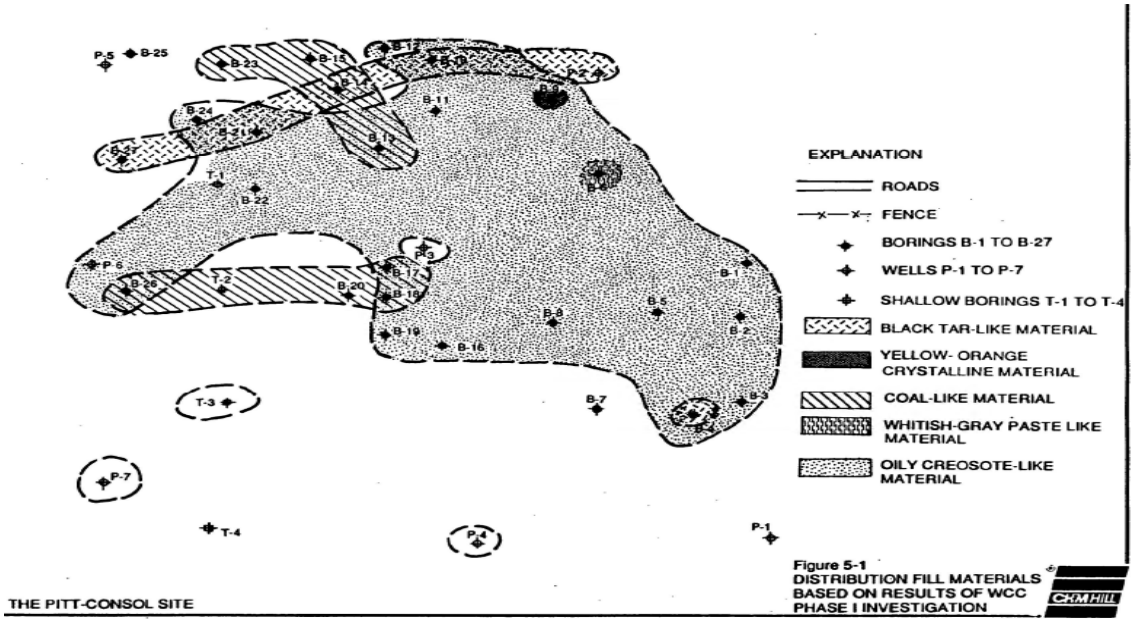
Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

An IntraSearch Aerial Photographic Analysis report on a 1944 photograph stated that fill material was likely placed prior to 1940 at the site to build a permanent land base above the water table, as the site was initially low-lying marshland (PAS-00014091). According to the Summary of Existing Environmental Data, Pitt-Consol Site, dated July 24, 1989, a layer of fill exists over the entire site; the fill material is less than two feet thick at the southwestern corner and approximately 10 feet thick in the center and northeast portions of the site. Much of the fill consists of rubble, including bricks, concrete, and wood debris in a sandy matrix. Coal-like and tar-like materials have been observed, primarily in the western half of the facility. An oily, creosote-like staining was observed throughout much of the northern half of the site (see figure below for locations of the different types of fill). The fill unit is an unconfined water-bearing zone that is saturated to grade in some portions of this site (PAP-00016509-10).

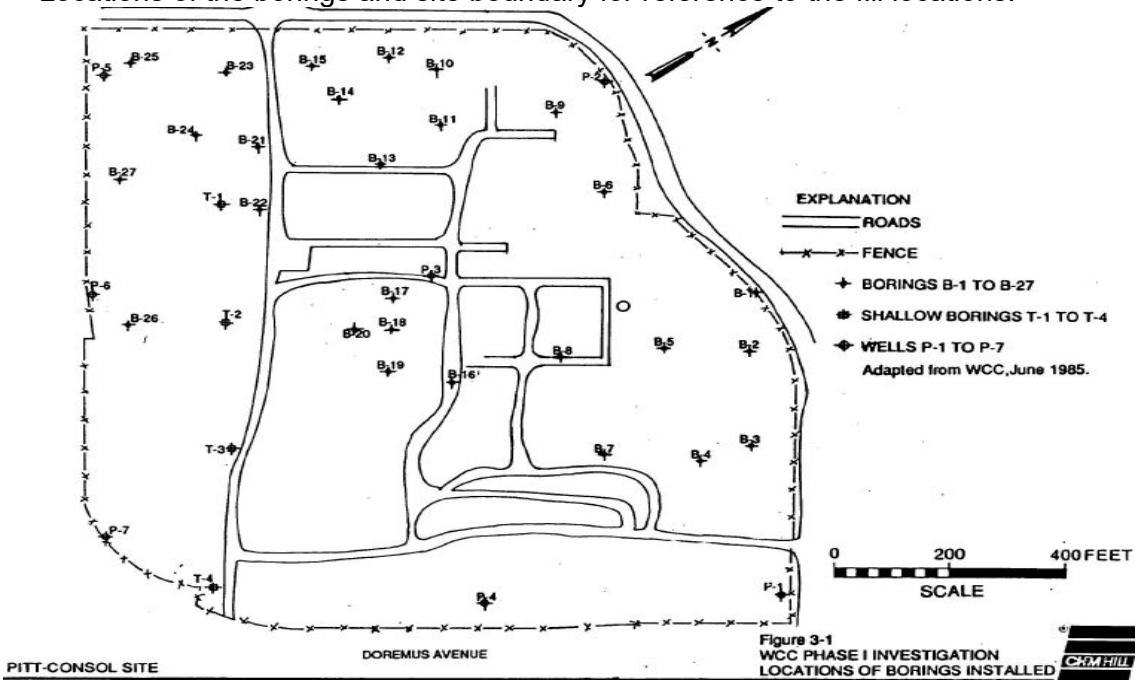
[1]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

A general distribution map of coal-derived materials in fill at the Pitt-Consol site is presented in the figure below from the Summary of Existing Environmental Data, Pitt-Consol Site, dated July 24, 1989. Since the orientation of the site is not presented in this figure, another figure showing the soil borings relative to the site boundaries is provided below this figure..



(PAP-00016466)

Locations of the borings and site boundary for reference to the fill locations.



(PAP-00016429)

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	21,100 mg/kg
Copper	2,770 mg/kg
Mercury	270 mg/kg
Benzo(a)anthracene	8,600 mg/kg
Benzo(a)pyrene	7,400 mg/kg
Benzo(b)fluoranthene	8,700 mg/kg
Benzo(k)fluoranthene	4,100 mg/kg
Dibenzo(a,h)anthracene	980 mg/kg
Indeno(1,2,3-cd)pyrene	3,500 mg/kg

(See Tables 2, 3, and 4 in the 2016 RIR [Specific pages listed in the table above] for soil concentrations)

5. COC Pathways

An EPA letter dated December 13, 1995 documented potential connections between the facility and the Passaic River based on the joint response to the EPA information request. The pathways identified included waste water discharges to the storm and sanitary sewers, as well as the possible drainage from Lagoon G to the Passaic River based on the conclusions from 1954 aerial photographs in the Woodward Clyde report. In addition, this letter noted that the high water table at the site is likely in contact with the material in the former lagoons (PAS-00051345-7).

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[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Sanitary Sewer

Based on the PVSC letters from 1958, 1960, 1970, and 1977, as well as the PVSC Annual Report for 1972 and a 1979 *Feasibility Study for the City of Newark Pollution Abatement Program* (see discussion in Section 3 [Operational History/COC Use and Presence at the Facility]), Pitt-Consol discharged their waste water to the Roanoke Avenue storm sewer from at least 1958 to December 1969, when the City of Newark built a dam to divert the dry weather flow into the sanitary and industrial sewers. The Roanoke Avenue storm sewer discharged directly to the Passaic River (PAS-00006271; PAS-00006274-5; PAS-00044119, 23, 25, 33, 41-42).

The waste effluent from the site was shown to contain copper, phenols, and cresols, according to a 1972 Waste Effluent Survey (PAS-00014145). A 1977 letter from Pitt-Consol to the PVSC states that the plant wished to continue to discharge industrial waste water to the City of Newark sanitary sewer and therefore the PVSC treatment plant (PAS-00014577).

The rate of discharge was identified in several documents as outlined below.

- According to a PVSC letter dated April 1, 1958, 200-300 gallons per minute of wastewater were being discharged to the storm sewer (PAS-00044123). A PVSC letter dated May 28, 1958, stated wastewater was being discharged into the Roanoke Avenue storm sewer from a sump on the Pitt-Consol property at a rate of 500 gallons per minute. The letter concluded that Pitt-Consol was likely the sole polluter of the storm sewer (PAS-00044125).

- A Waste Effluent Survey, dated August 30, 1972, listed 67,447,908 gallons as discharged to the sanitary sewer in 1974 (PAS-00014145-46).

- A Waste Effluent Survey dated March 10, 1975, stated 72,000 gallons per day were discharged to the municipal system (PAS-00014573-74).
- An undated Waste Effluent Survey stated 141,000 gallons per day were discharged to the “municipal system” (PAS-00014566).

- According to an Industrial Wastewater Questionnaire, dated August 29, 1978, Pitt-Consol did not pretreat its wastewater, which was discharged from one line at 185,000 gallons per day. The wastewater was listed as containing 0.05 mg/L copper and less than 0.2 mg/L lead (PAS-00000577).

- The Preliminary Assessment identified an annual volume of 309 million pounds per year for wastewater discharged to the PVSC (PAP-00016318).

A permit application to the NJDEP Bureau of Air Pollution Control states Pitt-Consol used an oil/water phase separator for the effluent as of September 1, 1981 (PAS-00014138). By 1986, the site was not discharging any water to the sanitary sewer, storm sewer, or the Passaic River (PAS-00014564).

Direct Release

The 1985 Draft Phase I Report stated that liquids in Lagoon G appeared to be overflowing the north bank and draining into a shallow ditch that emptied into the Passaic River, based on 1954 aerial photographs. Lagoon G and the shallow ditch were present in a 1957 aerial photograph, but Lagoon G was closed and the ditch adjacent to Lagoon G was not present in the interpretation of a 1966 aerial photograph. According to the 1985 Phase I Report, the lagoons contained manufacturing by-products, including tars and possibly a variety of phenolic compounds (PAS-00051420, 22, 24, 37-39).

Based on the *Summary of Existing Environmental Data, Pitt-Consol Site*, dated July 24, 1989, an oily, creosote-like staining was observed in fill on the northern portion of the site and coal-like and tar-like material have been observed in areas of the site, primarily on the western half of the facility in fill material (PAP-00016509-10). This material could be tar-like or hard like coal and had elevated concentrations of PAHs (total PAHs at 40,000 mg/kg) and lead (580 mg/kg). Mercury was detected at 0.16 mg/kg in the subsurface composite coal-tar sample analyzed (PAP-00016471-73).

The RIR identified the Passaic River as located approximately 600 feet from the site boundary (PAP-00009967).

6. Regulatory History/Enforcement Actions

Inspections

A site inspection by EPA in March 1983 noted that the impoundments and buildings at the site were leveled and empty rusty drums were at the site, but no spilled waste, runoff, standing liquids, or leaking drums were visible. Discolored water was occasionally noted when the groundwater level rose above ground during rain events. An incidence report to the Coast Guard, dated May 12, 1981, is listed on the inspection report and states that an "unknown" red liquid was released into the Passaic River by dumping or illegal discharge from Pitt-Consol on May 11, 1981. (PAS-00051363, PAS-00051497, PAS-00051507).

Violations

On February 29, 1984, an Administrative Complaint was filed by EPA alleging violations of Sections 6(e) and 15 of the Toxic Substances Control Act and EPA's regulations promulgated thereunder at 40 CFR 761. The complaint was due to the alleged failure to test the heat transfer system that had once contained PCBs and alleged disposal of liquid PCBs with a concentration greater than 500 ppm in a landfill in Model City, New York. Both parties agreed to settle the matter for $21,000 (PAP-00352865-66; PAS-00051520).

Permits

According to the Summary of Existing Environmental Data, Pitt-Consol Site, dated July 24, 1989, the facility was issued an Industrial Waste Permit by the PVSC in 1981 (PAP-00016423). PVSC permit number 20401072 allowed discharge from industrial outlet 20401071-44100-0201 with effective dates May 13, 1981 to May 13, 1986. Monitoring was required for non-COCs only, and no volume requirement was specified (PAP-00352848, 52).

In October 1986, a NJPDES permit was issued for the facility to discharge to ground waters of the State (PAS-00051526; PAP-00016417, 76). According to the public notice of NJDEP's draft permit, the NJPDES permit required the installation and sampling of groundwater monitoring wells to determine the facility's impact on the quality of groundwater (PAS-00051524).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Woodward Clyde Consultants (WCC) submitted the Draft Phase I Report, Preliminary Assessment of Environmental Impacts, Pitt-Consol Chemical Co. to DuPont on January 17, 1985 (PAS-00051414).
- CH2M Hill prepared a Summary of Existing Environmental Data, Pitt-Consol Site, dated July 24, 1989, which discussed a Phase I (Preliminary Environmental Assessment) performed by WCC in February and March 1985; a Phase II (Hydrogeologic Investigation) performed in August 1985; a hydrogeologic investigation performed by Roy F. Weston, Inc. in July 1986; and a November 1986 investigation of the characteristics of the buried tar materials by Mittelhauser Corporation (PAP-00016410).
- CH2M Hill prepared a Site Investigation Summary and Report of Findings, dated April 1992, that included groundwater, test pit, and soil sample results (PAP-00016343).
- Preliminary Assessment prepared by Corporate Remediation Group, April 15, 1998 (PAP-00016298)
- A Remedial Investigation Report (RIR) prepared by Geosyntec Consultants, dated May 4, 2016 (PAP-00009951)
- A Memorandum from Geosyntec Consultants dated October 23, 2017 (PAP-00009381)

Soil

Based on the Summary of Existing Environmental Data, Pitt-Consol Site, dated July 24, 1989, an oily, creosote-like like staining was observed in fill on the northern portion of the site and coal-like and tar-like material have been observed in areas of the site, primarily on the western half of the facility in fill material (PAP-00016509-10). The 2016 RIR presented the results for 780 on-site soil samples (PAP-00009962). Soil

investigations detected certain PAHs, PCBs, and certain metals at the site, but only the PAHs concentrations were attributed to site activities (PAP-00009985-88). Concentrations of PAHs were up to 49,000 mg/kg (naphthalene; p. 204 of 2016 RIR pdf). The sources of the site-related contamination, including free product, were identified as the former lagoons, former tank farm area, and former naphthalene area (PAP-00009965-67).

The results for PCBs were shown by the 2016 RIR to be distributed across the site with an unknown source and were not attributed to historical operations. PCBs were detected at concentrations up to 418 mg/kg and elevated concentrations were excavated in 2017 (PAP-00009382-83, 418-419, data table on p. 46 of pdf). Concentrations of metals were up to 21,100 mg/kg lead, 2,770 mg/kg copper, and 270 mg/kg mercury (See Tables 2, 3, and 4 in the 2016 RIR [p. 163, 91, 181 of pdf]), and were attributed to Historic Fill (PAP-00009988).

Sewer

A 1972 Waste Effluent Survey stated effluent from the site contained copper, phenols, and cresols. Copper was stated to be 1-10 ppm (lead and mercury were not analyzed), and while concentrations were listed next to the phenols and cresols, the units were not listed (PAS-00014145).

According to an Industrial Wastewater Questionnaire, dated August 29, 1978, Pitt-Consol did not pretreat its wastewater, which was discharged from one line at 185,000 gallons per day. The wastewater was listed as containing 0.05 mg/L copper and less than 0.2 mg/L lead (PAS-00000577). No other data for the sewer or effluent were in the available references.

According to the Feasibility Study for the City of Newark Pollution Abatement Program, revised January 1979, the Roanoke Avenue sanitary sewer received flow from the Pitt-Consol facility, and about 0.5 feet of a black, tar-like sediment was found in the sewer downstream of the Pitt-Consol connections. The same black material was observed on the ground surface at the Pitt-Consol plant, but was not found upstream or at the Roanoke outfall (PAS-00006261).

Remedial Activities

Woodward Clyde Consultants (WCC) prepared a Draft Phase I Report, Preliminary Assessment of Environmental Impacts, Pitt-Consol Chemical Co. on January 17, 1985. This report presented background information on the hydrogeology and groundwater quality, as well as interpretation of historical aerial photography (PAS-00051414).

CH2M Hill presented a Summary of Existing Environmental Data, Pitt-Consol Site, dated July 24, 1989, which summarized the previous investigations performed at the site. The following reports were discussed:

- A Phase I (Preliminary Environmental Assessment) was performed by WCC in February and March 1985 and provided a preliminary assessment of subsurface conditions at the site. During this investigation, 27 borings were installed to an average depth of 11 feet below grade to determine the nature and thickness of the fill materials above the peaty clay layer at the site. Bricks, concrete, and wood debris in a sandy matrix were observed, and an oily creosote-like material was found throughout the site. Additional materials noted were a black tar-like material, a dry crumbly, powdery coal-like material; a whitish-gray, paste-like sludge; and a yellowish orange crystalline material. Four additional borings were installed, and samples from 1 to 3 feet below ground surface (a total of 12 samples) were collected and analyzed for total phenolics and total organic carbon (TOC) (PAP-00016427-28, PAP-00016464).

- In November 1986, Mittelhauser Corporation investigated the characteristics of the buried tar materials to evaluate possible beneficial use of these materials. Eighteen test pits were excavated in and around Lagoons A, B, and F. A composite coal tar sample was analyzed for physical characteristics, metal contents, and organics. The sample was also subjected to the Toxicity Characteristic Leaching Procedure (TCLP) to measure the constituents potentially present in leachate from this material. Several PAHs, lead, and mercury were detected in the tar sample, while only naphthalene and phenanthrene were detected in the TCLP extract. Results for TCLP metals were not included (PAP-00016437, PAP-00016469-71).

The Site Investigation Summary and Report of Findings, dated April 1992, presented test pit results. Test pits determined the boundaries of the lagoons were generally consistent with the boundaries visible in historical aerial photographs. PCBs were not detected in soil samples from the former locations of tanks, so it was concluded that tank sludges did not contaminate the soil (PAP-00016353). The report concluded that the lagoon contents were materials that would be expected at a coal tar manufacturing facility (PAP-00016353).

The Preliminary Assessment, April 15, 1998, summarized the previous investigations at the site and defined three Areas of Concern: the former manufacturing/storage area, the former pitch storage/tar tank farm, and the former lagoons. Relevant COCs were identified as PAHs, naphthalene, and lead (PAP-00016333).

The RIR, dated May 4, 2016, identified four AOCs that redefined the original three AOCs based on common impacts: AOC-4 (historic fill and native geologic material), AOC-5 (historic fill/native geologic material, with solid crystalline tar pieces and soil lightly impacted with staining), AOC-6 (historic fill/native geologic material soil impacted to heavily impacted with free product (liquid tar/NAPL), and AOC-7 (groundwater impacted by AOCs-4, -5, and -6) (PAP-00009961, PAP-00009976, PAP-00010009-10).

The 2016 RIR stated the four AOCs were designated so remedial actions could be applied based on the nature of impacts to soil. The approximate areas and volumes of the soil AOC are as follows:

AOC Dimensions			
AOC	**Description**	**Area**	**Volume**
4	Historic Fill/ native geologic material (HF/NGM)	11.6 acres	414,000 cubic yards (CY)
5	HF/NGM with solid tar and light staining	18.9 acres	221,000 CY
6	HF/NGM and soil impacted with liquid tar	7.3 acres	36,000 CY**

**Could be up to 56,200 CY if the entire Lagoon F area requires remediation (PAP-00010009).

The RIR soil results had exceedances of the direct contact soil remediation standards and impact to groundwater soil remediation standards for certain PAHs, lead, and mercury, and PCBs exceeded the TSCA high occupancy screening criteria in at least one sample. The Historic Fill was stated to contain metals and PAHs in a random distribution. In addition, PCBs in soil were detected in localized areas distributed around the site with no correlation to historical operational practice. The RIR concluded that sources of the PAHs above soil remediation standards and free product, appeared to be linked to the former lagoons, former tank farm area, and former naphthalene area (PAP-00009961-67).

A Memorandum from Geosyntec Consultants dated October 23, 2017 documented the investigation and removal of PCB contaminated soil from the site. The contaminated soil had PCB concentrations above TSCA requirements for high-occupancy site use in one localized area. The soil removed was 1,160 square feet in surface and located near the center of the site (PAP-00009382).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

PMC, INC.

Facility Name, Address and Size: PMC Inc./Kleer Kast, Inc.; 450 Schuyler Avenue, Kearny, New Jersey; Block 226, Lots 3, 4, and 11; approximately 19 acres (PAS-00015074; PAS-00015106). The facility operated continuously on a 24-hour per day basis, 7-days per week, all year with overtime, and had a workforce of between 30 and 60 employees (PAS-00014848; PAS-00014918).

1. **Business Type:** Production of plastic products.

2. **Time Period of Ownership/Operations**

   Operator: 1971 to at least 2007
   Owner: 1971 to at least 2007

   Kleer Kast, Inc. (Kleer Kast) was incorporated in New Jersey on September 10, 1971. Kleer Kast utilized other company names including: (1) American Polymers, Inc., and (2) Ampol Division (PAS-00015610). Kleer Kast had estimated sales ranging from $1 million to $4.9 million in 1999, while operating as King Finishing, Inc. a division of PMC, Inc. (PAS-00015649-650). PMC Inc. (PMC) of Sun Valley, California, is the owner of the Kleer Kast site in Kearny, NJ, and operates Kleer Kast as a division. PMC was founded in 1971 and incorporated in the State of Delaware on August 11, 1993. PMC's ultimate domestic parent is PMC Global, Inc., which operates PMC as a subsidiary (PAS-00015595-PAS-599; PAS-00015634).

3. **Operational History/COC Use and Presence at the Facility**

   Site operations commenced in 1971 and continued until at least 2007 (PAS-00014918; PAS-00015613). From the late 1970s through at least 1999, operations at the facility involved several processes for the production of plastic products. These involved clear and black plastic sheeting for the graphic arts, stationery and packaging industries; cellulose acetate sheeting; acetate pellets; compounded and extruded cellulose; butyrate; propionate; acetate tool handles; and plasticized compounds (PAS-00014919; PAS-00014976; PAS-00014988; PAS-00015022; PAS-00015038; PAS-00015063; PAS-00015270; PAS-00015342).

   The facility operated continuously on a 24-hour per day basis, 7-days per week, all year with overtime, and had a workforce of between 30 and 60 employees (PAS-00014848; PAS-00014918). In 1994, casting was occurring 24 hours per day, 7 days per week; blending was occurring 24 hours per day, 5 days per week. The average daily wastewater flow was 160,000 gallons per day 4 days per week (PAS-00014914).



(PAS-00014834)

4. Identified COCs

- PAHs (release)
- Copper (use, release)
- Lead (use, release)
- Mercury (use, release)

PAHs

In 1994 and 1995, petroleum hydrocarbons were known or suspected to be present in the wastewater discharged to PVSC (PAS-00014838).

Metals – Copper, Lead and Mercury

Sampling from 1988 to 1995 of wastewater discharged to the Passaic Valley Sewer Commission (PVSC) from Kleer Kast contained copper, lead, mercury and oil (PAS-00014844).

In 1991, Kleer Kast advised PVSC that lead and mercury may have been present that year in the wastewater discharged to the PVSC system in excess of 15 kilograms per calendar month (PAS-00014838).

In 1994, the company stored pigments (containing chromium, cadmium and mercury) in drums located in the facility's pigment room which did not have any floor drains (PAS-00014915).

In 1994 and 1995, copper, lead, and mercury were known or suspected to be present in the wastewater discharged to PVSC (PAS-00014838). A 1994 Local Limits Baseline Monitoring Report shows copper (0.258 mg/l), lead (0.0302 mg/l) and mercury (<0.001 mg/l). The average daily flow in 1994 was 135,425 gallons (PAS-00014967).

In 1995 and 1996, raw, process and hazardous materials found onsite included copper, mercury and oil (PAS-00014976; PAS-00015214; PAS-00015226-235).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that

There is no information regarding sampling data in the available file material.

5. COC Pathways

Direct Discharge

The facility utilized water from wells and municipal sources for both cooling and process purposes. In the late 1970s and early 1980s, Kleer Kast discharged approximately 280,800 gallons per day of wastewater, including 10,000 gallons per day of contact water from the distillation column used for solvent recovery (PAS-00015015; PAS-00015023; PAS-00015039; PAS-00015041; PAS-00015045).

According to a 1977 NPDES Application and follow-up letter, 280,800 gallons of cooling water and 7,000 gallons of process water were discharged to Frank's Creek to the Hackensack River (PAS-00015012-14). A 1978 Process Flow sheet shows discharge to Frank's Creek with the receiving waters being listed as Passaic (PAS-00015023).

In February 1985, sampling of wastewater showed 0.1 mg/l lead, 0.019 mg/l of copper and 16 mg/l oil and grease (PAS-00015274).

Prior to July 1986, the facility discharged all wastewater to Frank's Creek, a tributary of the Passaic River, via a single outfall, designated as DSN001. This wastewater discharge was routed to a ditch that flowed to Frank's Creek. The facility's discharge to Frank's Creek was comprised of stormwater (roof and roadway runoff) as well as contact and non-contact cooling water (PAS-00015023; PAS-00015039; PAS-00015045).

In November 1990, the facility reported discharge of 44,497,504 gallons of process water and cooling water to the sanitary combined sewer and 84,486,143 gallons to the storm sewer/river/ditch (Franks Creek/Hackensack River) from October 1989 to September 1990 (PAS-00014848-49; PAS-00014856).

Testing of the industrial waste water showed 0.3 mg/l copper and 57 mg/l of petroleum hydrocarbons at outlet 15405031, which was receiving 121,911 gallons of daily flow at that time (PAS-00014852-3). Copper, lead and mercury were expected to be present in the wastewater (PAS-00014858).

The facility was discharging 7,000,000 gallons of process water and 13,300,000 gallons of cooling water to the sanitary combined sewer and 45,000,000 gallons to the storm sewer/river/ditch from October 1994 to September 1995 (PAS-00014975). Samples of effluent in 1995 showed copper at 39.8 µg/l (PAS-00015000).

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the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Sanitary Sewers

The facility is located in the PVSC's Ivy Street CSO district. The 1976 PVSC Overflow Analysis report states that overflows from the Ivy Street CSO District and outfall occur during periods of rainfall (PAS-00014842-3).

Kleer Kast advised PVSC in April 1985 that it was planning to rebuild its wastewater discharge system to conform to NJDEP's requirements and that the company would be applying for a sewer connection permit. The permit request was filed in September 1985 in response to a civil action by the United States Environmental Protection Agency against Kleer Kast for violation of the federal Clean Water Act for discharging contact cooling water to Frank's Creek. At that time, the facility had two sanitary sewer lines tied into the PVSC system and was requesting the tie-in of additional industrial lines into the PVSC system to eliminate the surface water discharge of contact cooling water. On July 1, 1986, the company began discharging contact cooling water to the PVSC system rather than to surface water (PAS-00015237; PAS-00015262; PAS-00015264; PAS-00015296-298; PAS-00015302-303).

By 1987, all process wastewater, contact cooling water and sanitary wastewater was directed to the PVSC treatment plant (PAS-00015063). Sampling of the facility's wastewater discharge to the sewer system in 1988 and 1990, following the rebuild of Kleer Kast's wastewater discharge system, identified copper (PAS-00015093; PAS-00015095; PAS-00015143). In November 1990, results for a PVSC Composite/Grab sample included 0.03 mg/l copper (PAS-00015143).

6. Regulatory History/Enforcement Actions

Inspections

During a June 9, 1994 facility inspection, NJDEP documented that an oil-like substance was leaking from the foundation of the loading dock area of Alexandria Plastics, a tenant at the Kleer Kast Site. The oil-like substance was observed discharging to the waters of the State. Kleer Kast was directed by NJDEP to determine the source of the oil-like substance, to immediately and permanently cease the unpermitted discharge and to submit a written report detailing the corrective actions taken by Kleer Kast. No further information has been obtained concerning the investigation and disposition, if any, of this unpermitted discharge (PAS-00014840; PAS-00015208).

On March 21, 1985, dye testing conducted at the Kleer Kast/ Ampol facility documented that process overflows discharged to facility drains ultimately flowed to Frank's Creek. The dye test was performed on a drain that received the water from the quench baths; these baths were sampled in December 1984 and copper and lead were detected (PAS-00014840).

Violations

On March 6, 1990, Kleer Kast reported to PVSC that approximately 50 gallons of Number 6 fuel oil were discharged to the sewer during a 1-hour period. The discharge resulted from a leak in a fuel oil recirculating line. PVSC issued a Notice of Violation (NOV) to Kleer Kast on March 7, 1990 for the discharge (PAS-00015134-136; PAS-00015134-6).

Permits

The facility had NJPDES Permit No. NJ0031313 for facility wastewater discharge to Frank's Creek, a tributary of the Passaic River from October 1, 1984 through February 28, 1992 (PAS-00014839; PAS-00015056; PAS-00015239). Petroleum hydrocarbons had a maximum limit of 15 mg/l (PAS-00015066). This permit did not require monitoring of any specific COCs.

PVSC Sewer Connection Permit No. 15405032 for facility wastewater discharge to the PVSC system was effective May 27, 1991 through May 24, 2001 (PAS-00014864; PAS-00014883). The facility had limits on discharge of lead, copper and mercury (PAS-00014907). However, available references did not include effluent monitoring data.

7. Response Actions

In April 1993, four underground fuel oil storage tanks (USTs) were excavated and removed from the facility. Sampling of the soils surrounding the USTs identified the following hazardous substances in soils:

- Fluoranthene
- Indeno(1,2,3-cd)pyrene
- Pyrene
- Benzo(g,h,i)perylene
- Total petroleum hydrocarbons (PAS-00014839).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

PPG Industries Inc.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

PITTSBURGH PLATE GLASS (PPG) INDUSTRIES INC.

Facility Name, Address and Size: Pittsburgh Plate Glass (PPG) Industries, Inc. formerly known as Pittsburgh Plate Glass Company was located at 29 Riverside Avenue, Newark, New Jersey (PAS-00006296). The Site has been subdivided into 15 parcels/lots in Block 614. The lots in the northern portion of the Se southern portion of the site have McCarter Highway addresses (Lots 61, 62, 63, 64, 65, 66, 67, and 68) (PAP-00037403). PPG is approximately seven acres and is located on the west bank of the Passaic River (PAP-00037403). The available references did not include information on the number of site employees and typical work shifts.

1. **Business Type:** PPG manufactured paints, lacquer, enamels, varnishes, linseed oil, and resins (PAP-00037400; PAS-00044277).

2. **Time Period of Ownership/Operations**

   Operator: 1902 to 1971
   Owner: 1902 to 1971 (PAP-00037404)

3. **Operational History/COC Use and Presence at the Facility**

   As reported by Woodard and Curran in the *Report on PPG Industries,* dated September 9, 2016 (Woodard Report), PPG manufactured paint, lacquer, enamels, varnishes, linseed oil, and resins. Flax seed oil and coal (for power) were brought into the property by barge until 1946. The majority of liquid raw materials were stored in aboveground storage tanks (ASTs) with ASTs in two buildings (Buildings 4 and 15). Large exterior ASTs were located south of Building 12, on the north side of Building 7, and adjacent to the Riverside Avenue vehicle entrance. Flax seed silos/grain elevators were located along the river next to the flax seed oil mill. Ten 10,000-gallon underground storage tanks (USTs) adjacent to Building 12 also stored non-chlorinated solvents (PAS-00044244).

   The primary coating manufacturing operations took place in the following buildings:
   - Buildings 2 and 3 – paint (early 1900s)
   - Building 12 – paint
   - Buildings 7 and 9 – varnish
   - Building 10 – flax seed oil mill
   - Building 14 – lacquer
   - Building 17 – resin (PAS-00044244)

   The report also notes that PPGs operations were gravity-based systems. Raw materials were stored on upper floors and piped to lower floors via gravity for mixing, thinning, and blending. Paint and resins vessels and vats were rinsed with caustics or non-chlorinated solvents to clean them. The resulting rinseate was reused typically in lesser quality coatings, recycled, or sent off-site for disposal/treatment. For a period of time, non-chlorinated solvents were recovered in a small building between Buildings 12 and 17. This building is no longer present (PAS-00044244).

As described in the Woodard Report, the manufacturing operations included the following:

Paint Manufacturing

PPG manufactured oil-based paints and enamels in Buildings 2, 3, 4, 5, and 12 (PAP-00037404; PAS-00044285). The primary products produced at PPG were oil-based paints and enamels. Paints were primarily composed of binders (e.g., polymers, resins), solvents or diluents, primary pigments (e.g., fine organic or inorganic particles), extenders (e.g., clays, chalk, gypsum, anhydrite), and additives (e.g., catalysts, driers). A simplified version of the paint making process included resin preparation and filtering, grinding pigments and mixing with the resins, adding additional resins if needed, adding and/or adjusting solvents and driers, and including any other additives, quality control checks, and product packaging (PAP-00037405; PAS-00044244).

The report also stated that according to company history, dry pigments and mixing varnishes or oils were brought to the top floor and mixed to form a paste. The paste mixture was fed through chutes to grinding mills on the next floor. Batches would then be sent again via chutes to a lower floor where thinning oils and solvents were added in large processing tanks. Tinting was also typically done on this floor. The product was then fed via pipes to the filling department. The filled one- and five-gallon cans were transferred by conveyer for packing for shipment or storage. Some paint was placed into 55-gallon drums. The filling equipment along with other equipment were air pressure operated machines (PAS-00044245).

The raw materials known to have been used by PPG during the paint manufacturing process included: natural gums, natural resins, flax seeds, non-chlorinated solvents, pigments, caustic soda, dyes, alkyd resins, chromium, lead, titanium, zinc, lead carbonate, mercury, copper oxide, and cadmium. Solvents included water, toluene, xylene, ethylbenzene, linseed oil, methyl ethyl ketone (MEK), naphtha, turpentine, and mineral spirits. Some of these solvents were also used in making resin, varnish, and lacquer (PAS-00044245). The primary metal pigments used at PPG contained lead or titanium oxides. Cadmium (yellow color) and chromium (durability) were used in some paints. Mercury was probably used in certain paints as a preservative (PAS-00044245).

Resin Manufacturing

Alkyd resin production occurred at PPG in Building 17 from approximately 1930 until 1969. The alkyd resins at PPG were produced from polyunsaturated fatty acids (i.e., vegetable oil, linseed oil) and polyols (i.e., glycerin). With heat, the process creates glyceride oil to which anhydride is added to increase the molecular weight. Synthetic phenolic resins were added as a secondary component for some coatings. Resins manufactured at PPG were then diluted with a non-chlorinated solvent and used in paint and varnish manufacturing. Phenolic resins were not made at the PPG, but rather purchased in solid flake form from a supplier (PAS-00044245).

Varnish Manufacturing

PPG began varnish manufacturing in 1910, which is when the original varnish building was constructed. In 1936, a new varnish building was constructed at the current Building 7 location. The new building was identified as Building 7 while the original Building 7 was subsequently identified as Building 7A. Building 7A was subsequently torn down (PAS-00044245).

Similar to the paint operation that occurred in other buildings at PPG, upper levels of the varnish building were used for mixing and preparing the varnish for heat treatment in the first floor pots. Varnish was made from drying oils/polymers (i.e., linseed oil) and non-chlorinated solvents. The primary non-chlorinated solvents were white spirits, mineral turpentine and kerosene with minor amounts occasionally of toluene, xylene, and naphtha (PAS-00044245).

Linseed Oil Manufacturing

Linseed oil was manufactured from flax seed at PPG from 1923 to 1947. The typical primary steps were pressing the seed to release the oil, then refinement of the oil with caustic soda (PAS-00044245). According to a September 18, 1996, Letter from PPG regarding the Passaic River Study Area, basic raw materials included natural gums and resins, flax seed, non-chlorinated solvents and pigments, though the chemical constituents of some of these materials changed over time (PAS-00006297).

Lacquer Manufacturing

As described in the Woodard Report, lacquers are a subset of paints with a high solvent content. At PPG, lacquer was primarily a combination of nitrocellulose (a resin) and solvents (such as butyl acetate). Nitrocellulose-based lacquers were developed in the early 1920s, and extensively used in the automobile industry for 30 years (PAS-00044287). Small amounts of flake naphthalene was reportedly used in lacquer production and small amounts of copper oxide was reportedly used in paint production (PAS-00006297).

Materials Use

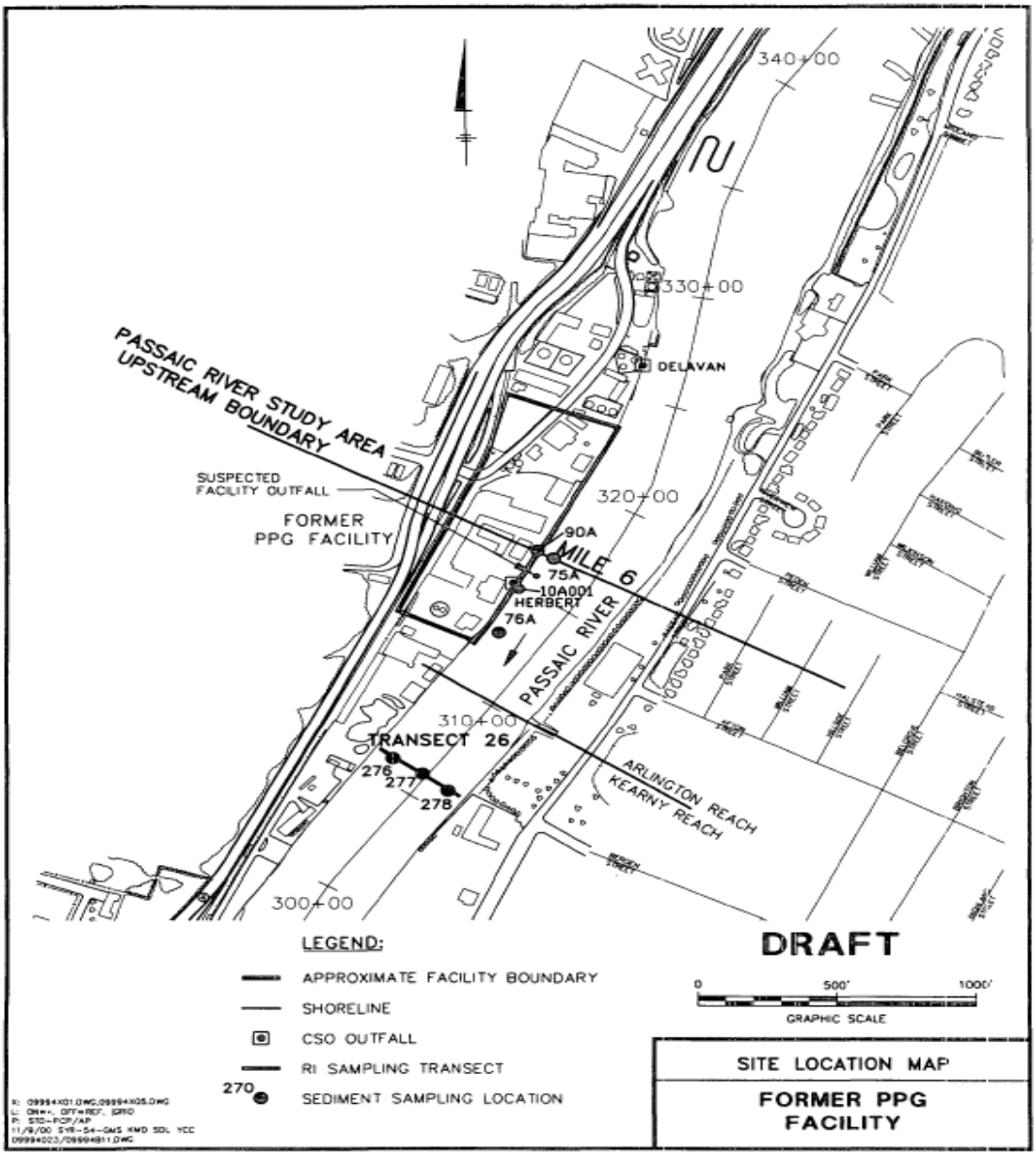
Materials used in manufacturing are provided below:

- Alkyd resins were manufactured at the site. These products were used by PPG as raw materials in paint and varnish manufacture. Phenolic resins were not manufactured, but would have been received at the site and used as raw materials in the manufacture of paints and varnishes (PAS-00006297).

- Toluene, xylene, ethylbenzene, and MEK were received at the site and used as raw materials in the manufacture of paints and varnishes (PAS-00006297).

- Pigments were brought to the site and used in the manufacture of paints. These were often metallic chemicals and included compounds of cadmium, chromium, lead, titanium, and zinc. Basic lead carbonate (white lead) was one of the pigments used as a raw material. Mercury was used as a preservative in certain paints (PAS-00006297).

- Polychlorinated biphenyls (PCBs), dioxins, 2,4-dichlorophenoxyacetic acid, and 2,4,5-trichlorophenoxyacetic acid were not received, utilized, manufactured, discharged, released, or disposed of the Newark site (PAS-00006297).



(PAS-00124660)



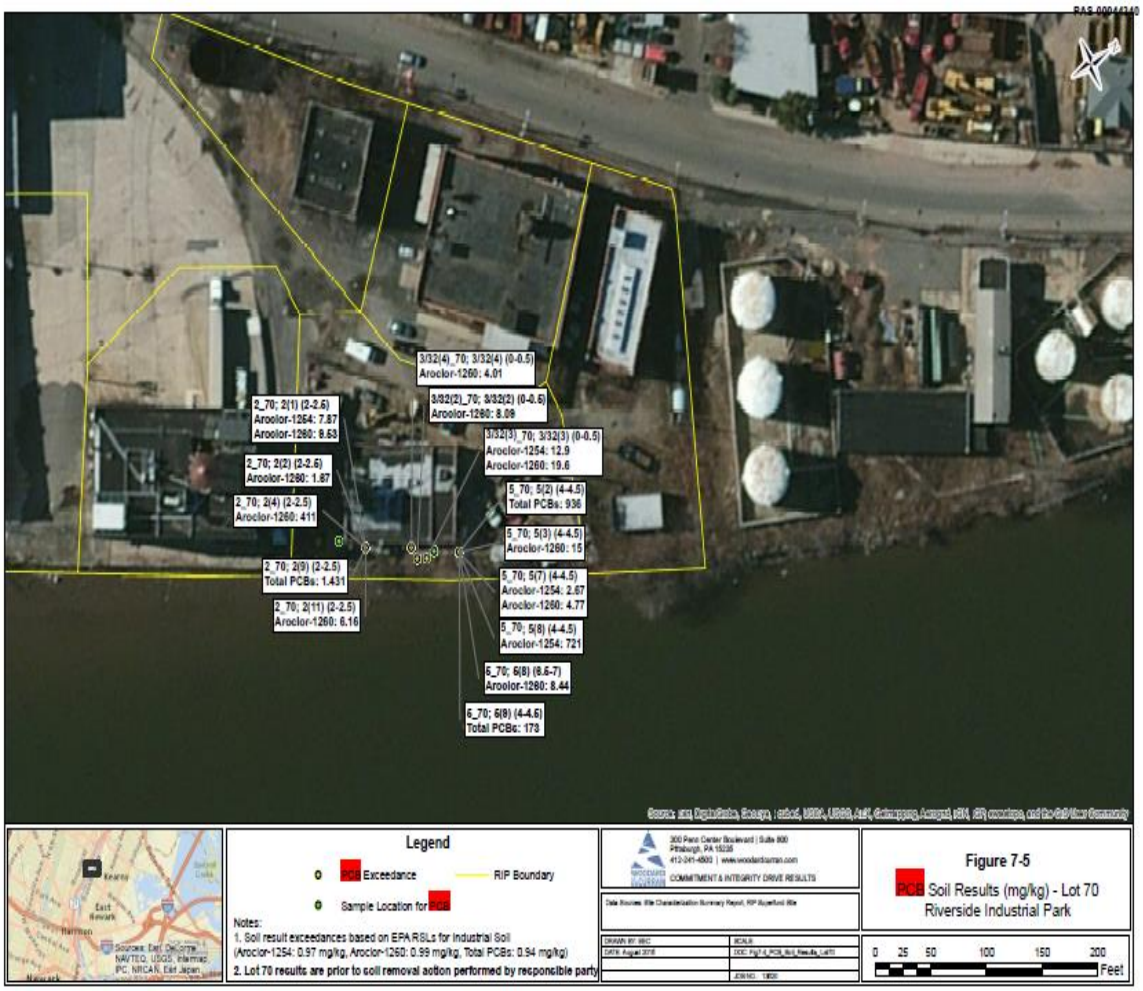
(PAP-00037403)

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Dioxins (detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (used, detected)

PCBs

PPG did not use PCBs in its coating operations at the facility. There is no information in the available references evidencing that PCBs were or would have been generated by PPG's operations, or released from or disposed at the facility during PPG's time of operations. PCBs have been detected in soil sampling at the facility, but those detected PCBs are reportedly not attributable to PPG. Rather, Federal Refining Company (a scrap metal recycler), and other parties are reportedly responsible for PCBs at the Facility. In addition, PCBs likely were deposited onto Facility soils due to flooding from the Passaic River (PAS-00044273-304). PCBs may have also been present in historic fill (PAS-00044273-304). The highest concentrations of PCBs at the facility were 721 mg/kg for Aroclor 1254 (Sample 5_70; collected at a depth of 4-4.5 feet bgs) and 411 mg/kg for Aroclor 1260 (Sample 2_70; collected at a depth of 2-2.5 feet bgs), both located on Lot 70 where Federal Refining Company conducted a metals reclamation operation (PAS-00044302, PAS-00044340).



(PAS-00044340)

Nearly all of the PCB exceedances (14 of 16 exceedances) are associated with Building 16 on Lot 70 and NJDEP Case E2000550 (Federal Refining Company) (PAS-00044302, PAS-00044339). PPG used Building 16 as a maintenance shop, which did not involve the use of PCBs (PAS-0044302). Beginning in 1985, Federal Refining Company operated a scrap metal recycling process that used an incinerator with various acidic and caustic liquids in Building 16 on Lot 70. Prior to initiating its operations and after the previous company (railroad ties and rails storage) vacated the property, Federal Refining undertook an environmental assessment of Lot 70 which included soil sampling (PAS-00044302). Federal Refining did not detect PCBs in soils on Lot 70 prior to its operations (PAS-00044302). In the early 2000s, Federal Refining undertook another environmental assessment as the responsible party for Case Number E2000550. That investigation and subsequent reports identified PCBs in soils on Lot 70, indicating that Federal Refining was the source of PCBs on Lot 70 (PAS-00044303). As further evidence of its responsibility for the PCBs on Lot 70, in March 2012, Federal Refining undertook a soil removal action to address the PCB-impacted soil and implemented engineering and institutional controls to address the remaining contamination. Federal Refining excavated soil containing PCBs greater than 50 mg/kg (PAS-00044303).



(PAP-00305940)

Other than Lot 70, there were limited PCB soil detections at the facility. All of the non-Lot 70 PCB detections were consistent with or less than the PCB sediment concentrations in the river (PAS-00044303). The low PCB soil concentrations (other than on Lot 70) likely reflect residual contaminated sediment from past flooding events. (PAS-00044303).

PCB detections have also been attributed to historic fill (PAS-00044301). Finally, of 134 recent soil samples taken at the property, the maximum detection of Aroclor 1254 was 3.1 mg/kg from sample B-40 collected on September 2017 at a depth of 0-1 feet bgs and the maximum detection of Aroclor 1260 was 10 mg/kg from sample B-67 collected on October 2017 at a depth of 2.5-3.8 feet bgs (PAP-00305856-69).

Dioxins

PPG has no information indicating that dioxins and furans were or would have been generated by its operations, or released from or disposed of at the facility during its period of operation. Dioxins were detected in soil sampling at the facility in 2017 and 2011 (PAP-00478818-19; PAS-00044273-306). The highest 2,3,7,8-TCDD concentration detected in samples collected in 2017 was at location DF-4 at 20.8 nanograms per kilogram (ng/kg). The soil samples were collected from zero to six inches on the eastern edge of the site adjacent to the Passaic River (PAP-00478818-19; PAP-00479072).[1]

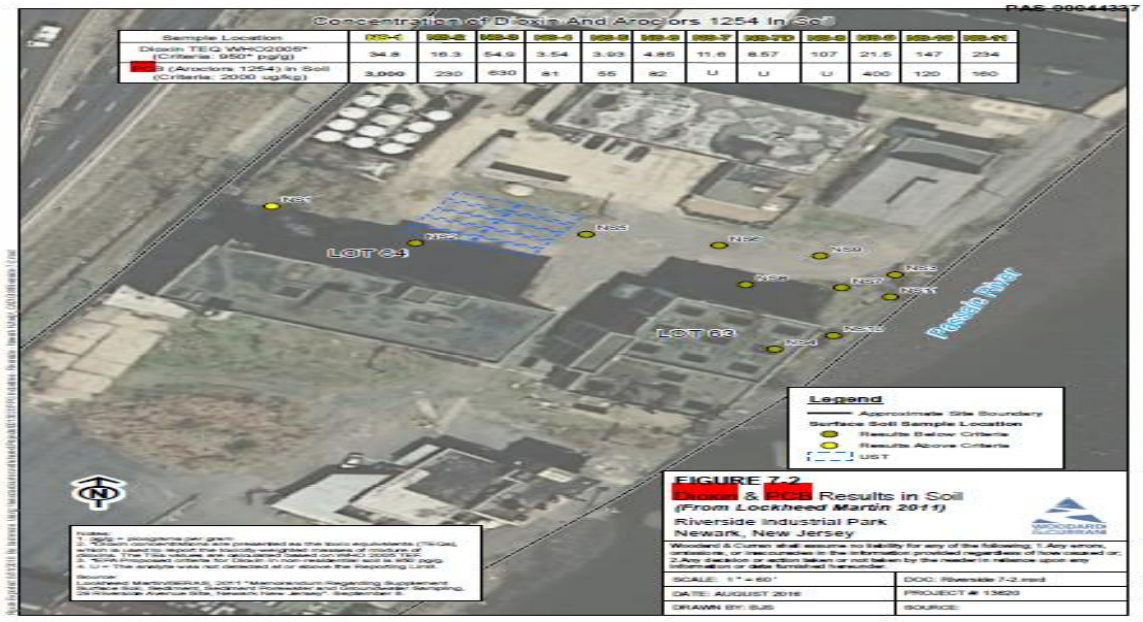
[1] This Report was revised to include documents received on May 22, 2020. The additional documents did not change PPG Industries Inc.'s previous certification.

For samples collected in 2011 from a depth of zero to six inches, the highest soil concentration of the dioxin toxicity equivalency quotient (TEQ) was 234 picograms per gram (pg/g) in a sample (NS-11) along the river wall. The 2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) concentration was 216 pg/g. The ratio of 2,3,7,8-TCDD to total TCDD was 0.7. The soil dioxin concentration is less than the average sediment 2,3,7,8-TCDD concentration adjacent to the Riverside Industrial Property indicating this area is not a source of dioxin, but its proximity to the river probably reflects residual sediment from past flooding events. The 2,3,7,8-TCDD/total TCDD ratio indicated that the source of the soil dioxin is herbicide manufacturing and is consistent with the 2,3,7,8-TCDD/total TCDD identified by others for a former manufacturing facility located at 80 and 120 Lister Avenue in Newark, New Jersey (near River Mile 3), which began producing pesticides and other products in the 1940s (PAS-00044302).

Presented below is a figure depicting the soil sampling locations at the Riverside Industrial Park (PAS-00044336):



Presented below is a figure depicting the dioxin detections in soil (From Lockheed Martin 2011) (PAS-00044337):



PAHs

Small amounts of flake naphthalene were used in lacquer (PAS-00044273-87; PAP-00039511). From December 1933 to May 1934, approximately 82 pounds of flake naphthalene was used in lacquer manufacturing (PAP-00039511).

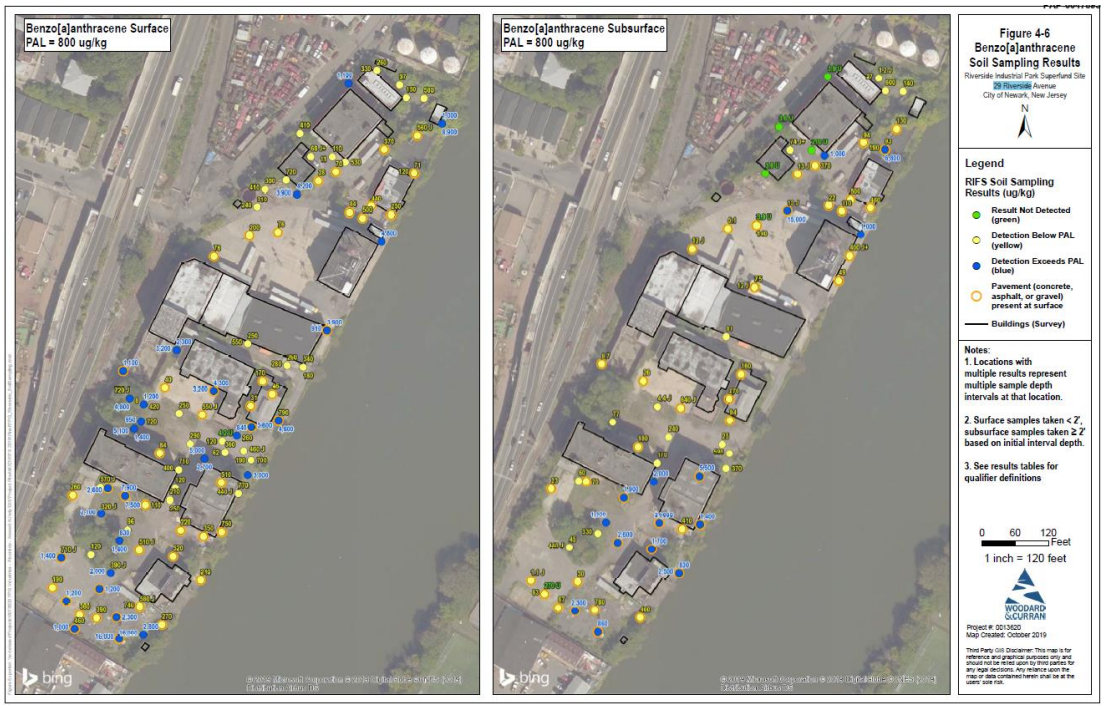
Raw materials were brought to the property by rail, tanker truck, or trailer truck (PAS-00044273-85). Until 1946, flax seed and coal were brought to the property by barges that tied up along the length of the Facility shoreline (PAP-00037406; PAS-00044273-85, 86).

PAHs are present in historic fill in New Jersey and have been detected in soils at the facility (PAS-00044273-96). As stated in the Final Remedial Investigation Report, dated April 20, 2020, the detection of PAHs above project action limits is primarily in the Lots 63/64 area with relatively higher concentrations in surface than subsurface soil. An onsite source for isolated detections has been identified as historic fill in NJDEP led remediation. The PAHs to the north of Buildings #7 and #12 are likely related to the UST or surface activities, including surface waste piles, vehicle dismantling, and 2012 UST removal activities which broke a water line causing overland flow of petroleum contaminated water. Presented below in a tabular format are the maximum concentrations of PAHs detected at the facility (PAP-00478816; PAP-00479027):[2]

[2] This Report was revised to include documents received on May 22, 2020. The additional documents did not change PPG Industries Inc.'s previous certification.

PPG's Max PAH concentrations		
Constituent	**Concentration**	**Sample ID/Depth**
Benzo(a)anthracene	34 mg/kg	B-85/2.5-3.5 ft bgs
Benzo(a)pyrene	28 mg/kg	B-85/2.5-3.5 ft bgs
Benzo(b)fluoranthene	29 mg/kg	B-85/2.5-3.5 ft bgs
Benzo(k)fluoranthene	27 mg/kg	B-85/2.5-3.5 ft bgs
Dibenz(a,h)anthracene	5 mg/kg	B-85/2.5-3.5 ft bgs
Ideno(1,2,3-cd)pyrene	16 mg/kg	B-85/2.5-3.5 ft bgs

Presented below are figures depicting the various PAH concentrations:[3]

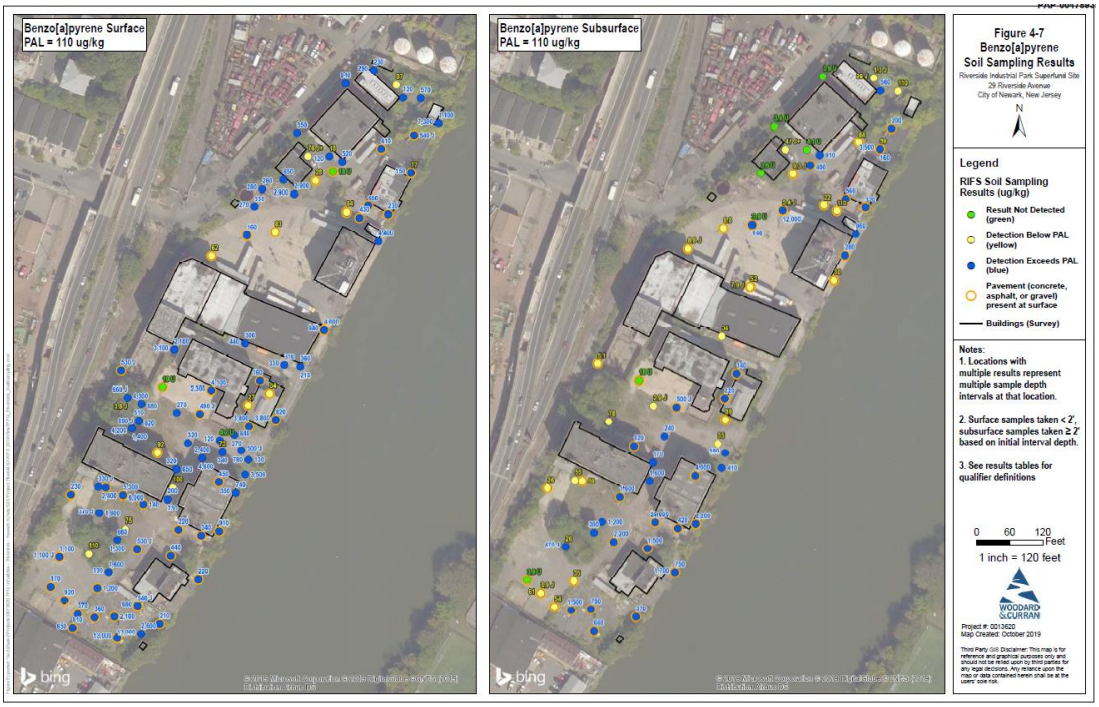


(PAP-00478934)

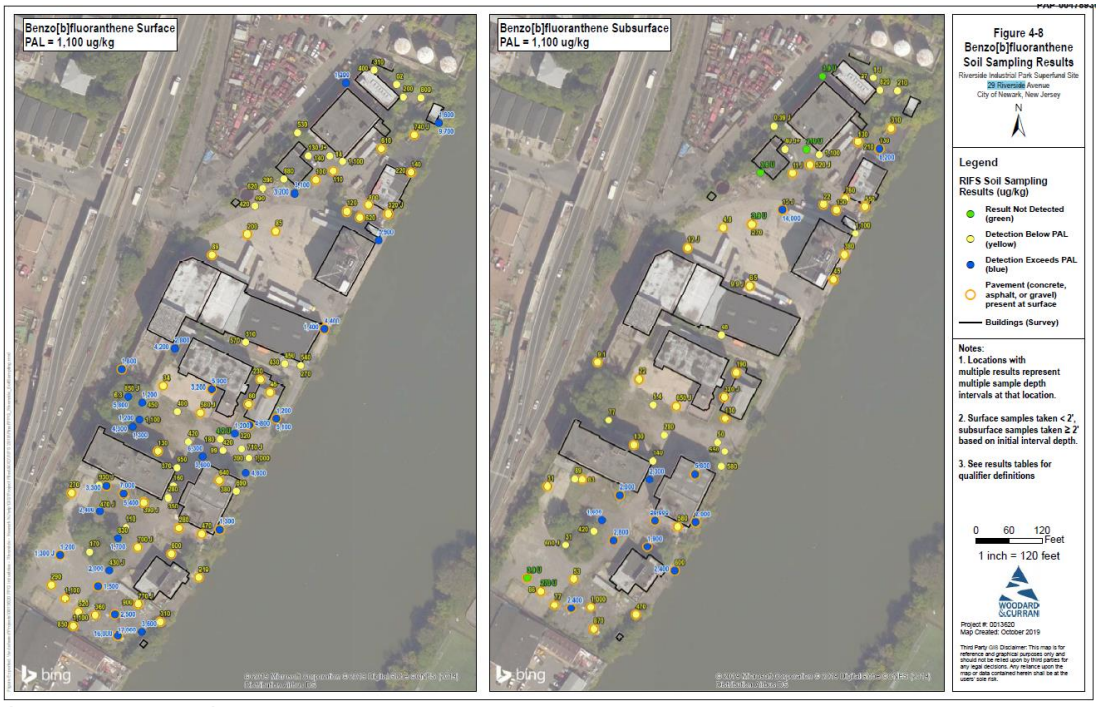
[3] This Report was revised to include documents received on May 22, 2020. The additional documents did not change PPG Industries Inc.'s previous certification.

PPG Industries Inc.

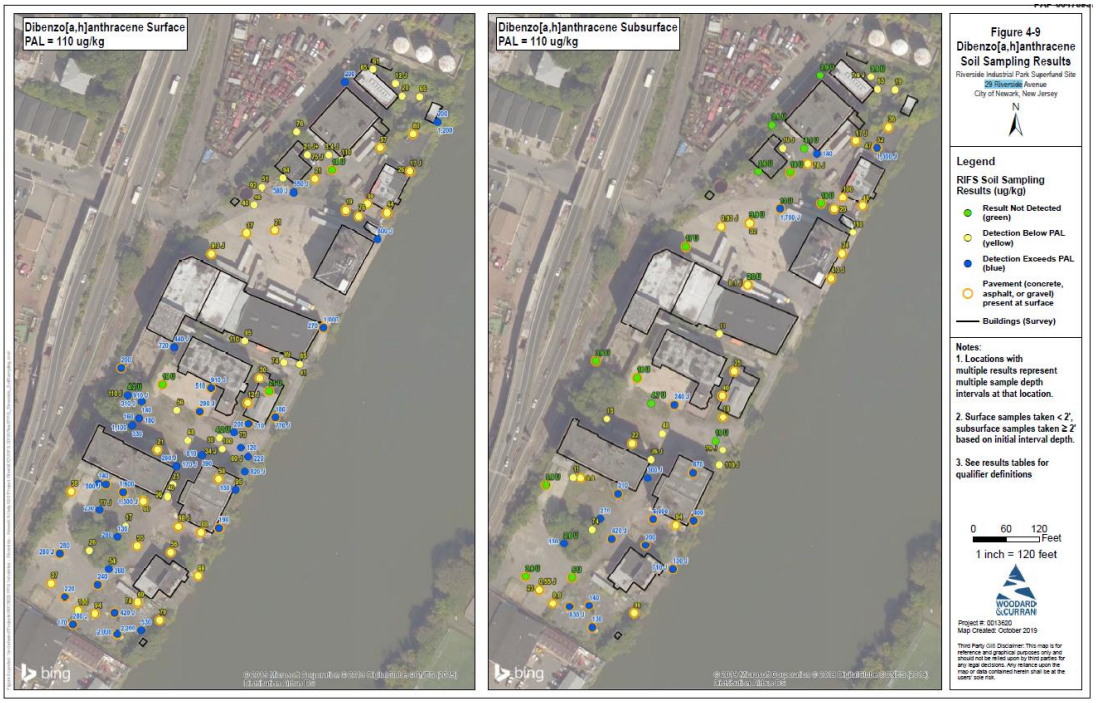
Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report



(PAP-00478935)



(PAP-00478936)



(PAP-00478937)

Copper

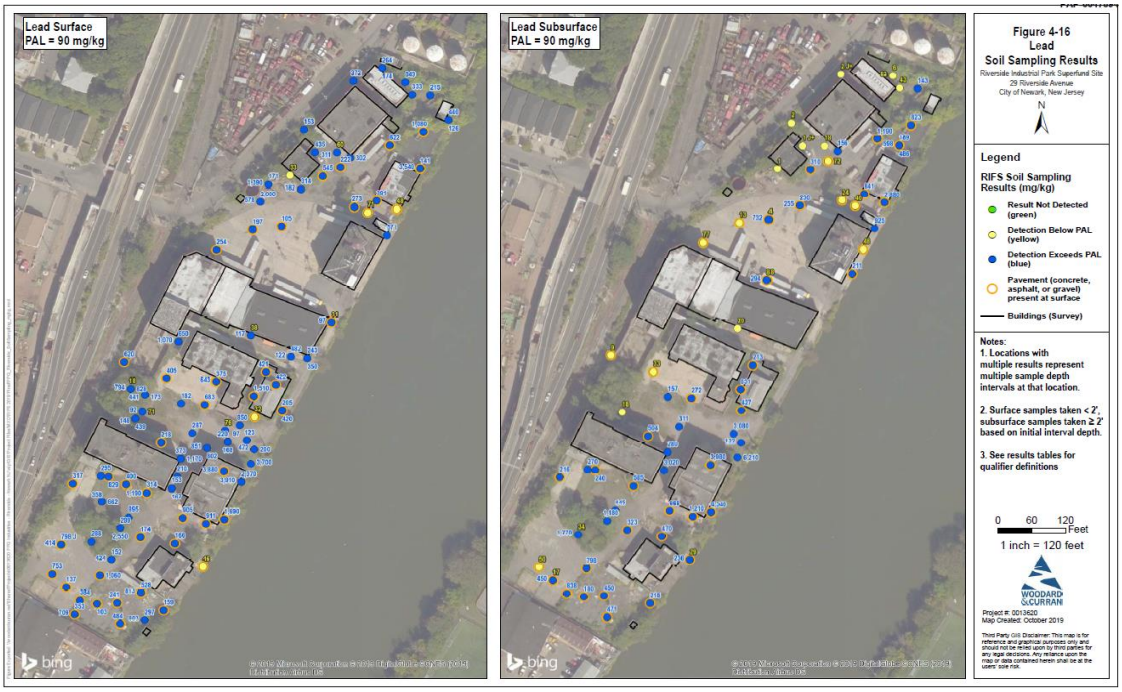
PPG used materials containing copper in paint manufacturing (PAS-00044273-286; PAP-00039510). Raw materials were brought to the property by rail, tanker truck, or trailer truck (PAS-00044285). Copper is present in historic fill in New Jersey and has been detected in soils at the facility (PAS-00044273-296; PAP-00305842-55). Copper was detected at a maximum concentration of 1,040 mg/kg from sample B-33 collected in October 2017 from a depth of 0.5-1 feet bgs (PAP-00305847). In addition, copper was also detected at a concentration of 145 mg/kg (PAP-00305852) in sample B-60 (FILL) collected in October 2017 at a depth of 4 feet bgs (PAP-00305842-55). These concentrations exceed concentrations NJDEP has identified as typical of historic fill. No figures showing the copper detections were available in the reference documents.

Lead

Certain pigments used in PPG's paint and lacquer manufacturing contained lead (PAS-00044286; PAP-00039505-508). Draft paint chip sampling results from Block 614, Lots 63 and 64 at the Riverside Industrial Park collected by a contractor for the City of Newark in August 2009 showed that the paint chips contained lead (PAP-00304521). The levels of lead detected in paint chip samples are presented below:

- Sample JA26014-1 – 8,620 mg/kg
- Sample JA26014-2 – 10,800 mg/kg
- Sample JA26014-3 – 5,620 mg/kg (PAP-00304521)

Small amounts of hot lead were used in refining linseed oil (PAP-00039505-508; PAP-00039459). As of November 1934, materials containing lead were used in the manufacture of paint, lacquer, and linseed oil (PAP-00039459; PAP-00039505-508). Paint manufacturing occurred in Buildings 2 and 3 in the early 1900s, in Buildings 4 and 5 as of 1934, and in Building 12 after 1925 (PAS-00044273-285). Raw materials were brought to the property by rail, tanker truck, or trailer truck (PAS-00044285). In an October 2017 soil sampling event (i.e., after the Relevant Time Period), lead was detected at a maximum concentration of 8,690 mg/kg collected from sample B-75 at a depth of 1 to 3 feet bgs (PAP-00305854). Lead was detected at a concentration of 2,550 mg/kg in sample B-60 (FILL) at a depth of 4 feet bgs (PAP-00305852).



(PAP-00478944)[4]

Mercury

Extremely low quantities of mercuric oxide and phenylmercuric acetate, which partially consists of mercury-containing material, were used in certain paints as preservatives (PAS-00044273-286; PAP-00039510). Draft paint chip sampling results from Block 614, Lots 63 and 64 at the Riverside Industrial Park collected by a contractor for the City of Newark in August 2009 showed that the paint chips contained low levels of mercury at the following concentrations:

- Sample JA26014-1 – 45.8 mg/kg
- Sample JA26014-2 – 17.2 mg/kg
- Sample JA26014-3 – 37.8 mg/kg (PAP-00304521)

[4] This Report was revised to include documents received on May 22, 2020. The additional documents did not change PPG Industries Inc.'s previous certification.

Soil sampling data collected at the Riverside Industrial Park showed a maximum detection of 31.4 mg/kg collected from sample B-80 in December 2018 at a depth of 0.3-1.3 feet below ground surface (bgs) (PAP-00479054).[5] Mercury is present in historic fill in New Jersey and has been detected in soils at the facility at a concentration of 8.3 mg/kg from sample B-60 (FILL) in September 2017 at a depth of 4 feet bgs (PAP-00305842-55). The concentration of mercury in soils at the facility exceeds concentrations NJDEP has identified as typical of historic fill.

Presented below are the mercury soil sampling results in surface and subsurface soil as presented in the Final Remedial Investigation Report, dated April 20, 2020 (PAP-00478946):[5]



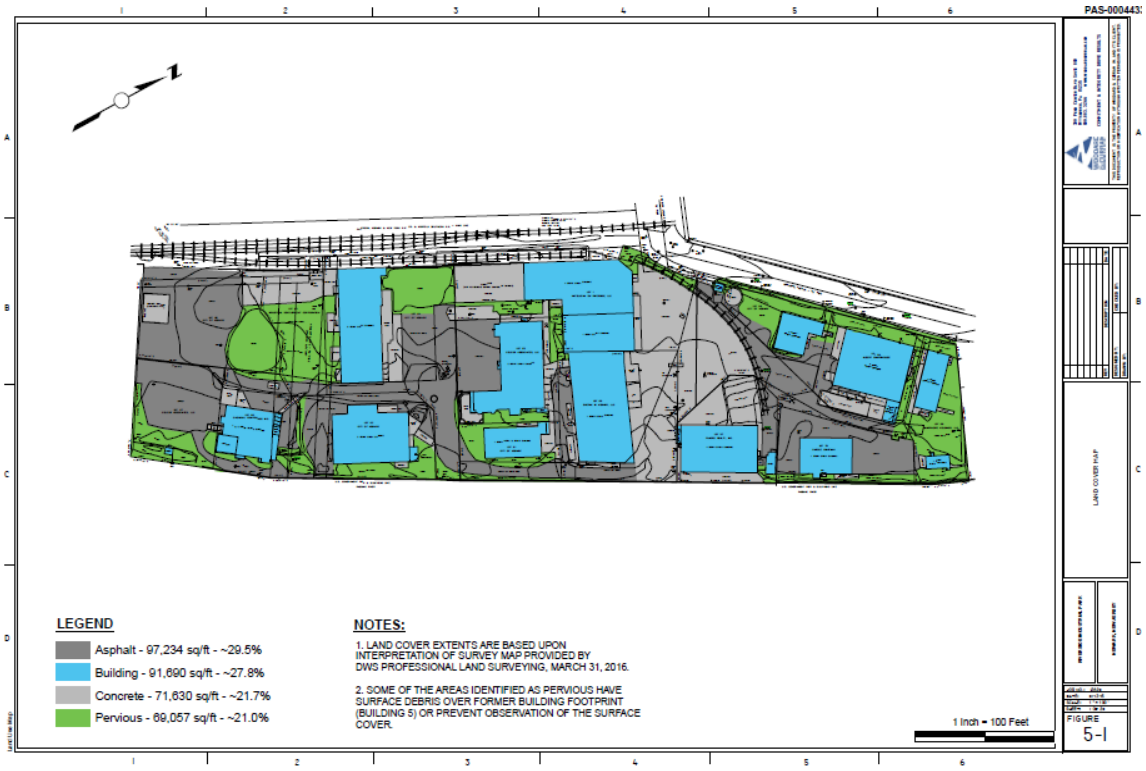
Historic Fill

According to the Woodard Report, a 1892 Certified Sanborn Map showed that the majority of the Site was part of the Passaic River (PAS-00044282). Specifically, the majority of Lots 57, 61, 62, 63, 64, 66, 67, 68, and 70 were originally within the footprint of the Passaic River (PAS-00044282). The origin of the fill material the site is built on is unknown, but soil boring data from several New Jersey Department of Environmental Protection (NJDEP) related investigations (NJDEP Case Numbers E88434; E20110199; E88483; E20080157; E98132; E89257; and E2000550) describe the presence of ash, cinders, and brick in the fill (PAS-00044282). River dredge spoils also could have been

[5] This Report was revised to include documents received on May 22, 2020. The additional documents did not change PPG Industries Inc.'s previous certification.

used for fill. The Riverside property is identified on NJDEP's historical fill map as having fill material (http://www.nj.gov/dep/njgs/geodata/dgs04-7.htm) (PAS-00044282).

Approximately 80 percent of the property at the facility is paved (PAS-00044290, PAS-00044334). An asphalt cap has been installed on Lots 68 and 70 and portions of Lots 61, 63, 66, and 67 as an NJDEP-approved engineering control (PAS-00044273-304).



(PAS-00044334)

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[6]

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[7] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the

[6] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[7] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

OU2 PAH COCs.[8] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[9]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00305837, 47, 54).

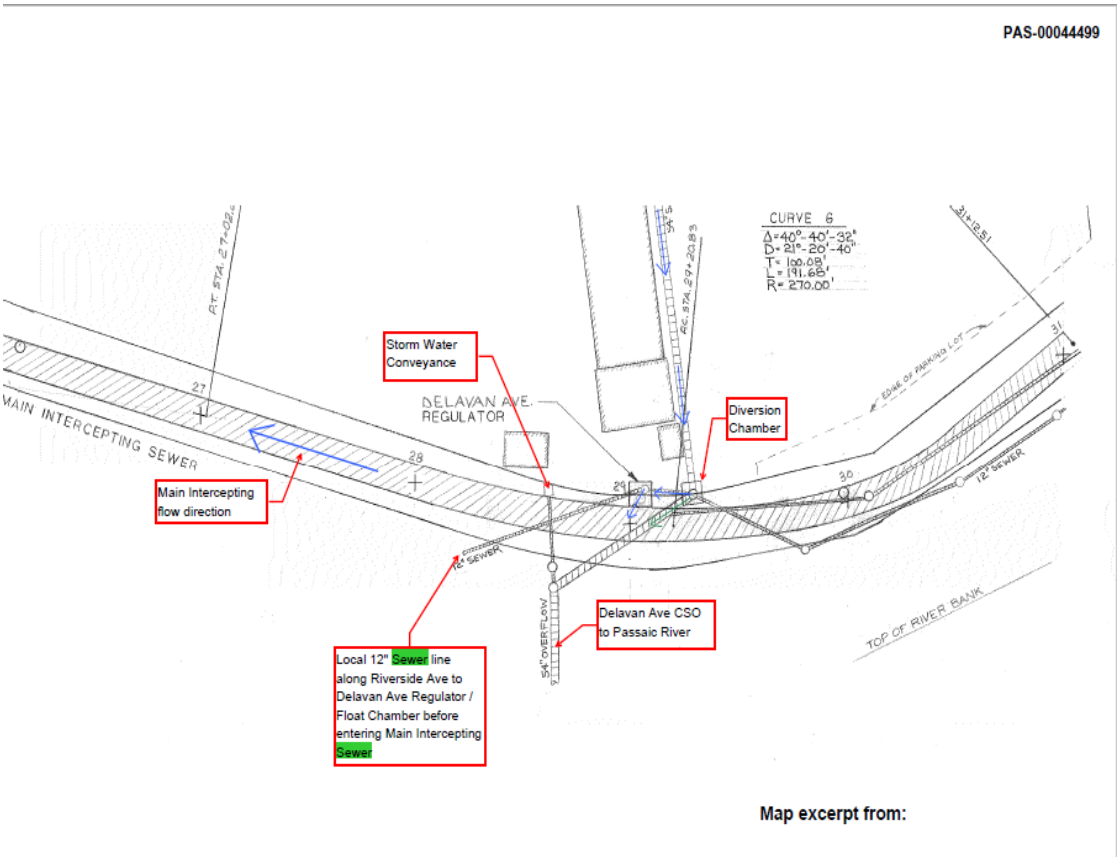
COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	8,690 mg/kg
Copper	1,040 mg/kg
Mercury	13.9 mg/kg
Benzo(a)anthracene	16 mg/kg
Benzo(a)pyrene	13 mg/kg
Benzo(b)fluoranthene	17 mg/kg
Benzo(k)fluoranthene	5.4 mg/kg
Dibenzo(a,h)anthracene	2.3 mg/kg
Indeno(1,2,3-cd)pyrene	7.3 mg/kg

5. COC Pathways

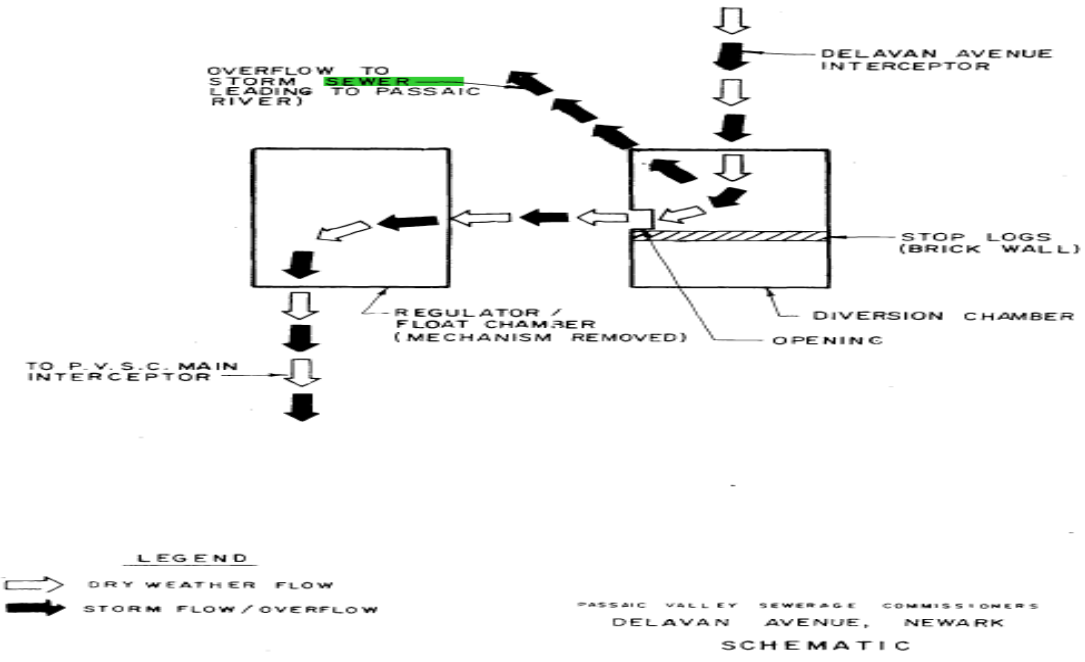
Storm Sewer

When the facility began operations in the early 1900s, it was connected to the Passaic Valley Sewerage Commissioners (PVSC) Delavan Avenue connector (PAS-00044291). Based upon PVSC Drawings, the 12-inch sewer line pipe from the facility is connected to the Delavan Avenue regulator chamber/float chamber before entering the Main Intercepting sewer (PAS-00044499). The connection of the facility sewer pipe to this chamber prevented facility discharges to the river during high flow or bypass events at the Delavan Avenue Combined Sewer Outlet (CSO) connection (PAS-00044293). Instead, facility sanitary wastewater entered the regulator chamber and flowed into the main PVSC intercepting sewer and to the PVSC treatment plant (PAS-00044293). Therefore, during high-flow conditions, such wastewater should not have reached the diversion chamber where bypass flow to the river occurs (PAS-00044293). Further, PVSC's reports state that the Delavan Avenue connector was not subject to high-flow conditions or overflow events. Based on investigation made of the upstream collection system, it was found that an overflow facility located within the City of Newark upstream of this regulator chamber was activated during period of rainfall (PAP-00305639).

[8] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[9] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

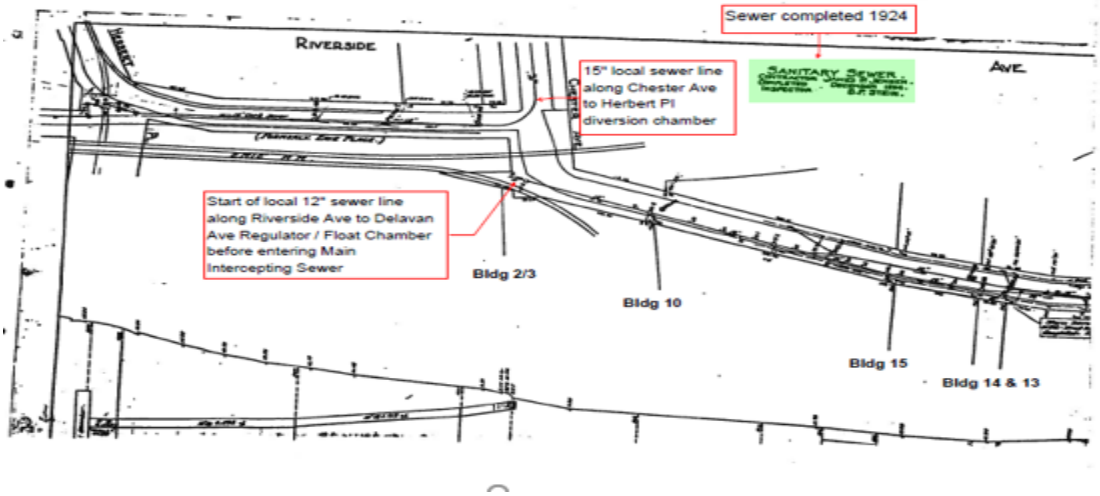


(PAS-00044499)



(PAS-00044500)

The only building at PPG that did not discharge to the Delavan connector was Building 17. Based on a 1959 revision of a 1942 drawing, a sewer from Building 17 existed going to the southwest, presumably connecting to the PVSC main sewer line.



(PAS-00044501)

PPG lacks information regarding the discharge rates, discharge volumes, and water quality data for discharge to the PVSC system. However, PPG would not have discharged any COC-containing effluent through facility pipes or the PVSC system because (1) it manufactured oil-based coatings that did not generate much liquid process waste, (2) any liquid process waste either was reused in other coatings or disposed off-site, and (3) it would have been impractical to discharge any liquid process waste through pipes because coating residue would clog those conveyances (PAS-00044273-85; PAP-00037406).

Direct Discharge

According to the November 1994 *Passaic River Study Area PRP Investigation, Summary of Evidence Pertaining to: Pittsburgh Plate Glass Company*, prepared by Kroll Associates (Kroll Summary), the former PPG facility potentially discharged hazardous substances to the Passaic River through the following mechanisms (PAS-00080135):

- Direct process discharge to the river via the combined sewer system – A combined sewer outfall (CSO) exists on facility property immediately downstream of PPG's connection to the local combined sewer line on Riverside Avenue. This outfall is known as the Herbert Place combined sewer outfall. Process-related discharges to the combined sewer were likely discharged from this outfall during periods of wet weather or CSO regulator malfunction (PAS-00080135; PAS-00080232). However, according to the Woodard Report, there is no evidence that wastewater discharged to the Herbert Place sewer at any time and wastewater could not be diverted to the Passaic River given the connection of piping to the Delavan regulator chamber (where no bypass option is available) (PAS-00044294).

- Direct dumping of containers to river, as reported in an affidavit of a former employee, though he stated that he had no knowledge of the contents of the containers (PAS-00080135; PAS-00080161-62).

- Interior spills, etc., disposed of via floor drains – Each building had 4-inch to 6-inch sewer pipes, which led to Passaic River. Numerous outfalls exist today along the former PPG facility bulkhead which are consistent with floor drain elevation (PAS-00080135). The affidavit of Willie Moore, a former PPG employee, dated September 1994, states that "[e]very building at the PPG facility had a 4-inch to 6-inch sewer pipe running directly to the river." He further had "witnessed PPG employees sweeping residue, including spills of products and raw materials, down these floor drains" (PAS-00080161). In contrast, according to the *Remedial Investigation and Feasibility Study Work Plan* dated July 28, 2017 (July 2017 RI/FS Work Plan), pipes in the river bulkhead wall are consistent with PVSC notes that state that the pipes are related to a water tank drain or compressor cooling water (PAP-00037438), and the only building documented to have floor drains was the Ardmore Chemical building (Building No. 14) (PAP-00037436, PAS-00044508). Affidavits from other former employees further refute the presence of floor drains in every building (PAP-00402709-10, PAP-00402712).

The *Final Remedial Investigation Report, dated April 20, 2020*, described a river wall pipe investigation. Figure 2-14 shows the locations of bulkhead wall pipes and associated pipes that were traced from the survey. Several pipes were traced to within Building #6, including a pipe connected to a roof drain. Pipes were not traceable inside other buildings. No residue or material which would be suggestive of manufacturing wastewater was observed in the pipes (PAP-00478776).[10]

Of the 21 pipes observed, seven have been identified as those described in the 1971 PVSC field notes. PVSC identified only seven river wall pipes and determined that these pipes were not associated with process wastewater discharges, and instead were either plugged/inoperable or associated with water tanks or non-contact cooling water. Of the 14 additional pipes identified during the RI, four pipes were associated with a roof drain, a fire suppression water tank drain, a storm water drain, and a hot water boiler drain. The use of the remaining 10 pipes identified during the RI could not be determined; these pipes may potentially have episodic discharge flow; however, these flows were not observed during the RI (PAP-00478777).[10]

During the river wall investigation, flow was observed coming from a pipe located in the wall bulkhead behind Building #10. Aroclor-1260 (0.13 J ug/L) and copper (51.1 ug/L), lead (41.4 ug/L), and mercury (1.8 ug/L) were detected in a water sample collected from this pipe (PAP-00478777; PAP-00479136).[10]

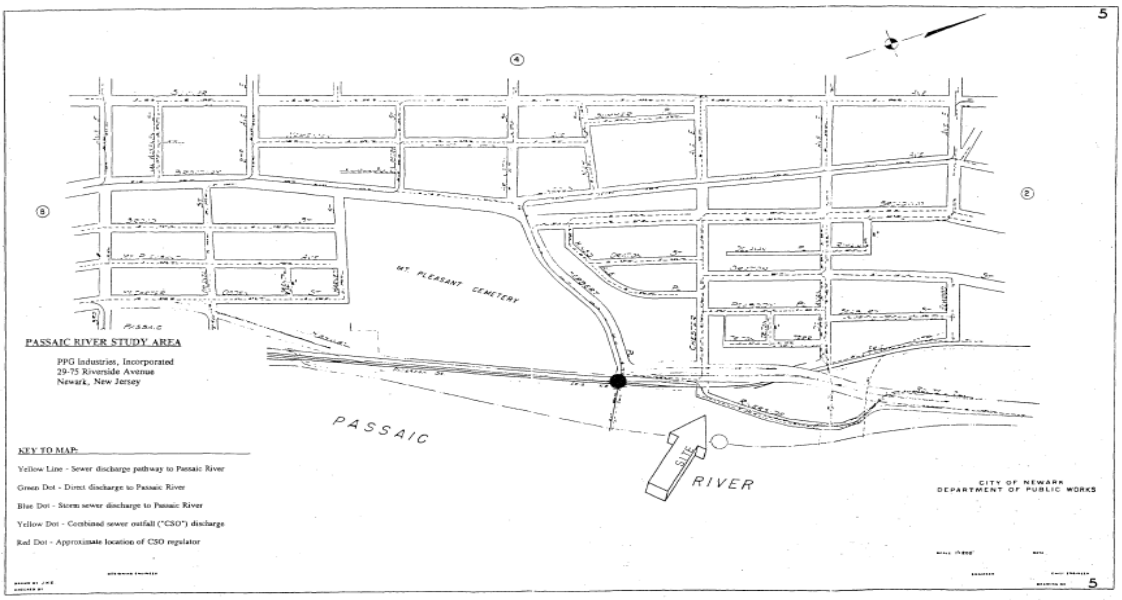
Figure 2-14 shows the location of the river wall pipe sample collected (in purple; PAP-00478906):[10]

[10] This Report was revised to include documents received on May 22, 2020. The additional documents did not change PPG Industries Inc.'s previous certification.



Floor Drains

According to the July 2017 RI/FS Work Plan, the only building documented to have floor drains was the Ardmore Chemical building (Building No. 14) (PAP-00037436, PAS-00044508). The Woodard Report and the July 2017 RI/FS Work Plan assert that the facility had no lagoons, ponds, landfills, disposal pits, dry wells, settling basins, disposal units, or surface water control measures (PAS-00044277; PAP-00037406).



(PAS-00129573)

Spills

There were no reported major spills or releases in the available references. Employees recalled that the company was concerned about safety and that minor spills were cleaned up promptly and placed in 55-gallon drums for disposal off property (PAS-00044290).

The only significant incident mentioned by former employees was a resin building fire in 1969. According to former employees, the 1969 resin building did not result in resin material reaching the river. The resin material was confined to the building (PAS-00044290). According to a PPG employee, a vapor cloud was released from one of the resin reactors in Building 17. Newark City firefighters pumped water from the river into the building and nearby storage tanks to attempt to contain the fire. The building was damaged beyond repair during the fire and was later demolished (PAS-00006303).

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Passaic River Study Area, Potentially Responsible Party Investigation, Summary of Evidence Pertaining to: Pittsburgh Plate Glass Company*, prepared by Kroll Associates (Kroll Report), dated November 1994 (PAS-00080125).
- *Report on PPG Industries, Nexus to Lower Passaic River Study Area*, prepared by Woodard & Curran (Woodard Report), dated September 2016 (PAS-00044232).
- *Remedial Investigation and Feasibility Study Work Plan*, prepared by Woodard & Curran (2017 RI/FS Work Plan), dated July 18, 2017 (PAP-00037395).
- *Site Characterization Summary Report Addendum, Riverside Industrial Park Superfund Site, PPG, Inc.*, dated October 2018 (PAP-00305739).

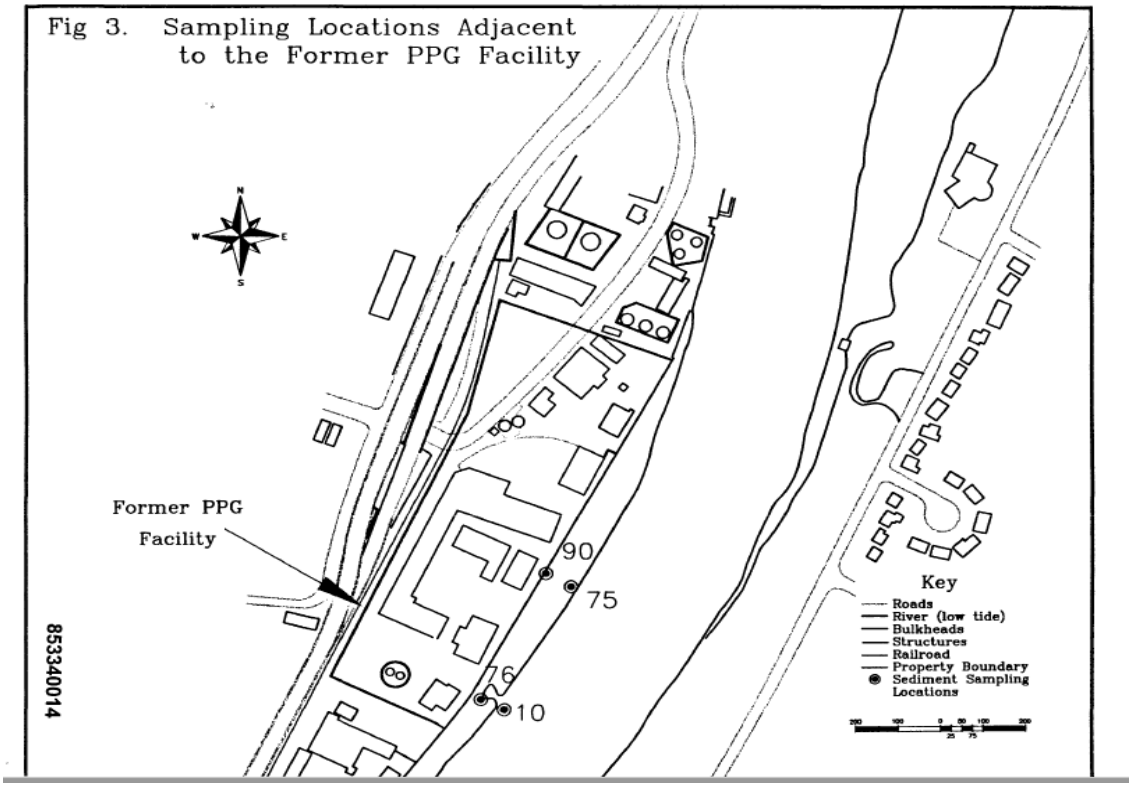
According to the Kroll Report, sediment sampling was conducted at locations in the Passaic River adjacent to the former PPG facility. These sediment samples were analyzed for the presence of organic and inorganic constituents and are detailed below (PAS-00080136).

PAHs/Semi-Volatiles

Elevated background concentrations of semi-volatile compounds were generally found in all sediments collected from this reach of the river. Compounds such as phenanthrene, pyrene, and chrysene were detected at significant concentrations in sediments and are likely resultant from handling, producing, or filling with coal tar and/or petroleum-related materials in the local vicinity. Neighboring facilities of the PPG site have included a bulk oil storage facility and an asphalt plant, which, in addition to PPG's expected use of oil for heating purposes, were likely sources of these materials. Additionally, some of the pigments that may have been used on-site by PPG were produced from coal tars, which may have contributed to the detected concentrations of certain compounds Naphthalene was reportedly used as a raw material for production at the facility (PAS-00080138). Detection limits for this compound in the sample collected immediately adjacent to the site were as high as 19,000 µg/kg. Naphthalene may have been present in this sample at concentrations as high as this, however, according to the Kroll Summary, naphthalene was reported as not detectable (PAS-00080139).

Dioxins

Elevated concentrations of the dioxin 2,3,7,8-TCDD were detected in sediments collected from this reach of the river. Sample 75, collected in March, 1993, adjacent to the facility bulkhead contained concentrations ranging up to 4,400 nanograms (ng)/kg of 2,3,7,8-TCDD. Sample 10, collected in November or December, 1991, in the vicinity of the Herbert Place CSO, and directly offshore of the former resin manufacturing building, contained concentrations ranging up to 32,000 ng/kg of 2,3,7,8-TCDD. The former resin manufacturing building is the anticipated location of phthalic anhydride use by PPG at the facility (PAS-00080139-40). However, the soil dioxin concentration is less than the average concentration in sediment, adjacent to the facility, indicating that this area is not a source of dioxin (PAS-00044302). Additionally, sediment from locations adjacent to and slightly downriver from the facility were selected for congener and homolog fingerprinting to identify a source site. The results of this analysis stated that the source of the soil is herbicide manufacturing and consistent with the 2,3,7,8-TCDD identified for 80 and 120 Lister Avenue (PAS-00044302, 8-9).



(PAS-00080137)

Metals

Based on the Kroll Report, metals utilized by PPG in the production of paint at the facility were also detected in sediments adjacent to the site. Copper, lead, and mercury are all known to have been used at the site (PAS-00080139). The Kroll Report also states that copper was detected at a maximum concentration of 794 mg/kg from sample location 90 at a depth of 22 inches; lead was detected at a maximum concentration of 1050 mg/kg from sample location 90 at a depth of 46 inches; and, mercury was detected at a maximum concentration of 16.3 mg/kg from sample location 90 at a depth of 22 inches (PAS-00080140).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

PUBLIC SERVICE ENTERPRISE GROUP (PSEG) SERVICES CORP
PUBLIC SERVICE ELECTRIC AND GAS
ESSEX GENERATING STATION

Facility Name, Address and Size: Essex Generating Station; 155 Raymond Blvd, Newark, New Jersey 07102. The PSE&G Essex Generating Station ranged in size over the years and currently occupies approximately 43 acres.

According to the *Discharge Prevention Containment and Countermeasure Plan and Discharge Cleanup and Removal Plan and Spill Prevention Control and Countermeasure Plan*, dated April 1999 and *PSEG Fossil LLC Essex Generating Station Discharge Prevention, Containment, and Countermeasure (DPCC) Plan and Discharge Cleanup and Removal (DCR) Plan and Spill Prevention, Control, and Countermeasure (SPCC) Plan* (SPCC Plan), amended January 2011, the Essex Generating Station occupied approximately 46 acres of land (PAP-00131917).

According to a March 12, 1975 Waste Effluent Survey, the Essex Generating Station had 200 employees working three shifts a day, seven days a week. [Note: This survey listed the acreage as 61 acres.] (PAP-00130792).

According to an August 9, 1988 *Questionnaire for Potential Large Commercial Users*, there were zero full time employees at the Essex Generating Station and that employees "remote report" from the Kearny Generating Station (PAP-00130886).

According to a June 30, 1989 Passaic Valley Sewerage Commission (PVSC) sewer connection application there were 10 full time employees working three shifts a day 365 days a year (PAP-00130915).

According to an August 6, 1990, letter transmitting an application to renew Permit No. NJ0000639, the Essex Generating Station was essentially an unmanned facility; the Manager of the Kearny Generating Station and his staff had overall responsibility for the operations at Essex (PAP-00132110).

1. **Business Type:** Electric generating plant (PAP-00130792).

2. **Time Period of Ownership/Operations:**

   Operator: 1915 to Present (PAP-00131333)
   Owner: 1915 to Present (PAP-00354146)

   The following figure from the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station*, dated August 13, 1996 summarizes the various transactions pertaining to the ownership of the site:

NO.	GRANTOR	GRANTEE	DATE	R.E.F.	REMARKS
1	MANUFACTURES EXT. R.R. CO.	THE HOLLAND CO. & P.S.E.&G. CO.	4-20-15	D-3274	EASEMENT
2	THE HOLLAND CO.	P.S.E.&G. CO.	7-23-17	D-400	THE STATE OF N.J. TO THE HOLLAND CO. 7-24-13
	THE HOLLAND CO.	P.S.E.&G. CO.	7-23-17	D-400	THE ESSEX & HUDSON LAND IMP. CO. TO THE HOLLAND CO. 7-23-13
3	THE HOLLAND CO.	P.S.E.&G. CO.	10-21-24	D-1805	C.F. MASSEY CO. TO THE HOLLAND CO. 1-9-72
4	THE HOLLAND CO.	P.S.E.&G. CO.	10-21-24	D-1420	J.R. NUGENT, ET UX. TO THE HOLLAND CO. 2-1-18
5	THE HOLLAND CO.	P.S.E.&G. CO.	10-21-24	D-1420	FIDELITY TRUST CO. TO THE HOLLAND CO. 4-24-18
6	THE HOLLAND CO.	P.S.E.&G. CO.	10-21-24	D-1420	P. LYNDON BRYCE, ET UX. TO THE HOLLAND CO. 4-16-18
7	THE HOLLAND CO.	P.S.E.&G. CO.	10-21-24	D-1970	J.R. NUGENT, ET UX. TO THE HOLLAND CO. 4-9-24
8	THE STATE OF N.J.	P.S.E.&G. CO.	1-21-29	D-2418	THE STATE OF N.J. TO THE HOLLAND CO. 1-21-24 (EASE.)
9	THE STATE OF N.J.	P.S.E.&G. CO.	4-15-29	D-2434	THE STATE OF N.J. TO THE HOLLAND CO. 4-21-24 (EASE.)
10	THE STATE OF N.J.	P.S.E.&G. CO.	6-17-29	D-2465	
11	THE HOLLAND CO.	P.S.E.&G. CO.	11-13-29	D-2491	GEOFFREY T. CLARKSON, ET UX. TO THE HOLLAND CO. 9-30-29
12	THE HOLLAND CO.	P.S.E.&G. CO.	4-30-30	D-2519	UNION TRUST CO. TO THE HOLLAND CO. 2-1-30
13	THE HOLLAND CO.	P.S.E.&G. CO.	4-30-30	D-2533	THE ESSEX & HUDSON LAND IMP. CO. TO THE HOLLAND CO. 3-12-30
14	THE HOLLAND CO.	P.S.E.&G. CO.	4-30-30	D-2521	COMMUNIPAW CENTRAL LAND CO. TO THE HOLLAND CO.
15	THE HOLLAND CO.	P.S.E.&G. CO.	11-29-30	D-2532	KATHERINE MOORE TO THE HOLLAND CO. 7-18-30
16	THE HOLLAND CO.	P.S.E.&G. CO.	11-29-30	D-2531	JOHN C. EISELE, INC. TO THE HOLLAND CO. 7-28-30
17	THE STATE OF N.J.	P.S.E.&G. CO.	7-20-31	D-2661	FOSTER M. VOORHEES & UNION CO. TRUST TO HOLLAND CO. 9-20-26
18	THE HOLLAND CO.	P.S.E.&G. CO.	4-5-35	D-2286	FOSTER M. VOORHEES & UNION CO. TRUST TO HOLLAND CO. 10-19-26
	ALONZO CHURCH, SPECIAL MASTER	P.S.E.&G. CO.	6-5-34	D-2886	THE DAYHILL CORP. TO THOMAS A. HANLON 12-2-31
19	THE CENTRAL R.R. OF N.J.	P.S.E.&G. CO.	7-7-52	D-3417	THOMAS A. HANLON TO THE HOLLAND CO. 3-1-32
20	THE CENTRAL R.R. OF N.J.	P.S.E.&G. CO.	8-7-53	D-3489	
21	N.J. TURNPIKE AUTHORITY	P.S.E.&G. CO.	10-26-53	D-3488	
22	P.S.E.&G. CO.	TRANSCO. GAS PIPELINE CORP.	11-24-50	D-3212	AGREEMENT
23	P.S.E.&G. CO.	TRANSCO. GAS PIPELINE CORP.	5-29-51	D-3252	
24	P.S.E.&G. CO.	N.J. TURNPIKE AUTHORITY	5-16-55	D-3603	
25	P.S.E.&G. CO.	THE STATE OF N.J.	10-26-61	D-4086	
26	ELECTRIC DEPARTMENT	GAS DEPARTMENT	5-2-62	D-1805	ALLOCATION
27	P.S.E.&G. CO.	AMERADA HESS CORP.	6-11-73	D-7710	D-7710 SUPERCEEDED BY S-76-0072 (#30)
28	P.S.E.&G. CO.	N.J. TURNPIKE AUTHORITY	12-29-75	D-6663	RESERVATION IN DEED
29	CITY OF NEWARK	P.S.E.&G. CO.	6-16-76	D-7279	
30	P.S.E.&G. CO.	AMERADA HESS CORP.	6-24-77	S-76-0072	EASEMENT
31	P.S.E.&G. CO.	HOUSING AUTH. OF THE CITY OF NEWARK	2-9-78	S-76-0071	RESERVATION IN DEED
32	P.S.E.&G. CO.	N.J. TURNPIKE AUTHORITY	4-30-79	D-9002	EASEMENT
33	HOUSING AUTH. OF THE CITY OF NEWARK	P.S.E.&G. CO.	4-25-79	S-76-0071A	RELOCATION OF EASEMENT
34	P.S.E.&G. CO.	HOUSING AUTH. OF THE CITY OF NEWARK	10-26-87	S-84-0056	QUITCLAIM & RELEASE OF PORTION OF A GAS PIPELINE EASEMENT

(PAP-00354363)

According to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station*, dated August 13, 1996, in 1973, an Amerada Hess Corporation underground fuel oil pipeline, originating at Hess' Bayonne terminal was installed under the site and placed into service. The Hess Oil Company owned and operated the pipe and held two easements related to the site, dated 1973 and 1977 (PAP-00354207).

3. Operational History/COC Use and Presence at the Facility

According to a *Public Service Electric and Gas Company Essex Generating Station Remedial Action Report*, dated July 1995, PSE&G has been generating electricity at the Essex Generating Station since 1915. In 1995, electricity was produced by four combustion turbine generators that were fueled by either kerosene or natural gas. Natural gas was the primary fuel; kerosene was used as a secondary fuel. Kerosene used for the operation of the combustion turbine generators was stored in an aboveground storage tank located on-site (PAP-00131333).

According to the *Essex Generating Station Assessment*, prepared in September 1999 by Arthur D. Little, the Station began commercial operation in 1915 using two low-pressure turbine generators powered by four low-pressure coal-burning boilers. By 1924, the Station added 20 low-pressure coal-burning boilers and four low-pressure turbine generators. The coal for the boilers was stored in a coal pile located in the approximate center of the property. The low-pressure coal-burning boilers produced bottom ash as a byproduct. This ash was quenched, crushed, and transferred via small rail cars to a wood lined concrete ash pit at the north end of the Station, referred to as the bottom ash pit. The ash was allowed to settle. Decant water was routed to the Passaic River. Settled bottom ash was transported off-site for beneficial commercial use, transported to the Kearny Generating Station and used as fill, or used on the Essex Station property as fill. Twelve low-pressure boilers and one low-pressure turbine generator were removed from service and removed from the property between 1937 and 1946. The remaining low pressure units ceased burning coal in 1966, but continued in service using No. 6 fuel oil (PAP-00132578-79).

In 1937, the electric generating capacity of the station was increased with the addition of one high-pressure turbine generator powered by two high-pressure boilers that were designed to burn either coal or No. 6 fuel oil. Another high-pressure turbine generator and a high-pressure boiler were installed in 1947. This unit was designed to burn coal, No. 6 fuel oil, or natural gas. The high-pressure coal-burning boilers also produced bottom ash and fly ash. Production of ash ended in approximately 1966 when the Station stopped using coal and began burning No. 6 fuel oil on a full-time basis. In the early 1970s, the Station began a phase-out of its steam-powered electric generation. The low-pressure and high-pressure units were completely removed from service in 1978 and were demolished in 1991 (PAP-00132579).

In 1970, a 5.4 million-gallon above ground storage tank was installed in the location of the former fly ash ponds to store distillate oil for use in the combustion turbine units. Oil-burning combustion turbine units have automatic purge oil collection systems to collect unburned fuel that remains in the engine each time a unit is shut down. The system typically collects less than five gallons of fuel each time a unit shuts down. The original collection system consisted of 275-gallon underground tanks and associated valves and piping. In the early 1990s, these purge oil tanks were replaced with new tanks that are contained in underground concrete vaults (PAP-00132579-80).

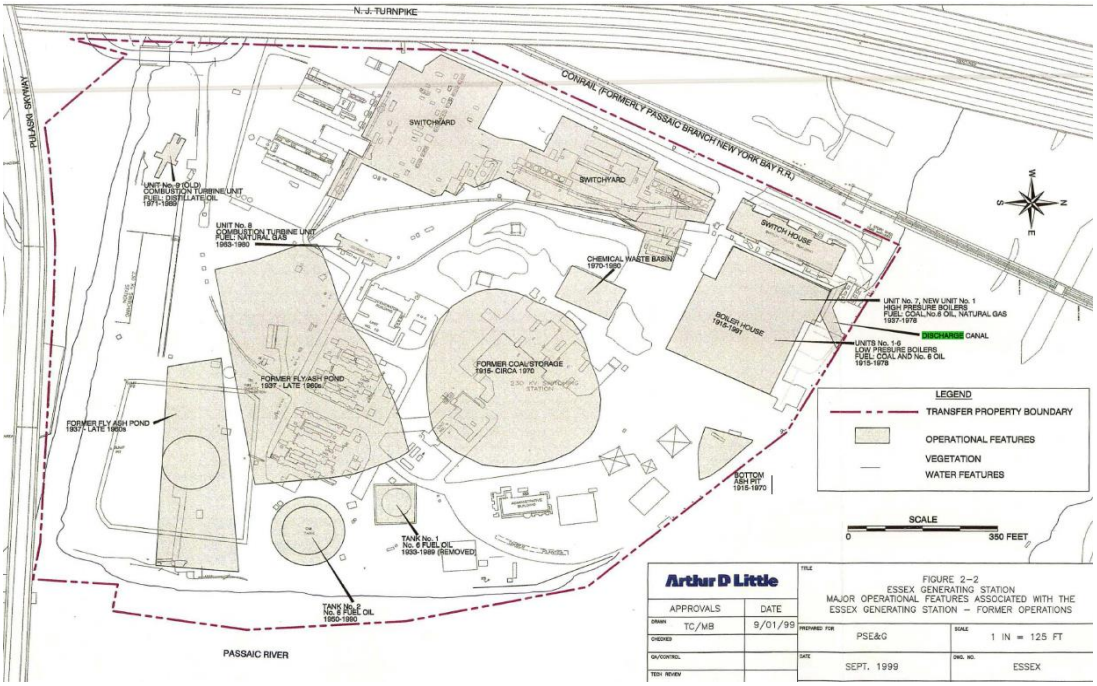
The following figure from the *Essex Generating Station Assessment*, prepared in September 1999 by Arthur D. Little shows the major operational features associated with the Essex Generating Station former operations (PAP-00132596):

PSEG Services Corp - Essex

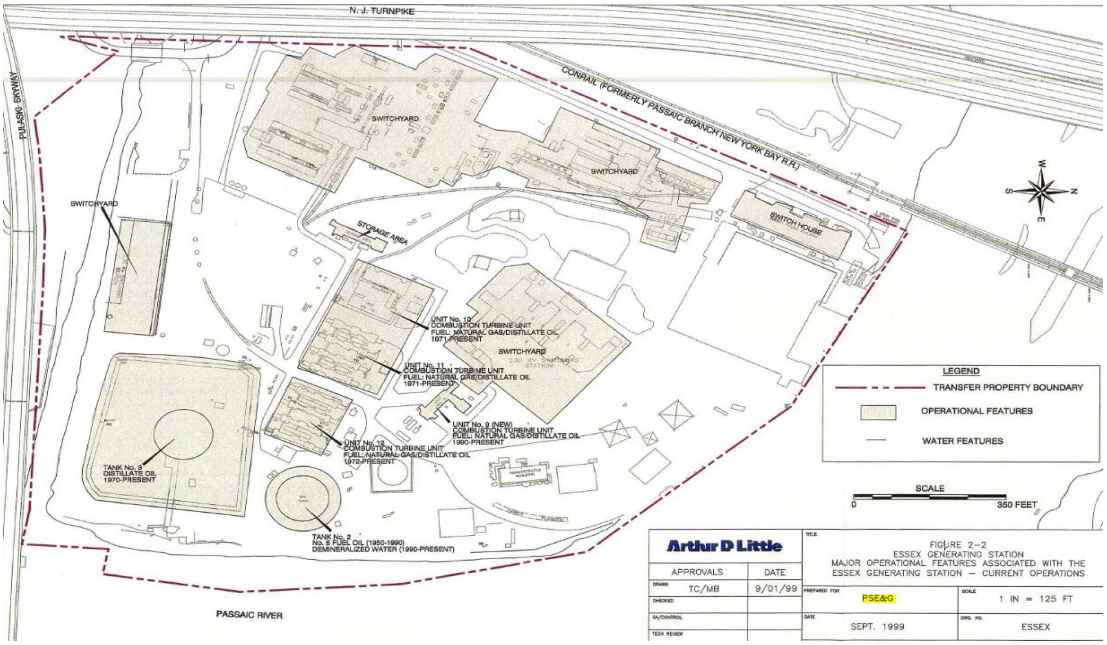
Diamond Alkali OU2 Allocation

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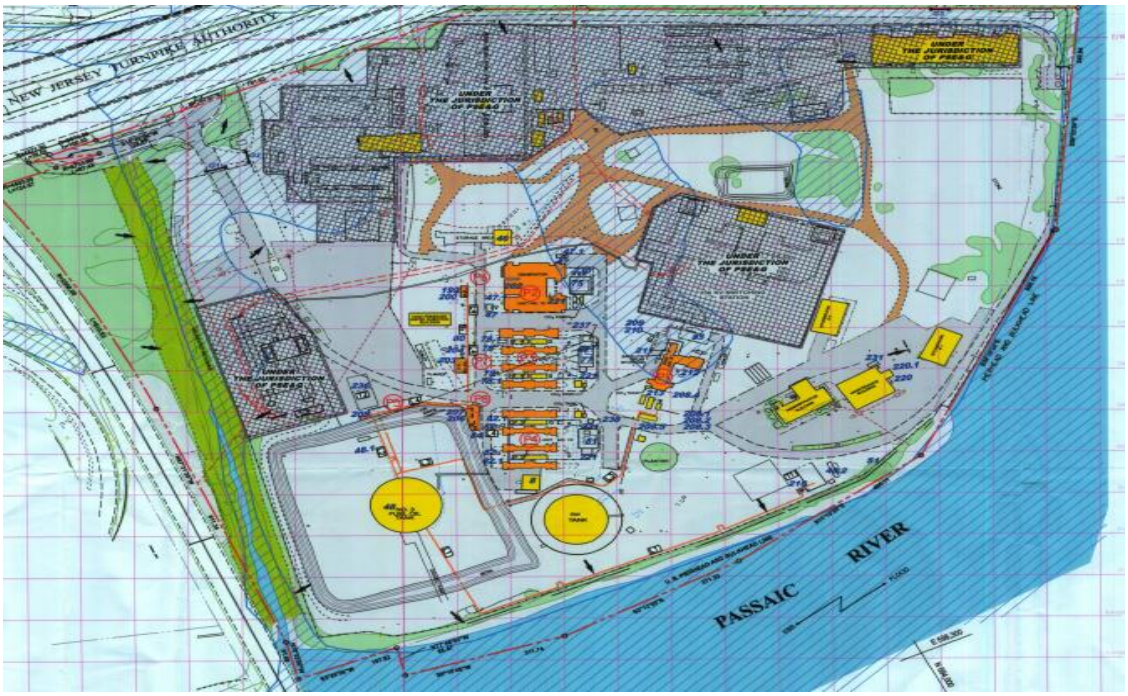
Facility Data Report



The following figure from the *Essex Generating Station Assessment*, prepared in September 1999 by Arthur D. Little shows the major operational features associated with the Essex Generating Station operations as of 1999 (PAP-00132598):



The following figure from the SPCC Plan, amended January 2011, shows the site layout as of August 2010. Note that the cross-hatched areas are under the jurisdiction of PSE&G.



(PAP-00354933)

4. Identified COCs

- PCBs (used, generated, released)
- Dioxins (detected)
- PAHs (used, generated, released)
- Copper (detected)
- Lead (used, detected)
- Mercury (used, released)

PCBs

According to the *Environmental Documentation of Demolition Phase 3 Report, Essex Generating Station*, dated June 1993, during the structural demolition of the decommissioned Essex Generating Station a battery of six oil circuit breakers was observed located bordering the eastern wall of the switch house at the north end of the unpaved area, located between the switch house and turbine area. Three additional oil circuit breakers were also located in this alleyway adjacent to the turbine building (PAP-PAP-00726575). PCBs were detected in many of the drums of oil that were drained from pieces of electrical equipment (i.e., oil circuit breakers) (PAP-00726563).

Sampling of the oil removed from the oil circuit breakers revealed PCB concentrations from 6 ppm to 33,000 ppm. Seven soil samples were also collected below six of the Oil Circuit Breakers. Four of the samples contained PCBs ranging from 170 to 730 µg/kg. The remaining three oil circuit breakers were determined to contain less than 2 ppm PCBs; accordingly no additional soil samples were collected. The interim soil action level for PCBs used by NJDEPE at the time was 1,000 to 5,000 µg/kg. As none of the samples contained PCBs at these concentrations, no further sampling was recommended for this area (PAP-00726575-76).

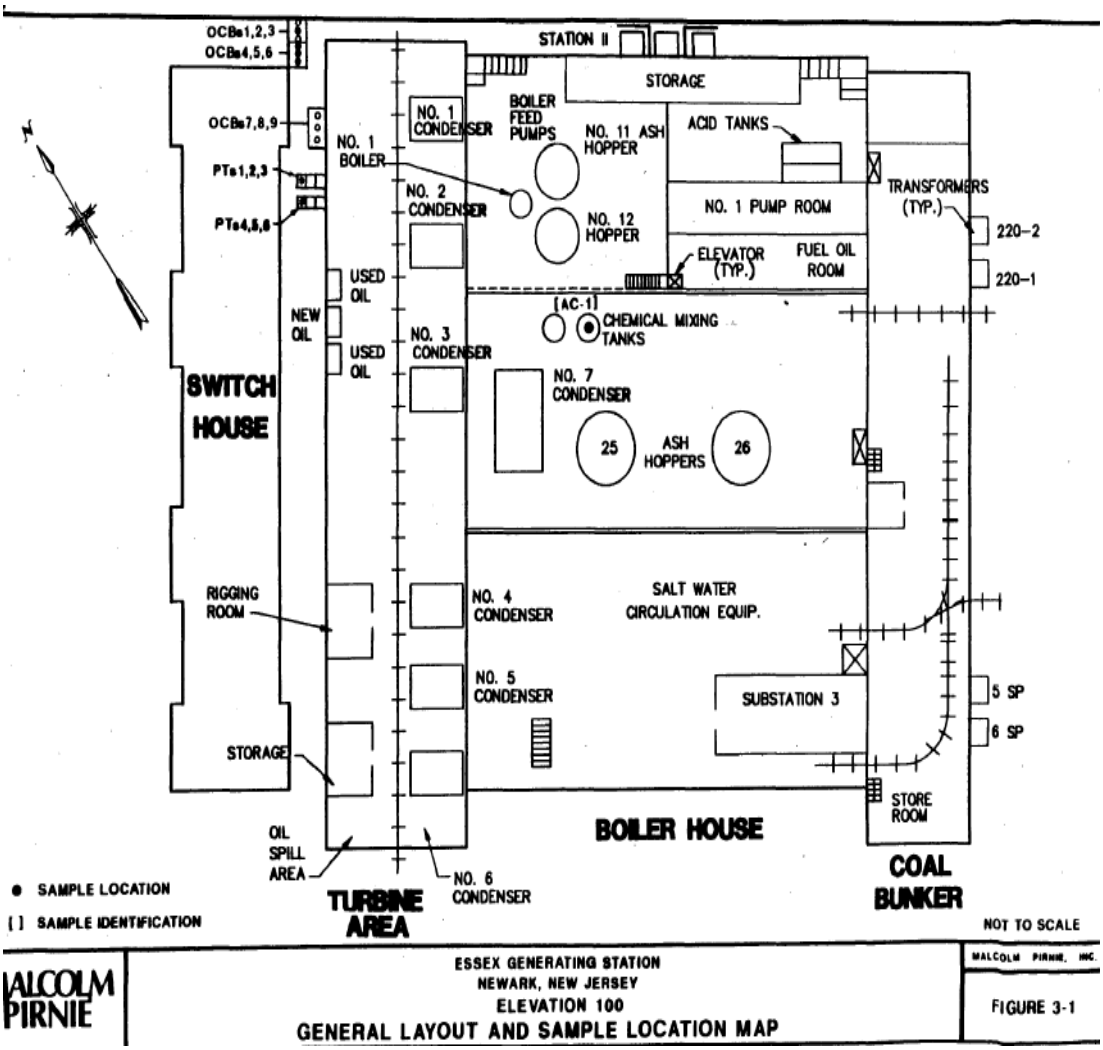
Diamond Alkali OU2 Allocation

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Facility Data Report

According to the *Environmental Documentation of Demolition Phase 3 Report, Essex Generating Station,* during the structural demolition of the decommissioned Essex Generating Station concrete surfaces located within two areas of the Essex Generating Station were observed to be oil stained. These areas were the concrete floor in the turbine building; and the two underlying concrete slabs where the oil pots containing percent levels of PCBs were removed from the potential transformer cabinets. No PCBs were detected in the samples collected within the building. The sample collected below potential transformer 1 contained 13,000 ppm of PCBs, and the sample collected below potential transformer 4 contained 60 ppm. In August 1992, a temporary enclosure was erected around the concrete slabs and the top three inches of the slabs were scarified and drummed (PAP-00726577).

The following figure from the *Environmental Documentation of Demolition Phase 3 Report, Essex Generating Station* shows the locations of the oil circuit breakers (labeled "OCB" on figure) and potential transformers (labeled "PT" on figure):



(PAP-00726585)

According to the SPCC Plan, dated April 1999, the regulated substances and wastes used, stored, handled, and transferred at Essex Generating Station included dielectric fluid (PAP-00131919). [Note: PCBs may be present in dielectric fluid.]

A mineral oil leak from a transformer, located hundreds of feet from the Passaic River or Lawyer's Ditch, occurred on September 16-17, 1993. No discharge to the Passaic River occurred. The mineral oil from the transformer and from the spill area was analyzed and shown to contain 10-11 ppm PCBs. It was estimated that 900 gallons of mineral oil were discharged to the gravel/soil beneath the transformer. Public Service implemented a remedial program, including removal and off-site disposal of all impacted soils (213 tons; soil PCB levels unknown), under NJDEP oversight. Post-excavation soil samples for total petroleum hydrocarbons and polynuclear aromatic hydrocarbons (PAHs) showed the contaminated soil had been removed to Residential Direct Contact Soil Cleanup Criteria (RDCSCC). However, the post-excavation samples were not analyzed for PCBs (PAP-00354243; PAP-00354017, 20-24, 45, 47). PSE&G received a No Further Action in June 1996 (PAP-00354243).

According to correspondence and *Discharge Confirmation Report*, dated September 16, 2005, on August 18, 2005, a discharge was reported in the PSE&G switchyard located on the Essex Generating Station with the probable sources of the discharge being three recently removed 26-KVA oil-filled reactors (Circuit D368). The release involved di-electric mineral oil. It was noted that it was unclear how much dielectric fluid was discharged. PSE&G believed the release was historic, and that the fluid may have been released from a leak in the reactors over a period of time. No sampling was conducted. All impacted bluestone and soil were removed to a depth beyond the level of visual impact. Further, all impacted bluestone was replaced to reestablish the secondary containment area (PAP-00133603-605). [Note: PCBs may be present in dielectric fluid.]

Dioxins

According to the Environmental Screening Study for the New Jersey Turnpike, Eastern Spur, Milepost 107.2 to 108.5, from Louis Berger & Associates, Inc. to the New Jersey Turnpike Authority dated January 1991, the Passaic River bed was dredged in the early 1960s, and the dredged materials were deposited on the river bank, as well as on New Jersey Turnpike Authority property, north of the Passaic River, between the river and Harrison Avenue. Dioxin concentrations from samples taken in 1991 beneath the New Jersey Turnpike bridge ranged from non-detect to 3.2 ppb. In the early to mid-1960s, the river bed was dredged and the dredged materials were deposited on the river bank. In 1960, the New Jersey Turnpike Authority granted approval to Gahagan and Bryan Associates to deposit dredged material on Turnpike property, north of the Passaic River, between River and Harrison Avenue. It is uncertain whether any dredged material was deposited on Turnpike property between the transcontinental pipeline located west of the Turnpike's western spur and the New Jersey Turnpike. Additionally, in 1965, the Authority granted permission to the Public Service Electric and Gas Company for the installation of a temporary dredge pipeline on Turnpike Property in order to pump mud to a disposal area located on Newark Paraffin Company property, on the west side of the Turnpike. The material was presumed to be from a submarine trench that may have contained dioxin (PAS-00013528-39, 47).

According to the *Potential PCB Sources to PRSA*, prepared for Chemical Land Holdings, the area where the dioxin was detected was reported to be part of the PSE&G Essex Generating Station property until at least 1965 (PAS-00124558). There are no citations or available underlying documents to support these statements in the available file material.

PAHs

According to an *Essex Generating Station Assessment*, prepared in September 1999 by Arthur D. Little, the low-pressure coal-burning boilers produced bottom ash as a byproduct. Settled bottom ash was sometimes used on the Essex Station property as fill. Production of ash ended in approximately 1966 when the Essex Generating Station stopped using coal (PAP-00132578-79). [Note: Coal ash could be a source for PAHs.]

Also according to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station,* dated August 13, 1996, PAHs were potentially present in trace amounts in feedstock coal (PAP-00354270).

Soil sampling on the site has detected PAHs (PAP-00139798, 800, 802-803; PAP-00139963-74, 77-78; PAP-00131454-59, 61; PAP-00131719-24; PAP-00131794-801, 816-819; PAP-00132435-47, 52-61; PAP-00354578-82; PAP-00354627-28; PAP-00138506-30). See Section 7, Response Actions, for further information on PAH releases and detection.

Metals – Copper, Lead and Mercury

According to the *Environmental Documentation of Demolition Phase 3 Report, Essex Generating Station*, dated June 1993, during the structural demolition of the decommissioned Essex Generating Station, several Bailey steam gauges were located on the low pressure boilers which contained elemental mercury. During asbestos removal activities, the steam gauges were disturbed, and a small amount of the mercury was accidentally spilled on the floor inside the building. No notification was made since it was determined that the spill was less than the reportable mercury quantity, which is one pound. PSE&G immediately cleaned up the spilled mercury using a mercury spill cleanup kit. Gauge carcasses, mercury contaminated debris, and contaminated personal protective equipment (i.e., gloves, Tyveks) was drummed for disposal. Liquid mercury was drained into appropriate storage containers so that it could be recycled (PAP-00726576-77).

According to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station,* dated August 13, 1996, copper, lead, and mercury were potentially present in trace amounts in feedstock coal. Typical maximum concentrations of copper, lead, and mercury were reported as 160, 590, and 1.25 parts per million by weight, respectively (PAP-00354268-70).

A 2008 Community Right to Know Survey completed on February 25, 2009, listed solid lead as being located at the Essex Generating Station. The location was listed as “facility wide” (PAP-00135721).

Soil sampling on the site has detected copper, lead, and mercury (PAP-00139963-74, 77-78).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the New Jersey Department of Environmental Protection (NJDEP).[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 contaminants of concern (COCs): PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00139963-74; PAP-00132410; PAP-00131794-801).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,080 mg/kg
Copper	1,850 mg/kg
Mercury	3.5 mg/kg
Benzo(a)anthracene	12.0 mg/kg
Benzo(a)pyrene	8.4 mg/kg
Benzo(b)fluoranthene	7.8 mg/kg
Benzo(k)fluoranthene	3.7 mg/kg
Dibenzo(a,h)anthracene	0.81 mg/kg
Indeno(1,2,3-cd)pyrene	2.4 J mg/kg

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] NJDEP, *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

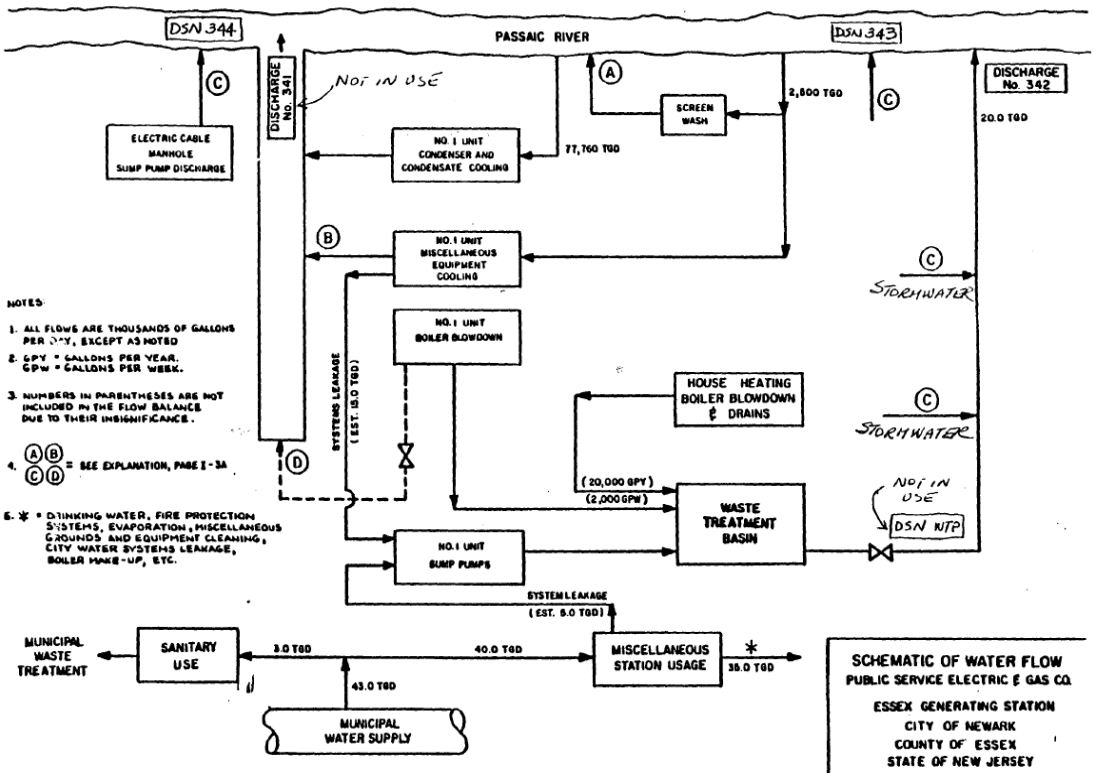
According to a *Public Service Electric and Gas Company Essex Generating Station Remedial Action Report*, dated July 1995, the Essex Generating Station property was filled for industrial development circa 1915 (PAP-00131333).

According to the *Essex Generating Station Assessment,* prepared in September 1999 by Arthur D. Little, the soils at the station property are generally comprised of 10 to 12 feet of fill materials consisting of sand, gravel, silt, and clay with fragments of brick, glass, and metal debris. Below the fill materials are tidal marsh sediments composed of gray to black highly organic silts, meadow mat, and peat ranging in thickness from 7 to 20 feet (PAP-00132583).

According to the *Site Investigation Report for Area of Concern A,* dated December 2015, soils observed during the Site Investigation (SI) performed between June and September 2015 are generally consistent with the soils previously described. Fill material having a thickness of 4 to 10 feet consists of sand, gravel, silt, and clay with fragments of miscellaneous debris such as anthracite coal, glass slag, brick, wood, and crushed cinder slag (PAP-00139929).

5. COC Pathways

The September 10, 1985, Fact Sheet for a draft New Jersey Pollutant Discharge Elimination System (NJPDES) Permit No. NJ0000639 provided the following diagram showing the discharge points at the Essex Generating Station:



(PAP-00130856; PAP-00132175)

Sanitary Sewer

According to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station*, dated August 13, 1996, from 1917 through 1927 sanitary sewage consisting of wastes from cafeteria, bathrooms and showers was collected and transported via pipeline to a cistern. No information is available with respect to the specific character of the wastes and whether, and, if so, what treatment of the wastes was performed there. Available information states that the cistern discharged to the Passaic River. The cistern was abandoned in 1927. Sewage ejectors, receiving pits, sewage pumps and piping were installed and the station's sanitary sewer piping system was connected to the PVSC system. Thereafter, all sanitary sewage from the station was routed to the PVSC. Circa 1970, wastewater from the station's laundry was also routed to the PVSC (PAP-00354211-12, 28).

According to a March 12, 1975, Waste Effluent Survey, the Essex Generating Station discharged 0.015 x 10^9 gallons of water to the sanitary sewer system in 1974 (PAP-00130793). [Note: The constituent characteristics of the effluent were not provided in the source document.]

A March 13, 1975, letter concerning discharges to the Passaic River stated that the Essex Generating Station only discharged normal sanitation wastes into the municipal sewage system; no other wastes including industrial wastes were included (PAP-00130794).

According to a June 30, 1989, letter transmitting a PVSC sewer connection application, the production of electricity using a water cycle at the Essex Generating Station ceased on February 17, 1978, with the retirement of Essex No. 1 Unit. The current (as of 1989) combustion turbine process did not use water in the production of electricity and produced no discharge to the sewerage system (PAP-00130913).

Storm Sewer

According to a March 12, 1975 Waste Effluent Survey, the Essex Generating Station discharged 27.395 x 10^9 gallons of water to the “Storm sewer, River, or Ditch” in 1974 (PAP-00130793). [Note: The constituent characteristics of the effluent were not provided in the source document.]

According to the SPCC Plan, dated April 1999, Essex was issued a revised NJPDES Discharge to Surface Water (DSW) permit on July 1, 1995. The permit authorized the station to discharge treated stormwater, from various secondary containments, to the Passaic River. The primary components of treatment works for this NJPDES facility were a holding tank and an oil/water separator. The oil/water separator was needed to remove any residual oils that may be carried off the surface of the equipment during a storm event. The station was only required to use the oil/water separator when the concentration of petroleum hydrocarbons within the holding tank was in excess of 15 milligrams per liter (mg/L). Otherwise, the stormwater could be discharged directly to the Passaic River. As an alternative to processing contaminated stormwater on the

premises, the Plan stated that Essex may also send this stormwater off-site for treatment (PAP-00131922).

Direct Release

According to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station*, dated August 13, 1996, circa 1948, after New Unit No. 1 commenced commercial operations, non-contact cooling and wastewater effluents were managed for discharge by outfall to the Passaic River via the Discharge Canal Outfall as follows:

Turbine Room Discharges to Discharge Canal Outfall
Saltwater • Discharge and drains from # 1-6 Condensers. • Discharge and drains from # 11-12 Condensate Coolers. • Discharge and drains from #3-6 Generator Air Coolers. • Discharge and drains from #2-6 Turbo Air Pumps. • Discharge and drains from #6A Steam Jet Air Pump. • Discharge and drains from #2-6 Turbine Oil Cooler. • Discharge and drains from #7 Turbine H2 & Oil Coolers. • Cooling water and gland leak-off #2-6A Circulators. • Cooling water and gland leak-off #4-5-6 Saltwater Pumps. • Cooling water and gland leak-off #l-4-5 Air Compressors. • Sump pump and steam syphon discharges. [Note: The sump pump and steam syphon discharges were re-routed in 1959 directly to the Passaic River.] Condensate - City or Service Water • Seal catch-all drains # 11 & 12 Circulators. • Seal catch-all drains # 11 & 12 Condensate Pumps. • Seal catch-all drains #3 & 7 Saltwater Pumps. • Seal catch-all drains #2-6A Condensate Pumps. • Drain from # 1 Condenser Hotwell. • Overboard from #2-6A Condensate Pumps.
No. 2 Pump Room Discharges to Discharge Canal Outfall Indirectly via Station Sewer System
Saltwater • Cooling water #1-3 Primary Feedwater Pumps. • Cooling water #1-3 Secondary Feedwater Pumps. • Turbine seal evactor #1-3 Secondary Feedwater Pumps. • No. 16 Sump Pump and syphon. Condensate - City or Service Water • Gland leak-off catch-alls #1-3 Primary Feedwater Pumps. • Gland leak-off catch-alls #1-3 Secondary Feedwater Pumps: • Freeblows on steam headers. • Overboard and drain from #7 Open Drip Tank. • Overflow from #7 Turbine seals. • Steam Trap discharge from chemical mix tanks. • Overflow from #3 Station Hotwell. Boiler Water

Turbine Room Discharges to Discharge Canal Outfall
• Drains from #25 & 26 Boilers. Feedwater Treatment • Drains from #11-12 & Triplex Chemical Mix Tanks drain to sewer.
No. 3 Pump Room Discharges to Discharge Canal Outfall Indirectly via Station Sewer System
Saltwater • Cooling water #6-8 Boiler Feedwater Pumps. • Steam syphon from trench. • Discharge from steam header manifolds. Condensate • Gland leak-off catch-alls #6-9 Boiler Feedwater Pumps. • Drains from #6-9 Boiler Feedwater Pumps. • Overflow and drains #5-6-7 Open Heaters. • Overflow #3 Surge Tank. • Freeblows and traps from steam headers.
Fuel Oil Room Discharge To Discharge Canal Outfall Indirectly Via Station Sewer System
Saltwater • Cooling water #1-3 Fuel Oil Pump Reduction Gears. Condensate • L.P. Steam Traps on #1-3 Fuel Oil Pump Turbines.
Switch House Discharge To Discharge Canal Outfall Indirectly Via Station Sewer System
• Sump pump discharges condensate from steam traps and seepage. [Note: This line was rerouted directly to the Passaic River in 1959.]
Chlorine and Screen House Discharges to Discharge Canal Outfall
Saltwater • Wash water for Canal Screens. Condensate • Heating system traps.
No. 1 Unit - Elev. 100 Feet
Saltwater • Cooling water # 11-12-13 Mills. • Drain and overflow #11-12 Acid Cleaning Tanks. • Overflow from seal #11-12 Ash Tanks. Condensate • Catch-all drains #11-12-13 Boiler Feedwater Pumps. • Drain from #11 Drain Tank. • Drain from Condensate System. Boiler Water • Drains from #1 Boiler

(PAP-00354219-23)

[Note: The constituent characteristics of the effluents were not provided in the source document.]

According to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station*, dated August 13, 1996, circa 1948, the ash sluice trench was modified and the ash pit was removed from service. The modified ash sluice trench was tied directly to the ash pit overflow outfall. Wastewater effluents routed to this modified outfall included the following:

- Surface runoff
- Laundry effluent
- Boiler Nos. 25 and 26 sluiceway effluents included boiler seal water overflow and miscellaneous leakage from piping and valves
- Surface water runoff and spillage from the chemical unloading area
- Miscellaneous roof and floor drains (PAP-00354223-24)

According to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station*, dated August 13, 1996, the remaining outfalls included the Cable Vault Sump Pump Outfall which drained groundwater and surface water runoff in an electrical cable vault located in the northwest section of property; and the Ash Lake Overflow Outfall which drained overflow in the ash lake from ash sluice from No. 1, No. 25 and No. 26 boilers; and overflow in the ash lake from Air Heater Wash Water from No. 1, No. 25 and No. 26 boilers (PAP-00354224).

According to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station*, dated August 13, 1996, certain wastewater effluents were routed to a naturally occurring on-site drainage ditch which flowed to the Passaic River. Wastewater effluents routed to the drainage ditch included groundwater and surface water collections in the station's other electrical cable vault. Circa 1963, the following effluents were routed to the drainage ditch: boiler blowdown pit overflow, No. 8 combustion gas turbine building and equipment drain and non-contact cooling water, and surface water runoff (PAP-00354224-25).

According to the *Response to USEPA April 30, 1996 Request for Information Essex Generating Station*, dated August 13, 1996, circa 1970, the Essex Generating Station, modified certain processes associated with the management of cooling and wastewater effluents. The principal modification involved the installation of a 288,000-gallon chemical waste basin. The 288,000-gallon chemical waste basin was an above ground structure with a liner and a dike. The installation of the chemical waste basin coincided with the termination of use of coal as a fuel, and the removal of the ash lakes and ash lake overflow outfall from service at the Essex Generating Station. The basin discharge was routed to the former ash pit overflow outfall, Discharge Serial Number (DSN) 342. Certain wastewater effluents were re-routed to the basin for primary treatment prior to discharge to the Passaic River via DSN 342. These wastewater effluents included wastewaters from low pressure boiler blowdown, high pressure boiler air heater washes and high pressure boiler washes. In addition, spent cleaning solutions generated by the chemical cleaning of major equipment were no longer discharged to the Passaic River, but disposed off-site (PAP-00354225).

According to the *Essex Generating Station Assessment,* prepared in September 1999 by Arthur D. Little, the primary wastewater effluent generated at the station was non-contact cooling water, which was discharged to the discharge canal. The volume of this discharge varied over the life of the Station, but normal operation required a flow of greater than 500 million gallons per day. Since 1975, this discharge was authorized by the station's NPDES/NJPDES permit. Secondary wastewater effluents included ash sluice water and wastewaters from building sumps, floor drains, boiler blowdown, and boiler equipment cleanings. These effluents were of low volume, particularly as compared to the non-contact cooling water flow. In some cases, they were intermittent. Prior to circa 1970, with the exception of ash sluice water, these low-volume process wastewaters were routed to the discharge canal where they were commingled with non-contact cooling water prior to discharge to the river. From circa 1970 to 1978, the low-volume process wastewaters were routed to a chemical waste basin for neutralization prior to discharge to the discharge canal. After 1975, all wastewaters were discharged in accordance with the station's NPDES/NJPDES permit (PAP-00132582). By 1999, the only wastewater was stormwater collected from process areas. This stormwater was collected in a 20,000-gallon frac tank and disposed of off-site at an approved facility (PAP-00132582-83).

The *Passaic Valley Sewerage Commissioners Monthly Report* for January and February 1976 reported an incident in January 1976 in which Inspector McLaughlin, accompanied by Supervisor F. D'Ascensio, observed a maintenance crew from Public Service pumping a black oily liquid from a manhole near their Essex Generating Station to the ground where it flowed to Lawyer's Ditch, a tributary of the Passaic River (PAP-00130801-02; PAP-00130804; PAS-00006732-33; PAS-00007007; PAS-00035291-92). The report noted that the manhole from which liquid was pumped was 75 feet from Lawyer’s Ditch. On January 19, 1976, Mr. Rutledge of PSEG called Mr. D’Ascensio of the PVSC to explain that the normal PSE&G procedure for removing liquids from manholes was to pump the materials into a tank truck and subsequently treat it at an oil skimming facility. Additionally, Mr. Rutledge noted that Essex Generating Station employees were aware of this procedure and that the January 14th occurrence was caused by personnel from a different PSE&G facility, and that subsequent to the incident, all PSE&G personnel, had been notified of this procedure in writing (PAS-00006732).

According to the SPCC Plan, dated April 1999, a revised New Jersey Pollutant Discharge Elimination System (NJPDES) Discharge to Surface Water (DSW) permit issued on July 1, 1995 for Essex authorized discharge of treated stormwater, from various secondary containments, to the Passaic River. As an alternative to processing contaminated stormwater on the premises, Essex could send this stormwater off-site for treatment. In addition to the treatment pursuant to the NJPDES permit, stormwater in parts of Essex Station either sheet-flows to the Passaic River, or flows into a drainage ditch southwest of the Essex Station which ultimately discharges to the river (PAP-00131922).

Spills

In addition, according to the report *Potential PCB Sources to PRSA*, prepared for Chemical Land Holdings, dated December 2001, the analysis of a 1940 aerial photograph reportedly identified two discharges (locations not specified) from the site to the Passaic River (PAS-00124557). This was also reported in the undated *Sources of Hazardous Substances in the Passaic River Study* (PAS-00013509, 12). The source of this statement for both of these reports was the report *Historical Aerial Photography Analysis, PSE&G Essex Generating Station, Essex County, New Jersey*, dated February 24, 1995, which also concluded that "no other discharges of liquid into the Passaic River are recognized on any aerial photography studied for this report" (PAS-00013512). According to the *Annual Report by Chief Engineer S. A. Lubetkin to the Passaic Valley Sewerage Commissioners for the Year 1973,* on June 15, 1973, traces of fuel oil were noticed by PSE&G in the circulating water discharge canal. Investigation revealed that the oil came from the pipe trench in the fuel oil room, specifically from a leak in the oil reclaim tank, and it was estimated that approximately 20 gallons of No. 6 oil leaked to the river. The leaking oil for the most part was contained by a fuel oil barge that was moored at the station dock. The spill was reported at 11:15 a.m. to the U.S. Coast Guard, PVSC, U.S. Army Corps of Engineers, NJDEP and EPA were notified. Workmen from Coastal Services Inc. arrived at 11:40 a.m. and vacuumed the oil into a tank truck and removed oil stained rocks from the Passaic River bank approximately fifty yards downstream. The clean-up was completed by 1:45 P.M. the same day (PAS-00034760; PAS-00124558).

According to the *Annual Report by Chief Engineer S. A. Lubetkin to the Passaic Valley Sewerage Commissioners for Operations during the Year 1974,* on November 26, 1974 the PVSC received a call from the Chief Engineer of Public Service Essex Generating Station that the watchman had observed some oil going into the Passaic River at 12:30 P.M. on November 26, 1974. This was traced to a leak from a relief valve which allowed oil to enter the trench leading to their cooling water which discharged to the Passaic River. A boat with a float and absorbent pillows was launched to contain the oil while it was removed from the river. ·Both PVSC and U.S. Coast Guard were notified. PVSC inspected the premise on November 27, 1974, and the inspector reported the clean up as satisfactory (PAS-00034902). [Note: No estimate of the quantity spilled was given.]

According to the *Annual Report by Chief Engineer S. A. Lubetkin to the Passaic Valley Sewerage Commissioners for Operations during the Year 1975,* on June 11, 1975, PVSC received a call from Public Service about an oil spill in a ditch on their property leading to the Passaic River. The EPA and U.S. Coast Guard were also informed. Inspector McLaughlin investigated and saw a boom across the ditch with absorbent pads holding back and absorbing an oily film in a small ditch located approximately 300 feet west of the N.J. Turnpike. In the vicinity were four 5-gallon cans with remains of a petroleum type liquid which had apparently been dumped into the ditch. In addition, about 50 feet away was another area where oil had been dumped and flowed into the ditch. Investigation revealed that the latter dump could be attributed to a PSE&G tank truck working with Electric Transmission Distribution Division, which had pumped water from a Public Service manhole at 400 Market Street, Newark. When the dump was made they realized the liquid also contained oil and gasoline. They were investigating a

possible underground leak from a nearby gasoline station. Clean-up was completed June 13, 1975. As per the PVSC request, residue from the manhole cleaning truck was discharged into existing skimming facilities located at Irvington and Roseland. This was confirmed in a letter from Public Service dated June 19, 1975 (PAS-00035072). [Note: No estimate of the total quantity spilled was given.]

The *Passaic Valley Sewerage Commissioners Monthly Report for January and February 1976* reported an incident in January 1976 in which Inspector McLaughlin, accompanied by Supervisor F. D'Ascensio, observed a maintenance crew from Public Service pumping a black oily liquid from a manhole near their Essex Generating Station to the ground where it flowed to Lawyer's Ditch, a tributary of the Passaic River (PAP-00130801-02, PAP-00130804; PAS-00007007; PAS-00035291-92). The report noted that the manhole from which liquid was pumped was 75 feet from Lawyer's Ditch (PAS-00006732). On January 19, 1976, Mr. Rutledge of PSE&G called Mr. D'Ascensio of the PVSC to explain that the normal PSE&G procedure for removing liquids from manholes was to pump the materials into a tank truck and subsequently treat it at an oil skimming facility. Additionally, Mr. Rutledge noted that Essex Generating Station employees were aware of this procedure and that the January 14th occurrence was caused by personnel from a different PSE&G facility, and that subsequent to the incident, all PSEG personnel, had been notified of this procedure in writing (PAS-00006732).

On November 2, 1989, NJDEP issued a Duty Officer Notification Report documenting a spill of 800 gallons of mineral oil at the Essex Generating Station (PAP-00130937). Note: The report stated contamination of land and not water. Similarly, a Duty Officer Notification Report from June 4, 1990 stated that a leak of 200 gallons of No. 2 fuel oil was contained within the containment dike area (PAP-00130938). Further, the November 2, 1989 report states that the spill was terminated and spilled substance was contained (PAP-00130937).

According to a September 25, 1992, amendment to the application to renew NJPDES-DSW Permit No. NJ0000639, the amendment addressed a pump and treat surface water discharge to the Passaic River which resulted from a groundwater remediation project at Essex. On January 28, 1991, an underground fuel transfer line at Essex developed a leak, resulting in the discharge of kerosene to the local ground and surface waters. On May 5, 1992, PSE&G and the DHWM concurred that the operation of the pump and treat system should be discontinued pending a review of the most recent well sample data. This concurrence was followed on May 12, 1992 by a request by PSE&G to permanently terminate the pump and treat operation at Essex due to a significant reduction in the levels of pollutants in the groundwater over time. A response from the DHWM was pending the review of well sample data for the month of August 1992 (PAP-00131058; PAP-00132118).

Correspondence dated December 8, 1992, and an undated *Discharge Confirmation Report* reported that on November 24, 1992, PSE&G Essex Generating Station reported a discharge of approximately 3,000 gallons of kerosene to the ground. The soils which came in contact with the product were removed and disposed of in accordance with applicable regulations (PAP-00131140-45). The documents do not state that the spill reached the Passaic River. The discharge confirmation report provided to the NJDEP

states that the cleanup began within hours of the reported spill and was completed the following day. The report states that "[a]reas where product made contact with the soil were removed and placed into an onsite oily waste dumpster for future disposal. Liquid waste was placed in storage on the hazardous waste pad for future disposal at an approved TSDF" (PAP-00131142).

In November 1992, sixteen purge oil USTs were removed (each designated as an AOC #1-16), and a discharge was discovered (PAP-00132404). An *Underground Storage Tank Site Assessment Summary*, dated April 1, 1993, documented a diesel fuel discharge which resulted in contamination of the ground. Sampling was conducted and 292,700 ppb of base-neutral compounds were still in the ground (PAP-00131209-11). [Note: The specific base-neutral compounds detected were not provided.]

A mineral oil leak from a transformer, located hundreds of feet from the Passaic River or Lawyer's Ditch, occurred on September 16-17, 1993. The cited document states no discharge to the Passaic River occurred. The mineral oil from the transformer and from the spill area was analyzed and shown to contain 10-11 ppm PCBs. It was estimated that 900 gallons of mineral oil were discharged to the gravel/soil beneath the transformer. Public Service implemented a remedial program, including removal and off-site disposal of all impacted soils (213 tons; soil PCB levels unknown), under NJDEP oversight (PAP-00354243; PAP-00354017, 20-24, 45, 47). No Further Action was approved in June 1996 for this spill (PAP-00354243).

Correspondence dated May 26, 1995, submitted a Confirmation Report for Case No. 95-5-3-1312-02 documenting a historical spill at the Essex Generating Station. The spill involved turbine lubricating oil and was reported on May 3, 1995. The area of concern was located near the center of the site, distant from the Passaic River (PAP-00131412). The Unit No. 9 Gas Turbine Generator had been decommissioned after a fire in 1988 (it had operated from 1971 until 1988); while the turbine section was decommissioned, the generating section remained, but was inactive. The generator section was left intact on top of a concrete foundation. On April 26, 1995, PSE&G personnel discovered oil in a vault located in the northeastern comer of the unit's concrete foundation. On April 27, 1995 and May 2, 1995, PSEG personnel and its consultants discovered that the soil beneath the foundation had settled, creating a void where the oil collected. The cited document states "PSE&G experts have posited that the oil was discharged from the unit's lubricating oil storage tank, which had previously been dismantled and removed" (PAP-00131411-12). Reportedly 2,845 gallons of product had been removed with about ¼-inch remaining (PAP-00139670-71). PSE&G had a sample of the discharged oil analyzed. COCs which were detected in the oil included acenaphthene at 80,000 μg/kg, fluorene at 18,000 μg/kg, fluoranthene at 26,000 μg/kg, and pyrene at 70,000 μg/kg (PAP-00139692-93). The soil remediation of both the lubricating oil and kerosene oil areas was deemed complete as of November 1995 when TPH concentrations were below 10,000 ppm and all VOCs and PAHs met the NJDEP RSCC (PAP-00131413-14). An NFA was issued for this remediation in March 2012 (PAP-00139729).

According to correspondence and attached *Discharge Confirmation Report*, dated September 16, 2005, on August 18, 2005, a discharge was reported in the PSE&G switchyard located on the Essex Generating Station with the probable sources of the discharge being three-recently removed 26-KVA oil-filled reactors (Circuit D368). The release involved di-electric mineral oil. It was noted that it was unclear how much dielectric fluid was discharged. PSE&G believed the release was historic, and that the fluid may have been released from a leak in the reactors over a period of time. Underlying gravel and soil was removed to a depth where visually it was not impacted. The total volume of material removed was approximately 30 cubic yards, or 19,000 kilograms. No sampling was conducted because, according to PSE&G, all impacted bluestone and soil were removed to a depth beyond the level of visual impact (PAP-00133603-605). [Note: PCBs may be present in dielectric fluid.]

On March 5, 2009, PSE&G submitted a *Historical Fuel Oil Discharge Notification* to NJDEP for oily soil discovered on February 25, 2009, during excavation activities on the Essex site. Immediate containment measures were implemented followed by cleanup and removal activities. It was reported that oil was immobilized within the soil, never entering the waters of the state or migrating off-site. PSE&G attributed the source to underground kerosene lines which had been removed prior to 1978 and this discharge could only have occurred prior to January 23, 1980 (PAP-00135754).

According to the *Preliminary Assessment Report for Historical Kerosene Discharge*, dated September 2010, oily soil was discovered on February 25, 2009, during excavation activities on the Essex site. The discharge occurred at the southeast corner of Generator Unit No. 11. Generator Unit No. 11 is located in the central portion of the property. The area where visually impacted soil was observed was approximately 30 feet long by 10 feet wide to a depth of 4 feet. An inquiry was conducted to identify the source of the oil. It was found that underground kerosene piping was situated in the vicinity of the excavation area. This piping was removed prior to 1978 and replaced with above ground piping. The above ground kerosene piping was in excellent condition, with no sign of leakage and inspected regularly by operators during their environmental rounds. As there was no other known potential source of the discharge, Essex asserted that the underground kerosene lines were the source of the discharge discovered during excavation on February 25, 2009 and this discharge could only have occurred prior to January 23, 1980. Following the discovery, work in the vicinity of the discharge was stopped and immediate containment measures were implemented, followed by cleanup and removal activities. A Case number for this spill was not assigned; the site was referred to as AOC-1 (PAP-00136876, 86, 96, 98). [Note: This appears to be the same spill described in the March 2009 *Historical Fuel Oil Discharge Notification*.]

According to the SPCC Plan, dated April 1999, potential off-site discharge points from Essex which could be impacted from potential spill events included Lawyers Ditch and the Passaic River. The Plan described the potential spill events as pipeline failure, Tank No. 3 failure, truck unloading area spill, or a transformer leak (PAP-00131981).

The SPCC Plan, amended January 2011, reported the following spills which may have involved COCs (PAP-00355050-51):

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

Spills				
Substance	**Date**	**Quantity**	**Location**	**Corrective Actions Taken**
Oily water	1/31/2009	~150 gallons	Construction Excavation-site	Vacuum trucks used, oily gravel removed and taken off-site for disposal.
Oily soaked soil	2/25/2009	Unknown (Historic spill)	Former underground kerosene piping	Contaminated soil was excavated and disposed. Cleanup and removal activities were implemented. Upon sampling soil and groundwater in 2012, no contaminants associated with the historical kerosene discharge were identified. An unrestricted response action outcome was recommended (PAP-00139753).
Oil Water	2/26/2009	<1 gallon	Unit No. 9 Fuel Oil Filter secondary containment area	Oily water was pumped out of the containment and the surround gravel was excavated and removed
Oil	1/3/2010	40 gallons	Unit No. 10 sensing line	Oil was vacuumed out of the engine compartment and oil the contaminated gravel was excavated, placed inside drums and removed.
Oil	5/4/2010	1 quart	PSE&G Transmission & Distribution Oil Circuit Breakers (OCBs) located on-site	Contaminated gravel was excavated and removed. A secondary containment was installed around the OCB.
Dielectric Fluid for Transformer	10/5/2010	½ gallon	Spill on asphalt surface	Speedy dry placed on area. Area swept and speedy dry was placed in a drum and taken off-site.
Dielectric Fluid from a Pole Top Transformer	10/26/2010	40 gallons	Parking lot	Drains were blocked to prevent the escape of fluid. Speedy dry and absorbent pads were used to soak up oil. Waste material was taken off-site for disposal.
Oil	3/12/2011	10 gallons	Inside new product storage area	This leak was inside a secondary containment. The leaked product was cleanup up and disposed of.
Lube Oil	4/14/2011	10 gallons	Unit No. 9 Lube Cooler Head	Vacuum truck used to remove freestanding product. Absorbent pads and speedy dry was used to soak up the liquid.

6. Regulatory History/Enforcement Actions

Inspections

The *Passaic Valley Sewerage Commissioners Monthly Report for January and February 1976* reported an incident in January 1976 in which Inspector McLaughlin, accompanied by Supervisor F. D'Ascensio, observed a maintenance crew from Public Service pumping a black oily liquid from a manhole near their Essex Generating Station to the ground where it flowed to Lawyer's Ditch, a tributary of the Passaic River (PAP-00130801-02, PAP-00130804; PAS-00006732-33; PAS-00007007; PAS-00035291-92). The report noted that the manhole from which liquid was pumped was 75 feet from Lawyer's Ditch (PAS-00006732).

On January 19, 1976, Mr. Rutledge of PSE&G called Mr. D'Ascensio of the PVSC to explain that the normal PSE&G procedure for removing liquids from manholes was to pump the materials into a tank truck and subsequently treat it at an oil skimming facility. Additionally, Mr. Rutledge noted that Essex Generating Station employees were aware of this procedure and that the January 14th occurrence was caused by personnel from a different PSE&G facility, and that subsequent to the incident, all PSE&G personnel, had been notified of this procedure in writing (PAS-00006732).

On February 23, 1991, NJDEP investigated the Essex Generating Station as follow-up to the January 28, 1991 discharge of kerosene from a leaking underground fill line. It was noted that 125 gallons of product had been recovered February 22, 1991. It was also noted that there was an area approximately 10-12 feet wide where some light discharge was still occurring. This was being addressed through the use of absorbent sweep pads. An inspection of the ends of the boom showed no accumulation of escaping product and only an occasional sheen was observed outside the boom (PAP-00131046-47). The February 23, 1991 NJDEP Investigation report stated that "Any product that continued to discharge into the river through the shoreline was captured by absorbent booms placed in the water. A hard boom was placed beyond that to trap anything that escaped the absorbent boom." (PAP-00131046-47). NJDEP issued an NOV requiring PSE&G to implement a remedial action program for the incident. This NOV was resolved by entering into a Memorandum of Agreement (MOA), pursuant to which a site remediation program was implemented. This program included media characterization, excavation and off-site disposal of contaminated soils and a groundwater recovery and monitoring program. PSE&G completed the site remedial program and the NJDEP issued PSE&G a No Further Action Letter in June 1994 (PAP-00354241).

Violations

According to the *Annual Report by Chief Engineer S. A. Lubetkin to the Passaic Valley Sewerage Commissioners for the Year 1973,* on June 15, 1973 traces of fuel oil were noticed by PSE&G in the circulating water discharge canal. Investigation revealed that the oil came from a leak in the oil reclaim tank, and it was estimated that approximately 20 gallons of No. 6 oil leaked to the river. The leaking oil for the most part was contained by a fuel oil barge that was moored at the station dock. The U.S. Coast Guard, PVSC, U.S. Army Corps of Engineers, NJDEP and EPA were notified. Workmen

vacuumed the oil into a tank truck and removed oil stained rocks from the Passaic River bank approximately fifty yards downstream. The clean-up was completed 1:45 P.M. the same day (PAS-00034760).

According to the *Annual Report by Chief Engineer S. A. Lubetkin to the Passaic Valley Sewerage Commissioners for Operations during the Year 1974,* on November 26, 1974 the PVSC received a call from the Chief Engineer of Public Service Essex Generating Station that the watchman had observed some oil going into the Passaic River at 12:30 PM on November 26, 1974. This was traced to a leak from a relief valve which allowed oil to enter the trench leading to their cooling water which discharged to the Passaic River. A boat with a float and absorbent pillows was launched to contain the oil while it was removed from the river. ·Both PVSC and U.S. Coast Guard were notified. PVSC inspected the premise on November 27, 1974 and the inspector reported the clean up as satisfactory (PAS-00034902). [Note: No estimate of the quantity spilled was given.]

According to the *Annual Report by Chief Engineer S. A. Lubetkin to the Passaic Valley Sewerage Commissioners for Operations during the Year 1975,* on June 11, 1975 PVSC received a call from Public Service about an oil spill in a ditch on their property leading to the Passaic River. The EPA and U.S. Coast Guard were also informed. Inspector McLaughlin investigated and saw a boom across the ditch with absorbent pads holding back and absorbing an oily film in a small ditch located approximately 300 feet west of the N.J. Turnpike. In the vicinity were four 5-gallon cans with remains of a petroleum type liquid which had apparently been dumped into the ditch. Note: The Report does not in any way attribute this spill to PSE&G or its operations. In addition, about 50 feet away was another area where oil had been dumped and flowed into the ditch. Investigation revealed that the latter dump could be attributed to a PSE&G tank truck working with Electric Transmission Distribution Division, which had pumped water from a Public Service manhole at 400 Market Street, Newark. When the dump was made they realized the liquid also contained oil and gasoline. They were investigating a possible underground leak from a nearby gasoline station. Clean-up was completed June 13, 1975. As per the PVSC request, residue from the manhole cleaning truck was discharged into existing skimming facilities located at Irvington and Roseland. This was confirmed in a letter from Public Service dated June 19, 1975 (PAS-00035072). Note: No estimate of the total quantity spilled was given.

In January 1991, PSEG was issued a *Notice of Violation* by the NJDEP for the January 28, 1991 discharge of kerosene from a leaking underground fill line at its Essex Generating Station at 155 Raymond Blvd. (PAP-00131028-29; PAP-00131033; PAP-00131037). A citizen report to the NJDEP the same day and NJ State Police report on February 2, 1991, reported oil sheen on the Passaic River (PAP-00131038-39). On February 4, 1991, NJ State Police issued Summons No. 55756 to PSE&G, Essex Generating Station for the kerosene pollution (PAP-00131040; PAP-00131041). A February 14, 1991, letter from PSE&G to NJDEP discussing the initial and follow on response to the spill stated that 10,700 gallons of the calculated maximum of 13,000 gallons had been recovered (PAP-00131043). A second phase of the remediation was being commenced to address remaining free product. NJDEP issued an NOV requiring PSE&G to implement a remedial action program for the incident. This NOV was resolved by entering into an MOA, pursuant to which a site remediation program was

implemented. This program included media characterization, excavation and off-site disposal of contaminated soils and a groundwater recovery and monitoring program. PSE&G completed the site remedial program and the NJDEP issued PSE&G a No Further Action Letter in June 1994 (PAP-00354241).

Permits

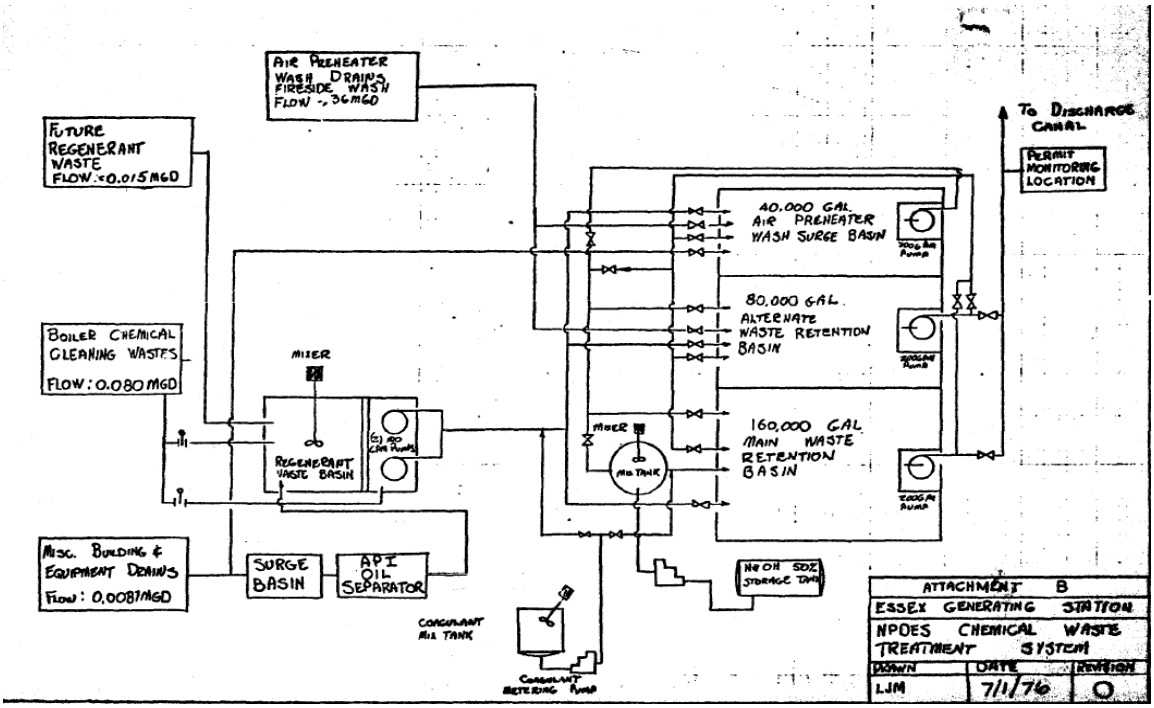
PSE&G Essex Generating Station Permit Summary				
Permit No.	**Issued**	**Use**	**Dates**	**Discharge Limits**
NJ0000639	EPA	All discharges	January 31, 1975 to January 3, 1980	Beginning July 1, 1977: Daily maximum of 1.0 mg/L for total copper and 20 mg/L for oil & grease. The daily average limitation for oil & grease was 15 mg/L.
On July 31, 1979 (revised February 4, 1980) PSE&G submitted an Application to renew Permit NJ0000639. Note: The actual permit was not provided.				
NJ0000639	EPA	All discharges	March 1, 1986 to February 28, 1991	Aldrin/dieldrin [0.0019 micrograms per liter (μg/L)], PCBs (0.03 μg/L), Dichlorodiphenyl-trichloroethane (DDT) and metabolites (0.001 μg/L), petroleum hydrocarbons (15 mg/L)
79-8-76 NJ0000639	NJDEP	Discharge Prevention, Containment	September 1, 1986 with no expiration date.	Not listed
91-01-28-1450	DHWM	Emergency discharge to surface water from treatment system	February 25, 1991, 90 day reauthorizations, last issued March 24, 1992.	Same as NJPDES-DSW NJ0000639
On August 6, 1990, Essex Generating Station filed an application to renew Permit No. NJ0000639. [Note: The actual permit was not provided.]				
NJ0000639	EPA	All discharges	July 1, 1995 to June 30, 2000	Petroleum hydrocarbons (15 mg/L)
On December 22, 1999, PSE&G submitted their application to renew NJPDES-DSW Permit No. NJ0000639. [Note: The actual permit was not provided.]				
NJ0000639	EPA	All discharges	June 1, 2004 to May 31, 2009	Petroleum hydrocarbons (15 mg/L)
Draft NJ0000639	EPA	All discharges	February 17, 2009 to Unknown	Petroleum hydrocarbons (15 mg/L)
NJ0000639	NJDEP	Stormwater discharges	July 1, 2009 to June 30, 2014	Petroleum hydrocarbons (15 mg/L)
Not applicable	NJDEP	Discharge of dewatering groundwater	180 calendar beginning on occurrence of discharge	Not listed

On December 30, 1974, the EPA issued NJPDES-DSW Permit No. NJ0000639 to Essex Generating Station. The permit authorized the Station to discharge to the Passaic River. The permit was effective from January 31, 1975 to January 3, 1980 (PAP-00130732). Discharge limitations for DSNs 341, 342A and 342B did not include that for any COCs (PAP-00130735-76). Discharge limitations for the waste treatment plant effluent beginning July 1, 1977, and lasting until the date of expiration included a daily maximum of 1.0 mg/L for total copper and 20 mg/L for oil & grease. The daily average limitation for oil & grease was 15 mg/L. The waste treatment plant effluent was noted to include low volume wastes, boiler blowdown and metal cleaning wastes (PAP-00130737).

According to the Engineering Report for Essex Generating Station Environmental Protection Agency National Pollutant Discharge Elimination System Permit No.: NJ 0000639 during the period beginning July 1, 1977, and lasting until the date of expiration for the permit the discharge limits for copper were as follows:

- DSN 342A (Air Heater Wash): 1.6 kg/wash or 3.6 lb/wash
- DSN 342B (Fireside Wash Water: 0.57 kg/wash or 1.25 lb/wash (PAP-00353613)

The discharge limitations for copper were previously 0.8 kg/wash or 1.8 lb/wash (PAP-00353612). An included diagram of the NPDES Chemical Waste Treatment System dated July 1, 1976 included the following flow rates: Air Preheater Wash Drains/Fireside Wash (0.36 MGD); Future Regenerant Waste (0.015 MGD); Boiler Chemical Cleaning Wastes (0.080 MGD); and Misc. Building and Equipment Drains (0.0081 MGD) (PAP-00353624).



(PAP-00353624)

On July 31, 1979 (revised February 4, 1980) PSE&G submitted an Application to renew Permit NJ0000639. The application was for two discharge points: DSN 341, main circulating water, and DSN 342, waste treatment basin discharge (PAP-00130818-43).

The water discharge rates were given as follows:

- Two Discharge Points to Surface Water: 80,265,000 gallons/day
- One Discharge Point to Sanitary Sewer: 3,000 gallons/day (PAP-00130820; PAP-00353627).

The July 31, 1979 (revised February 4, 1980) Application also stated that boiler drains periodically go to the discharge canal. This may occur once or twice during the proposed operational period. The volume of approximately 20,000 gallons was expected to contain less than 1.0 mg/L of copper (PAP-00130821). [Note: The actual permit was not provided.]

According to a March 31, 1985 *Fact Sheet* for Permit No. NJ0000639, the facility at the time had a permit to discharge stormwater through three outfalls, DSNs 342, 343, and 344; and treated groundwater through one outfall DSN 345T. However, the permittee no longer discharges stormwater through DSN 342,343, or 344. Instead, the permittee proposed to discharge stormwater that accumulated within secondary spill containment areas through a new outfall designated as outfall DSN 346. This permit action would simultaneously terminate outfalls DSN 342, 343, 344, and 345T and permit outfall DSN 346 in this permit renewal. DSN 346 would intermittently discharge an average of approximately 0.006 MGD of stormwater, once per week, to the Passaic River. When necessary, the stormwater was treated through an oil/water separator prior to discharge (PAP-00131288-89). The discharge limitation for petroleum hydrocarbons was 15 mg/L (PAP-00131291). [Note: No other discharge limitations were listed.]

On January 6, 1986, Essex Generating Station was issued NJPDES Final Permit No. NJ0000639. The permit took effect on March 1, 1986, and expired February 28, 1991 (PAP-00130859; PAP-00132139). The discharge limitation for petroleum hydrocarbons was 15 mg/L (PAP-00130877). Additional effluent discharge limitations included aldrin/dieldrin (0.0019 μg/L), PCBs (0.03 μg/L), DDT and metabolites (0.001 μg/L) (PAP-00130879; PAP-00132159).

On August 27, 1986, NJDEP issued to Essex Generating Station a Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR) Permit No 79-8-76 NJ0000639. The permit was effective beginning September 1, 1986, with no expiration date. It was noted that the permit did not relieve PSE&G from obligations to meet effluent limitations (PAP-00130881). [Note: No effluent limitations were listed.]

On August 3, 1990, Essex Generating Station filed an Application for Exemption for NJPDES Permit No. NJ0000639 retaining discharge No. 343 and terminating discharge Nos. 341, 342 and 344 which were no longer discharging as sections of the facility were no longer in service (PAP-00130986; PAP-00131000-02). Discharge No.343 was

described as untreated sump pump discharge from the basement of Essex's service building; this was untreated stormwater and river water that collected inside of the building. This discharge was only used in case of water ingress from heavy rains, high tide seepage through the walls, etc. Since this discharge was located in a remote section of an inactive building, it was rarely used. The last reported flow was 75 gallons on March 1988 (PAP-00131018).

On August 6, 1990, Essex Generating Station filed an application to renew Permit No. NJ0000639 which allowed the discharge of sump pump discharge from the basement of Essex's service building of untreated stormwater and river water that collected inside the building into the Passaic River (PAP-00130989; PAP-00132110). On September 24, 1992, Essex Generating Station requested an endorsement from PVSC for an amendment adding two additional sources; a proposed surface water discharge of stormwater collected from existing on-site secondary containments and an existing discharge to surface waters resulting from an on-site groundwater remediation program (PAP-00132112). [Note: The actual permit was not provided.]

On February 25, 1991, an Emergency Discharge Permit (Division of Hazardous Waste Management [DHWM] Permit No. 91-01-28-1450) was issued by the DHWM, which authorized an emergency discharge to surface water from the groundwater treatment system installed at Essex. The Emergency Discharge Permit required PSE&G to sample weekly for contaminants which included base neutral compounds. The Emergency Permit was subsequently reauthorized by the DHWM via 90-day Emergency Discharge Authorizations, the last of these authorizations being issued on March 24, 1992 and therefore approved through June 22, 1992. It was stated that by way of this submittal, PSE&G was seeking authorization to discharge treated groundwater from the pump and treat system at Essex to the Passaic River under the authority of NJPDES-DSW Permit No. NJ0000639 (PAP-00131063-64; PAP-00131123; PAP-00132118-19).

On September 25, 1992, PSE&G amended its application for renewal of NJPDES-DSW Permit No. NJ0000639 to discharge stormwater which accumulates in various secondary spill containments located on the site to the Passaic River. This stormwater had the potential to be contaminated with petroleum hydrocarbons. It was estimated that approximately 2,210,500 gallons per year of stormwater would be discharged from the site. The amendment also addressed a pump and treat surface water discharge to the Passaic River which resulted from a groundwater remediation project at Essex (PAP-001310561-62).

Essex Generating Station was issued NJPDES-DSW Permit No. NJ0000639 on May 25, 1995. The permit authorized the Station to discharge stormwater to the Passaic River. The permit was effective from July 1, 1995 to June 30, 2000 (PAP-00132098-100). The discharge limitation for petroleum hydrocarbons was 15 mg/L. There were no limitations for the daily flow (PAP-00132105).

On December 22, 1999, PSE&G submitted their application to renew NJPDES-DSW Permit No. NJ0000639. Only one discharge (DSN 346) was permitted to discharge stormwater that collected in secondary spill containments to the Passaic River (PAP-00132491-92, 506). The included Pollution Analysis Summary noted that "no sampling was performed due to no discharge" (PAP-00132523). [Note: The actual permit was not provided.]

On April 30, 2004, Essex Generating Station was issued a final NJPDES-DSW Permit No. NJ0000639 (PAP-00133386, 93). The permit was valid from June 1, 2004 to May 31, 2009 (PAP-00133393). The discharge limitation for discharge 346A for petroleum hydrocarbons was 15 mg/L (PAP-00133394). [Note: No other discharge limitations were listed.]

On December 1, 2008, PSEG Fossil LLC Essex Generating Station applied to renew NJPDES-DSW Permit No. NJ0000639 (PAP-00135572). The current permit was to expire on May 31, 2009 (PAP-00135585). The application was for DSN 346A to discharge containment water through oil/water separator to the Passaic River (PAP-00135594-95). It was noted that no storm water had been discharged at the facility, as the containment water was removed by an outside contractor, and there had been no spills or leaks at the facility since the previous Permit Renewal Application (PAP-00135596).

On February 17, 2009, NJDEP issued draft NJPDES-DSW Permit No. NJ0000639 to PSEG Fossil Essex Generating Station (PAP-00135673). The included Fact Sheet notes that this site was unique in the fact that there had been no stormwater discharges in over 17 years. Stormwater from secondary containment areas was collected via vacuum truck after each rainfall and transferred to a storage tank. This storage tank, when full, was removed by an outside contractor for off-site treatment and disposal. Though there were no stormwater discharges to surface water, PSEG Fossil Essex Generating Station had elected to continue with the renewal of their individual permit for stormwater discharges to surface water (PAP-00135677-78). The discharge limitation for petroleum hydrocarbons remained at 15 mg/L (PAP-00135680).

On May 29, 2009, NJDEP issued NJPDES-DSW Permit No. NJ0000639 to PSEG Fossil Essex Generating Station. The permit was effective July 1, 2009 through June 30, 2014 (PAP-00428178). The discharge limitation for petroleum hydrocarbons remained at 15 mg/L (PAP-00428176).

On August 17, 2017, the NJDEP issued a NJPDES-Discharge to Groundwater (DGW) permit to PSEG Fossil LLC to allow the discharge of groundwater associated with construction dewatering activities. The construction activities included trenching and excavation for the installation of a water line. The discharge approved through this authorization would be to the ground surface for percolation back to the water table at the site. The approved discharge to ground was not to exceed 180 calendar days beginning on the day the discharge first occurs (PAP-00140059-61).

7. Response Actions

Characterization Activities

The majority of sampling and site characterization activities took place in conjunction with the remedial actions. Therefore, other than the two areas discussed below, these activities are discussed in the next section.

Area of Concern 1

As noted above, according to the *Preliminary Assessment Report for Historical Kerosene Discharge*, dated September 2010, oily soil was discovered on February 25, 2009 at the southeast corner of Generator Unit No. 11. Essex asserted that the underground kerosene lines, which were removed prior to 1978, were the source of the discharge discovered during excavation on February 25, 2009 and this discharge could only have occurred prior to January 23, 1980. Following the discovery, work in the vicinity of the discharge was stopped and immediate containment measures were implemented, followed by cleanup and removal activities. A Case number for this spill was not assigned; the site was referred to as AOC-1 (PAP-00136876, 86, 96, 98). According to the *Case Inventory Document - PSEG Fossil LLC Essex Generating Station Historical Discharge*, dated November 4, 2009, a preliminary assessment was conducted in 2010 which identified this discharge as an area of concern (AOC) and recommended a SI (PAP-00139753).

According to the *Site Investigation Report for The Historical Kerosene Discharge*, dated January 2013, a SI was conducted at the historical kerosene discharge AOC in June and August 2012. The purpose was to determine if any contaminants associated with the discharge were present in soil and groundwater at concentrations above the applicable NJDEP standards and to evaluate the presence or absence of product in the subsurface (PAP-00139774). The SI included the collection of eight soil samples from six new borings. The soils samples were analyzed for naphthalene and 2-methylnapthalene. Naphthalene and 2-methylnaphthalene were not detected above the NJDEP Direct Contact Soil Remediation standards in any sample. Naphthalene was not detected in any sample above the NJDEP default Impact to Groundwater Screening Level (IGWSL). 2-Methylnaphthalene was detected above the NJDEP default IGWSL in three samples at concentrations of 7, 9.6, and 18 mg/kg. However, the SI noted that the impact to groundwater pathway did not apply because these samples were collected from the saturated zone (PAP-00139786-87).

The concentration ranges for detected COCs in the SI samples were as follows:

AOC-1 Site Investigation Samples		
COC	**Concentration Ranges**	**Depth of Max Concentration**
Naphthalene	Non-detected to 0.17 J mg/kg – 0.88 mg/kg	4-4.5 ft
2-Methylnaphthalene	Non-detected to 0.19 mg/kg – 18 mg/kg	4-4.5 ft

(PAP-00139798, 800)

The SI concluded that no soil contaminants associated with the historical kerosene discharge were identified during the SI. Several PAHs were identified above regulatory standards, but were associated with fill at the site and would be addressed separately. Based on this, the SI recommended an unrestricted use response action outcome (PAP-00139794).

Area of Concern A

The *Site Investigation Report for Area of Concern A*, dated December 2015, documented the results of a soil and groundwater investigation that was conducted at AOC-A between June and September 2015. This AOC was identified by PSE&G on 23 April 2015 when sheen was observed on groundwater in test pits being excavated within the former 26 kilovolt (kV) Essex Switchyard on the site. The test pits were excavated to characterize soil for waste disposal in support of PSE&G's construction of a new 238 kV switchyard (PAP-00139925). As part of the construction of a switching station in the area of the former switchyard, nine test pits were excavated to characterize soil intended for future disposal. AOC-A was assigned when sheen was observed on groundwater at six test pit sampling locations. Waste classification samples were collected from the nine test pits. Benzo(a)pyrene (three test pits) and benzo(b)fluoranthene (one test pit) were detected at concentrations exceeding the NJDEP Residential Direct Contact (RDC) and Non-Residential Direct Contact (NRDC) Soil Remediation Standard (SRS) (PAP-00139930).

The objective of the SI was to characterize soil and groundwater quality at AOC-A. The SI involved the following: advancement of 14 soil borings (one soil boring was advanced per quarter acre); collection of soil samples; installation of four monitoring wells; and collection of groundwater samples. Soil borings at AOC-A were advanced to varying depths down to approximately 15 feet bgs. A total of 43 soil samples, including three duplicates, were collected (PAP-00139925, 32).

The majority of the samples were analyzed for extractable petroleum hydrocarbons (EPH). Twenty-five percent of the samples with EPH detections were analyzed for contingent analyses including SVOCs, PCBs, and metals. Contingent analyses were biased towards those samples with the highest EPH concentrations (PAP-00139934-35).

PAHs, including benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were detected in six of the ten soil samples analyzed for SVOCs, at concentration exceeding the NJDEP Direct Contact SRS and/or default IGWSL. The PAHs dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were also detected in three of ten soil samples. Concentrations of PAH exceedances identified in soil were reported to be consistent with those in historic fill, which was known to be present at the site based on NJDEP historic fill maps and a review of boring logs (PAP-00139941).

Four metals were present above the NJDEP Direct Contact SRS in the soil samples. Lead was detected above the NJDEP RDC SRS of 400 mg/kg in three soil samples and also above the NRDC SRS of 800 mg/kg in two of those samples, at concentrations ranging from 734 to 1,080 mg/kg (PAP-00139941). Several metals were also present

above the NJDEP default IGWSL in the soil samples. These metals included lead in six of ten samples, and mercury in eight of ten samples (PAP-00139941-42).

PCBs were not detected in any soil sample. No further investigation of PCBs was recommended at AOC-A (PAP-00139941, 65, 69, 73).

The concentration ranges for detected COCs in the AOC-A SI samples were as follows:

AOC-A Site Investigation Samples		
COC	**Concentration Ranges**	**Depth of Max Concentration**
Benzo(a)anthracene	0.060 mg/kg – 1.9 mg/kg	0.5-1 ft
Benzo(a)pyrene	0.040 mg/kg – 2.4 mg/kg	5-5.5 ft
Benzo(b)fluoranthene	0.17 mg/kg – 4.3 mg/kg	0.5-1 ft
Benzo(g,h,i)perylene	0.073 J mg/kg – 1.0 mg/kg	0.5-1 ft
Benzo(k)fluoranthene	0.046 mg/kg – 1.5 mg/kg	0.5-1 ft
Dibenzo(a,h)anthracene	Non-detected to 0.066 mg/kg – 0.36 mg/kg	5-5.5 ft
Indeno(1,2,3-cd)pyrene	Non-detected to 0.081 mg/kg – 1.2 mg/kg	0.5-1 ft 5-5.5 ft
Copper	7.0 mg/kg – 1,850 mg/kg	0.5-1 ft
Lead	4.8 mg/kg – 1,080 mg/kg	0.5-1 ft
Mercury	0.033 mg/kg – 3.5 mg/kg	10.5-11 ft

(PAP-00139963-74)

Remedial Activities

The following reports on remedial investigations at the Essex Generating Station are summarized in this Section:

- Public Service Electric and Gas Company Essex Generating Station Remedial Action Report NJDEP Case No. 91-01-28-1450-16, dated July 1995, described the remediation which occurred as a result of the January 28, 1991 kerosene spill.

- Public Service Electric and Gas Company Essex Generating Station Remedial Action Report NJDEP Case Nos. 93-9-17-1855-42 and 93-9-28-1503-15, dated June 1996, documented the remediation of a mineral oil discharge that occurred at the Essex Generating Station on September 16, 1993.

- Essex Generating Station Retired Gas Turbine Unit No. 9, NJDEP Case 95-5-3-1312-02, Remedial Action Report, dated June 1996 documented the remediation of lubricating oil and kerosene discharges (NJDEP Case No. 95-5-3-1312-02) that occurred at the Essex Generating Station former Unit No. 9 Gas Turbine Generator.

- Essex Generating Station Supplemental Remedial Action Report, NJDEP Case No. 95-5-3-1312-02, dated November 1997, documented the replacement of well MW-6 during June 1997 with a new well identified as MW-6A and resampling.

- Initial Receptor Evaluation Report for Historical Oil and Kerosene Discharge, completed February 2012 for Case No. 95-5-3-1312-02, the former Unit No. 9 generators determined that there no sensitive land use receptors within 200 feet of the Essex Station-site.

- Remedial Investigation Report and Remedial Action Work Plan for the Underground Storage Tanks at Generator Units #11 and #12, dated December 1997 documented the remediation of 16 kerosene underground storage tanks (USTs) which were removed from the Essex Generating Station during November 1992 and the results of the soil and groundwater investigation that was conducted

- Supplemental Remedial Investigation Report and Revised Remedial Action Work Plan for the Underground Storage Tanks at Generator Units #11 and #12, dated November 1999 documented the results of a soil and groundwater investigation that was conducted during 1998 and 1999 in the area of the former USTs at the direction of NJDEP.

- August 2004 Groundwater Monitoring Report for the Underground Storage Tanks at Generator Units #11 and #12, dated November 2004, documented the groundwater monitoring event conducted in August 2004 at the site.

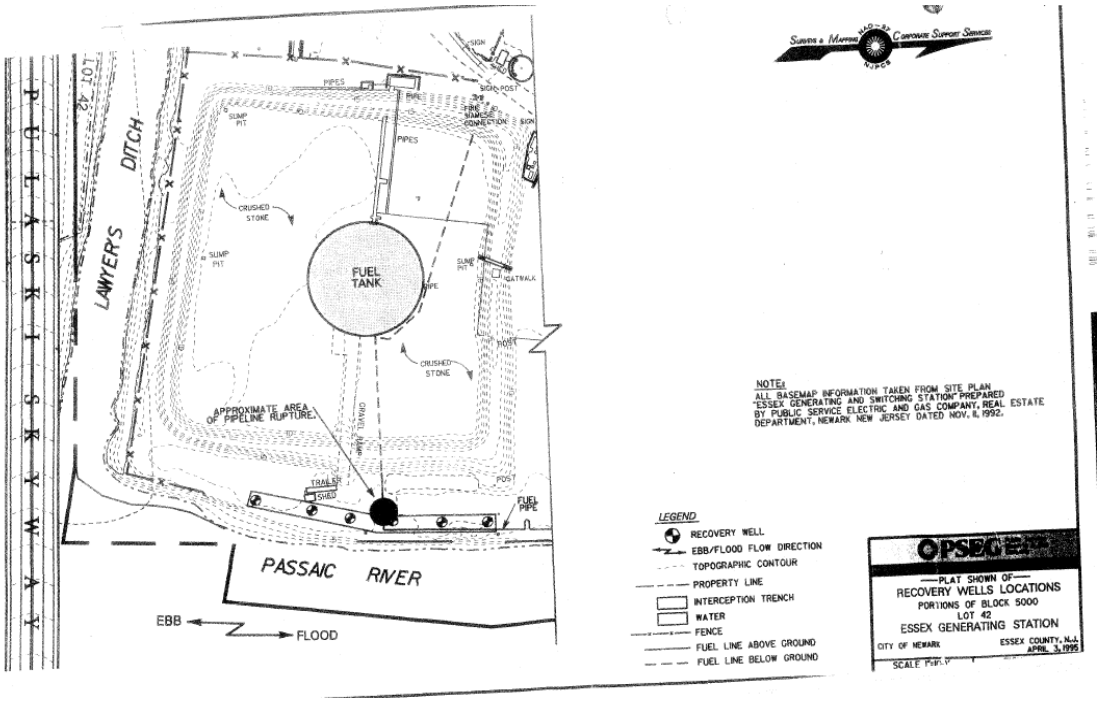
- Remedial Action Progress Report for the Underground Storage Tanks at Generator Units #11 and #12, dated April 2008 discussed groundwater quality for natural attenuation during the period of October 1, 2007 to March 31, 2008.

- Initial Receptor Evaluation Report Underground Storage Tanks at Generators Units #11 and #12, dated October 2011.

NJDEP Case No. 91-01-28-1450-16

The *Public Service Electric and Gas Company Essex Generating Station Remedial Action Report NJDEP Case No. 91-01-28-1450-16,* dated July 1995, described the remediation which occurred as a result of the January 28, 1991 kerosene spill. These remedial actions took place from January 28, 1991 to May 1993 and included the application of sorbent booms and mechanical oil skimmers, excavation of an interceptor trench, and groundwater pump and treat operations. Treated groundwater was discharged into the Passaic River. NJDEP required PSE&G to sample and analyze the treated groundwater prior to being discharged to the Passaic River. Groundwater samples were taken on August 6, 1992 and again for a final time on May 17, 1993 and submitted to the NJDEP. The report concluded that no further action was necessary (PAP-00131331-38). Note: The results of the sampling discussed were not included in the source document.

The following figure from the *Remedial Action Report* shows the location of the spill relative to the Passaic River:



(PAP-00131341)

On October 24, 1995, the NJDEP approved the proposal for No Further Action for the January 28, 1991 kerosene spill (PAP-00131342-43).

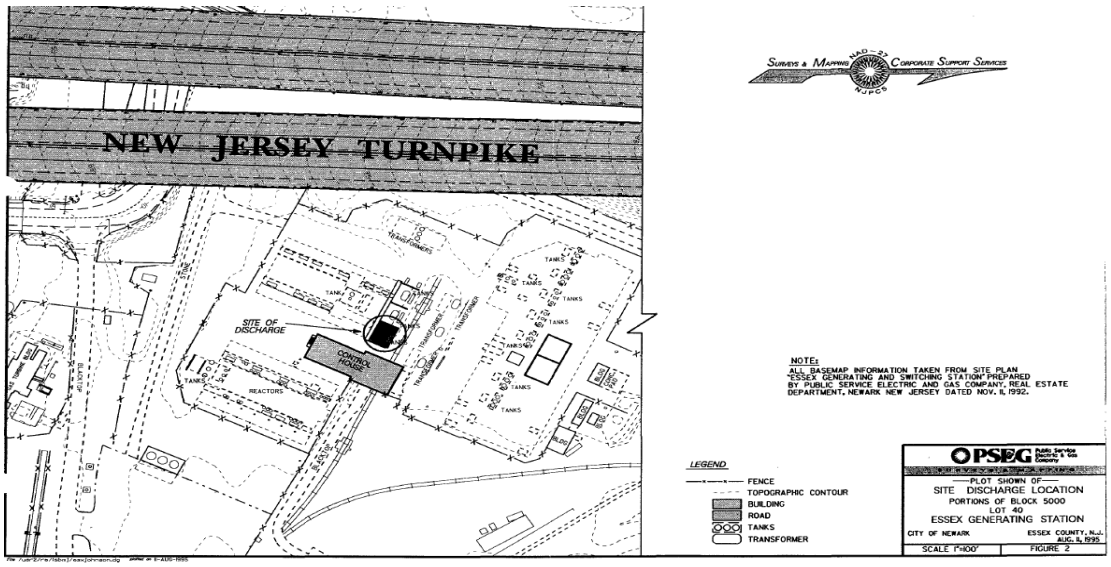
NJDEP Case Nos. 93-9-17-1855-42 and 93-9-28-1503-15

The *Public Service Electric and Gas Company Essex Generating Station Remedial Action Report NJDEP Case Nos. 93-9-17-1855-42 and 93-9-28-1503-15*, dated June 1996, documented the remediation of a mineral oil discharge that occurred at the Essex Generating Station on September 16, 1993. Specifically, the discharge was from a mineral oil transformer1 identified by the Station as Transformer No. 132-1, Phase 3 Unit. The discharge was immediately reported to the NJDEP and assigned Case No. 93-9-17-1855-42. On September 28, 1993, the NJDEP was again notified of the same discharge and a second case number was assigned (i.e., Case No. 93-9- 28-1503-15). A Discharge Confirmation Report was submitted to the NJDEP by letter dated October 18, 1993 (PAP-00354017).

The *Remedial Action Report* provided a summary of the mineral oil discharge events and relevant documentation. The activities occurred in two phases. The mineral oil discharge was discovered on September 17, 1993 at 6:40 p.m., reported to the NJDEP at 6:55 p.m., and stopped by 7:00 p.m. Immediately following this discovery, the leaking radiator was cut off from the main mineral oil reservoir within the transformer by closing the connecting valves. This action helped to reduce the leak. A drum was placed under

the leaking radiator to prevent further discharge of mineral oil to the gravel. The NJDEP assigned this discharge Case No. 93-9-17-1855-42. It was believed that the discharge began sometime on September 16, 1993 and it was estimated that approximately 900 gallons of mineral oil were discharged from the transformer. On September 18, 1993 cleanup of the area surrounding the transformer was begun using a vacuum truck to remove the visibly stained gravel and accumulated mineral oil. A visual inspection of the soil beneath the gravel did not show the presence of mineral oil. A total of fifteen cubic yards of gravel was excavated. By September 21, 1993 an additional fifteen cubic yards of stained gravel were removed and temporarily staged on a plastic liner until it could be classified for waste disposal. The purpose of this additional excavation was to determine the lateral extent of the discharge. Total Petroleum Hydrocarbons (TPH) field testing to determine if TPHs were present in the soil directly below the gravel showed negative results and no further excavations were made. On September 21, 1993 the transformer was detached from its support rails and removed for repair (PAP-00354020).

The following figure from the *Remedial Action Report* shows the site of the discharge:



(PAP-00354030)

NJDEP Case No. 95-5-3-1312-02

The *Essex Generating Station Retired Gas Turbine Unit No. 9, NJDEP Case 95-5-3-1312-02, Remedial Action Report*, dated June 1996 documented the remediation of lubricating oil and kerosene discharges (NJDEP Case No. 95-5-3-1312-02) that occurred at the Essex Generating Station former Unit No. 9 Gas Turbine Generator. The Unit No. 9 Gas Turbine Generator was put in-service on June 25, 1971, and was used for the production of electricity during periods of peak demand. The generator was fueled by kerosene via underground pipelines from an on-site aboveground storage tank. Lubricating oil was used to cool the bearings of the turbine engine (PAP-00131409-16). In 1988, the generator was destroyed by a fire and the turbine section was dismantled and removed. On April 26, 1995, PSE&G personnel discovered oil in a vault located in

the northeastern corner of the generator's concrete foundation. Upon further investigation it was found that the soil beneath the foundation had settled, creating a void where the oil collected. During the remediation of the lubricating oil spill, residual kerosene was discovered. The remediation of contaminated soils took place during November and December 1995. About 1,540 cubic yards of lubricating oil contaminated soil and 1,327 cubic yards of kerosene contaminated soil were excavated (PAP-00131409-16).

Post-excavation samples were collected from the area formerly contaminated with lubricating oil and analyzed for petroleum hydrocarbons and contingent PAHs. Post excavation samples from the kerosene spill area were analyzed for naphthalene. Soil samples were not collected from the bottom of the kerosene excavation due to the presence of groundwater. In January 1996, groundwater samples were collected from five of six wells and analyzed for base neutral compounds. The report concluded that post remediation soil and groundwater samples confirmed that all of the contaminated soil was removed and that groundwater was unaffected. PSE&G believed that no further remediation was warranted (PAP-00131409-16).

The concentration ranges for all detected COCs in the post-excavation samples were as follows:

NJDEP Case 95-5-3-1312-02 Post-Excavation		
COC	**Concentration Ranges**	**Depth of Max Concentration**
Benzo(a)anthracene	0.11 J ppm (only one detection)	41-47 inches
Benzo(a)pyrene	0.084 J ppm (only one detection)	41-47 inches
Benzo(b)fluoranthene	0.11 J ppm (only one detection)	41-47 inches
Benzo(g,h,i)perylene	0.062 J ppm (only one detection)	41-47 inches
Benzo(k)fluoranthene	0.064 J ppm (only one detection)	41-47 inches
Indeno(1,2,3-cd)pyrene	0.05 J ppm (only one detection)	41-47 inches
Phenanthrene	0.06 J ppm – 0.46 J ppm	42-48 inches
Pyrene	0.33 ppm – 2.5 ppm	42-48 inches

(PAP-00131454-59)

On March 9, 2012, NJDEP issued a No Further Action Letter for Case No. 95-5-3-1312-02 acknowledging the completion of the Remedial Investigation and/or Remedial Action discussed above and allowing unrestricted use for the Former Unit No. 9 AOC (PAP-00139729-31).

NJDEP Case No. 92-12-04-1433

On October 1, 1992, PSE&G Essex Generating Station applied for a Memorandum of Agreement with NJDEPE concerning the closeout of the remedial action which resulted from contamination which was the result of a discharge from an underground kerosene pipeline resulting in the discharge of approximately 13,000 gallons into the ground (PAP-00131119-22). On April 7, 1993, the Memorandum of Agreement went into effect (PAP-00131214-18).

Correspondence from NJDEP to PSE&G dated July 17, 1995, discussed existing underground storage tanks (UST) cases requiring additional remedial action. The letter referenced an April 7, 1993 letter report containing soil and groundwater analytical data and documenting the removal of sixteen 275-gallon kerosene tanks. It was noted that a formal remedial investigation report had not been received. The letter also noted that five of the tank excavation had analytical results with base neutral compounds exceeding the Departments most restrictive Soil Cleanup Criteria. The letter stated that additional remedial actions were required (PAP-00353920-26).

The *Remedial Investigation Report and Remedial Action Work Plan for the Underground Storage Tanks at Generator Units #11 and #12,* dated December 1997 documented the remediation of 16 kerosene USTs which were removed from the Essex Generating Station during November 1992 and the results of the soil and groundwater investigation that was conducted in the area of the 16 former USTs. Each UST location was identified as a separate AOC (AOCs 1-16). The soil investigation conducted when the USTs were removed detected several base neutral SVOCs above their respective NJDEP proposed RDCSCC. Based on these results the NJDEP required a formal remedial investigation of these contaminants. This was conducted during 1997. The remedial investigation for soil included initial confirmation sampling at the five areas where contaminants were detected above their respective RDCSCC and horizontal delineation of soil contaminants detected by the initial confirmation sampling (PAP-00131769-75).

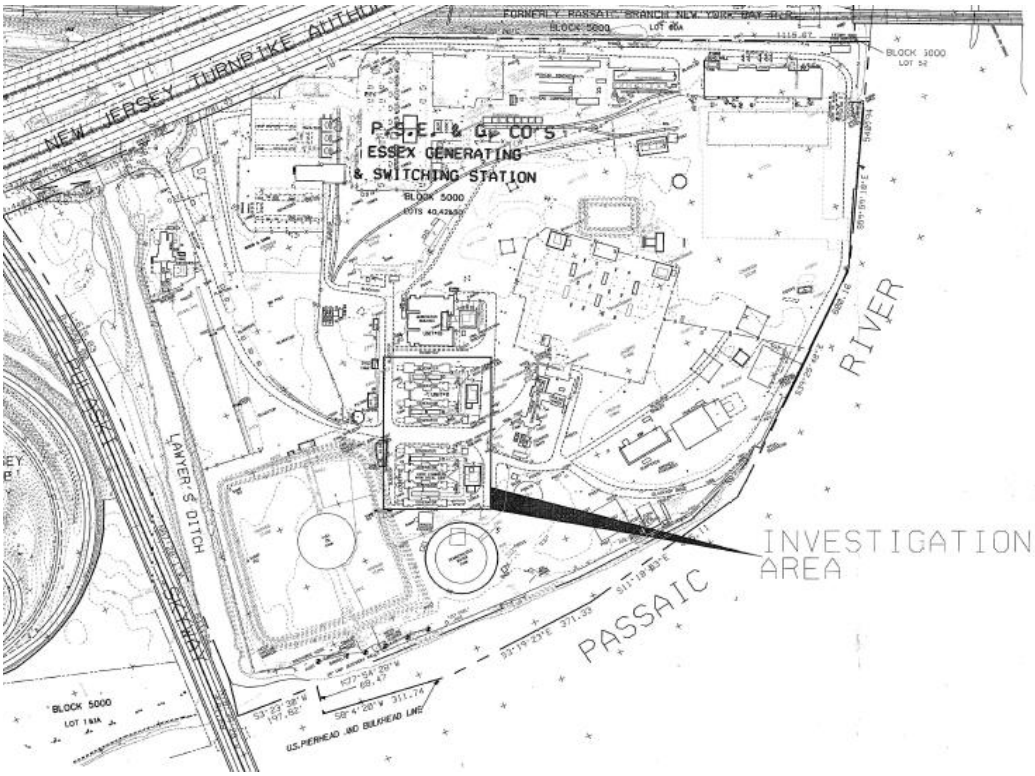
The concentration ranges for all detected COCs in the post-excavation samples were as follows:

Generator Units 11 and 12 Post Excavation Samples		
COC	**Concentration Ranges**	**Depth of Max Concentration**
Benzo(a)anthracene	0.26 J mg/kg – 12.0 mg/kg	7.5-8.0 ft
Benzo(a)pyrene	0.23 J mg/kg – 5.0 mg/kg	7.5-8.0 ft
Benzo(b)fluoranthene	0.20 J mg/kg – 5.8 mg/kg	7.5-8.0 ft
Benzo(g,h,i)perylene	0.16 J mg/kg – 2.6 J mg/kg	7.5-8.0 ft
Benzo(k)fluoranthene	0.22 J mg/kg – 3.7 mg/kg	7.5-8.0 ft
Dibenzo(a,h)anthracene	0.47 mg/kg (only one detection)	10.0-10.5 ft
Indeno(1,2,3-cd)pyrene	0.18 J mg/kg – 2.4 J mg/kg	7.5-8.0 ft

(PAP-00131794-801)

The *Remedial Investigation Report* concluded that the 16 AOCs associated with the soil had been fully delineated. PSE&G submitted that no further action should be required for AOCs 1, 3 through 5, and 7 through 16. Soil sample results of AOCs 2 and 6 detected base-neutral compounds above NJDEP's RDCSCC; however, due to their location excavation was not possible. Institutional control through a Declaration of Environmental Restriction (DER) was recommended for these two AOCs (PAP-00131783-84).

The following figure from the *Remedial Investigation Report* shows the location of the UST remedial investigation relative to the Passaic River:



(PAP-00131825)

The *Supplemental Remedial Investigation Report and Revised Remedial Action Work Plan for the Underground Storage Tanks at Generator Units #11 and #12,* dated November 1999 (Supplemental Remedial Investigation) documented the results of a soil and groundwater investigation that was conducted during 1998 and 1999 in the area of the former USTs at the direction of NJDEP. The Supplemental Remedial Investigation addressed data gaps that remained following the completion of the 1997 Remedial Investigation which included the delineation of soil and groundwater contamination (PAP-00132402).

The Supplemental Remedial Investigation for soil included the collection of soil samples to complete horizontal and vertical delineation at AOCs 1 through 10, and 13 through 16. Horizontal delineation of soil contaminants was conducted in the 7.5 to 8.0 feet bgs soil horizon. Vertical delineation of soil contaminants was conducted in the soil horizon below the respective former UST, which was at 10 to12 feet bgs. A total of 60 soil borings were completed. Each soil sample was collected at a depth of 7.5 to 8.0 feet bgs. Soil samples were also collected from below the base of the former UST (10 to12 feet bgs) and/or from the peat layer below the former UST (12 to 16 feet bgs) and held for analysis to complete vertical delineation. These samples were analyzed only if contaminants were detected at concentrations above their respective NJDEP RDCSCC in the shallower sample (PAP-00132407-08).

The soil results show that several base neutral compounds exceeded their respective NJDEP RDCSCC in six of the 38 samples collected to complete horizontal delineation at the 7.5 to 8.0 foot depth interval bgs. These six samples were collected from AOCs 1, 3, 6, 9, 10, and 15. The compounds , and their corresponding maximum concentration, that exceeded their respective NJDEP RDCSCC are benzo(a)anthracene (6.3 mg/kg in boring 3-S), benzo(b)fluoranthene (4.9 mg/kg in boring 1-N), benzo(k)fluoranthene (2.3 mg/kg in boring 1-N), benzo(a)pyrene (3.8 mg/kg in boring 1-N), and indeno(1,2,3-cd)pyrene (1.4 mg/kg in boring 1-N) (PAP-00132407-08).

In the soil horizon below the former USTs, several base neutral compounds exceeded their respective NJDEP RDCSCC in four of the five samples collected. These four samples were collected from borings 1-S, 9-W, 10-W, and 15-E. The compounds , and their corresponding maximum concentration, that exceeded their respective NJDEP RDCSCC are benzo(a)anthracene (9.1 mg/kg in boring 1-S), chrysene (9.6 mg/kg in boring 1-S), benzo(b)fluoranthene (7.8 mg/kg in boring 1-S), benzo(k)fluoranthene (3.0 mg/kg in boring 1-S), benzo(a)pyrene (8.4 mg/kg in boring 1-S), indeno(1,2,3-cd)pyrene (2.4 mg/kg in boring 15-E), and dibenzo(a,h)anthracene (0.81 mg/kg in boring 15-E) (PAP-00132410).

In the peat layer, several base neutral compounds exceeded their respective NJDEP RDCSCC in four of the seven samples collected. These four samples were collected from 1-S, 2-W, 3-S, and 6-E. The compounds, and their corresponding maximum concentration, that exceeded their respective NJDEP RDCSCC are benzo(a)anthracene (9.6 mg/kg in boring 1-S), chrysene (9.5 mg/kg in boring 1-S), benzo(b)fluoranthene (6.0 mg/kg in boring 1-S), benzo(k)fluoranthene (2.0 mg/kg in boring 1-S), benzo(a)pyrene (6.0 mg/kg in boring 1-S), and indeno(1,2,3-cd)pyrene (1.7 mg/kg in boring 2-W) (PAP-00132410-11).

The concentration ranges for all detected COCs in the supplemental remedial investigation samples were as follows:

Supplemental Remedial Investigation Samples		
COC	**Concentration Ranges**	**Depth of Max Concentration**
Benzo(a)anthracene	0.019 J mg/kg – 9.6 mg/kg	13.0-13.5 ft
Benzo(a)pyrene	0.0099 J mg/kg – 8.4 mg/kg	10.5-11.0 ft
Benzo(b)fluoranthene	0.015 J mg/kg – 7.8 mg/kg	10.5-11.0 ft
Benzo(g,h,i)perylene	0.011 J mg/kg – 2.4 mg/kg	11.5-12.0 ft
Benzo(k)fluoranthene	0.010 J mg/kg – 3.0 mg/kg	10.5-11.0 ft
Dibenzo(a,h)anthracene	0.020 J mg/kg – 0.81 mg/kg	11.5-12.0 ft
Indeno(1,2,3-cd)pyrene	0.0098 J mg/kg – 2.4 mg/kg	11.5-12.0 ft

(PAP-00132435-47)

The Supplemental Remedial Investigation concluded that random distribution of base neutral compounds generally shows their likely association with the fill placed around the former USTs and at the site in general and not any particular discharge of unused fuel oil. There did not appear to be any correlation between the contamination detected in

the horizontal delineation samples from the 7.5 to 8.0 foot bgs and the vertical delineation samples collected from the 10 - 12 feet soil horizon and the peat layer. PSE&G stated that they were not contemplating any remedial activities for the soil at this time. The analytical results show that contamination present within soil was most likely randomly distributed both horizontally and vertically in the area of the former USTs. Furthermore, contamination present with the peat layer also appeared to be randomly distributed and possibly naturally occurring (PAP-00132419-21).

The NJDEP also required that soil sampling be conducted in the area of MW-5 to document that no residual free product soil contamination was present. MW-5 was sampled on January 17, 2003. Sheen was visible on the water surface, but no measurable product was detected in the well. Base-neutral compounds were not detected above the GWQS. PSEG responded in a letter dated January 31, 2003 that the elevated base-neutral concentrations detected in April 2002 were related to the free product that was encountered in MW-5 at that time but had since been removed. PSEG collected soil samples for AOC-17, AOC-18, and AOC-19 (free product areas) in December 2003. No free product, odors, sheen or staining were observed in soil borings. Soil samples collected from AOC-17 showed the presences of PAHs greater than the NJDEP Soil Cleanup Criteria. Contaminants were attributed to fill and not with any particular discharge or free product. Soil samples collected from AOC-18 revealed no impacts. Soil samples collected for AOC-19 showed elevated levels of petroleum hydrocarbons, but PAHs were below the NJDEP Soil Cleanup Criteria (PAP-00138495-96).

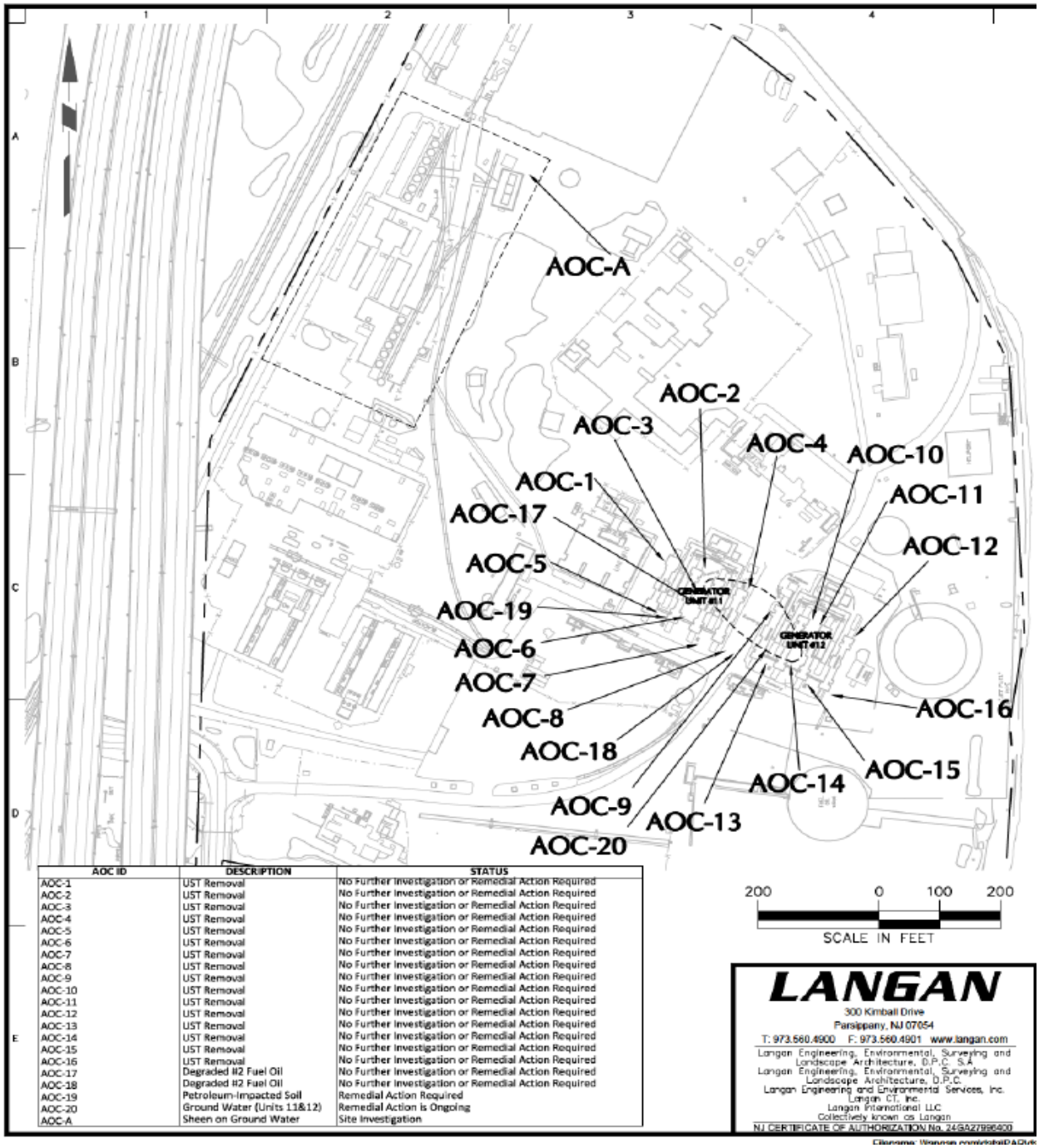
The Receptor Evaluation Report listed the following concentration ranges for all detected COCs in two soil samples collected December 4, 2003 at a depth of 3.0-3.5 ft:

Benzo(a)anthracene:	0.431 mg/kg – 0.931 mg/kg
Benzo(b)fluoranthene	0.766 mg/kg – 0.91 mg/kg
Benzo(k)fluoranthene:	0.699 mg/kg (only one detection)
Benzo(a)pyrene:	0.405 mg/kg – 0.928 mg/kg
Dibenzo(a,h)anthracene:	0.0729 J mg/kg (only one detection)
Benzo(g,h,i)perylene:	0.219 mg/kg – 0.437 mg/kg (PAP-00138506)

According to the *Remedial Action Work Plan for AOC-19 at Generator Units #11 and #12*, dated July 2016, 21 AOCs were associated with the site. Sixteen of these (AOCs 1 through 16) relate to former USTs. Three (AOC-17, AOC-18, and AOC-19) relate to monitoring wells MW-3, MW-8, and MW-5, respectively, where free product was historically detected. One (AOC-20) was related to groundwater contamination. The final AOC (AOC-A), was discovered in April 2015 and was identified as a sheen observed on groundwater in test pits excavated for a construction project. AOCs 1 through 20 were being addressed under the NJDEP *Case No. 92-12-04-1433.* AOC-A was being addressed under a separate NJDEP activity number under the Licensed Site Remediation Professional program. No further investigation or remedial action was required for AOCs 1 through 18. For AOC-20, groundwater contamination had been fully investigated and was being remediated via monitored natural attenuation remedial action with a groundwater remedial action permit and CEA. AOC-A was currently being investigated and the remedial action at AOC-19 was planned for 2017 (PAP-00140017-

19, 32). [Note: No further discussion of the remedial action for AOC-19 is included here as the COC for that AOC was EPH.]

The following figure from the *Remedial Action Work Plan for AOC-19 at Generator Units #11 and #12*, shows the locations of the 21 AOCs at the site:



AOC ID	DESCRIPTION	STATUS
AOC-1	UST Removal	No Further Investigation or Remedial Action Required
AOC-2	UST Removal	No Further Investigation or Remedial Action Required
AOC-3	UST Removal	No Further Investigation or Remedial Action Required
AOC-4	UST Removal	No Further Investigation or Remedial Action Required
AOC-5	UST Removal	No Further Investigation or Remedial Action Required
AOC-6	UST Removal	No Further Investigation or Remedial Action Required
AOC-7	UST Removal	No Further Investigation or Remedial Action Required
AOC-8	UST Removal	No Further Investigation or Remedial Action Required
AOC-9	UST Removal	No Further Investigation or Remedial Action Required
AOC-10	UST Removal	No Further Investigation or Remedial Action Required
AOC-11	UST Removal	No Further Investigation or Remedial Action Required
AOC-12	UST Removal	No Further Investigation or Remedial Action Required
AOC-13	UST Removal	No Further Investigation or Remedial Action Required
AOC-14	UST Removal	No Further Investigation or Remedial Action Required
AOC-15	UST Removal	No Further Investigation or Remedial Action Required
AOC-16	UST Removal	No Further Investigation or Remedial Action Required
AOC-17	Degraded #2 Fuel Oil	No Further Investigation or Remedial Action Required
AOC-18	Degraded #2 Fuel Oil	No Further Investigation or Remedial Action Required
AOC-19	Petroleum-Impacted Soil	Remedial Action Required
AOC-20	Ground Water (Units 11&12)	Remedial Action is Ongoing
AOC-A	Sheen on Ground Water	Site Investigation

(PAP-00140056)

8. Summary of Asserted Defenses

Public Service asserts a number of defenses, including but not limited to the following:

- Discharges from the site were permitted discharges exempt from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Emergency Planning and Community Right-to-Know Act (EPCRA) release reporting requirements pursuant to CERCLA section 101(10).

- Discharges of “petroleum, including crude oil or any fraction thereof” are excluded from CERCLA’s definition of “pollutant or contaminant.”

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

PUBLIC SERVICE ENTERPRISE GROUP (PSEG) SERVICES CORP
PUBLIC SERVICE ELECTRIC AND GAS
HARRISON GAS PLANT

Facility Name, Address and Size: Public Service Enterprise Group Services Corp., 2000 Frank E. Rodgers Boulevard, Harrison, New Jersey, 07029. The facility ranged in size over the years; it is currently 32 acres in size (PAP-00130581). According to the *Remedial Alternatives Evaluation, Former Harrison Gas Plant*, prepared April 1999, the facility covered approximately 32 acres and was designated as Lot 1 of Block 78 (PAP-00128412). According to a *Fact Sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey,* dated October 1, 1985, the site occupied an area of approximately 37.5 acres in Lots 3, 7A, and 1; Blocks 128, 143, and 78 (PAP-00140281, 84).

According to a March 28, 1979, *Waste Effluent Survey*, the Public Service Electric and Gas (PSE&G) Harrison Gas Plant employed 158 full time employees working three shifts a day, seven days a week (PAP-00134897). This survey reported the area of the property as 68.9 acres, which included liquefied petroleum gas storage facilities, not associated with the manufactured gas plant (PAP-00134897).

According to a *PVSC Application for Sewer Connection Permit,* as of January 1986, the PSE&G Harrison Gas Plant employed 124 full-time employees working three shifts a day, 365 days a year (PAP-00140314).

According to a Passaic Valley Sewerage Commission (PVSC) Application for Sewer Connection Permit, as of January 1991, the PSE&G Harrison Gas Plant employed 62 full-time employees and 15 part-time employees working three shifts a day, 365 days a year (PAP-00140810).

1. **Business Type:** Retired oil-gas production plant, natural gas storage, metering and regulating operations, liquid propane air production plant, and retired pilot synthetic-natural gas production plant (PAP-00140468; PAP-00140812).

2. **Time Period of Ownership/Operations**

   Operator: 1902 or 1909 to present (PAP-00140468; PAS-00007043-44)
   Owner: 1884 to present (PAS-00007043-44)

   According to the *Spill Prevention, Control and Countermeasure; Discharge Prevention, Containment and Countermeasure; Discharge Cleanup and Removal; and, Hazardous Waste Contingency Plans Prepared for Public Service Electric and Gas Company's Gas Business Unit, Harrison Gas Plant, Linden Synthetic Natural Gas Plant* (SPCC Plan) prepared March 1989, the Harrison Gas Plant began operation as an oil and gas storage area in 1909 (PAP-00140468). However, according to the May 1985 *Harrison Gas Plant, Preliminary Site Assessment and Proposed Monitoring Plan*, and the *Public Service Electric and Gas ("PSE&G") Company's Initial Response to USEPA Request For Information* (Response to Request for Information), site operations began in 1902, but from 1902 to 1926 included only storage of oil and gas manufactured from the former Market Street Manufactured Gas Plant (PAP-00140229; PAS-00007043-44).

According to the *Response to Request for Information*, the Harrison Gas Plant site was generally acquired in separate transactions over a period from 1884 through 1924 by the Newark Consolidated Gas Company. Newark Consolidated Gas Company leased its plant properties and franchises to the United Gas Improvement Company in 1898 which assigned the lease that same year to the Essex and Hudson Gas Company. In 1903, Public Service Corporation of New Jersey acquired the plant, property and franchises of the Essex and Hudson Gas Company, which included the site. The Essex and Hudson Gas Company and Newark Gas Company merged with, and into PSE&G in 1939 (PAS-00007043-44).

According to the *Conceptual Site Model and Non-Aqueous Phase Liquid Migration Barrier Wall Remedial Action Approach Report*, dated August 2016, a small part of the Site in the northeast corner was recently sold by PSE&G to the Port Authority Trans-Hudson Corp (PATH) and a minor subdivision of the site has occurred. The site is now designated as Lots 1.01 (PATH) and Lot 1.02 (PSE&G) within Block 78 (PAP-00361735).

3. Operational History/COC Use and Presence at the Facility

According to an April 1999 *Remedial Alternative Evaluation* prepared by Langan Engineering and Environmental Services, Inc. (Langan), PSE&G first utilized the site commencing in 1902 as a large oil and manufactured gas storage facility for the Company's former Market Street Gas Works, located on the west side of the Passaic River in Newark (PAP-00128412). According to the *Response to Request for Information*, circa 1915, a tunnel was constructed under the river connecting the Harrison Gas Plant site with the Market Street Gas Works in Newark, New Jersey. The tunnel contained four six-inch steel lines at the bottom encased in concrete which were used for tar and oil transfer between the Harrison Gas Plant site and the Market Street Gas Works in Newark (PAS-00007045).

According to the May 1985 *Harrison Gas Plant, Preliminary Site Assessment and Proposed Monitoring Plan*, and April 1999 *Remedial Alternative Evaluation*, the former Harrison gas plant was constructed at the site from 1924 to 1926 and commenced commercial operations in 1926. The primary gas manufacturing process utilized at the Site was the carbureted water gas process. The primary liquid and solid raw materials utilized in this process included coal for steam generation, and coke and carburetion oil for gas generation. The peak annual quantities of raw materials utilized in this manufacturing process included in excess each of 100,000 tons of coal and coke, respectively, and in excess of 1.5 million barrels of oil. Various chemicals were also utilized in this process in connection with liquid and dry gas purification processes. The primary product and by-products generated were manufactured gas and tars/light oils, respectively. Peak annual production of manufactured gas was approximately 30,000 MCF (thousand cubic feet). Peak annual production of tars and light oils was approximately 18,000,000 gallons and approximately 600,000 gallons, respectively. Residual from the manufacturing processes generated in bulk included clinker ash and purification wastes (PAP-00128412-13; PAP-00140229).

According to a 1995 *Application for Standard Memorandum of Agreement* between New Jersey Department of Environmental Protection and Energy (NJDEPE) and PSE&G, because of the nature of the by-products and wastes generated, stored, handled and/or disposed of at the site relating to the manufactured gas plant operation, the NJDEPE had determined that a potential existed that constituents of the above by-products and wastes which were classified as hazardous substances may be present in the subsurface at the site (PAP-00128154-55).

According to the *Remedial Alternatives Evaluation* and *Harrison Gas Plant Preliminary Site Assessment and Proposed Monitoring Plan*, during the period 1926-1954, the only change in facility operation was the addition of liquefied petroleum gas-air production equipment in the late forties and the use of natural gas instead of reformed bunker oil for Btu enrichment in 1950. From 1954 to 1963 additional gas manufacturing capability utilizing the cyclic catalytic reforming process, with natural gas or kerosene as the feedstock, was installed. The plant operated as a baseload plant until approximately 1963 when it was converted to peak shaving status. Between 1963 and 1965 six of the carbureted water gas sets were converted to a high Btu oil gas process with kerosene as the feedstock for peak shaving purposes (PAP-00128412-13; PAP-00140229).

According to *Harrison Gas Plant Preliminary Site Assessment and Proposed Monitoring Plan* dated May 17, 1985, since 1965 the Harrison Plant was primarily a metering and distribution point for pipeline natural gas, with only the high Btu oil gas sets and liquefied petroleum gas-air (LPG-A) on peak loading service. During the spring of 1973, a small 20-million cubic feet per day substitute natural gas facility, utilizing naphtha as a feedstock, was put into operation to supplement the supplies of gas for distribution. Use of this facility was discontinued in 1980. From 1975-1985, the plant operated, on average, only 25 days/year. In 1985, the Harrison Gas Plant was producing high Btu oil gas and liquefied petroleum gas-air mixtures to supplement the amounts of pipeline natural gas distributed through the plant to meet peak demand (PAP-00140229-30).

According to the *Remedial Alternatives Evaluation* prepared April 1999, the plant was retired from service after the 1986/87 winter period. As of the 1999 Evaluation, the site was used as a sub headquarters for a PSE&G gas distribution and customer service operations, and as a headquarters facility for PSE&G's Gas Construction Division. The site also contained a major natural gas metering and regulating station (PAP-00128412-13).

According to a March 28, 1979 *Waste Effluent Survey*, natural gas was received and distributed by the plant without processing throughout the year. During winter months, when this supply was insufficient, gas was produced from kerosene. The gas made from kerosene produced a tar which was separated from a tar water emulsion. The separated dry tar was sold and the water was treated. All of the Passaic River Water taken in was used for non-contact cooling in gas condensers and in barometric condensers and was returned to the river. The above mentioned treated water constituted never more than 1 percent of the total plant effluent during production periods (PAP-00134897).

PSEG Services Corp - Harrison

Diamond Alkali OU2 Allocation

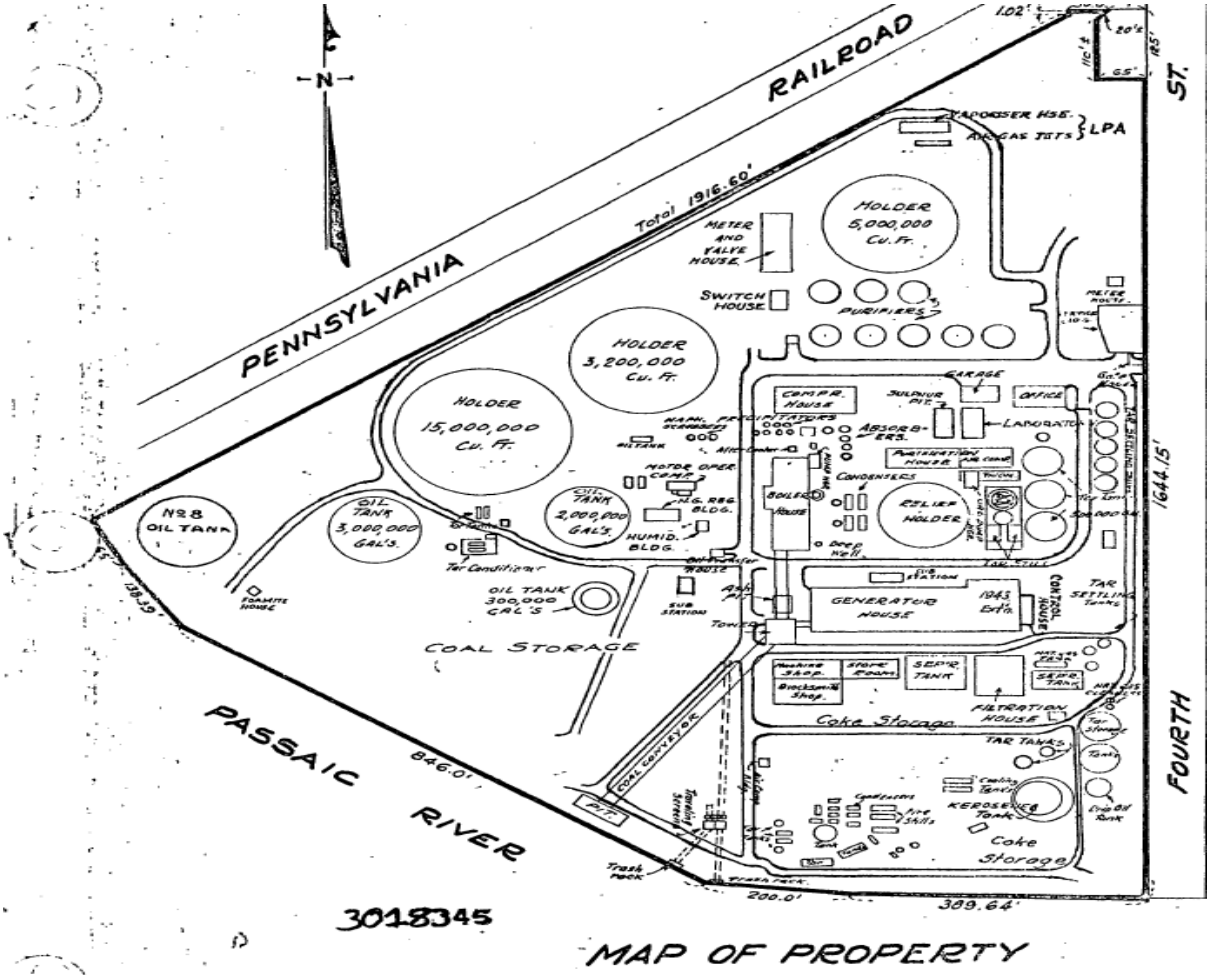
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Facility Data Report

According to the March 28, 1979 *Waste Effluent Survey*, the Harrison Gas Plant used 3,580,815,260 gallons of water in 1978. Of this, 800,000 gallons were discharged to the sanitary sewer and 3,579,225,260 gallons were discharged to a "Storm sewer, River, or Ditch" (PAP-00134898). The reported waste effluent characteristics did not specifically identify any COCs; however, it was reported that the effluent to the sanitary sewer contained 2.7 mg/L of emulsified oils and the effluent to a "Storm sewer, River, or Ditch" contained 2.0 mg/L of emulsified oils (PAP-00134899-900).

Also according to the April 28, 1987 *RCRA Compliance Evaluation Inspection Report*, *PSE&G Harrison Gas Plant*, in 1987 the Plant was phasing down operations. The Synthetic Natural Gas Plant operation was abandoned in approximately 1981, and the oil/gas plant operation which involved the thermal cracking of kerosene was closed March 1987 (PAP-00140393).

The following site layout plan for the Harrison Gas Plant facility was provided with a June 1971 Initial Application to the U. S. Army Corps of Engineers for permit to discharge or work in navigable waters and their tributaries:



(PAP-00140736)

Diamond Alkali OU2 Allocation

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Facility Data Report

According to the *SPCC Plan* prepared March 1989 the following aboveground storage tanks were located at the Harrison Gas Plant facility:

- Six (6) tanks for kerosene and diesel fuel
  7.6 million gal capacity. Estimated volume in 1989 - 1.9 million gallons

- Three (3) # 6 fuel oil tanks
  Total storage capacity - 2,028,400 gallons. Total stored at any one time - approx. 900,000 gallons

- Twenty seven (27) tar tanks
  Only eight (8) in use in 1989. Total combined storage capacity for these eight tanks is 2,040,000 gallons; however, in 1989, approximately 450,000 gallons of tar were stored at the plant.

- One (1) spent oil tank
  Primarily kerosene used to scrub the oil-gas of its naphthalene. No longer used in 1989. Contains residuals (PAP-00140475-76)

The March 1989 *SPCC Plan* also noted that Drip Oil pumped from the drip collection system on the natural gas mains was stored in fifty-five gallon drums in the drum storage area (PAP-00140476).

The March 1989 *SPCC Plan* also stated that there was an underground tank removal program underway at the Harrison Gas Plant. Many of the underground tanks had been taken out of service. In 1989, there was one (1) 2,000-gallon gasoline tank in use (PAP-00140477). The remainder of the underground tanks still in service in 1989 would fall under the category of oil-water separators (PAP-00140478). The March 1989 *SPCC Plan* described the following process areas within the Harrison Gas Plant facility where hazardous materials were handled:

- <u>Four tank truck unloading/receiving stations</u>.
  # 6 Fuel Oil – located at the Transfer House, west of the Boiler Room
  Tar – located at the #25 Tar Tank, southeast corner of the main office building. The 1989 Plan states that this tar station would no longer be needed and would be taken out of service.
  Kerosene – located at the Transfer House, west of the Boiler Room. The 1989 Plan states that the kerosene station was rarely used at this time and would be taken out of service.
  Gasoline – located behind the garage

- <u>Barge and Dock Facilities</u>
  Barge transfer station for both Kerosene and # 6·Fuel Oil is located at the southern portion of the plant at the Passaic River. The piping manifold is situated on a fender barge. A spill pan with a capacity of approximately one hundred and forty (140) gallons is located on the fender barge. Spill and containment equipment are located adjacent to the barge/dock area on shore.

Deployment of the spill and containment equipment could be accomplished within minutes of a discharge should one occur.

- Drum Storage/Handling Areas
  Polychlorinated biphenyl (PCB) contaminated liquids stored in drums in the Generator House basement
  Lubricating oils, boiler fuel treatment chemicals, and boiler feed water chemicals stored west end of the Generator House basement and outside the Generator House basement. Non-PCB waste oils are stored inside the TK-8 tank dike area (PAP-00140482-83).

4. Identified COCs

- PCBs (used, detected)
- Dioxins (detected)
- PAHs (used, generated, released, detected)
- Mercury (used, detected)
- Copper (used, detected)
- Lead (used, detected)

According to *Excerpts from Final Pretrial Order, PSE&G v. Certain Underwriters at Lloyd's of London, CA No. 88-4811*, dated October 1994, included in the Tierra/Maxus summary report *Sources of Hazardous Substances in the Passaic River Study Area: Potentially Responsible Party Public Service Electric & Gas Company,* former employees who worked at the Harrison Gas Plant prior to 1944 allegedly stated that on-site disposal of tar wastes on the ground occurred at the site. Reportedly, heat in the summers would cause the tar in the tar/soil mixture to rise to the surface (PAS-00013565-66). During testimony, a PSE&G chemist testified in deposition that he observed an area in the north corner of the Harrison Plant where solidified tar, clinkers, and debris had been buried and covered with gravel. As early as the 1940s, he noticed that the solidified tar associated with the buried waste would re-liquefy during the summer months and rise to the surface (PAS-00013567). It was also testified in deposition that some gas plant materials, such as coke, were stored on the ground and that other gas plant materials, such as tar, tarry and oily wastes, condensates, light oils, and spent oxide wastes were present in or on the ground due to leaks, spills, and occasional on-site disposal (PAS-00013571).

PCBs

According to the August 13, 1996 *Public Service Electric and Gas Company's ("PSE&G") Initial Response to USEPA Request for Information* (Response to Request for Information), circa 1981, PSE&G received notice that the gas condensate collected at PSE&G gas system interconnections with certain of its natural gas suppliers was contaminated with PCBs (PAP-00356878).

According to the April 28, 1987 *RCRA Compliance Evaluation Inspection Report a* Natural Gas Metering - Regulation Station (Gate Station) was at the Harrison Gas Plant location. The function of the Gate Station was to reduce pressure from the high pressure distribution main to the lower pressure required for public distribution. At this

point of pressure reduction, the plant had four scrubber systems (125-150 gal apiece) which led to a 600-gallon underground condensate collection tank. The condensate material was periodically tested for PCB contamination, and if the concentration was greater than 50 ppm, the material was considered hazardous waste (PAP-00140393-94).

Also according to the April 28, 1987 *RCRA Compliance Evaluation Inspection Report*, the PSE&G Harrison Gas Plant acted as the receiving facility for PCB contaminated wastes greater than 50 ppm from different PSE&G plants and Regulating Stations throughout the state. The facilities transported their waste material in 55-gallon drums to PSE&G Harrison using facility vehicles (PAP-00140394).

PCB waste manifested and transported from the Harrison Gas Plant was as follows:

- March 31, 1987 – 1,450 gal
- March 30, 1987 – 1,100 lbs
- June 12, 1986 – 15,150 lbs
- November 21, 1985 – 3,250 gal
- April 28, 1983 – 3,500 gal (PAP-00140387; PAP-00140395)

Correspondence from PSE&G to NJDEP in December 1987 stated that soil contaminated with tar was one of two major concerns of former gas plant operations. PSE&G was participating in a program to ship tar contaminated soils to Canada to be burned for fuels. As part of this, a sample of soil contaminated with tar was analyzed. The sample was found to contain PCBs at 4 ppm and lead at 0.194 ppm (PAP-00140408-14). Note: The location where the soil sample was taken was not provided in the source document.

In September 1988, a *Consent Agreement and Consent Order* were executed for PCB violations at the Harrison Gas Plant discovered during the April 8, 1987 inspection of the Harrison Gas Plant facility by representatives of the Environmental Protection Agency (EPA). The inspection found several violations concerning annual documentation, container labeling, and storage of PCB waste for more than one year (PAP-00140436-37).

According to the March 1989 *SPCC Plan*, PCB-contaminated liquids were stored in drums in the Generator House basement, located south of the Boiler House. The area was isolated from other areas of the basement and was clearly marked with PCB posters. The drums were stored in catch pans, eight drums to a pan, stacked as a single layer. This waste was disposed of in accordance with 40 CFR 761 (PAP-00140483).

On March 16, 1990, the PSE&G Harrison Gas Plant filed an EPA Notification of PCB activity. The notification included a map; however, it is not clear what is being identified on the map (PAP-00140700-01).

October 1990 correspondence from the manager of the PSE&G Harrison Gas Plant to NJDEP provided notification of PCB hazardous waste storage at the site. Storage for potential PCB-containing material began August 11, 1982. The storage area for PCB and any other hazardous waste from plant operations was inside the concrete first floor of what was known as the generator house. The PCB storage area was posted and marked; area drains were sealed to provide secondary containment. PCB drums were further protected by placing into metal troughs containing a maximum of 7-55 gallon drums each. There were 10 trays available with a maximum capacity of 70 drums. Daily inspections were made of the areas for leakage, container closure, and label application. The PCBs were in light hydrocarbon distillates from natural gas pipelines. There could also be a small amount of PCBs in some water condensate and also from gas pipelines. Other hazardous wastes stored included materials used in operations such as used engine lubricants and cleanup materials (PAP-00140781-85). In November 1990, the NJDEP responded that based on the review of the information, the Bureau of Hazardous Waste Engineering had determined that the submitted information was acceptable and PSE&G met the requirements of N.J.A.C. 7:26-9.l(c)(l7)iii and v. It was noted that PSE&G was required to dispose of the PCB hazardous waste within one year of placing it into storage (PAP-00140790).

A NJDEP Division of Hazardous Waste Management printout of hazardous waste manifests from January 1991 to April 1994 for the PSE&G Harrison Gas Plant on Fourth Street (Generator NJD000768028) included quantities of PCB-contaminated liquids and solids as well as lead being transferred to various treatment, storage, and disposal facilities (PAP-00128124-30).

A June 1996 letter from PSE&G to the NJDEP reported that the PCB storage at the Harrison Gas Plant had been moved to another building. PSE&G managed its PCB waste by shipping the waste off-site to an authorized facility within one year of the time the PCB waste was placed into the storage area (PAP-00128244).

A list of wastes generated by the PSE&G Harrison Gas Plant facility for the year 1997 included 6.78 tons of lead waste and 8 tons of lead and PCB waste. These waste streams were both transported off-site and landfilled (PAS-00104679-80).

A Classification Exception Area (CEA)/Well Restriction Area (WRA) for the PSE&G Harrison Gas Plant was established in August 2001 as a result of two aquifers being impacted. COCs which have impacted the aquifers include PCBs (Aroclor-1242, Aroclor-1248) (PAP-00128856-58; PAP-00357330-32).

According to the EPA *PCB National Report* dated February 25 2010, PSE&G Harrison Gas Plant is a classified as a generator of PCBs (PAP-00129920-21).

Soil sampling on the site has detected PCBs. Aroclor 1248 was detected in site soil at concentrations ranging from non-detected to 8.88 mg/kg; Aroclor 1254 was detected in site soil at concentrations ranging from non-detected to 2.1 mg/kg; Aroclor 1260 was detected in site soil at concentrations ranging from non-detected to 0.65 mg/kg (PAP-00128416-17; PAP-00128592; PAP-00128608; PAP-00128653-94; PAP-00128749-65; PAP-00129038-55).

Dioxins and Furans

A January 2007 *Notice of Deficiency* from the NJDEP to PSEG Services Corporation discussed a November 2006 Progress Report which identified a dioxin waste stream for which the Remedial Action Work Plan did not identify as an area of concern or provide specific details, delineation and data. Required corrective actions included revising the progress report within 45 days to include all data that was used for delineation and characterization of the dioxin waste stream area (PAP-00128884-85). A meeting was held on February 6, 2007, at the NJDEP to discuss the Notice of Deficiency. The meeting was attended by PSEG Services Corporation, MACTEC Engineering and Consulting, Inc. and the NJDEP. Tables summarizing the dioxin results and a map showing the locations where the samples were collected were presented at the meeting. NJDEP stated that submission of these documents would address the deficiency (PAP-00128889-93). 2,3,7,8-TCDD was detected at concentrations up to 14,600 pg/g (parts-per-trillion per gram) (PAP-00128893). According to the Remedial Action Report – Phase I River Front Stage, prepared for PSE&G, dated March 2009, the analytical results of this sample were consistent with results from shallow samples collected in sediments from the "Harrison Reach" of the Passaic River by EPA. These results showed that the dioxins detected can be attributed to migration from the Passaic River and are not associated with the former Harrison Gas Plant operations (PAP-00128997-98). This position was accepted by the NJDEP in correspondence dated May 30, 2007 (see Harrison Attachment 1.pdf). [Note: A map showing the location of the samples was not included in the source document.]

PAHs

An August 4, 1969 Surveillance Report described locating a settling lagoon with oil floating on the surface (PAS-00013591). Note: PAHs may be present in oils and kerosene.

According to a January 1991 *PVSC Application for Sewer Connection Permit*, principal raw materials used at the Harrison Gas Plant included #6 Fuel Oil and kerosene (PAP-00140812).

According to the August 13, 1996 Response to Request for Information, PAHs have generally been detected in No. 6 Fuel Oil, gas oils, coke oven coal tars, and carbureted water gas tars (PAP-00356897-98, 901). Note: This data is from literature and does not necessarily reflect the materials actually used at the Harrison Gas Plant.

A CEA/WRA for the PSE&G Harrison Gas Plant was established in August 2001 as a result of two aquifers being impacted. COCs which have impacted the aquifers include PAHs (naphthalene, 2-methylnaphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene) (PAP-00128856-58; PAP-00357330-32). Soil on the site has detected PAHs (PAP-00128330-34; PAP-00128644-51, 53-93; PAP-00128722-44, 49-65; PAP-00129020-55; PAP-00129399-417; PAP-00129669-70,

683-707; PAP-00360110-18; PAP-00358052-62, 66-73; PAP-00359382-84; PAP-00360509-11; PAP-00360596-97; PAP-00360622-25).

Metals - Copper, Lead and Mercury

According to *Harrison Gas Plant Preliminary Site Assessment and Proposed Monitoring Plan* sampling was conducted in 1983 as part of the assessment on water samples taken upstream of the plant and at the plant discharge from the Passaic River and from the well located on the site. The Plan concluded that these analyses showed that any contamination which may exist on-site has not migrated from the site (PAP-00140252). Copper was detected in the well water sample (28 ppb), in the upstream sample (45 ppb), and in the discharge effluent sample (76 ppb). Mercury was detected in the well (0.7 ppb) and upstream samples (0.7 ppb) but was not detected in the discharge effluent sample. Lead was not detected in any of these samples (PAP-00140261).

According to a *Community Right to Know Survey* for 1989 for the PSE&G Harrison Gas Plant, chemicals stored on-site included copper stored in the R&D Lab; fuel oil stored in the auto garage, generator house, and yard; lead and lead nitrate stored in the R&D Lab; mercury stored in the R&D Lab; mercuric sulfate stored in the TAR-Lab; and petroleum oil in several locations (PAP-00140702-20). Note: R&D and TAR-Lab are not defined in the source document.

According to the August 13, 1996 Response to Request for Information, metals including lead and copper have generally been detected in No. 6 Fuel Oil and would have similar concentrations in heavy gas oils. In addition, lead has generally been detected in tars found at three unrelated non-PSE&G gas plant sites (not including the Harrison Gas Plant) where the carbureted water gas and oil gas processes were used (PAP-00356899, 903). Note: This data is from literature and does not necessarily reflect the materials actually used at the Harrison Gas Plant.

A list of wastes generated by the PSE&G Harrison Gas Plant facility for the year 1997 included 6.78 tons of lead waste and 8 tons of lead and PCB waste. These waste streams were both transported off-site and landfilled (PAS-00104679-80).

A CEA/WRA for the PSE&G Harrison Gas Plant was established in August 2001 as a result of two aquifers being impacted. COCs which have impacted the aquifers include lead and mercury (PAP-00128856-58; PAP-00357330-32).

According to a Standard Compliance Inspection of the Harrison Gas Plant conducted by the NJDEP on September 11, 2007, the site used fluorescent lamps, batteries and mercury regulators. The mercury regulators were found to be stored in compliance with no signs of breakage. Neither lamps nor batteries were found being stored on-site during the inspection (PAP-00128907-22). Soil a sampling on the site has detected metals including lead, mercury, and copper (PAP-00128336-39, 54-56; PAP-00128655-93; PAP-00128722-44, 49-65; PAP-00129020-56; PAP-00129399-417; PAP-00129670, 681-705; PAP-00358052-62, 66-73; PAP-00359382-84; PAP-00360110-18; PAP-00360509-11; PAP-00360596-97; PAP-00360627-30).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00129034, 38, 43; PAP-00129400).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	4,890 mg/kg
Copper	3,330 mg/kg
Mercury	65.8 mg/kg
Benzo(a)anthracene	2,050 mg/kg
Benzo(a)pyrene	1,990 mg/kg
Benzo(b)fluoranthene	1,630 mg/kg
Benzo(k)fluoranthene	1,100 mg/kg
Dibenzo(a,h)anthracene	427 mg/kg
Indeno(1,2,3-cd)pyrene	1,200 mg/kg
PCBs	8.88 mg/kg

No information is available regarding when fill materials were placed on the facility site.

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Available references include information on the sanitary and storm sewers at the site, but do not include specific information regarding COCs that may have entered the system or been discharged through it.

Sanitary Sewer

A 1926 *Report on the Status of Pollutions from Industrial Establishments* reported that the Public Service Gas Company facilities in Harrison and Newark were classified as plants where treated sewage goes to the sewer and then is discharged to the river. Separating tanks, chemical coagulation, and filters were the treatment methods used at both plants and both plants were rated satisfactory (PAP-00129826-27).

According to a March 28, 1979 *Waste Effluent Survey*, the PSE&G Harrison Gas Plant discharged approximately 800,000 gal of water to the sanitary sewer in 1978 (PAP-00134898). The reported waste effluent characteristics did not include any COCs (PAP-00134899-900).

According to the March 1989 *SPCC Plan*, boiler condensate and oily waste water from various building floor drains, fire walls, and dikes discharged to the plant's oil-water separation system. This system consisted of a Pielkenroad Corrugated Plate Interceptor (CPI) separator, sedimentation and sand filtration. The pH of the outflow was adjusted with soda ash as needed to meet specifications prior to discharge to the Passaic Valley Sewerage System. Waste oil from the CPI was transferred to waste storage for disposal (PAP-00140487).

According to a *PVSC Application for Sewer Connection Permit # 13403712* dated January 13, 1986, the Harrison Gas Plant discharged the 10,221,200 gallons of process waste water to the sanitary/combined sewer and 11,126,792,000 gallons of cooling water to the river the previous year (PAP-00140315). The daily flow for outlet 13403711 was reported as 21,589 to 35,902 gallons (PAP-00140318). Results for a sample collected December 24, 1985 reported “0.000” for mercury. No other COCs were reported (PAP-00140319-20).

According to a January 1991 PVSC Application for Sewer Connection Permit, process waste water and effluent go through oil separators and sand filters before discharging at outlet # 13403712. An estimated daily flow rate of 24,000 gal was reported. Samples were collected December 13, 1990 from this outlet. Lead was reported at 0.007 mg/L, copper and mercury were not detected (reported as 0.00 mg/L and 0.000 mg/L, respectively) (PAP-00140813-14; PAP-00428220-22).

Storm Sewer

According to a March 28, 1979 *Waste Effluent Survey*, the PSE&G Harrison Gas Plant discharged approximately 3,579,225,260 gal~~lons~~ of water to a "Storm Sewer, River or Ditch" in 1978 (PAP-00134898). The reported waste effluent characteristics did not include any COCs (PAP-00134899-900).

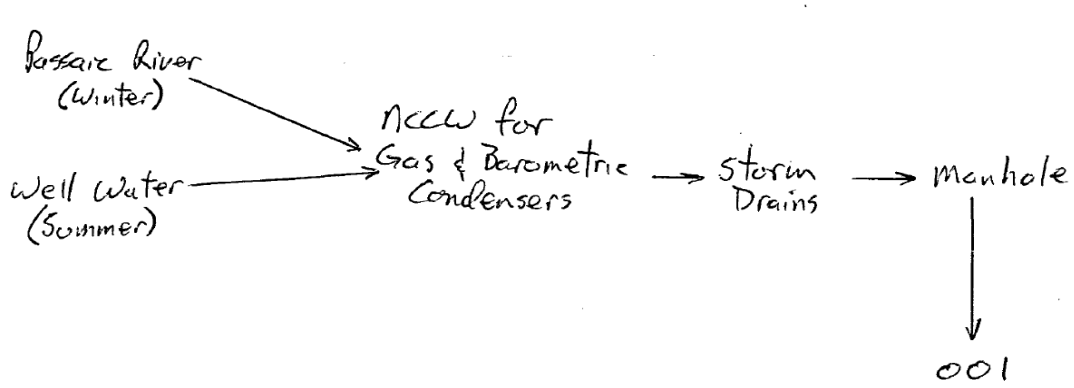
According to the March 1989 *SPCC Plan*, non-contact cooling water from various equipment which was uncontaminated, was discharged to the Passaic River at outfall DSN002. Stormwater which was uncontaminated was allowed to run to a storm sewer system which ran parallel to Frank E. Rogers Boulevard and also discharged to the Passaic River at outfall #DSN002 as authorized by NJPDES-DSW Permit # NJ0000560. A permanent containment boom was installed at this outfall as a precaution (PAP-00140487).

According to an August 1990 *Application for Renewal NJPDES Permit # NJ0000566,* both the stormwater from the Harrison Gas Plant and the non-contact cooling water system discharge to the municipal storm sewer system which then discharges to the Passaic River. Samples for monitoring purposes are collected prior to the blending of the municipal and site discharges (PAP-00140791-92).

According to a *Fact Sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey*, dated October 1, 1985 for Permit # NJ0000566, there were two permitted discharges, Discharge 001 and Discharge 002. Discharge 001 was a discharge of non-contact cooling water for compressors and barometric and gas condensers. The flow rate was 14.4 MGD during gas production and 2.9 MGD in non-operating periods. The Passaic River was the source of the water. Discharge 002 consisted of stormwater runoff from the site and from bordering Fourth Street (PAP-00140281, 84).

The following flow diagrams for Discharge 001 and Discharge 002 were presented in an October 15, 1985 *Discharge Surveillance Report:*

PLANT DIAGRAM AND FLOW SEQUENCE:



Note: The sample collected here did not report any COCs (PAP-00140291).

PLANT DIAGRAM AND FLOW SEQUENCE:



Note: No sample was collected here as there was no discharge (PAP-00140292).

The December 10, 1979 *Water Pollution Violation Report* stated that approximately 75 gal of kerosene had leaked from an underground 6-inch pipe (PAP-00137126). The kerosene was observed to flow out of the pipe into a storm sewer which allowed it to reach the Passaic River. Coast Guard investigators observed that approximately 75 gal of kerosene was contained by the boom. The Coast Guard noted that some of the product was entraining under the boom due to current action. The sheen that was surfacing was dissipating rapidly (PAP-00137128).

Direct Release

PVSC Correspondence from 1927 through 1931 states that on several occasions, tar and oily matter from the Harrison Gas Plant were bypassed and/or leaked directly into the Passaic River as a result of malfunctions with PSE&G's filtering system (PAS-00013696-98).

Correspondence from December 8, 1927, discussed gas plants operated by Public Service along the Passaic River which included one at Newark and one at Harrison. At each of these places the author of the letter reported that he had received frequent reports of tar and oily matter being allowed to escape. It was stated that the indications were that this was being purposely by-passed to the river instead of going to the treatment plant. The author stated that it was a matter of faulty operations of the purification plant that they were complaining about, and that they had not charged that PSE&G had made no efforts to avoid pollution of the river (PAP-00139719; PAS-00013696).

Correspondence from August 31, 1928, discussed possible sources for tar oil on the Passaic River, a bilge tank of a boat was mentioned as a possible source, but the PSE&G Harrison Gas Plant was thought to be the source of tar oil seen on the river on August 15, 1928 (PAP-00134894; PAP-00140154; PAS-00013697).

Correspondence from August 6, 1931, regarding the Public Service Gas Plant, Harrison, New Jersey reported that an investigation took place after considerable quantities of tarry oils were observed to be discharging from the plant. It was reported that the tar line in the plant had started leaking and that the tar reached the waste treatment plant,

smearing up the sand in the filter and rendering the treatment plant inoperative. It was stated that when the leak had been traced and repaired, it would be necessary to replace the filter sand with new material. This would cause pollution tor several days, depending on how long it took to locate and repair the tar line leak (PAP-00355295; PAS-00013698).

A PVSC report titled *Stream Contamination during May 1947* described an incident where a very oily slick was observed next to the PSE&G Harrison Gas Plant dock. No leaks in the pipeline were observed. It was noted that sludge on the river bed was gassing and bringing up large blotches of oil film (PAP-00355300).

An August 4, 1969 Surveillance Report described locating a settling lagoon with oil floating on the surface (PAS-00013591). Note: PAHs may be present in oils and kerosene. A December 15, 1969 letter from PSE&G to the NJ Department of Health confirmed the presence of oil in the plants outfall and the past operation of two temporary ponds used for the separation of oil-water mixture resulting from a surface drainage condition. These ponds were completely removed by the time of the 1969 letter (PAS-00013592-93).

A June 1971, *Initial Application* to the U.S. Army Corps of Engineers for permit to discharge or work in navigable waters and their tributaries for the Harrison Gas Plant identified three water inlets and two outfalls from the facility. The two outfalls identified were: # 004, the Plant Flume Outlet and # 005, the outlet for Tar Conditioner Steam condensate to the Passaic River. Both outlets had estimated flows of 50,050 MGD (PAP-00140730-73). No COCs were stated as being present.

According to the August 13, 1996, *Response to Request for Information*, an SPCC Study Plan dated 1974 referenced the occurrence of six floods at the site on the following dates: November 25, 1950; November 7, 1953; September 12, 1960; April 3, 1961; March 6, 1962; and January 23, 1966. The referenced SPCC Study did not contain any information regarding any leaks, spills, discharges or disposal activities associated with these six floods (PAP-00356867).

According to the report *Potential PCB Sources to PRSA*, prepared by Tierra / Maxus dated December 2001, process waste water from the plant was discharged directly to the Passaic River until January 1979, at which time effluent was diverted to the PVSC sewer system. These direct discharges historically included tarry water effluent from the filter house; effluent from the purification sedimentation basin; boiler water blowdown; overflow water from the ash settling pit; steam condensate from various processes; non-contact cooling water from various processes; and site stormwater (PAS-00124584). [Note: There are no citations or available underlying documents to support these statements.]

Spills

According to the March 1989 *SPCC Plan*, there were several different types of secondary containment and diversion structures used to keep spilled hazardous substances from reaching State waters. These structures included: dikes, curbs, liquid waste treatment systems, segregated waste streams, drip pans, and catch basins which direct flow to oil water separators (PAP-00140486).

The March 1989 *SPCC Plan*, stated that on October 18, 1983, five gallons of tar leaked from a discharge line to the separators at a point where the line crosses a vault directly on top of the storm sewer that runs parallel to the separators. The vault had a hole allowing tar to get into the storm sewer which was connected to the plant outfall. The spill was contained by the permanent boom at the outfall. Tar was removed from water with skimmer pump and absorbent pads (PAP-00140504). Note: PAHs may be present in tar.

According to the August 13, 1996, *Response to Request for Information* and other source documents, the following spills to the Passaic River were reported at the Harrison Gas Plant:

Spills				
Date	**Reporting Entity**	**Substance Spilled**	**Volume**	**Citation**
January 25, 1977	U.S. Coast Guard	Discolored, oily water	Approx. 2-3 gal	PAP-00129995-96; PAP-00130026; PAP-00356862
December 10, 1979	U.S. Coast Guard	Kerosene	50-75 gal	PAP-00137126; PAP-00137729; PAP-00356862-63
July 11, 1981	U.S. Coast Guard	Tar	Approx. 10 gal	PAP-00140116; PAP-00140138; PAP-00356863
October 18, 1983	U.S. Coast Guard	Tar Oil	Approx. 5 gal	PAP-00140219-23; PAP-00140157-59; PAP-00356863-64
May 23, 1994	U.S. Coast Guard	Oily substance	Unknown	PAP-00128131; PAP-00128132; PAP-00128135; PAP-00128136; PAP-00130590

6. Regulatory History/Enforcement Actions

Inspections

According to the September 1988 *Consent Agreement and Consent Order*, on April 8, 1987, representatives of the EPA conducted an inspection of the Harrison Gas Plant facility for the purpose of enforcing the federal PCB regulations. The inspection found

several violations concerning documentation, and storing PCB waste more than one year after being placed into storage for disposal (PAP-00140392-95; PAP-00140436-37). As a result of these violations, PSE&G was assessed a penalty of $8,500 (PAP-00140440).

A Standard Compliance Inspection of the Harrison Gas Plant was conducted by the NJDEP on September 11, 2007. The hazardous waste generated by PSEG was gas condensate and silica gel. The gas condensate was generated infrequently in drip pots from gas lines. The drip pots collected impurities and condensation from natural gas, which was then pumped to a 55-gallon drum once the drip pot was full. One 55-gallon drum of waste gas condensate filters was the only waste found. This drum was being stored in the hazardous waste storage building. The weight of this drum was 101 lbs. It was also noted that the site generates fluorescent lamps, batteries and mercury regulator solid wastes. No lamps or batteries were found being stored on-site at the time of the inspection. The mercury regulators were found to be stored in compliance with no signs of breakage (PAP-00128907-22). It was noted that the site was last inspected on April 27, 2000, and no violations were found regarding Large Quantity Generators requirements (PAP-00128910).

Violations

Correspondence from PSE&G to the NJ Department of Health on December 15, 1969 discussed an October 3, 1969, letter notifying PSE&G of violations concerning pollutants from the Harrison Gas Plant entering the Passaic River. A sample of the plant's outfall collected by the Department of Health on August 21, 1969, contained 363 parts per million (ppm) of ether soluble matter (usually inferred as oil). A duplicate sample was not available for PSE&G analysis. A sample taken by PSE&G at the same location during the forenoon of the same date found a chloroform soluble matter content of 18 ppm (PAP-00140328-29; PAP-00140419-20).

Additionally, the correspondence noted that the plant was potentially in violation of statutes by virtue of the operation of two temporary ponds used for the separation of an oil-water mixture resulting from a surface drainage condition. This latter condition had been corrected with the result that the two ponds, being no longer necessary, having been completely removed (PAP-00140419-20).

On January 25, 1977, a discharge of discolored oily water from the PSE&G Harrison Gas Plant reached the Passaic River. PSE&G paid a $50 fine to the U.S. Coast Guard for this violation (PAP-00129995-96; PAP-00130026). It was noted that approximately 2-3 gal reached the Passaic River (PAP-00129995).

February 29, 1980 correspondence from the U.S. Coast Guard to PSE&G concerned a violation for the discharge of 50 gal of oil from the PSE&G Harrison Gas Plant to the Passaic River which occurred on December 10, 1979. A preliminary penalty of $600 was assessed (PAP-00137729). The December 10, 1979, *Water Pollution Violation Report* stated that approximately 75 gal of kerosene had leaked from an underground 6-inch pipe (PAP-00137126). The kerosene was observed to flow out of the pipe into a storm sewer which allowed it to reach the Passaic River (PAP-00137128). It was

reported that Coast Guard investigators observed approximately 75 gal of kerosene contained by boom and kerosene still exiting the outfall; however, the PSE&G Harrison Gas Plant Manager estimated that approximately 30 gallons of oil had entered the water. Clean-up operations consisted of sorbents, a vacuum truck and a steam operated diaphragm pump to remove the kerosene from the water (PAP-00137128-29).

November 19, 1980 correspondence from the U.S. Coast Guard to PSE&G concerned a violation for improper containment which occurred on May 30, 1980 (PAP-00139880). The violation pertained to an oil drain catchment at the dock front that was portable rather than fixed. The inspector who rejected it on May 30, 1980, approved the revised arrangement on November 10, 1980 (PAP-00139885).

On October 5, 1981, the U.S. Coast Guard sent notice to PSE&G concerning a possible violation resulting from a discharge of approximately 10 gallons of tar to the Passaic River on July 11, 1981 (PAP-00140138-39). According to an August 14, 1981, Water Pollution Violation Report, the discharge involved approximately10 gal of tar from Tank #21 which leaked from the discharge line. Approximately 5-10 gallons of tar entered and were then removed from the River using a skimmer to remove tar contained by the facility boom. No samples were taken (PAP-00140116, 18).

On January 29, 1985, the U.S. Coast Guard assessed a $100 penalty to PSE&G for a October 18, 1983, violation at the Harrison Gas Plant. During an October 30, 1984, hearing, PSE&G disputed the findings that the release was to a navigable waterway as the release, caused by a leak in pipe, occurred into the flume and the oil was contained by a boom (PAP-00140219-23). According to an October 18, 1983 Water Pollution Violation Report, the discharge involved approximately 5 gal of tar as a result of the sump pump discharge line developing a leak (PAP-00140157). The report also stated that the U.S. Coast Guard observed sheen emitting from the flume discharge point into the Passaic River (PAP-00140159).

On September 25, 1987, the EPA found PSE&G Harrison in violation of general facility requirements pertaining to PCBs. A penalty of $8,500 was assessed (PAS-00104676-77). Note: The nature of the violation was not described in further detail.

In May 1994, an oily discharge to the Passaic River occurred at the PSE&G Harrison Gas Plant. Black oil was evident seeping from the river bank into the river (PAP-00128131; PAP-00128132; PAP-00128135; PAP-00128136; PAP-00356865). As a result of this spill, PSE&G was issued Notices of Violation by the U.S. Coast Guard and the Hudson County Regional Health Commission and required to develop and implement a long-term site remediation plan (PAP-00128137-38; PAP-00128156-59; PAP-00356865). In July 1994, PSE&G entered into a Memorandum of Agreement with the New Jersey Department of Environmental Protection and Energy to conduct Remedial Investigation and Remedial Actions as needed (PAP-00128139-61; PAS-00013585-89; PAP-00356865).

According to a July 1994 *Memorandum of Agreement* and September 1988 *Consent Agreement and Consent Order*, the PSE&G was found to be in violation of regulations relating to the labeling, duration of storage, or compilation and maintenance of annual documents for the storage and disposal of PCB contaminated soils by the U.S. EPA in 1988 and was fined $8,500.[5] (PAP-00128156; PAP-00140401-07; PAP-00140440).

On August 8, 1994, there was another discharge from the former Harrison Gas Plant in an area of the Passaic River not addressed by containment devices installed after the May event. The discharge was reported to the NJDEP and assigned Case # 94-8-8-1608-37 (PAP-00128212; PAP-00128214). [Note: Other source documents list the case number as 94-8-8-1607-37 (PAP-00128214-19).] As the source for both discharges was determined to be the same it was requested that the cases be consolidated (PAP-00128214-19).

In November 2004, PSE&G voluntarily reported an un-manifested PCB shipment from the Harrison Gas Plant facility. It was believed that the PCB contamination in the waste shipped on October 11, 2004, may have come from sludge material removed from a manhole. The shipped waste included material removed from a particular manhole which was later determined to contain a non-leaking transformer with a PCB concentration of 208 mg/kg. Other possible sources of the PCBs could be from a previously removed transformer or other cross-contamination (PAP-00128850-52). As a result of this violation, the U.S. EPA stated that it anticipated issuing an administrative complaint in this matter, seeking a civil penalty in the amount of $19,500 but offered to settle the matter for $11,375 (PAP-00128853-54; PAP-00128855; PAP-00128859-66).

In April 2010, PSE&G voluntarily reported an un-manifested PCB shipment from the Harrison Gas Plant facility which occurred on March 29, 2010. One drum of waste oil which was not expected to contain PCBs was shipped for disposal and was tested and found to contain regulated levels of PCBs (PAP-00129922-23; PAP-00129928). The drum contained 223 ppm PCBs (PAP-00129928).

In April 2011, PSE&G and U.S. EPA entered into a Consent Agreement and Final Order in which PSE&G agreed to pay a civil penalty of $13,670 for violating TSCA on three occasions by storing PCB waste and/or shipping PCB waste for disposal without identifying it as PCB on EPA Manifest Form 8700-22 (PAP-00130040-47; PAP-00130049-55).

[5] The Harrison Gas Plant site was used as a storage facility before ultimate proper disposal of various materials. The PCB materials in question, which appear to have been received at the Harrison site from off-site, were securely stored in containers and drums on-site. These violations concerned the improper labeling of these containers/drums, failure to dispose of these materials within one year of storage, or failure to maintain annual records of these materials (PAP-00140401-07).

Permits

PSE&G Harrison Gas Plant Permit Summary				
Permit #	**Issued**	**Use**	**Dates**	**Discharge Limits**
NJ0000566	EPA	All discharges	Sept. 30, 1974 - Sept. 30, 1979	Oil & Grease
98042-13280-052-292	PVSC	Sewer Connection	Oct. 24, 1978	< 100 mg/L of mineral oil or grease. No discharge containing floatable oil or grease.
NJ0000566	EPA	All discharges	Oct. 31, 1980 - Oct. 31, 1985	Discharge 001: petroleum hydrocarbons (5 mg/L), and copper (1 mg/L) Discharge 002 petroleum hydrocarbons (15 mg/L)
13403712	PVSC	Sewer Connection	July 31, 1981 - July 31, 1986,	< 100 mg/L of mineral oil or grease. No discharge containing floatable oil or grease.
NJ0000566	EPA	All discharges	Feb. 1, 1986 – Jan. 31, 1991	aldrin/dieldrin (0.0019 μg/L), PCBs (0.03 μg/L), DDT and metabolites (0.001 μg/L), petroleum hydrocarbons (5 mg/L)
NJG0088323	NJDEP	Stormwater	June 4, 2008	Not known

An October 18, 1972 Memo concerning the PSE&G Harrison Gas works stated that at that time the plants wastewater treatment facilities had not been approved by the NJDEP nor had permits been issued (PAS-00013596).

In March 1974, Public Service Electric and Gas Company submitted revised National Pollutant Discharge Elimination System (NPDES) applications to the U.S. EPA for Outfall #'s 004 and 005, "Plant Outlet Flume" and "Tar Conditioner Cooling and Steam Condensate Drain to River" for the Harrison Gas Plant (PAP-00128123).

On August 30, 1974, a final determination was made by the EPA to issue PSE&G NPDES Permit # NJ0000566. Discharge limitations included oil and grease (which may have contained PAHs). The discharge limit for oil and grease applying from September 30, 1974 to September 30, 1979 was 5.0 lb/day during non-production periods. The discharge limits for oil and grease applying from September 30, 1976 to September 30, 1979 were: 1 mg/L (anytime), 5.0 lb/day average and 10.0 lb/day maximum (non-production) and 20.8 lb/day average and 40.0 lb/day maximum (PAP-00128187-203). The permit was effective September 30, 1974 and expired September 30, 1979 (PAP-00128247-63).

On October 24, 1978, PVSC issued Permit # 98042-13280-052-292 to allow PSE&G Harrison Gas Plant to discharge 187,000 gallons per day to the industrial sewer (PAP-00132788). Discharge limitations included any discharge containing more than 100 mg/L of mineral oil or grease and any discharge containing floatable oil or grease (PAP-00132789).

On September 3, 1980, PSE&G Harrison Gas Plant renewed NPDES Permit # NJ0000566. The permit was effective October 31, 1980, and expired October 31, 1985 (PAP-00140073; PAP-00355998). The maximum daily discharge limitations for Discharge 001 included petroleum hydrocarbons (5 mg/L) and copper (1 mg/L). The discharge limitations for Discharge 002 included petroleum hydrocarbons (15 mg/L) but no COCs (PAP-00140074-75; PAP-00355999-6000).

From July 31, 1981 to July 31, 1986, the PSE&G Harrison Gas Plant operated under PVSC Sewer Permit # 13403712 (PAP-00140101; PAP-00140330). Discharge limitations included any discharge containing more than 100 mg/L of mineral oil or grease and any discharge containing floatable oil or grease. No discharge limitations were given for the effluent characteristics, biological oxygen demand (BOD), total suspended solids (TSS), and volume from either Outlet #1 Industrial Flow, or Outlet #2 Sanitary Waste (PAP-00140101-02, 05-06; PAP-00140330-31, 34-35).

The *Fact Sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey,* dated October 1, 1985 for Permit # NJ0000566 reported the discharge limitations for Discharges 001 and 002. The discharge limitations for Discharge 001 included petroleum hydrocarbons (5 mg/L) and copper (no limit given). Because the cooling water was both pumped from and discharged to the Passaic River, net effluent limitations are applicable. The discharge limitations for Discharge 002 included petroleum hydrocarbons (15 mg/L) but no specific COCs (PAP-00140281, 84-86).

The Harrison Gas Plant was issued NJPDES Permit # NJ0000566 on December 30, 1985. The permit was effective February 1, 1986, through January 31, 1991, and granted permission to discharge stormwater runoff and non-contact cooling water to the Passaic River (PAP-00140293). The surface water quality maximum concentrations included aldrin/dieldrin (0.0019 μg/L), PCBs (0.03 μg/L), DDT and metabolites (0.001 μg/L), petroleum hydrocarbons (5 mg/L) (PAP-00140311, 13).

In August 1990, PSE&G Harrison Gas Plant filed an *Application for Renewal NJPDES Permit # NJ0000566* to discharge to the municipal storm sewer system (PAP-00140791-92).

According to the August 1990 *Application for Renewal NJPDES Permit # NJ0000566,* the PSE&G Harrison Gas Plant held Air Permits for thirteen storage tanks which included a gasoline storage tank, tar process & storage tanks, spent oil tank, and a naphtha storage tank (PAP-00140800).

In January 1991, PSE&G Harrison Gas Plant filed an Application for Sewer Connection Permit # 13403712 (PAP-00140810).

In a letter dated September 22, 1994, PSE&G reported to the Bureau of Standard Permits Division of Water Resources, that by September 13, 1994 the Harrison Gas Plant facility had ceased discharging any non-contact cooling water. Because there was no longer a non-contact cooling water discharge, PSE&G requested an Application for Exemption to terminate that portion of NPDES Permit # NJ0000566 (PAP-00128204-05; PAP-00128226-29).

In July 1996, PSE&G Harrison Gas Plant requested a modification of Sewer Connection Permit # 13403712 because operational changes had reduced their process waste water discharge, and resulted in a sole constant industrial discharge of an average 500 gallons per day from an analytical laboratory (PAP-00128245-46). On August 2, 1996, the PVSC stated that they would not renew the permit because the facility no longer met the criteria to be classified as an industrial user (PAP-00128264-65). Any wastewater generated from site demolition or remediation projects would need to be approved by PVSC before it could be discharged to the sanitary sewer (PAP-00128264-65).

On March 21, 2012, NJDEP issued Remedial Action Soil Permit No.: RAP120002 to PSE&G to conduct remedial activities at the PSE&G Future Substation Area A/K/A: Red Bull Substation/ Former Harrison Gas Plant. The permit became effective March 26, 2012 (PAP-00130508).

7. Response Actions

Characterization Activities

April 21, 1980, correspondence from PSE&G to Hackensack Meadowlands Development Commission concerned the chemical analysis of five samples of dredged material taken from the Passaic River in the dock area of the Harrison Gas Plant. Thirteen thousand cubic yards of this material had been dredged from the river and PSE&G was asking about the suitability of this material in a landfill or as a cover for a landfill (PAP-00139407). PCBs, copper, lead and mercury were detected in all five samples at the following concentration ranges: Aroclor-1242 (1.9-4.6 ppm), Aroclor-1254 (not detected-2.9 ppm), copper (3.45-6.35 ppm), lead (8.35-11.32 ppm), mercury (0.003-0.007 ppm) (PAP-00139408, 10-11). As of May 1979, maintenance dredging had last been performed at the Harrison Gas Plant facility in 1975 (PAP-00135615).

In 1985, a Preliminary Site Assessment was conducted at the PSE&G Harrison Gas Plant. According to *Harrison Gas Plant Preliminary Site Assessment and Proposed Monitoring Plan* dated May 17, 1985, waste deposits were described as sludge from oil tanks, tar tanks, and the tar separator as well as spent oxide, clinker, gas set brick, and ash which were apparently deposited at two locations along the north property line, prior to 1930. One deposit was removed and trucked off the property in 1953. The second deposit was partly removed during construction of a Vaporizer Building in 1954. Noticeable tar accumulations were noted to be visible at several locations on the ground east of the vaporizer building. It was also noted that priority pollutant analyses for phenols, base neutrals, and metals were performed on water samples taken upstream of the plant and at the plant discharge from the Passaic River and from the well located on the site showed that any contamination which may exist on-site had not migrated from

the site (PAP-00140252). The results for the samples collected September 20, 1983 were non detected for PAHs, and 2,4,6-trichlorophenol (PAP-00140256-59). Copper was detected in the well water sample at 28 μg/L, 45 μg/L in the upstream sample, and 76 μg/L in the discharge effluent sample. Lead was not detected in any sample, and mercury was detected at 0.70 μg/L in the well and upstream samples but was not detected in the discharge effluent sample (PAP-00140261).

Remedial Activities

According to the *Focused Remedial Investigation Report* dated February 1997, a focused remedial investigation was conducted in 1996 by Golder Associates, Inc. for PSE&G at the PSE&G Harrison Gas Plant. This investigation was in response to the Memorandum of Agreement with the NJDEP which was the result of the May 1994 spill. The investigation was not designed to fully investigate and delineate environmental conditions at the site but was intended to identify potential interim remedial actions at the site which would minimize hydraulic communication between the site and the adjacent Passaic River. Groundwater and soils samples were collected as part of this investigation. Samples were collected from four test pits, four soil borings, and seven groundwater monitoring well locations. Analytical results for soil samples from the layer of soil identified as fill had exceedances of NJDEP Soil Cleanup Criteria for PAHs in two samples and exceedances of NJDEP Soil Cleanup Criteria for metals (primarily arsenic, cadmium, and / or lead) in eight samples. The concentration ranges of the COCs detected in the soils samples were as follows:

Soil Concentrations	
COC	**Concentration**
Benzo(a)anthracene	Not detected to 160 μg/kg – 2,400 μg/kg
Benzo(a)pyrene	Not detected to 160 μg/kg – 3,500 μg/kg
Benzo(b)fluoranthene	Not detected to 150 μg/kg – 1,800 μg/kg
Benzo(k)fluoranthene	Not detected to 130 μg/kg – 1,500 μg/kg
Indeno(1,2,3-cd)pyrene	Not detected to 140 μg/kg – 1,400 μg/kg
Benzo(g,h,i)perylene	Not detected to 170 μg/kg – 2,200 μg/kg
Copper	5.68 mg/kg – 75.93 mg/kg
Lead	4.39 mg/kg – 455.97 mg/kg
Mercury	Not detected to 0.28 mg/kg – 2.62 mg/kg

(PAP-00128330-39)

An April 1999 *Remedial Alternative Evaluation* prepared by Langan for PSE&G included a summary of the affected media at the PSE&G Harrison Gas Plant. The fill layer of the soil had significant contamination by semi-volatile organic compounds (SVOCs), primarily PAHs and various metals at levels exceeding the Residential Direct Contact Soil Cleanup Criteria (RDCSCC) as well as VOCs (PAP-00128416-17).

An RI was conducted by Langan for PSE&G between November 1997 and July 1999. The results of the RI were reported in the *Remedial Investigation Report (Including Remedial Action Selection Report) Former Harrison Gas Plant,* prepared September 1999. As part of the RI, a total of 126 test pits were excavated to determine subsurface

conditions within the fill at suspected areas of contamination *(e.g.,* gas main, manufactured gas plant gas production and product storage areas). Soil samples were collected from selected test pits for PAH screening and subsequent laboratory analyses. One soil sample was collected from the zero to two foot depth interval from each of 60 test pits to represent surface (zero to two feet) soil conditions. The samples were biased towards fill material that appeared to be most contaminated based on visual observations or photoionization detector readings. The soil samples were field screened in a mobile laboratory for PAHs. Thirteen of the PAH screening samples with the highest analytical results were analyzed at the laboratory for SVOCs, PCBs, and Target Analyte List Inorganics in addition to other analyses. In addition to the 13 samples that were laboratory analyzed based on PAH screening results, 10 samples were collected from pre-determined locations. Additionally, one sample of tar was collected from each of two test pits excavated from the buried tar area near the former vaporizer house at the north end of the Site (PAP-00128557-59).

The results of the field screening showed that samples collected in manufactured gas plant production and tar storage areas typically possessed higher concentrations of PAHs than samples collected in non-production or tar storage areas. The most common PAHs detected were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene. These were detected at low concentrations in most samples. The highest benzo(a)pyrene concentrations were detected in the tar storage area south of the office building, in the area of the purifier boxes, and in the tar storage area south of the machine shop. PAHs were not detected in seven test pit samples (PAP-00128589-90).

A total of 143 soil borings were drilled between November 1997 and October 1998 to gather stratigraphic information at various locations and to determine contaminant distribution (PAP-00128560-61). No exceedances of NJDEP RDCSCC were detected in the three soil samples collected off-site in the fill. Exceedances were detected in 22 of 27 on-site samples. Organic and inorganic contaminant concentrations decrease by at least a factor of five between on-site and off-site samples along Frank E. Rodgers Boulevard (PAP-00128591).

PAH exceedances were detected in 22 of 22 surface samples. The most common PAH exceedances were benzo(a)pyrene, benzo(a)anthracene, and benzo(b)fluoranthene. These and other SVOCs were typically present in the gas production and storage areas on-site (PAP-00128591). Inorganic exceedances which include lead were detected in 14 of 20 surface samples. PCB exceedances were detected in four of 24 surface samples. However, none were detected at the former transformer pads (PAP-00128592).

PAH exceedances of RDCSCC were detected in eight of 12 subsurface fill samples. All exceedances were from on-site samples. PAHs were widely distributed over the site. No off-site exceedances were detected. Inorganic exceedances of RDCSCC were detected in 7 of 11 subsurface fill samples. The most common inorganic exceedances detected included lead. Less common were copper and other metals. The analysis of the tar samples detected high levels of several SVOCs. The analysis of the sample from TP-39 detected high levels of several SVOCs, copper, lead, and other metals. One off-site exceedance of RDCSCC was detected for lead (PAP-00128593).

The concentration ranges for detected COCs from the on-site soil samples were as follows:

Soil Concentrations (mg/kg)	
COC	**Concentration**
Benzo(a)anthracene	Not detected to 0.01 mg/kg – 780 mg/kg
Benzo(a)pyrene	Not detected to 0.0091 mg/kg – 660 mg/kg
Benzo(b)fluoranthene	Not detected to 0.017 mg/kg – 600 mg/kg
Benzo(k)fluoranthene	Not detected to 0.033 mg/kg – 230 mg/kg
Dibenzo(a,h)anthracene	Not detected to 0.017 mg/kg – 60 mg/kg
Indeno(1,2,3-cd)pyrene	Not detected to 0.008 mg/kg – 280 mg/kg
Benzo(g,h,i)perylene	Not detected to 0.01 mg/kg – 270 mg/kg
Copper	5.8 mg/kg – 2,490 mg/kg
Lead	3.0 mg/kg – 4,890 mg/kg
Mercury	Not detected to 0.05 mg/kg – 1.9 mg/kg
Aroclor-1260	Not detected to 0.11 mg/kg – 0.65 mg/kg
Aroclor-1254	Not detected to 0.11 mg/kg – 2.1 mg/kg
Aroclor-1248	Not detected to 0.17 mg/kg – 3 mg/kg

(PAP-00128653-79)

Several SVOC (mostly PAHs) exceedances were detected in 14 of 31 on-site shallow aquifer piezometers distributed over the entire site. The SVOCs included naphthalene, 2-methylnaphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene. No SVOCs were detected in exceedance of the Class IIA GWQS in any of the off-site piezometers (PAP-00128601-02). A minimum of one inorganic exceedance was detected in each of the 31 on-site shallow aquifer piezometers distributed over the entire site. These inorganics included copper, lead, and mercury in addition to other metals (PAP-00128602).

The concentration ranges for detected COCs from the on-site shallow aquifer piezometer samples were as follows:

Shallow Aquifer Concentrations (µg/L)	
COC	**Concentration**
Benzo(a)anthracene	0.9 µg/L – 210 µg/L
Benzo(a)pyrene	0.8 µg/L – 160 µg/L
Benzo(b)fluoranthene	0.9 µg/L – 130 µg/L
Benzo(k)fluoranthene	1.0 µg/L – 59 µg/L
Dibenzo(a,h)anthracene	1.3 µg/L – 26 µg/L
Indeno(1,2,3-cd)pyrene	1.2 µg/L – 83 µg/L
Benzo(g,h,i)perylene	1.6 µg/L – 110 µg/L
Copper	4.1 µg/L – 4,520 µg/L
Lead	5.2 µg/L – 4,730 µg/L
Mercury	0.13 µg/L – 81.5 µg/L

(PAP-00128722-44)

Additional post-excavation soil samples were collected during the RI following the removal of six underground storage tanks (USTs). A total of 30 post-excavation soil samples were collected from the six UST excavations (PAP-00128572-73)

The concentration ranges for detected COCs from the post-excavation soil samples were as follows:

Post-Excavation Soil Concentrations (mg/kg)	
COC	**Concentration**
Benzo(a)anthracene	2.4 mg/kg - 7.2 mg/kg
Benzo(a)pyrene	2.3 mg/kg - 5.8 mg/kg
Benzo(b)fluoranthene	2.6 mg/kg - 5.6 mg/kg
Benzo(k)fluoranthene	0.86 mg/kg - 1.9 mg/kg
Dibenzo(a,h)anthracene	Not detected to 0.36 mg/kg - 0.81 mg/kg
Indeno(1,2,3-cd)pyrene	0.94 mg/kg - 2.9 mg/kg
Benzo(g,h,i)perylene	1.3 mg/kg - 4 mg/kg
Copper	5.2 mg/kg - 261 mg/kg
Lead	22.4 mg/kg - 210 mg/kg
Mercury	0.04 mg/kg - 3.3 mg/kg
Aroclor-1260	0.097 mg/kg (only one detection)

(PAP-00128680-93)

The *Remedial Investigation Report (Including Remedial Action Selection Report) Former Harrison Gas Plant* concluded that onsite soils within the fill had been impacted by Harrison Gas Plant operations. Contamination was widely distributed over the site with regions of greater contamination in former gas plant production and storage areas. Tar and/or oil staining was identified at most subsurface exploration locations across the site extending down to the Organic Clay (PAP-00128618). It was also concluded that Harrison Gas Plant operations had impacted off-site soils within the fill to the west of the

site along the Railroad right-of-way (ROW). Tar and/or staining was identified at many subsurface exploration locations extending to the Organic Clay, especially west of the former No. 3 gas storage holder (PAP-00128618).

The *Remedial Investigation Report* also noted that three hardened tar masses had been identified: one by the former vaporizer house at the north end of the site, one west of the former No. 3 gas storage holder along the western property boundary and extending onto the Railroad ROW, and the last on the Railroad ROW northwest of the No. 1 gas storage holder. The tar mass at the north end of the Site was approximately 2,000 cubic yards (cy) in size, the second tar mass was approximately 1,300 cy in size and the last tar mass was approximately 13 cy in size. Tar, present as free product, was observed at four locations: south of the tar separators, south of the former No. 3 gas storage holder, west of the former tar storage tank Nos. 28 and 29, and within the Railroad ROW west of the former No. 3 gas storage holder (PAP-00128618).

The *Remedial Investigation Report* estimated that 3,000 gallons of recoverable tar were present south of the former tar separators, that 150 gallons of recoverable tar were present south of the No. 3 gas storage holder, that 1,200 gallons of recoverable tar were present west of the tar storage tanks, and that 250 gallons of recoverable tar were present west of the former No. 3 gas storage holder (PAP-00128618-19).

Light non-aqueous liquids (LNAPLs) such as oil were observed at five locations: two were south of the current office building in the vicinity of the relief holder, one was west of the former gas purifiers, one was along the gas main in the center of the Site, and one was along the gas main trench near the bulkhead. It was estimated that 3,338 gallons of recoverable LNAPL was present along the gas main trench near the bulkhead (PAP-00128619).

According to the *Remedial Action Report - Phase I Riverfront Stage, Former PSE&G Harrison Gas Plant Site,* excavation activities were completed in July 2005 to expose underground utilities for the purpose of upgrading the natural gas supply service main. Although this excavation was not part of a remedial action, soil was removed which was comprised of historic fill. A total of 85 tons of soil (historic fill material) were excavated from the northeastern section of the site along the fence line near Frank E. Rodgers Boulevard, and 6,284 gallons of groundwater were pumped for off-site disposal to a licensed facility. There were no observations of oil material and/or tar material, related to the historic operations of the former Harrison Gas Plant during excavation activities. Post excavation side wall samples were not collected. The area was backfilled with 91 tons of certified clean sand (PAP-00128948).

During the Phase 1 Riverfront Stage remedial action which took place between July 1, 2006 and January 11, 2008, a total of 53,690 cubic yards of contaminated soils were excavated from the Harrison Gas Plant site. With the exception of two specific areas containing COCs in soil identified during previous Phase II RI/waste classification sampling events (Former Area D Benzene and Former Area E Dioxin) the objective of the remedial action was the removal of source material (oil material and tar material) (PAP-00128952-53, 97). Each excavation was extended to the depths sufficient for removal of oil material and tar material, removal of historic plant structures and/or to the

maximum extent practicable. Post-excavation samples were collected at the 10 remediation excavation areas (PAP-00128966).

According to the *Remedial Action Report - Phase I Riverfront Stage, Former PSE&G Harrison Gas Plant Site*, Remediation Area 3 contained elevated levels of chlorinated dibenzo-p-dioxins in soils from 5.5 to 11.0 feet bgs. Soils in this area were removed to approximately 22 feet bgs with the exception of the northeast comer which was removed to a depth of approximately 14 feet bgs. Therefore according to the *Remedial Action Report*, the soils that contained elevated levels of dioxin were effectively removed. Four post excavation samples were collected and analyzed for dioxins in addition to the other post excavation parameters. Dioxins were detected in each of the samples. The results state that the dioxin concentrations are highest at sample PEB-AE-5B located closest to the waterfront. This sample was collected from material that was located below the former relieving platform and presumed to be sediment based on its physical characteristics. The analytical results of sample PEB-AE-5B was consistent with results from shallow samples collected in sediments from the “Harrison Reach” of the Passaic River by EPA. These results state that the dioxins detected in the post excavation samples can be attributed to migration from the Passaic River and are not associated with the former Harrison Gas Plant operations. The area was capped. Residual dioxin concentrations would be documented in the deed notice to be filed upon completion of the subsequent phases of remedial actions at the site (PAP-00128997-98).

The following table compares the analytical data EPA sediment RI data from the Passaic River for selected dioxin compounds: (PAP-00128998).

Harrison Post-Excavation Data with Comparison to Sediment EPA RI Data[a]

Congener	PEB-A3-5A	PEB-A3-5B	PES-A3-5A	PES-A3-5B	12A001[a]	13A020[b]
2,3,7,8-TCDD	ND	384	ND	ND	534	ND
OCDD	5.76	5100	1.82	808	6090	3040
Total TCDD	ND	536	ND	1.18	564	3

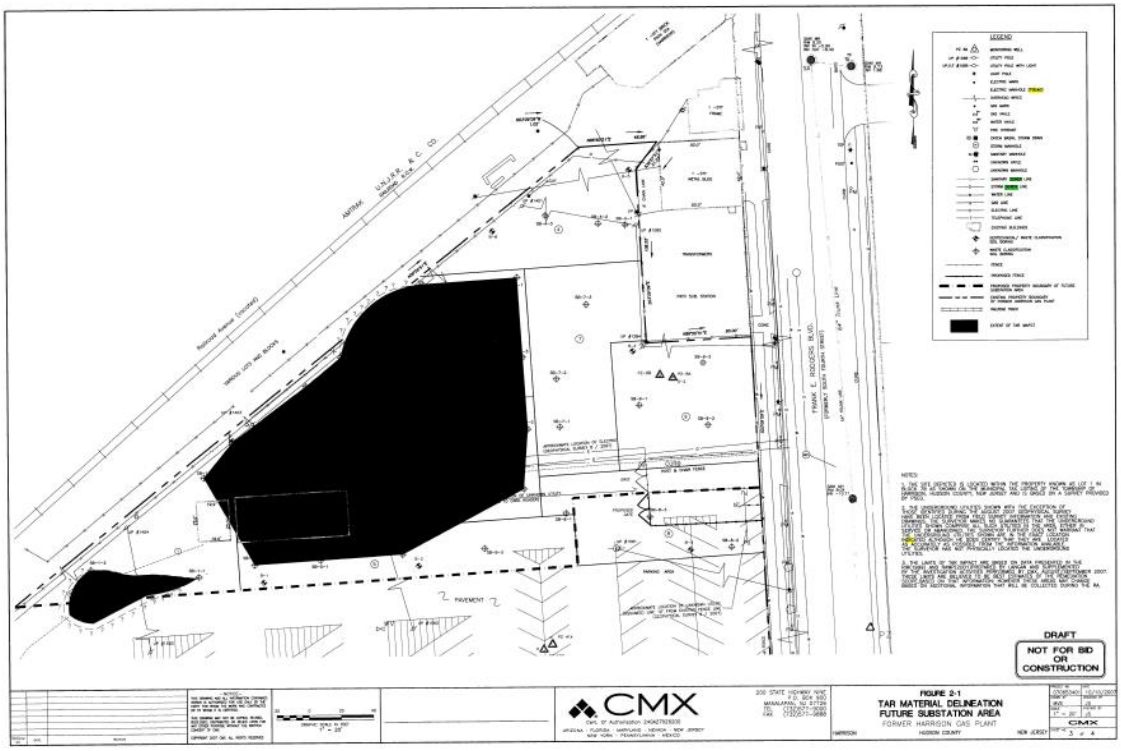
[a] 0 foot depth; EPA April 1995 RI report
[b] 3.17 foot depth; EPA April 1995 RI report
All concentrations are picograms/gram
ND = Nondetected
April-95: "Analytical Data Summary Tables - Passaic River Study Area Remedial Investigation"

According to the *Remedial Action Report - Phase I Riverfront Stage, Former PSE&G Harrison Gas Plant Site*, the remedial action was effective in removing source material (oil material and tar material) and several former structures possibly related to these sources from the areas excavated. However, based on field observations, oil material and tar material remained at the site beyond the limits of the excavation at several locations. These locations included the following: 1) in the shallow fill material above the silty clay confining layer at numerous locations north of the landside sheeting, and north, east and west of Area 7-8-9; 2) in native soils below the silty clay/peat confining layer at depths that exceeded the maximum practicable depth permitted by the sheeting design at

the southeastern corner of Area 1-4; 3) in sediments located beneath the former relieving platform in Area 3 (in cells A3-2, A3-3, A3-4, and A3-5); 4) in native soils below the silty clay/peat confining layer north of the landside sheeting at Area 3, 4b, 5, 6 and 10; and 5) in a small pocket of sand/gravel north-northwest of Area 10 at approximately -27 to -32 msl (PAP-00128998-99). The report recommended conducting additional remedial investigations to determine the horizontal and vertical extent of the remaining oil material and tar material (PAP-00129000).

According to the *Interim Remedial Action Report, Former Harrison Gas Plant, Future Substation Area (Interim Remedial Action Report)*, dated March 2009, an Interim Remedial Action was conducted on a portion of the former Harrison Gas Plant known as the Future Substation Area in 2008. This area was remediated to allow for construction of a new electrical substation. The purpose of the Interim Remedial Action was to remove tar material from the area of the proposed substation construction, and prevent recontamination of the area. The Interim Remedial Action included the excavation and removal of soils containing tar material within the Future Substation Area; placement and compaction of clean backfill; installation of a low-permeability seal between the clean fill and excavation side walls where tar material was present at the boundary of the planned excavation, and; establishment of an institutional control in the form of a deed notice (PAP-00129342). The Future Substation Area was located in the north-eastern most corner of the former Harrison Gas Plant site (PAP-00129392).

The figure on the next page shows the extent of the tar identified during the Interim Remedial Action for the future substation at the Harrison Gas Plant site:



(PAP-00129394)

From August 2008 to September 2008, excavation was conducted to remove the tar material. Not all of the tar material could be removed due to groundwater entering the excavation from the deeper aquifer. Tar material was observed seeping from the southern end of the western wall and the southern side wall. These areas were covered with a bentonite geotextile (Bentomat™) to prevent tar material from reentering the excavation. Soils containing tar material were excavated into the top of the organic clay layer, approximately 10 feet below grade (PAP-00129372-73). A total of 16,895.87 tons of soil excavated from the site were transported for off-site thermal treatment and reuse as daily landfill cover (PAP-00129378).

The *Interim Remedial Action Report* concluded that the remedial activities at the Future Substation Area successfully removed tar material to the extent practicable as necessary to allow construction of the electrical substation. This included removal of tar material within and near the footprint of the substation to the top of the underlying Organic Clay Layer. The environmental conditions that could not be addressed by this Remedial Action would be addressed by the future sitewide Remedial Action for the former Harrison Gas Plant (PAP-00129387). A deed notice was to be established for the substation area to serve as an institutional control to prevent potential exposure to affected soils. The deed notice extends to the limits of the excavation and includes soil contamination that remains in place on the substation area following completion of the excavation activities (PAP-00129357, 80).

The concentration ranges for detected COCs from the samples collected for the deed notice are as follow:

Deed Notice Future Substation Area		
COC	**Concentration Ranges**	**Depth of Max Concentration**
Benzo(a)anthracene	0.029 J mg/kg – 6.5 mg/kg	-9.5 to -10.0
Benzo(a)pyrene	0.02 J mg/kg – 4.9 mg/kg	-9.5 to -10.0
Benzo(b)fluoranthene	0.016 J mg/kg – 3.1 mg/kg	-9.5 to -10.0
Benzo(g,h,i)perylene	0.011 J mg/kg – 0.74 J mg/kg	-9.5 to -10.0
Benzo(k)fluoranthene	0.018 J mg/kg – 4.8 mg/kg	-9.5 to -10.0
Dibenzo(a,h)anthracene	Not detected to 0.036 J mg/kg – 0.52 mg/kg	-9.5 to -10.0
Indeno(1,2,3-cd)pyrene	0.0089 J mg/kg – 0.97 mg/kg	-9.5 to -10.0
Copper	26.3 mg/kg – 3,330 mg/kg	-6.0 to -6.5
Lead	82.8 mg/kg – 4,890 mg/kg	-6.0 to -6.5
Mercury	0.19 mg/kg – 2.1 mg/kg	-4.5 to -5.0

(PAP-00129399-400)

As reported in the *Supplemental Remedial Investigation Report, Future PATH Substation Investigation*, dated August 2009, additional investigations were conducted in June 2009 at the location of the PATH substation to delineate the horizontal and vertical extent of areas of tar material and oil material in the footprint of the Future PATH Substation Area. This investigation included obtaining soil samples within the footprint of the Future PATH Substation Area to provide data necessary for conducting a remedial action (soil removal) and implementing institutional controls (deed notice), as well as

obtaining additional groundwater samples in the shallow and intermediate aquifers to identify groundwater COCs (PAP-00129653, 64-65).

SVOCs above the Soil Remediation Standards or Impact to Groundwater Soil Screening Levels were primarily 2-methylnaphthalene, fluorene, fluoranthene, pyrene, naphthalene and suspected carcinogenic PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were detected in approximately half of the samples collected from borings installed in fill material. Samples obtained from glaciofluvial soils below the meadow mat stratum did not contain SVOCs above the Remediation Standards or Soil Screening Levels. Observations of oil material/sheens generally coincided with sampling locations where elevated levels of SVOCs were identified (PAP-00129669).

The highest levels detected above the Remediation Standards were found in one boring at a depth of 9.0-9.5 bgs. The concentrations were as follows: (PAP-00129669-70)

Soil Boring Concentrations (mg/kg)	
COC	**Concentration**
Benzo(a)anthracene	139 mg/kg
Benzo(a)pyrene	129 mg/kg
Benzo(b)fluoranthene	53.9 mg/kg
Benzo(k)fluoranthene	54.8 mg/kg
Dibenzo(a,h)anthracene	15.8 mg/kg
Indeno(1,2,3-cd)pyrene	41.7 mg/kg

Approximately 25 percent of samples obtained from the fill material contained metals above the NJDEP Soil Remediation Standards or Impact to Groundwater Soil Screening Levels which included lead and mercury (PAP-00129670). The highest levels of lead and mercury detected were as follows:

June 2009 Supplemental Remedial Investigation		
COC	**Concentration**	**Depth**
Lead	1,240 mg/kg	1.5 to 2.0
Mercury	6.4 mg/kg	8.0 to 8.5

(PAP-00129670)

The concentration ranges for detected COCs from the June 2009 Supplemental Remedial Investigation soil sampling were as follows:

June 2009 Supplemental Remedial Investigation	
COC	**Concentration**
Benzo(a)anthracene	Not detected to 0.0354 J mg/kg – 139 mg/kg
Benzo(a)pyrene	Not detected to 0.0376 J mg/kg – 129 mg/kg
Benzo(b)fluoranthene	Not detected to 0.0308 J mg/kg – 53.9 mg/kg
Benzo(k)fluoranthene	Not detected to 0.0295 J mg/kg – 54.8 mg/kg
Dibenzo(a,h)anthracene	Not detected to 0.0198 J mg/kg –15.8 mg/kg

Indeno(1,2,3-cd)pyrene	Not detected to 0.0216 J mg/kg – 41.7 mg/kg
Benzo(g,h,i)perylene	Not detected to 0.0347 J mg/kg – 55 mg/kg
Copper	9.6 mg/kg – 373 mg/kg
Lead	3.3 mg/kg – 1,240 mg/kg
Mercury	Not detected to 0.12 mg/kg – 6.4 mg/kg

J= Estimated (PAP-00129681-707).

A total of 33,459.26 tons of excavated soil, debris and fragmented piping as well as 5,355.74 tons of soil containing hazardous lead were removed for disposal (PAP-00360064).

The report concluded that the Interim Remedial Action was successful in that the following specific remedial action objectives were completed:

- Removal of soils above and below the shallow groundwater table that were considered to be a source of groundwater contamination;
- Removal of subsurface former gas plant structures considered to be a source of site soil and groundwater contamination;
- Inhibit re-contamination of imported certified clean backfill with the installation of a Vertical Hydraulic Barrier and Geosynthetic Clay Liner bottom panels; and,
- Allow for long-term use of the future PATH Substation #9 construction area with the implementation of a Deed Notice and continued operation and maintenance of the site engineering controls and institutional controls (e.g., groundwater classification exception area) (PAP-00360074).

On March 2, 2011, the Deed Notice for the former PSE&G Harrison Gas Plant facility designated as Block 78, Lot 1 was finalized (PAP-00359951). The remaining contamination which prevents unrestricted use was reported using the concentrations noted above in the table titled “Deed Notice Future Substation Area”.

On July 11, 2012, a Deed Notice for the former PSE&G Harrison Gas Plant facility designated as Block 78, Lot 1 was issued (PAP-00360452). This deed notice was terminated on August 10, 2016 (PAP-00361883). On January 5, 2017 and December 22, 2017, deed notices were issued for Lots 1.02 and 1.01, respectively (PAP-00361786; PAP-00361844).

According to the *Remedial Investigation Report Former Harrison Gas Plant*, in 2014, Paulus, Sokolowski & Sartor, LLC implemented and managed a Pre-Design Investigation on behalf of PSE&G. The Pre-Design Investigation was conducted from April through June of 2014 for Parcels A and B (western half of the Site) and September through December of 2014 for Parcels C and D (upper half of Site). The focus of the Pre-Design Investigation was to characterize soils underlying the property and to identify the presence of contamination as related to the former on-site manufactured gas plant operations (PAP-00130613). A total of 389 soil borings were installed via direct push drilling techniques. The sample locations were chosen using an approximate sampling

grid of 50 foot center to center, and were advanced to a maximum depth of 49 feet bgs. 156 soil borings were field screened and 188 soil samples were collected for laboratory analysis (PAP-00130613).

The *Remedial Investigation Report Former Harrison Gas Plant* reported the following findings of the Pre-Design Investigation:

- Previous explorations and investigations had stated the presence of coal tar or NAPL in a layer of coarse sand located between 15-35 feet bgs northeast of Former Gas Holder No. 3 through the southern half of Former Gas Holder No. 1. This coarse sand layer was observed during sampling activities performed during this investigation in April 2014. The coarse sand tested positive for oil hydrocarbons and typically had PID readings greater than 9,999 ppm.

- Locations near the historical naphthalene drip tanks had a separate fluorescent tar signature in observed logs. This could potentially be the result of the historical naphthalene storage. A sample taken from 39.5 to 40 feet bgs in Boring B-2-16 had an observed naphthalene concentration of 960 mg/kg.

- Using the 3-D model developed from the investigative data, a significant mass of 130,000 cubic yards of manufactured gas plant waste was found in the subsurface across Parcels A through D. Thickness of the soil impact within the model ranges between 6 and 49 feet bsg. The model also shows the likely presence of additional manufactured gas plant waste in other portions of the site.

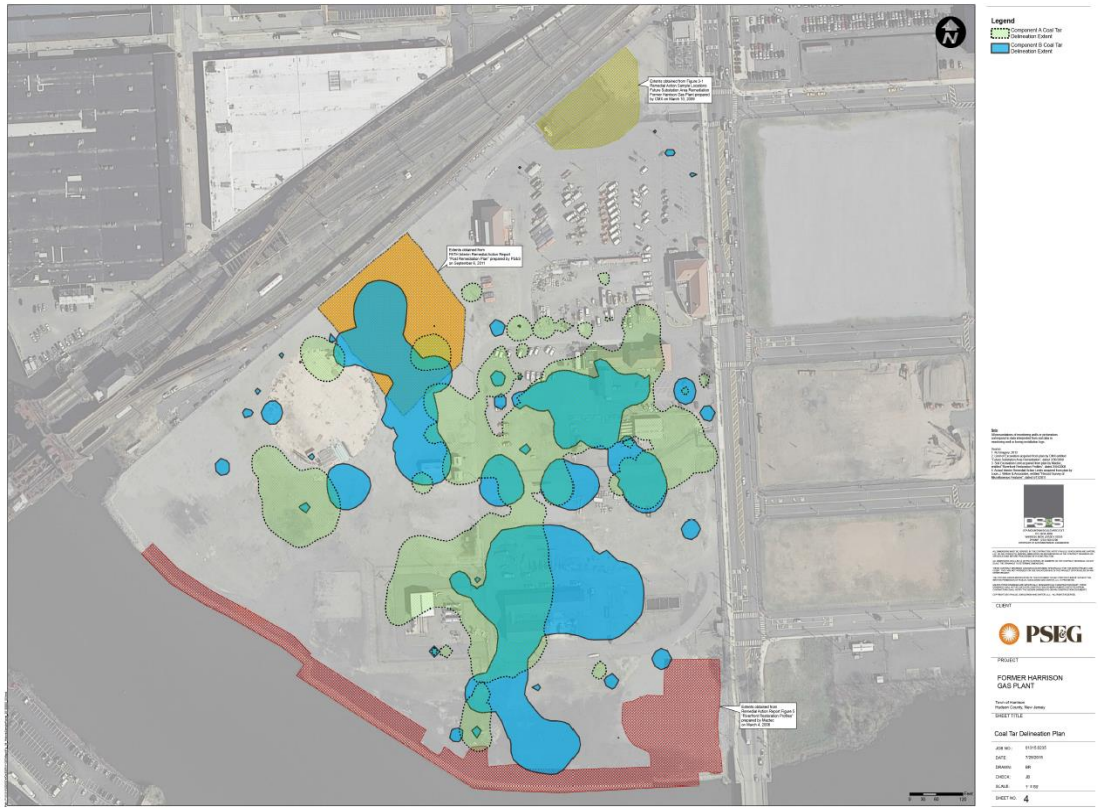
- Vadose zone impact as related to NJDEP's Default IGWSSL's are minimal due to the majority of coal tar identified being below the shallow water table.
- The thickest accumulations of manufactured gas plant waste are located adjacent and below the former gas holders.

- The 3-D model identifies that coal tar in the man-emplaced fill material totals 6,000 cubic yards of the coal tar mass, where the average depth of the fill is approximately 9 feet bgs. The model shows that 45,000 cubic yards of coal tar mass are identified within the clay/peat (meadow mat), ranging from approximately 9 to 15 feet bgs. The model shows the remaining 79,000 cubic yards of coal tar mass within the sand below the meadow mat, ranging from approximately 15 feet to 49 feet (maximum depth of borings during the investigation) (PAP-00130615-16).

The Pre-Design Investigation concluded that that much of the un-remediated portions of the Site are impacted with coal tar or manufactured gas plant waste. It was also noted that there was a high degree of variability in coal tar PAH concentrations and PAH distributions. An output of the Pre-Design Investigation was the development of the 3-D Model to be used as a management strategy for expediting characterization of the site. The Model was constructed by using historical soil and groundwater data from all prior Remedial and Field Investigations of the site, site lithology and historical buildings and

features along with aerial photography and the data developed during the 2015 Pre-Design Investigation (PAP-00130616-19).

The following figure presents the Component A (green) and Component B (blue) Coal Tar delineation extents:



(PAP-00130658)

Note: The different components were based upon the PAH molecular structure (PAP-00130614). The report did not state which PAHs were found in each component.

8. Summary of Asserted Defenses

Public Service asserts a number of defenses, including but not limited to the following:

- Discharges from the site were permitted discharges exempt from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Emergency Planning and Community Right-to-Know Act (EPCRA) release reporting requirements pursuant to CERCLA section 101(10).

- Discharges of “petroleum, including crude oil or any fraction thereof” are excluded from CERCLA’s definition of “pollutant or contaminant.”

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

PURDUE PHARMA TECHNOLOGIES

Facility Name, Address and Size: Lemke Chemicals, Inc./Napp Chemicals, Inc./Napp Technologies, Inc.; 199-201 Main Street, Lodi, New Jersey; 1.728 acres; 108 employees; the number of shifts was unavailable (PAP-00127288)

1. **Business Type:** Bulk pharmaceutical manufacturing and processing (PAP-00127288)

2. **Time Period of Ownership/Operations**

Operator: 1971 to 1995
Owner: Not Applicable

1946: B.L. Lemke & Co. Inc. owned and operated the site from 1946 to 1970 (PAS-00085127).

1970: According to a *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, Nappwood Land Corporation took ownership of the site beginning in 1970 (PAP-00127496; PAS-00085127). Purdue Pharma Technologies, Inc. (PPTI) was incorporated in the State of Delaware under the name “195-203 Fine Products Corporation” on December 17, 1970 (PAS-00081948).

1971: B.L. Lemke & Co. Inc. was merged into PPTI on March 13, 1971, with PPTI as the surviving corporation and doing business under the new name of "Lemke Chemicals, Inc." (PAS-00081948). PPTI (known as Lemke Chemicals, Inc.) began operating the site on or about March 13, 1971 (PAS-00081939).

1973: A Certificate of Amendment was filed on January 30, 1973, changing the name from "Lemke Chemicals, Inc." to "Napp-Lodi, Inc." On March 30, 1973, Napp-Lodi, Inc. was merged with Napp-Clifton, Inc. and Napp Chemicals, Inc., with Napp-Lodi, Inc. surviving under the name "Napp Chemicals, Inc." (PAS-00081948).

1981: In 1981, to accommodate a need for additional warehouse space, Napp Chemicals, Inc. leased 18,000 square feet of an adjacent “Sawwood Warehouse.” The Sawwood Warehouse, located at 175 Main Street, was used solely by Napp Chemicals, Inc. for the warehousing of non-flammable raw materials and finished products (PAS-00084885). This property was leased from Robert Fortunato (doing business as R&R Realty) (PAS-00084885; PAP-00127468).

1993: A Certificate of Amendment was filed on April 17, 1993, changing the name from Napp Chemicals, Inc. to Napp Technologies, Inc. (PAS-00081948).

1995: On April 21, 1995, an industrial accident at the site destroyed a portion of the site and caused plant operations to cease (PAP-00127495).

2002: A Certificate of Amendment was filed on March 26, 2002, changing the name from Napp Technologies, Inc. to Purdue Services, Inc.; and, a Certificate of Amendment was filed on October 7, 2002, changing the name from Purdue Services Inc. to the current name of PPTI (PAS-00081948).

2018: According to a Soil Remedial Action Permit, Deed Notice with Engineering Control, dated July 2, 2018, Douglas Kanter/KLS LODI LLC is the property owner (PAP-00374435). It is unclear when ownership of the property was transferred from Nappwood Land Corporation to Douglas Kanter/KLS LODI LLC, and if there were any intermediate property owners.

It is noted that the site was comprised of three distinct areas:

- PPTI site: the property leased by PPTI from Nappwood Land Corporation;
- Sawwood Warehouse: located at 175 Main Street, leased from Robert Fortunato (doing business as R&R Realty), and used solely for the warehousing of non-flammable raw materials and finished products; and,
- Common Area: the parking area behind the Sawwood Warehouse leased by PPTI from Robert Fortunato (PAS-00084885; PAP-00127468).

According to a *Soil Remedial Action Report*, dated April 22, 2016, prior to 2003, the remedial investigation for the PPTI site included the Sawwood Warehouse and the Common Area (hereinafter, the Fortunato property). According to the report, the remedial investigation documented delineation of contamination to NJDEP “Residential Direct Contact Soil Cleanup Criteria” based on data collected on the Fortunato property. Thereafter, counsel for the Fortunato property owner notified PPTI's counsel that the property owner would be remediating the contamination at the Fortunato property, and terminated PPTI's right to access the Fortunato area. In a May 20, 2004 letter to NJDEP from its counsel, the Fortunato property owner committed to undertake appropriate actions to achieve NJDEP Industrial Site Recovery Act compliance for the Fortunato area. In an e-mail letter to Mr. John Graham, NJDEP supervisor, dated June 8, 2004, the Fortunato property owner's counsel confirmed that the property owner's environmental consultant would undertake all future field and other remedial activities necessary to remediate the Fortunato property and other property owned by the property owner. Mr. Graham, in a telephone conversation with PPTI's legal counsel on June 8, 2004, advised PPTI's legal counsel that NJDEP had no objection to this division of activity as long as NJDEP received all of the data collected. From 2004 to 2008 several remedial actions were completed on the Fortunato property to remediate the soil and the property was redeveloped (PAP-00127855). Note: Details of these remedial actions on the Fortunato property were not available in the file material.

The location of the Fortunato property is depicted in Section 7 below (PAP-00127644).

3. Operational History/COC Use and Presence at the Facility

According to a *Preliminary Assessment Report*, dated February 1996, PPTI manufactured bulk generic drugs and performance chemicals for the cosmetic and pharmaceutical industries. Processes included the synthesis and drying of compounds mixed with water and/or solvent, the blending and grinding of mixtures of dry powder, sometimes mixed with water to produce other products, and micronizing and other particle size reduction operations. Specific processes included, but were not limited to, para-hydroxybenzoic acid production, methylparaben production, and trimethoprim production. Operations were conducted on a contract basis. Raw materials used and finished products varied with each contract (PAS-00085143).

According to a *Draft Environmental Priorities Initiative, Visual Site Inspection Report for Napp Chemicals Inc.*, dated December 1992, chief products were methylparaben (methyl para-hydroxybenzoate) and propylparaben (propyl para-hydroxybenzoate), which are used as preservatives in the food, beverage, pharmaceutical, and cosmetics industries. The parabens were produced via an esterification reaction involving 4-hydroxybenzoic acid and methanol or propanol. The site also finished (e.g., pulverized, ground) the parabens to meet customer specification. According to the document, the principle hazardous materials were sodium hydroxide, hydrochloric acid, methanol, n-propanol, isopropanol, and acetone (PAP-00128041).

According to a *Community Right to Know Survey for 1991*, the following materials containing OU2 COCs were present at the site: copper, copper chloride, cupric nitrate, cupric sulfate, lead acetate, lead nitrate, lead perchlorate, mercuric acetate, mercuric chloride, mercuric iodide, mercuric oxide, mercuric sulfate, mercury, naphthalene, copper gluconate. These chemicals were also reported in 1992 and 1993 (PAS-00081981-2168). With the exception of copper gluconate, these materials were listed as being present in the site laboratory (PAS-00082050-168). According to a *Community Right to Know Survey for 1994*, only copper gluconate was handled at the site (PAP-00127291). Copper gluconate was listed as being present at the pulverizing and blending area and finished goods warehouse (PAS-00081957). Finally, according to a *Preliminary Assessment Report*, dated February 1996, copper acetate monohydrate, lead, and various petroleum products were handled at the site (PAS-00085146-51).

It is noted that according to a *Preliminary Assessment Report*, dated February 1996, United Pierce and Dye Works (UPDW) operated at the site between 1903 and 1939. The report states that it appeared that the site was used for office space and shipping activities (PAS-00085127-28); however, a *Remedial Investigation Report/Remedial Action Workplan*, dated June 17, 2004, states that the site began manufacturing dyestuffs during World War I. The document states that prior to 1939, when UPDW closed, dyestuffs were almost exclusively manufactured from coal tar products. Coal tar is comprised primarily of polynuclear aromatic hydrocarbons (PAHs). In addition, it states that metals, including copper, were historically used as mordants or laking compounds, and that these COCs were found at the site, “supporting a conclusion that UPDW operations resulted in several of the constituents found beneath the former plant areas,” including PAHs and metals (PAP-00127496-97).

4. Identified COCs

- PCBs (detected)
- Dioxins/Furans (detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (used, detected)

A figure depicting the locations of contaminant source areas referenced in this section is included in Section 7 below (PAP-00127644).

PCBs

According to the *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, prepared for Napp Technologies, Inc., dated June 1999 (1999 RIR/RIWP Addendum), PPTI never used polychlorinated biphenyls (PCBs), nor operated any heat exchange equipment that would potentially contain PCBs (PAS-00084970); however, PCBs were detected at the site as discussed below.

An industrial sewer line historically ran north to south across the site, beginning at the adjacent Hexcel property and continuing to the Hendricks pump station located adjacent to the Fortunato property (PAP-00127468, 559). It appears that the Hendricks pump station discharged to the Passaic Valley Sewerage Commission (PVSC) treatment plant (PAS-00087289). The following PCB concentrations by media were detected at sample locations along the trace of the industrial sewer line on PPTI property, as discussed in the 1999 RIR/RIWP Addendum, and the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004:

- Soil: Ranging from 0.6 milligrams per kilogram (mg/kg) at a depth of four feet below ground surface (bgs) to 8,500 mg/kg collected from seven to 7.5 feet bgs at sample location TP-7, and 1,700 mg/kg collected from nine to 9.5 feet bgs at sample location TP-7B (PAS-00084957; PAP-00127670).

- Sewer residue: Aroclor 1242 was detected at 26,000 mg/kg at sample location TP-7-Pipe at the northern property boundary with Hexcel, 6,300 mg/kg at sample location MH-1(PAS-00084957). It should be noted that the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, identified the concentration of PCBs in sample TP-7-Pipe as 26 mg/kg, rather than 26,000 mg/kg reported in the 1999 RIR/RIWP Addendum (PAP-00127670; PAS-00084957). In addition, the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, states that Aroclor 1242 was detected at a maximum concentration of 820 mg/kg in the industrial sewer line manhole/sumps (PAP-00127748).

- PCB-laden (Aroclor 1242) light non-aqueous phase liquid (LNAPL): 3,400 mg/kg at well MW-E14 installed just south of Molnar Avenue adjacent to Hexcel (PAS-00084957).

PCBs also were present in soil along approximately 200 feet of the Saddle River riverbank at concentrations as high as 94 mg/kg, as discussed in the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004. The PCBs extended south from the Hexcel property line, where the primary Aroclor detected was 1242, to the Fortunato property line, where the primary Aroclors detected were 1254 and 1260. Horizontal delineation was achieved to the west at the majority of locations immediately adjacent to the Saddle River, with the exception of three sample locations where PCBs were present immediately adjacent to the river at concentrations "just slightly greater" than the NJDEP "Residential Direct Contact Soil Cleanup Criteria" (0.49 mg/kg) at a maximum concentration of 3.18 mg/kg. However, no PCBs were present in sediment. Vertical delineation was achieved at depths ranging from approximately one to 1.5 feet at the Saddle River to approximately five feet at the PPTI fence line. Based on the 200 feet of riverbank, an average width of 15 feet and an average depth of four feet, it was approximated that 670 cubic yards of soil contained PCBs at a concentration greater than the "Residential Direct Contact Soil Cleanup Criteria" (0.49 mg/kg) (PAP-00127627, 56).

With respect to the origin of PCB contamination, the following is noted:

- According to the 1999 RIR/RIWP Addendum, the presence of PCB Aroclors 1242 in site soils was a result of an upgradient off-site source. Aroclor 1242 was never used by PPTI, nor was it detected in any of the soil samples from PPTI's process areas. PPTI contends in the document that these PCB Aroclors were from the adjacent property, Hexcel's "signature compounds," and were associated with LNAPL that migrated onto the PPTI property via the industrial sewer line and other utility pipelines and trenches which traverse the PPTI property. Aroclor 1242 was detected only along the northern property boundary with Hexcel and in the western portion of the PPTI property along underground utilities that originated on Hexcel property. Reworking of soils as a result of earthmoving activities conducted in the western portion of the site (associated with periodic utility line maintenance) was believed to be responsible for the detection of Aroclor 1242 in the near-surface soils (PAS-00084899-900).

- The 1999 RIR/RIWP Addendum, states further that "early in the investigation of the Hexcel property, Hexcel acknowledged that off-site migration of PCB oils via its sewer system was of concern due to the sewer's questionable integrity." No supporting original documentation related to this acknowledgement was identified in the available file material. The highest concentration of PCBs on the PPTI site existed along the trace of the industrial sewer line at the northern property boundary between PPTI and Hexcel. The report states that "it is clear" from visual observations, comparison of LNAPL constituents, and the proximity the sample locations, that the LNAPL is migrating onto the PPTI site from the Hexcel property (PAS-00084957).

- Finally, according to the 1999 RIR/RIWP Addendum, in the late 1980s, PVSC required Hexcel to eliminate the introduction of PCB-contamination into their sewer system. Hexcel, in correspondence to PVSC dated October 14, 1987, reported that the industrial sewer onsite and downstream from the property was "substantially clogged" with sediments and sludge containing PCBs (Aroclor 1242) ranging in concentration from 10 mg/kg to 7,660 mg/kg. The concentrations of PCBs (Aroclor 1242) were reported to increase downstream in the sewer system, with the highest concentration reported in the wet well at the Hendrix pump station. The only PCB Aroclor detected in the PVSC sewer system was Aroclor 1242 (PAS-00084958; PAS-00091036-38, 46-48). It is also noted that according to a *Summary Report of Preliminary Environmental Sampling at the Fine Organics Corporation Facility, Lodi, NJ*, prepared for Hexcel, dated October 14, 1987, sludge and sediment samples collected from the industrial sewer system in 1987 by Hexcel included a sample from a manhole on the PPTI site. Aroclor 1260 was detected at a concentration of 490 mg/kg (PAS-00091040-41).

According to the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, although NJDEP agreed that constituents found adjacent to portions of the industrial sewer line running north to south through the PPTI site were caused by upstream source(s), it maintained that PPTI should remediate constituents found downstream of its tie-in to the sewer line. PPTI was required to further characterize the industrial sewer line and document the extent of the suspected disposal area that had previously been found adjacent to the sewer line (PAP-00127501).

With respect to the Fortunato property, the following is also noted: Brick-lined trenches were used to collect and transfer process wastewater historically at the PPTI site, based on review of the *Preliminary Assessment Report*, dated February 1996. Use of these trenches dated back to UPDW's ownership of the site (PAP-00373427, PAS-00085049). According to the 1999 RIR/RIWP Addendum, four catch basins were identified in the concrete slab floor of the Sawwood warehouse of the Fortunato property. The catch basins were connected to trenches, similar to those observed on the PPTI site. It was concluded that both trench systems were part of one large gravity-drainage central trench systems (PAS-00084863-64). Sediment samples were collected from four catch basins in 1996. Total PCBs were detected in all sediment samples at concentrations ranging from 0.97 mg/kg to 3,100 mg/kg (PAS-00084970).

Dioxins and Furans

2,4,6-Trichlorophenol was detected in soil at the Hexamethylene Diamine Loading Area at an estimated concentration of 0.025 J mg/kg (PAP-00127741). According to the *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated June 1997, hexamethylene diamine was periodically loaded from tank trucks to holding vessels located in Building 5 (PAS-00085072). Note: No information as to the source of the 2,4,6-trichlorophenol was identified in the available file material. In addition, the size of the holding vessel and if any spills occurred is not addressed in available references.

PAHs

PAHs were detected in soil sampled in 1998 and 2002, as discussed in the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, primarily at sample location PIT A/B/C (a former wastewater collection sump located in the westerly section of the pulverizing and blending area), along the historical wastewater collection trench system, at the Hexamethylene Diamine Loading Area, and along the industrial sewer line in subsurface soil. The highest concentrations were detected along the industrial sewer line at depths of four to 10 feet (PAP-00127697, 718, 729, 741, 744 and 747). A figure depicting the PAH exceedances in these areas was not identified in the referenced document.

According to the *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated June 1997, PPTI did not use or store PAH compounds at the site (PAS-00085034). The *Preliminary Assessment Report*, dated February 1996, also states that PAH compounds were not identified as a potential COC based on a review of the inventory of material used in PPTI's operations (PAS-00085178). However, operations at the PPTI site between 1903 and 1939 by UPDW reportedly involved the use of coal tar products that would include PAH compounds (PAP-00127496-497).

Copper

According to the *Remedial Investigation Report/Remedial Action Workplan*, dated June 17, 2004, copper was detected in soil sampled in 1998 and 2002, with maximum concentrations being detected along the industrial sewer line. The concentrations detected along the sewer line ranged from 12.8 mg/kg at a depth of 6.5 to seven feet to 1,740 mg/kg at a depth of 8.0-8.5 feet (PAP-00127745).

Lead

Review of the Sewer Connection Permit (No. 17401142), effective from 1991 to 1996, statess that monitoring for lead was required. Effluent limitations for lead were listed as a maximum for one day of 690 micrograms per liter (µg/L) and maximum monthly average of 320 µg/L (PAP-00128029, 38). According to a letter prepared by an analytical laboratory, dated November 20, 1990, lead was detected in a wastewater effluent sample collected on October 30, 1990 at a concentration of 85 parts per billion (ppb) (PAP-00128098). No other monitoring data were identified in the available file material.

In addition, according to the *Remedial Investigation Report/Remedial Action Workplan*, dated June 17, 2004, lead was detected in soil sampled in 1998 and 2002, with maximum concentrations being detected along the industrial sewer line. The concentrations detected along the sewer line ranged from 6.6 mg/kg at a depth of 6.5-7 feet to 2,800 mg/kg at a depth of 9 feet (PAP-00127745).

Mercury

According to the *Remedial Investigation Report/Remedial Action Workplan*, dated June 17, 2004, mercury was detected in soil sampled in 1998 and 2002, with maximum concentrations being detected along the industrial sewer line. The concentrations detected along the sewer line ranged from 0.05 mg/kg at a depth of 6.5-7 feet to 11.7 mg/kg at a depth of 9.5 feet (PAP-00127745).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00084903).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Copper	1,280 mg/kg
Benzo(a)anthracene	17 mg/kg
Benzo(a)pyrene	18 mg/kg
Benzo(b)fluoranthene	22 mg/kg
Benzo(k)fluoranthene	8.7 mg/kg
Dibenzo(a,h)anthracene	2.5 mg/kg
Indeno(1,2,3-cd)pyrene	7.4 mg/kg
PCBs	36 mg/kg

According to the *Remedial Investigation Report/Remedial Action Workplan*, dated June 17, 2004, the site is underlain by fill material. The fill material ranges in thickness from several inches to more than 10 feet at the western edge of the site. Several fill events have occurred on the site since the mid-1930s, the most significant of which involved the filling and redirection of flow of the adjacent Saddle River (PAP-00127468; 504). The fill material varied in its composition, and consists of a mix of clays, silts, sand and gravels, with fragments of brick, glass, wood and other materials interspersed throughout it. The fill material on the eastern side of the site is more typical of industrial fill, and consists of stone, brick, concrete and other fill material (PAP-00127504).

With respect to PCBs, according to a 1999 RIR/RIWP Addendum, “background levels” of PCBs were detected in the fill material located within the western portion of the site. It states that PCBs were detected throughout the fill materials at heterogeneous concentrations ranging from “levels below the NJDEP unrestricted use criteria to levels indicative of an historic discharge.” PCBs were observed at all depths at varying concentrations and a variety of Aroclors (1242, 1248, 1254 and 1260) were detected. It also states that PCBs were not used in commerce until approximately 1930; and, therefore, it is unlikely that PCB-contaminated fill material was placed beneath the buildings on the eastern portion of the site prior to 1917. It goes on to state that it is possible that the fill material used beneath the most recent building on the northern boundary of the site could have contained PCBs. It was concluded that the Historic Fill placed in the Saddle River between 1939 and 1951 contained PCBs when it was deposited on the site. Finally, the report states that the highest concentration of PCBs observed in the fill material was 36 mg/kg at a depth of 1.5-2 feet. It states that the data supported a conclusion that background levels of PCBs in the fill material are 36 mg/kg or greater (PAS-00084900-01).

With respect to PAHs, the 1999 RIR/RIWP Addendum, also states that PAHs are randomly distributed on the western portion of the site which is consistent with the heterogeneous nature of fill material. It states that the concentrations of contaminants are consistent with the historical fill values reported by NJDEP (PAS-00084902). The *Preliminary Assessment Report*, dated February 1996, states that PAH compounds were not identified as a potential COC based on a review of the inventory of material used in PPTI’s operations, suggesting that the PAHs detected in upgradient and downgradient soil samples may be the result of regionally affected river sediments that had been

deposited along the shoreline or were historically present in fill materials used in previous site development along the river. The document goes on to state that this was supported by a review of aerial photographs from 1940,1951, and 1961 which showed inundated, low lying areas along the Saddle River shoreline immediately west and southwest of the PPTI buildings (PAS-00085178).

Finally, according to the 1999 RIR/RIWP Addendum, copper was detected in the fill material at concentrations exceeding the "NJDEP unrestricted soil cleanup criteria." It states that the random distribution pattern is consistent with a Historic Fill origin and that the analytical data is similar to Historic Fill concentrations reported by NJDEP. Trends with depth or distance from any specific location were not apparent, and there were some locations where concentrations increased with depth (PAS-00084902).

It is noted that according to the *Remedial Investigation Report/Remedial Action Workplan*, dated June 17, 2004, NJDEP disagreed with the conclusion that all PCBs, PAHs, and metals present in the filled portion of the site were associated with the fill (PAP-00127499).

According to the 1999 RIR/RIWP Addendum, Historic Fill was sampled for PAHs, copper, and PCBs. The report states that the presence of Historic Fill was demonstrated by the heterogeneous and random distribution of the contaminants detected (PAS-00084900-02).

5. COC Pathways

The approximately two-acre site is adjacent to the Saddle River (PAS-00084796), a tributary to the Passaic River. The site is two miles upstream of the confluence of the Saddle River with the Passaic River (PAS-00007951).

Sanitary and Storm Sewer

According to the *Preliminary Assessment Report*, dated February 1996, the site sewer system was installed in 1916, and was expanded in 1930, specifically to handle the volume of water discharged by UPDW (the occupant of the site at the time). Therefore, the report states that it can be inferred that the site was hooked into the municipal sewer system as early as 1930 and probably as early as 1916. The site system pumped from Lodi to Wallington, New Jersey, then directly to the PVSC system (PAS-00085154).

Historically, brick-lined trenches were used to collect and transfer process wastewater, based on review of the *Preliminary Assessment Report*, dated February 1996. Use of these trenches dated back to UPDW's ownership of the site. The system was upgraded between 1981 and 1990 (PAP-00373427, PAS-00085049). The piping systems constructed and installed between 1981 and 1990 were constructed of a variety of materials compatible with the type of process wastewater collected and discharged from manufacturing and processing areas.

Wastewaters discharged to this system included the following:

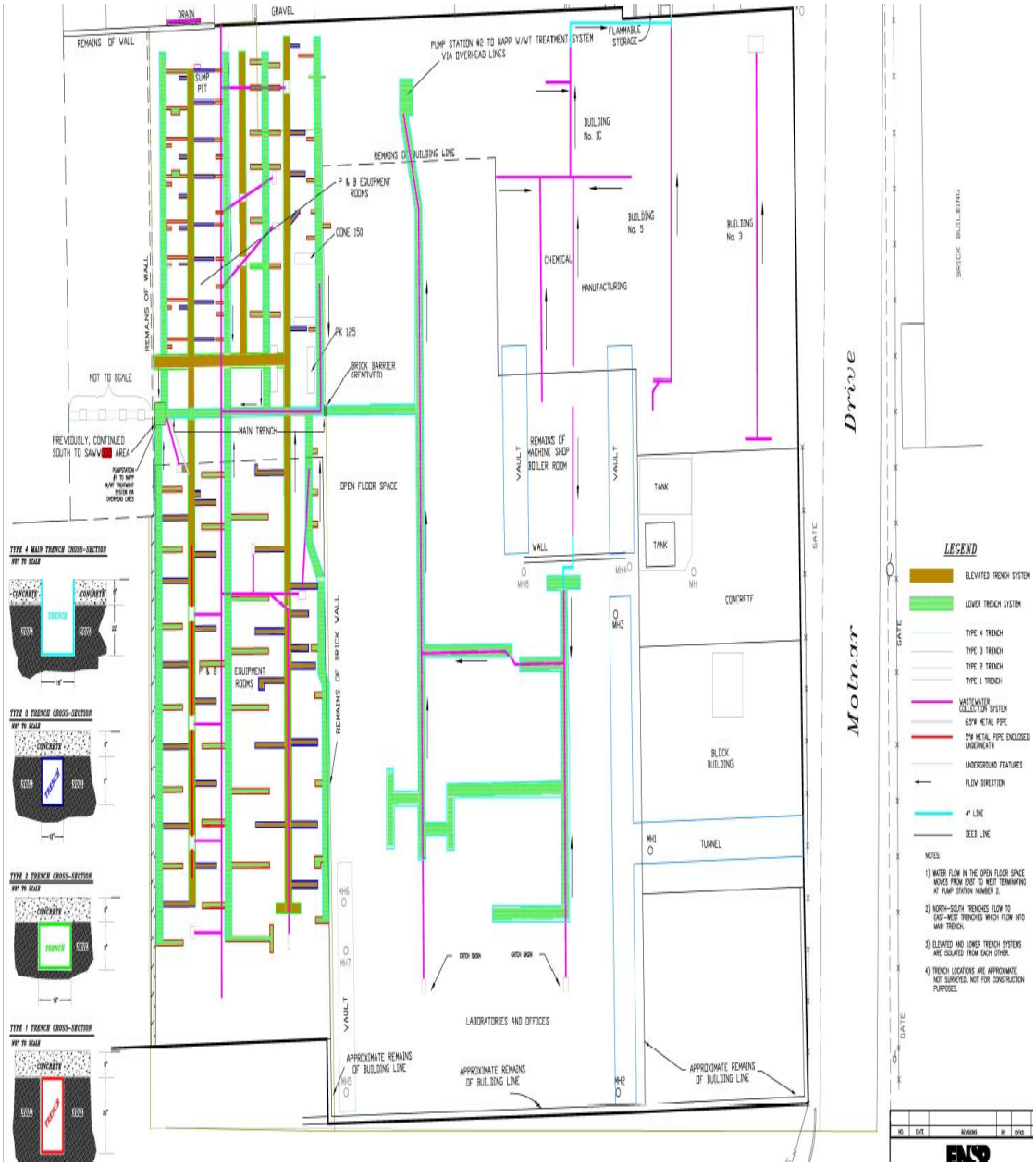
- boiler blowdown;
- compressor condensate;
- stormwater runoff from the drum storage pad and hazardous waste storage area;
- floor wash water from manufacturing and processing areas;
- wash water from equipment change-outs discharged to trench drains in manufacturing and processing areas;
- condensate from site non-contact recirculation system; and,
- spills and leaks from manufacturing and processing areas of the site (PAP-00373423).

Based on review of available file material, it is unclear if OU2 COCs were associated with these discharges.

Concrete pits were associated with final collection and treatment of process wastewater within the site effluent treatment system. A 500-gallon pit received all process wastewater from the manufacturing site via gravity flow from an adjacent concrete basin and weir structure. Process wastewater then flowed by gravity to a 1,000-gallon effluent treatment pit where it was monitored and treated for discharge to PVSC (PAP-00373423, 25). The document does not state for what parameters the wastewater was monitored. The 500-gallon and 1,000-gallon pit were constructed after 1981 when the site began pretreatment of its process wastewater. Effluent treatment operations consisted solely of pH adjustment of process wastewaters. According to the *Preliminary Assessment Report*, dated February 1996, this system was operated in compliance with a Sewer Connection Permit (No. 17401142) from the PVSC (PAP-00373423).

Review of the Sewer Connection Permit (No. 17401142), effective from 1991 to 1996, statess that monitoring for lead was required. Effluent limitations for lead were listed as a maximum one-day concentration of 690 µg/L and maximum monthly average of 320 µg/L (PAP-00128029, 38). Discharges were permitted through two outfalls (PAP-00128024-26); however, information on the sources of discharge and volumes discharged were not identified.

A 1997 figure depicting the layout of the process wastewater system at the site is presented on the next page (PAP-00127454):



It is noted that according to the *Remedial Investigation Report/Remedial Action Workplan*, dated June 17, 2004, an industrial sewer line ran north to south across the property, beginning at the adjacent Hexcel property and continuing to the Hendricks pump station located adjacent to the Fortunato property (PAP-00127559). The industrial sewer line was a cast iron pipe that was encountered at 8 to 10 feet bgs (PAP-00127899).

Direct Release

According to a *Purdue Pharma Technologies, Inc. Response to USEPA Request for Information, Lower Passaic River Study Area*, dated April 7, 2004, stormwater discharge was governed by a "Storm Water Discharge Permit" (NJ0088315) (PAS-00081945). A copy of the permit was not identified in the available file material. According to the *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated June 1997, stormwater from the site was directed to a storm sewer emanating from the northeast portion of the manufacturing building (PAS-00085105).

According to the *Preliminary Assessment Report*, dated February 1996, stormwater from raw material and waste storage areas located outside the manufacturing building did not enter this collection system; these areas were contained via berms, curbs or grading of the area to direct discharge to the site effluent treatment system (PAP-00373429). The *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated June 1997, states that during site operations, only stormwater expected to be non-contaminated was discharged through this system. The system was kept closed during non-operating hours at the site. There was no history of hazardous material or waste releases from the site. However, due to the emergency response activities associated with the explosion/fire in 1995, it is possible that contaminated material may have entered the storm sewer system. The sewer ultimately discharged to the Saddle River through a single outfall. The total length of the storm sewer piping was approximately 230 feet, and included four known manholes/inlets (PAS-00085105).

According to a *Purdue Pharma Technologies, Inc. Response to USEPA Request for Information, Lower Passaic River Study Area*, dated April 7, 2004, there were no direct discharges of wastewater to the Saddle River from the site. Since PPTI began operating at the site in 1970, and for decades before under prior operations, all process wastewater discharges were sent to the PVSC sewer system (PAS-00081939, 45).

Spills

According to a U.S. EPA *Pollution Report*, dated April 25, 1995, following an explosion and fire at the site on April 21, 1995, firefighting runoff was "very evident" in the Saddle River as the river exhibited a bright green coloration, caused by fluorescein, a non-hazardous dye used for eye treatment, for its entire two-mile length to its confluence with the Passaic River (PAS-00007951).

The reports states that no PCBs were detected in a downstream Saddle River sample collected following the fire (PAS-00085178). Data were not identified in the referenced report, and no discussion of other OU2 COCs was included in the report.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections concerning COCs in the available file material.

Violations

There is no information regarding violations concerning COCs in the available file material.

Permits

The site obtained a PVSC Sewer Connection Permit (17401142) on February 24, 1991, effective through February 24, 1996 (PAP-00128020; PAS-00085632). It appears that the site had a PVSC permit prior to this date (at least as early as 1990, and possibly as early as 1982, based on a letter dated September 25, 1990); however, the dates are not specified in the available references (PAS-00085255).

According to a *Purdue Pharma Technologies, Inc. Response to USEPA Request for Information, Lower Passaic River Study Area*, dated April 7, 2004, stormwater was discharged to the Saddle River via a "Storm Water Discharge Permit" (NJ0088315) (PAS-00081945). According to the *Preliminary Assessment Report*, dated February 1996, the permit was issued in 1993 for the discharge of stormwater runoff (PAP-00373403); additional information was not included in the referenced document. A copy of the permit was not identified in the available file material.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Preliminary Assessment Report*, dated February 1996 (PAS-00085125);
- *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated June 1997 (PAS-00084984);
- *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated June 30, 1999 (PAS-00084846);
- *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004 (PAP-00127464);
- *Remedial Action Work Plan Addendum*, dated April 7, 2008 (PAP-00127768); and,
- *Soil Remedial Action Report*, dated April 22, 2016 (PAP-00127852).

The site became subject to the NJDEP Industrial Site Recovery Action in 1995 when operations at the site ceased because of an industrial accident. Remedial investigations of the site were completed from 1995 to 2012 under the oversight of the NJDEP Site Remediation Program. In April 2012, the site entered into the Licensed Site Remediation Profession program. Remedial investigation reports were submitted to the NJDEP in 1997, 1999, and 2004 (PAP-00127853).

According to a *Soil Remedial Action Report*, dated April 22, 2016, three source areas and two areas of concern (AOCs) were identified on the PPTI site (after combining numerous smaller AOCs into larger AOCs):

- Source Area 1 (SA1): Hazardous Waste Storage Area, Drum Storage Area, Dry Well, Pavement Cracks, and Soil Boring SB-09;
- Source Area 2 (SA2): Pit A/B/C (a former wastewater collection sump located in the westerly section of the pulverizing and blending area) and Pump Station F-2;
- Source Area 3 (SA3): Historic Trench System;
- Courtyard Dry Well; and,
- Sample Locations E-1, E-2A and E-1E and Hexamethylene Diamine Loading Area (PAP-00127874).

Source areas are depicted on the figure below (PAP-00127644):



Sewers

According to *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated June 1997, the storm sewer was cleaned out and inspected to the extent possible, and on April 24 and May 14, 1996, samples of material removed from the storm sewer were collected. Note that this was conducted following the explosion and fire in 1995. Data showed the presence of PCBs at concentrations above NJDEP "soil cleanup criteria" (PAS-00085105). The PCB concentrations were not available in the file material; it is unclear what concentration is equivalent to the "soil cleanup criteria."

An industrial sewer line historically ran north to south across the site, beginning at the adjacent Hexcel property and continuing to the Hendricks pump station located adjacent to the Fortunato property (PAP-00127468, 559). It appears that the Hendricks pump station discharged to the PVSC treatment plant (PAS-00087288-89). The following PCB concentrations by media were detected at sample locations along the trace of the industrial sewer line on PPTI property, as discussed in the 1999 RIR/RIWP Addendum, and the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004:

- Soil: Ranging from 0.6 mg/kg at a depth of four feet bgs to 8,500 mg/kg collected from seven to 7.5 feet bgs at sample location TP-7, and 1,700 mg/kg collected from nine to 9.5 feet bgs at sample location TP-7B (PAS-00084957; PAP-00127670).

- Sewer residue: Aroclor 1242 was detected at 26,000 mg/kg at sample location TP-7-Pipe, at the northern property boundary with Hexcel, 6,300 mg/kg at sample location MH-1(PAS-00084957). It should be noted that the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, identified the concentration of PCBs in sample TP-7-Pipe as 26 mg/kg, rather than 26,000 mg/kg reported in the 1999 RIR/RIWP Addendum (PAP-00127670; PAS-00084957). In addition, the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, states that Aroclor 1242 was detected at a maximum concentration of 820 mg/kg in the industrial sewer line manhole/sumps (PAP-00127748).

- PCB-laden (Aroclor 1242) LNAPL: 3,400 mg/kg at well MW-E14 installed just south of Molnar Avenue adjacent to Hexcel (PAS-00084957).

It is reported that horizontal delineation of PCBs found along the industrial sewer line was achieved to the east within the SA1 and SA2/3 areas. In these areas, vertical delineation was achieved at a consistent depth of 13.5 to 14.0 feet (PAP-00127565).

The *Remedial Investigation Report/Remedial Action Work Plan*, prepared for PPTI, dated June 17, 2004, states that results of the investigation demonstrated that the industrial sewer line potentially represented an ongoing primary source of discharges to soil and groundwater (PAP-00127560). The report states that the PCBs found along the

northern portion of the sewer line and throughout SA1 (and into the northern portion of SA2) were exclusively the Hexcel "signature" Aroclor 1242. The PCBs in the free product found in MW-E14 and adjacent to the sewer line also were exclusively Aroclor 1242. The report states that the data support a conclusion that discharges of PCBs on the Hexcel property were the source of Aroclor 1242 found along the northern portion of the sewer line and in SA1 and SA2 (PAP-00127561). The report states that the highest concentrations of PCBs found in any sediment sample were found in sample Hexcel TP-11, located at the northern end of the sewer line, at a concentration of 820 mg/kg (PAP-00127563, 670).

South of SA1 (at approximately the Fortunato property line), the Aroclor signature changed to 1254 and 1260 (PAP-00127561). In addition, PCBs obtained from the pit and manhole on the PPTI site contained primarily Aroclors 1254 and 1260, and were found at much lower concentrations than those found in the main sewer line samples. The report states that the difference in Aroclors found in different locations along the industrial sewer line was very pronounced (PAP-00127563). The source of Aroclors 1254 and 1260 is not discussed in the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004. The 1999 RIR/RIWP Addendum, states that PPTI never used PCBs, nor operated any heat exchange equipment that would potentially contain PCBs (PAS-00084970). It is also noted that according to a *Summary Report of Preliminary Environmental Sampling at the Fine Organics Corporation Facility, Lodi, NJ*, prepared for Hexcel, dated October 14, 1987, sludge and sediment samples collected from the industrial sewer system in 1987 by Hexcel included a sample from a manhole on the PPTI site. Aroclor 1260 was detected at a concentration of 490 mg/kg (PAS-00091040-42).

With respect to the Fortunato property, the following is also noted: Brick-lined trenches were used to collect and transfer process wastewater historically, based on review of the *Preliminary Assessment Report*, dated February 1996. Use of these trenches dated back to UPDW's ownership of the site (PAP-00373427, PAS-00085049). According to the 1999 RIR/RIWP Addendum, four catch basins were identified in the concrete slab floor of the Sawwood warehouse of the Fortunato property. The catch basins were connected to trenches, similar to those observed on the PPTI site. It was concluded that both trench systems were part of one large gravity-drainage central trench systems (PAS-00084863-64). Sediment samples were collected from four catch basins in 1996. Total PCBs were detected in all sediment samples at concentrations ranging from 0.97 mg/kg to 3,100 mg/kg (PAS-00084970).

Soil

According to a letter sent to NJDEP, dated October 5, 1987, PPTI employees collected soil samples from under an existing floor slab during pipeline modifications at the pulverizing and blending area of the PPTI site. Two composite soil samples were sent to Malcolm Pirnie, Inc. for evaluation. PCBs were detected at a concentration of 62.5 parts per million (ppm) in the first composite sample and 7.5 ppm in the second composite sample (PAP-00128061).

According to the *Preliminary Assessment Report*, dated February 1996, PPTI took responsibility for the remediation of the soil, and the remediation was completed "to EPA's satisfaction" (PAS-00085254).

The *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, states that PCBs were found at four locations on the PPTI site including: along the industrial sewer line, at sample locations PIT-A/B/C (a former wastewater collection sump located in the westerly section of the pulverizing and blending area, part of SA2) and TREN-12 (collected beneath the trench system), and along the Saddle River riverbank (PAP-00127599). Detected concentrations reported in the document were as follows:

- Aroclor 1242 was detected adjacent to the sewer line at concentrations ranging from 0.42 mg/kg (10-10.5 feet) to 8,500 mg/kg (7-7.5 feet) (PAP-00127645, 70).

- Total PCBs were detected at concentrations ranging from 280 mg/kg (3.5 feet) to 8,000 mg/kg (2.5 feet) at PIT-A/B/C, and from 0.1 mg/kg (2.5-3 feet) to 230 mg/kg at TREN-12 (PAP-00127553, 660-61).

- Total PCBs were detected in soil along approximately 200 feet of the Saddle River riverbank at concentrations ranging from 0.2 mg/kg (zero to 0.5 feet) to 94 mg/kg (3-3.5 feet). The PCBs extended south from the Hexcel property line, where the primary Aroclor was 1242, to the Fortunato property line, where the primary Aroclors were 1254 and 1260. Horizontal delineation was achieved to the west at the majority of locations immediately adjacent to the Saddle River, with the exception of three sample locations where PCBs were present immediately adjacent to the river at concentrations just slightly greater than the NJDEP "Residential Direct Contact Soil Cleanup Criteria" (0.49 mg/kg). However, no PCBs were present in sediment. Vertical delineation was achieved at depths ranging from approximately one to 1.5 feet at the Saddle River to approximately five feet at the PPTI fence line. Based on the 200 feet of riverbank, an average width of 15 feet and an average depth of four feet, it was approximated that 670 cubic yards of soil contained PCBs at a concentration greater than the "Residential Direct Contact Soil Cleanup Criteria" (0.49 mg/kg) (PAP-00127627, 56).

In addition to the above-listed areas, it is noted that PCBs were also identified at the following locations:

- Aroclor 1242 was detected in soil sampled in 2002 at SA1 (Hazardous Waste Storage Area, Drum Storage Area, Dry Well, Pavement Cracks, and Soil Boring SB-09) at concentrations ranging from 1 mg/kg (6-6.5 feet) to 690 mg/kg (20-20.5 feet bgs) (PAP-00127707).

- A total PCB concentration of 1,500 mg/kg was found at sample location V-11 (located south of the PPTI property boundary in the leased parking area of the Fortunate property) at a depth of 0.58 to 1.08 feet (PAS-00084907).

In addition to PCBs, copper, lead, and mercury were detected in soil sampled in 1998 and 2002, as shown in the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004. The following concentrations of these metals were detected along the industrial sewer line:

- Copper detections ranged from 12.8 mg/kg at a depth of 6.5-7 feet to 1,740 mg/kg at a depth of 8.0-8.5 feet

- Lead detections ranged from 6.6 mg/kg at a depth of 6.5-7 feet to 2,800 mg/kg at a depth of 9 feet; and,

- Mercury detections ranged from 0.05 mg/kg at a depth of 6.5-7 feet to 11.7 mg/kg at a depth of 9.5 feet (PAP-00127745).

PAHs also were detected in soil sampled in 1998 and 2002, as shown in the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, primarily at sample location PIT A/B/C, at SA3 (the historic trench system), at the Hexamethylene Diamine Loading Area, and along the industrial sewer line in subsurface soil. The highest concentrations were detected along the industrial sewer line at depths of four to 10 feet (PAP-00127697, 718, 729, 741, 744 and 747). A figure depicting the PAH exceedances in these areas was not identified in the referenced document.

Finally, 2,4,6-trichlorophenol was detected in soil at the Hexamethylene Diamine Loading Area at an estimated concentration of 0.025 J mg/kg at a depth of 3.5-4.0 feet (PAP-00127741).

Saddle River

According to the *Preliminary Assessment Report*, dated February 1996, in order to determine the potential impact of potentially contaminated firewater and/or other materials potentially discharged into the stream through the outfall, stream and sediment sampling was conducted. Samples of river water were collected at the outfall as well as upstream and downstream of the outfall. Samples were analyzed for base neutral/acid extractable organics, metals, pesticides, and PCBs, among others. The report states that in general, concentrations detected in upstream samples were higher than or approximately the same as concentrations detected in downstream samples or at the outfall. Additional testing was conducted to determine the potential effect on the river sediments and aquatic life in the river. Sediment samples were collected upstream and downstream of the site. PCBs were detected upstream of PPTI, but not in the downstream sample. The report concludes that the sample data showed that river conditions were “essentially the same” upgradient and downgradient of the PPTI site, which demonstrated that there had been no “significant” discharges from the site, either historically or as a result of the fire/explosion, which had adversely affected the environment (PAP-00373430). The referenced data were included and discussed in the 1999 RIR/RIWP Addendum. Aroclor 1242 and Aroclor 1254 were detected in the sediment samples. Both PCB Aroclors were detected at their highest concentration at

sample location SED-5a (a total PCB concentration of 1,210 µg/kg), which was obtained upstream of the Napp property line. A total PCB concentration of 360 µg/kg was also detected at sample location SED-2; however, the document does not discuss whether this sample location was up- or downgradient of the PPTI site (PAS-00084944-49).

According to the *Remedial Investigation Report/Remedial Action Work Plan*, dated June 17, 2004, 14 sediment samples were collected during the 2002 and 2003 investigations of the Saddle River. No PCBs were detected in any sediment samples collected from eight locations in the Saddle River, two of which were located upstream of the site, four of which were located adjacent to the site, and two of which were located downstream of the site (PAP-00127594-95). The results of the 2002 sediment investigation were used in conjunction with sediment data from previous investigations completed in 1995, 1996, and 1998. Only one compound, benzo(a)pyrene, was detected at a concentration of 0.55 mg/kg. Benzo(a)pyrene was also detected in the upstream sediment sample at a concentration of 0.22 mg/kg. However, the report states that other PAHs were detected at comparable concentrations in both the upstream and downstream samples. The report states that detection of numerous PAHs in sediment of an urban river was expected because PAHs are common constituents in urban runoff. It goes on to state that the Saddle River received surface water runoff from numerous sources, including roads and parking areas, in which PAHs and other constituents are present (PAP-00127596). Other than the benzo(a)pyrene concentration, PAH data were not identified in the referenced document.

Remedial Activities

According to a letter sent to NJDEP dated October 5, 1987, PPTI employees collected soil samples from under an existing floor slab during pipeline modifications at the site. Two composite soil samples were sent to Malcolm Pirnie, Inc. for evaluation. PCBs were detected at a concentration of 62.5 ppm in the first composite sample and 7.5 ppm in the second composite sample (PAP-00128061). According to the *Preliminary Assessment Report*, dated February 1996, PPTI took responsibility for the remediation of the soil, and the remediation was completed “to EPA's satisfaction” (PAS-00085254).

According to a *Draft Environmental Priorities Initiative Visual Site Inspection Report for Napp Chemicals, Inc*., dated December 1992, PCB-contaminated soil was identified during an excavation beneath an existing floor slab in the center of the site. PPTI was unable to determine the source of the PCB contamination (PAP-00128044).

According to the document, never having used PCB equipment in its operations, PPTI speculated that the contamination must have come from transformers owned by the electrical utility or from previous industrial activity in the vicinity. PPTI excavated soils and disposed them offsite in 1988 and 1990. According to site representatives, no additional samples were taken after the removal of the contaminated soil (PAP-00128044).

On April 21, 1995, an industrial accident at the PPTI destroyed a portion of the site and caused the plant operations to cease. Following the industrial accident, the buildings on the site were demolished (PAP-00127779).

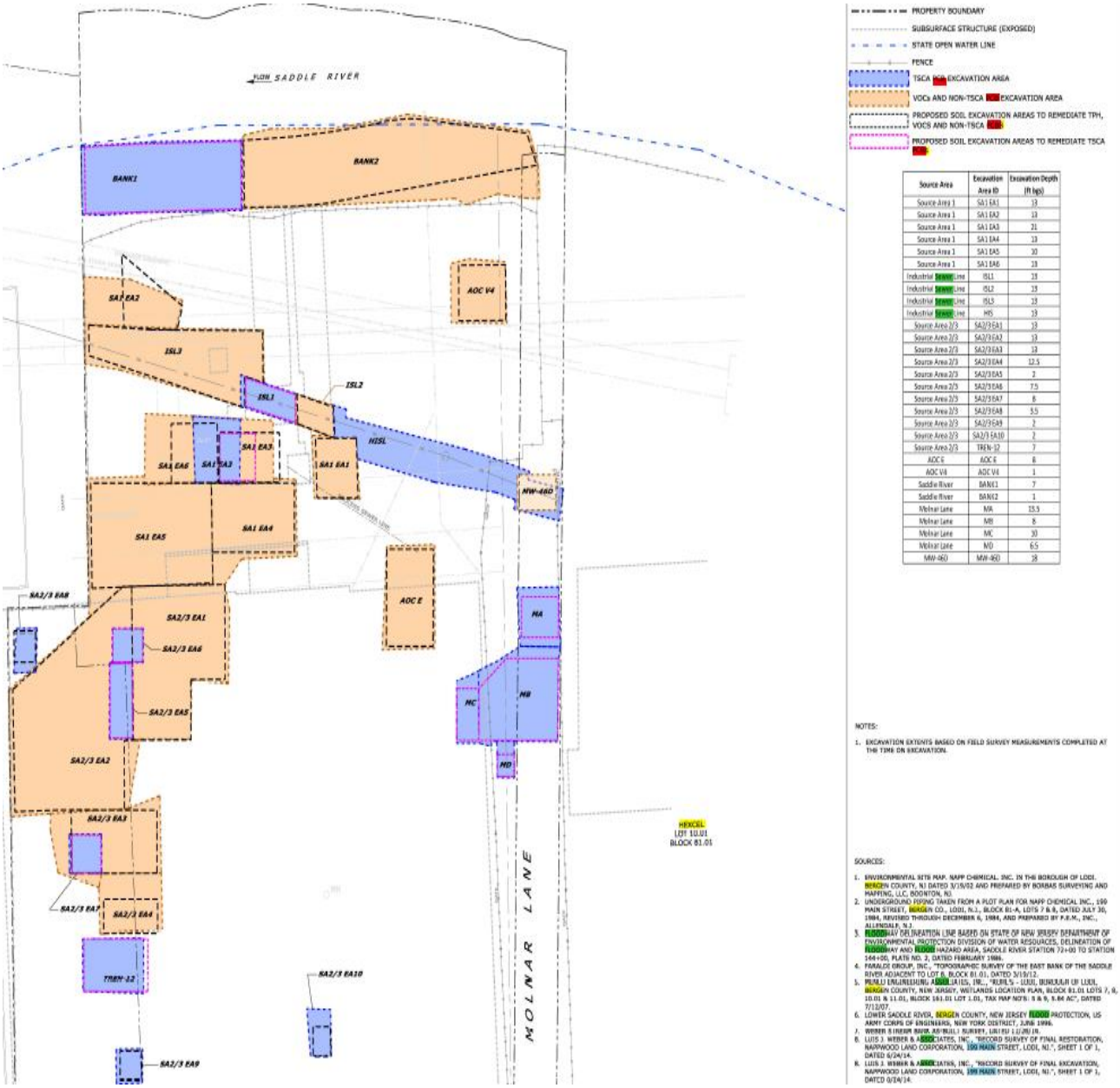
The industrial sewer line remedial action included the removal of a former 24-inch industrial sewer line that traversed the western portion of the PPTI site, as discussed in the *Soil Remedial Action Report*, dated April 22, 2016. According to the report, the sewer line and its contents (sludge/liquids) were remnants of the former UPDW site that operated on all three properties. The industrial sewer line was a cast iron pipe that was encountered at 8 to 10 feet bgs. The section of the industrial sewer line to the north on the Hexcel site was removed in May/June 2003 and April 2010 as a part of the remedial actions for the Hexcel site. The industrial sewer line was not removed on the Fortunato property site because the industrial sewer line was located beneath an active force sewer main and the industrial sewer line could not be removed without compromising the force sewer main. Four separate excavations were completed to remove the industrial sewer line and adjacent soil that contained PCBs at concentrations above remedial action objectives (PAP-00127898-99).

According to a *Soil Remedial Action Report*, dated April 22, 2016, soil remedial action objectives included the following, among others: (1) removal of PCBs in soil as set forth in an "October 2011 Self-Implementing PCB Cleanup and Disposal Plan" based on identified "high and low occupancy use" areas with a cap; (2) removal of soil containing PCBs, metals, and PAHs from the Saddle River bank to meet the NJDEP "Residential Direct Contact Soil Cleanup Criteria;" and, (3) capping the site to prevent direct contact to residual concentrations of PAHs, PCBs and metals, among other contaminants, that remained in soil (not on the river bank) at concentrations greater than the NJDEP "Residential Direct Contact Soil Cleanup Criteria" (PAP-00127854). The report states that site contamination was horizontally delineated except for "a few" areas at the property boundary with the adjacent properties (PAP-00127854-55). The report states that an internal NJDEP memorandum dated October 5, 2004, documented that site related discharges were not migrating off-site and no additional perimeter sampling was warranted (PAP-00127876).

According to the *Soil Remedial Action Report*, dated April 22, 2016, PCB concentrations for the site were horizontally delineated to the NJDEP "Residential Direct Contact Soil Cleanup Criteria" of 0.49 mg/kg (PAP-00127896).

Soil remedial actions for the site were completed from February through June 2014, February/March 2015 and October 2015. The remedial actions included excavation of 29 areas (PAP-00127856). The PCB excavation areas for SA1 and SA2/3 were remediated to the EPA "high or low occupancy use cleanup criteria" of 10 mg/kg and 100 mg/kg, respectively, depending on the use of the excavation area. Post excavation sample results that achieved the EPA cleanup criteria but exceeded the NJDEP criteria were included in the PPTI site deed notice and capped (PAP-00127896). Approximately 12,628 tons of contaminated soil was removed from the site and disposed of off-site (PAP-00127856). In addition, the Saddle River bank was remediated to meet the NJDEP "Residential Direct Contact Soil Cleanup Criteria" for PCBs, metals, and PAHs; therefore, no engineering controls or institutional controls were required (PAP-00127856). The NJDEP remediation goal for PCBs was listed as 0.49 mg/kg (PAP-00127895). The NJDEP "Residential Direct Contact Soil Cleanup Criteria" for the remaining COCs was not identified in the referenced document.

Areas requiring excavation are depicted below (PAP-00127941):



A Deed Notice was filed for the site on April 15, 2016. The “Restricted Area” encompassed 84% of the horizontal extent of the property, totaling 1.7 acres and extending to a depth of 21.5 feet below ground surface. The Deed Notice states that the Restricted Area is associated with former operations and consists of soil with concentrations of PCBs, PAHs, metals, and VOCs above the 1999 NJDEP “Residential Direct Contact Soil Cleanup Criteria.” An engineering control for the Restricted Area consists of a cap consisting of a combination of impervious (asphalt or concrete) and impervious (gravel) surface cover (PAP-00374297, 322-25).

According to the *Soil Remedial Action Report*, dated April 22, 2016, the remedial investigation of groundwater for the site is in progress (PAP-00127868). Based on a Groundwater Remedial Action Permit, dated April 4, 2018, it appears that remediation is ongoing (PAP-00374444-45).

With respect the Fortunato property, the 1999 RIR/RIWP Addendum, states that PPTI conducted voluntary removal and disposal of "significant volumes" of accumulated sediment found within the historical trench system discovered under the concrete slab flooring which was attributable to prior owners/operators of the properties unrelated to PPTI. Because a number of incoming trenches were identified within the Sawwood Warehouse of the Fortunato property, and there was evidence of contaminants being introduced into the trench system from off-site, PPTI proposed no further action with regard to any trenches lying below areas outside of the Sawwood Warehouse (PAS-00084973).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

QUALITY CARRIERS INC.

Facility Name, Address and Size: 80 Doremus Avenue, Newark, New Jersey Block 5011, Lot 1; 7 acres (PAP-00145607). According to the Chemical Leaman Tank Lines, Inc. (CLTL) Permit No. 20404242 Renewal Application, in 1992 there were 20 employees, 260 work days per year with one shift per day for the office workers; two shifts per day for the tank cleaning operations and 3 shifts per day for the Maintenance – Operations (PAP-00328856). According to the July 3, 1997, Permit No. 20404242 Renewal Application, at the time of the application, there were 11 full time employees, 312 work days per year with three shifts per day (PAP-00328880). According to the March 8, 2002, Permit No. 20404242 Renewal Application, at the time of the application, there were 8 full time employees, 312 work days per year with three shifts per day (PAP-00328968). The site abuts the west bank of the Passaic River (PAP-0145642).

1. **Business Type:** Trucking terminal, including repair shop and tanker truck cleaning (PAP-00145606).

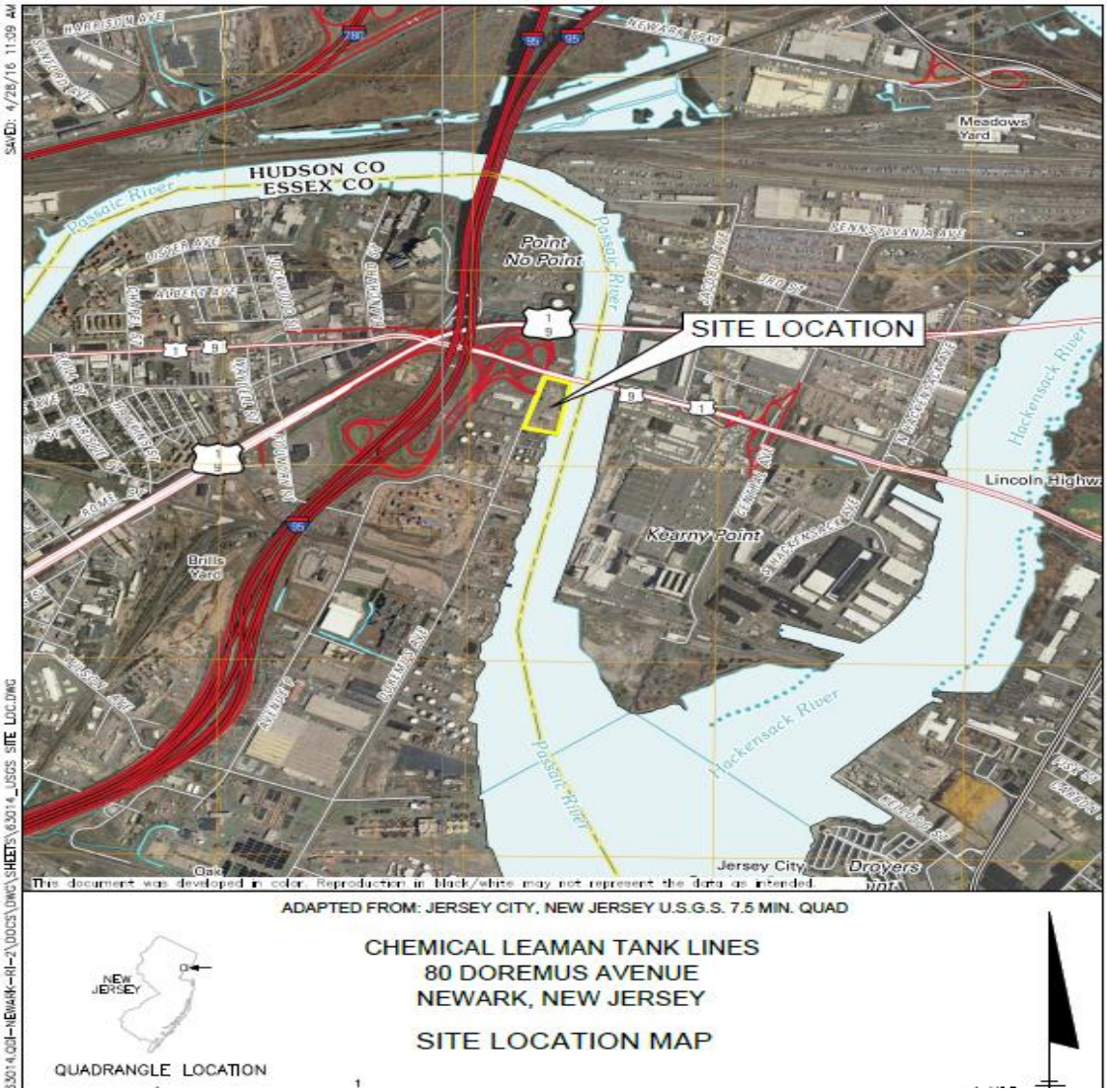
2. **Time Period of Ownership/Operations**

   Operator: 1970 to 2007 (PAP-00145606)
   Note: QCI operated the transportation terminal from 1970 to 2007 and a tank wash from 1970 until 1992; Quala Systems, Inc. (QSI) operated the tank wash from 1993 to 2007 (PAP-00145606)
   Owner: 1970 to present (PAP-00145606)

   According to the May 2016 *Final Remedial Investigation Report* (RIR) by OBG, (2016 OBG Final RIR) the site was originally developed in the early 1900s and has been used for various industrial purposes throughout its history. Historical activities at the Facility included trolley car maintenance by a predecessor of PSE&G and oil storage and distribution by a predecessor of Chevron. CLTL acquired the property in 1970. In January 1993, operations began on site by a corporate affiliate, Quala Systems, Inc. In 1998, CLTL merged with Montgomery Tank Lines to become Quality Carriers, Inc. Quality Carriers' corporate parent is Quality Distribution, Inc. (QDI). In 2007-2008, the site was redeveloped by QDI in order to accommodate storage and cleaning facilities for intermodal bulk storage containers. As part of redevelopment, all buildings and above-grade structures were demolished to allow for new construction (PAP-00145606).

   On May 8, 2008, an Agreement of Sale between Quality Carriers, Inc., and Metro Port LLC was reached. According to the agreement, the Property was offered for sale in its "as-is" and "where-is" condition. Quality Carriers, Inc. was to complete remediation of the Property pursuant to the Amended Remediation Agreement, until Seller receives a "no further action" letter, case closure, or approval of a Negative Declaration or other written communication from NJDEP confirming that no further investigation, remediation or operation and maintenance is required on the Property and shall contain the NJDEP's covenant not to sue (PAP-00331099, 103)

   The new facility is presently operated by Boasso America Corporation, a QDI-affiliated company (PAP-00145606). A site location map is provided below.



(PAP-00145642)

3. Operational History/COC Use and Presence at the Facility

According to a *Site Investigation Report*, prepared by BCM Engineers Inc., dated January 1999, (1999 BCM SI Report) the Sanborn Maps collected for the SI Report showed that the site was the location of a portion of the operations of the Public Service Corporation of New Jersey from prior to 1908 until sometime between 1950 and 1973. Trolley car maintenance was performed on site during that time period. Sanborn Maps also identify Paragon Oil Co. at the site in 1973. The exact years that Paragon operated onsite are unknown. However, according to the available information from the 1999 BCM SI Report, Paragon received bulk fuel oil shipments by barge and pumped the oil into a 3 million-gallon aboveground on-site storage tank. The oil was then transferred to tank trucks for local delivery to residential and industrial users (PAS-00084612-13).

The 1999 BCM SI Report stated that the CLTL the predecessor of QCI, had operated a trucking company and tank truck washing facility onsite since 1970 (PAS-00084613). The sewer connection was established in 1970 by a preceding unrelated operator of the Facility, Charter Bulk (PAP-00147738; PAP-00328827).

In January 1993, the tank trailer cleaning operations were conducted by QSI. Following the merger between CLTL and Montgomery Tank Lines, Quality Carriers Inc., resumed the trucking terminal operations. The terminal was used for parked storage of empty tank trucks utilized for transporting bulk liquids including chemicals, food products, and other materials. A daily average of 80 tank trucks were parked in the terminal. A majority of these tank trucks were not owned by QCI. (PAS-00084613).

According to a September 23, 1998 New Jersey Department of Environmental Protection (NJDEP) Inspection Report, QSI maintained an on-site, enclosed, three-bay truck-washing structure. The tank trucks were washed in Bay No. 1, No. 2, or No. 3, depending upon the previous contents of the tank truck. Bay Nos. 1 and 2 were "full-services" bays that were used for washing tank trucks that contained non-food product liquids. Bay No. 3 was solely used for washing tank trucks that contained liquid food products (PAS-00084712-13; PAS-00084668).

The 1999 BCM SI Report stated that the wash process generally consisted of using diesel fuel or caustic solution and steam to clean individual tankers, followed by a cold or hot water rinse. Other documents reported that cleaning involved: 1) hot water wash or rinse, 2) cold water wash or rinse, 3) caustic cleaning solution, 4) detergent cleaning solution, or 5) high temperature steam (PAP-00328544; PAS-00084713). All rinseate was collected and diverted to the onsite wastewater treatment plant (WWTP) through concrete trenches on the bay floors The onsite WWTP consisted of a liquid collection basin and a modular unit comprised of a holding tank, batch treatment tank, clarifier, sludge tank, and sludge drying bed. Each of these units is described below.

- Liquid Collection/Settlement Tank − The washwater collection/settlement tank was a sub-grade, steel-lined, concrete basin. Liquids from the wash bays drain to this tank. During the preliminary assessment, liquid in this tank appeared dark-brown and oily. Oil was skimmed from this tank and placed into drums. The drums are stored in the drum storage area. Sediment/sludge from the bottom of the tank was collected and was placed in the sludge drying bed.

- Holding Tank − Liquid in the collection/settlement tank was pumped into the holding tank for blending and equalization. From the holding tank, the wastewater was pumped to the batch treatment tank.

- Batch Treatment Tank − The batch treatment tank was charged with a polymer and aluminum hydroxide for flocculating suspended solids. Caustic or sulfuric acid was added for pH level control.

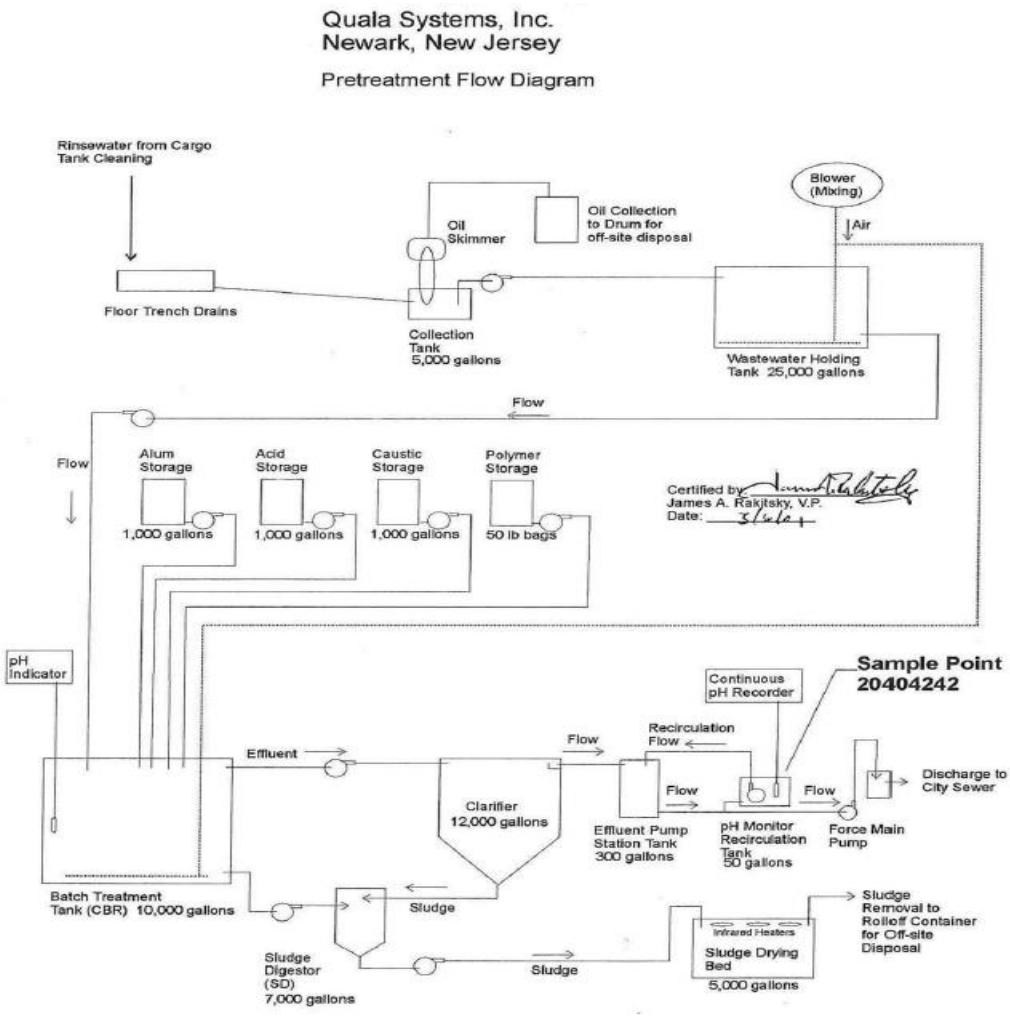
- Clarifier − The treated wastewater flows to a clarifier. Following clarification, the treated wastewater was discharged into the Passaic Valley Sewage Authority sewage collection system.

- Sludge Tank − Sludge formed in the clarifier was pumped to a sludge tank. Residual liquid which separates from the sludge in the sludge tank was pumped back to the collection/settlement tank.

- Drying Bed − Sludge from the sludge tank was pumped to a drying bed. Once dried, the sludge was placed into a roll-off container and shipped off-site for disposal by Philip Services Corporation.

(PAS-00084613-14).

The following Pre-Treatment Flow Diagram demonstrates in further detail the process described above (PAP-00328562).



In addition, spent caustic solution was generated from cleaning of flexible hoses used by the tank trucks. Hoses were soaked in two horizontal hose troughs containing caustic solution. The hose troughs were drained every 1.5 months to the floor drain in Bay No. 1 (PAS-00084614).

According to the 1992 renewal application for Sewer Connection Permit No. 20404240, the following principal raw materials were used at the Facility:

- Naphtha used for maintenance
- Sodium Hydroxide; Potassium Hydroxide; Trichloroethane used for tank cleaning
- Sulfuric Acid; Sodium Hydroxide; Aluminum Sulfate used for wastewater treatment (PAP-00328857).

The 1999 BCM SI Report stated that QSI maintains two contiguous drum storage areas used for storing 55-gallon drums containing liquid waste or semi-liquid residues drained from tank trucks being washed at the wash building. All drums are properly sealed, labeled, and stored for less than 90 days. The storage areas are constructed with impermeable concrete floors and concrete dikes. Records for the drummed wastes generated onsite are maintained at the facility. All drummed waste is subsequently sent offsite for disposal at a permitted facility (PAS-00084658).

A facility layout is presented below (PAS-00084658).

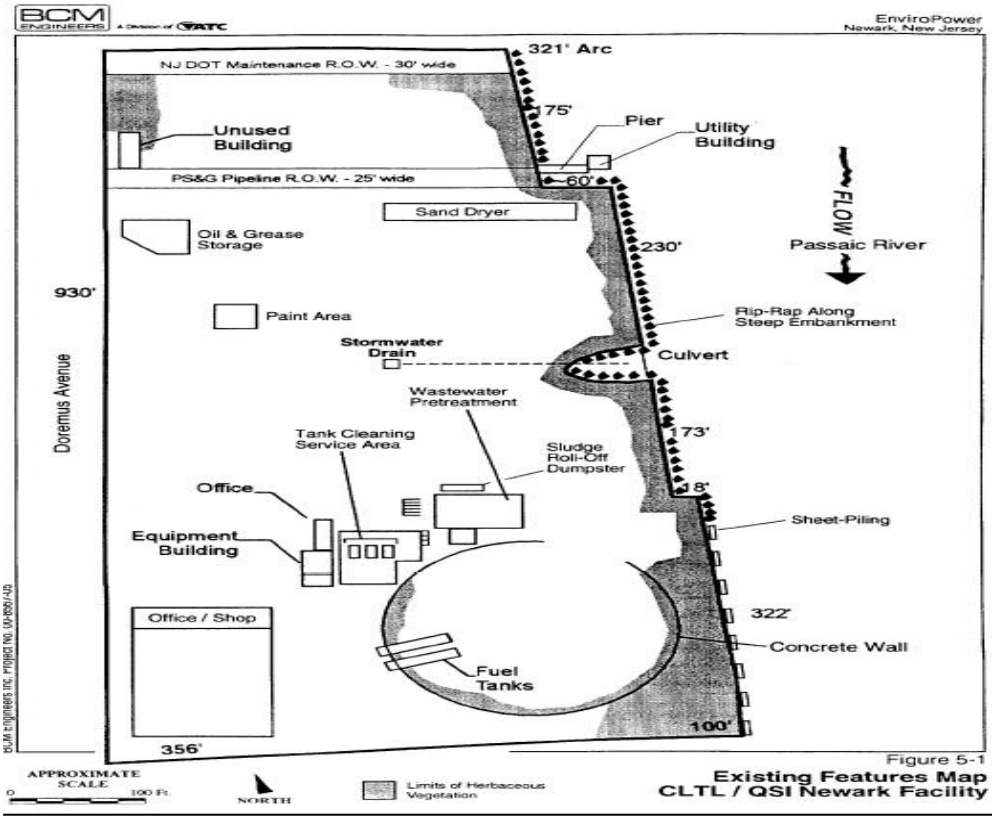


Figure 5-1
Existing Features Map
CLTL / QSI Newark Facility

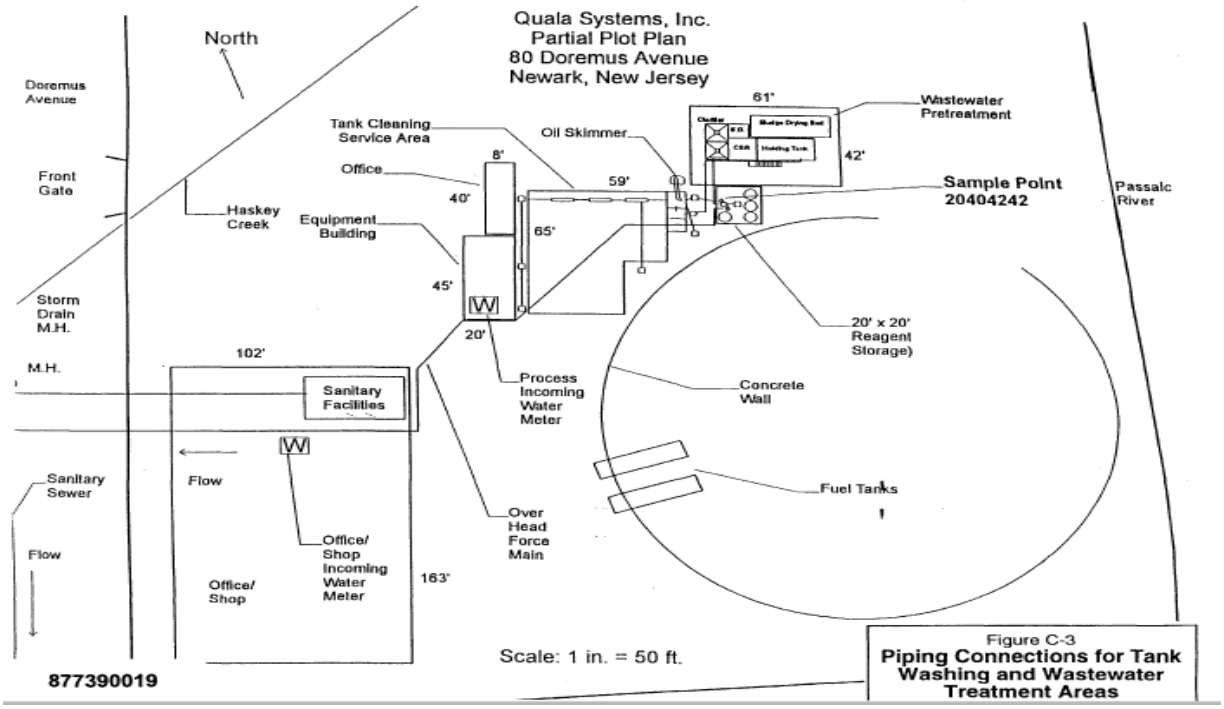
Quality Carriers Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

A Partial Plot Plan showing the piping connections for tank washing and wastewater treatment areas at the time of the 1999 BCM Report is presented below:



(PAS-00084623)

According to the *Preliminary Assessment Report*, prepared by BCM Engineers Inc., under NJDEP Industrial Site Recovery Act (ISRA) dated April 1998, (1998 BCM ISRA PSA), the following hazardous substances were kept on site:

- Between 1991 and 1996, between 50,000 and 250,000 pounds of Diesel Fuel were stored in an aboveground storage tank. Location of storage tank listed as on the east end of yard, inside containment area.

- In 1991, 1993, and 1996, 101 to 1,000 gallons of Corrosive Liquids NOS were stored in plastic drums on the east end of the yard on the Drum Storage Pad.

- In 1994, 1 gallon of High Range Cod Reagent was stored in a glass container in the Waste Room. Location of the Waste Room was not listed.

- In 1996, 1,001 to 12,810 pounds of Sulfuric Acid was being stored in a tank in the WW Pre-treatment building. In 1994, 500 gallons of Sulfuric Acid was being stored in a plastic container in the Waste Room. The location of the Waste Room was not listed.

- In 1997, 5,000 to 8,000-gallons of Fuel No. 2 were stored in an aboveground storage tank. Location of storage tank not listed (PAP-00147673-87).

On August 5, 2003, QSI requested that Section 2 - "Monitoring Requirements and Discharge Limitations" of Permit Number 20200022 be changed to allow QSI to submit a Pollutant Management Plan (PMP) as a means for compliance for non-polar material, copper and mercury. According to the attached PMP, approximately 5,750 trucks were cleaned yearly at the Newark Facility. The products commonly cleaned at the facility included latex, oils, adhesives, resins, and organic chemicals. QSI removed any drainable residual before performing interior cleaning. These residuals comprised the typical types of wastes generated at the facility. Commercial cleaners and diesel fuel are used in the tank cleaning process (PAP-00329018).

A Product Inventory in compliance with Sewer Use Permit No.: 20200022 was submitted to PVSC. The inventory included the following potential products to be cleaned;

- aromatic solvents,
- copper compounds,
- diesel fuels,
- diesel fuel type compounds,
- ethylbenzene,
- fuel oil additives,
- gasoline,
- gasoline additives,
- heavy aromatic petroleum distillates,
- herbicides,
- insecticides,
- jet fuel compounds,
- kerosene,
- lube oil additives,
- lube oil,
- motor oil,
- naphtha type compounds,
- pesticides,
- petroleum oils,
- transmission fluid (ATF; hydrotreated paraffinic oil)

(PAP-00329286-91).

As noted above, in 2007-2008 the site was re-developed by an Affiliate of QCI, Boasso America, to accommodate the storage and cleaning of intermodal bulk storage containers (ISO Containers). Tank truck transportation and cleaning related activity at the site ended prior to this redevelopment. All buildings and above-grade structures were demolished to allow for the construction of a new ISO tank cleaning building and associated treatment structures.

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

According to the 2000 ENVIRON Supplemental SI Report further soil sampling was conducted as requested by NJDEP based on the 1999 BCM SI Report (PAS-00084493, 97). The following table is a Summary of Soil Samples (highest concentration) taken for PCBs:

Max PCB Soil Samples				
COC	**ASTs 4-4.5 feet bgs**	**Drum Storage Pad 1-1.5 feet bgs**	**Wastewater Handling System .5-1 feet bgs**	**Historic Fill 7-8 feet bgs**
Aroclor 1248	N/A	N/A	N/A	0.892 ppm
Aroclor1260	0.0337 mg/kg	0.0567 mg/kg	0.0937 mg/kg	3.55 ppm

(PAS-00084545-61)

According to a 1994 CLTL Environmental Compliance Program Manual, QCI and its predecessors did not transport or handle PCBs or clean tanks that had previously contained PCBs pursuant to its tank cleaning policy (PAP-00328833).

PAHs

Polynuclear aromatic hydrocarbon (PAH) containing materials such as No. 2 fuel oil, No. 4 fuel oil, and gasoline were handled at the site as a part of plant operations. The Analysis Results Sampling Map from the 1999 BCM SI Report shows that the fuel tanks were surrounded by a concrete wall located in the southern part of the Facility (PAS-00084655). See the map below for locations of the fuel tanks. A 10,000-gallon aboveground storage tank containing fuel oil was located at the Facility and was part of the Spill Prevention Control and Countermeasures Plan (PAP-00329152).

A report from International Testing Laboratories Inc., dated December 1, 1988, stated that petroleum hydrocarbons were detected on site at a maximum concentration of 77.5 ppm (PAS-00084757).

The 1999 BCM SI Report stated that a total of four surface soil samples were collected from the 3 million-gallon aboveground storage tank (AST) area. The results from these soil samples showed the presence of total petroleum hydrocarbons (TPH) and PAHs in shallow soils. Concentrations of TPH ranged from 101 mg/kg to 2,640 mg/kg. In sample GP-1 (0 to 2 feet bgs), a total Priority Pollutant PAH concentration of 34.1 mg/kg was detected (PAS-00084634). The following is a breakdown of the PAH COCs:

- Benzo[a)anthracene − 3.2 mg/kg
- Benzo[b)fluoranthene − 3.0 mg/kg
- Benzo[k]fluoranthene − 3.7 mg/kg
- Benzo[a)pyrene − 3.7 mg/kg
- lndeno[1,2,3-cd]pyrene − 1.4 mg/kg (PAS-00084646)

In two soil samples that were collected from the south side of the facility near the area of three gasoline underground storage tanks (UST), TPH was detected in the shallower interval at a concentration of 1,510 mg/kg and in the deeper interval at a concentration of 1,150 mg/kg (PAS-00084634-35).

According to the 1999 BCM SI Report, TPH concentrations in soil samples taken at the north end of the site near the trailer staging area ranged from a low of 170 mg/kg in sample Stain-1 at a depth of 0-18" to a high of 5,200 mg/kg in sample Stain-5 at a depth of 0-12 inches (PAS-00084637).

One sample of soil/sediment was collected from below the metal grate on the left rear side of the maintenance building and TPH was detected at 1,500 mg/kg (PAS-00084635).

TPH was detected at a concentration of 188 mg/kg at the Pre-Solv filling area (PAS-00084635).

Low levels of TPH (310 mg/kg and 230 mg/kg) were detected in two surface soil samples collected from beneath each of the two 20,000-gallon diesel fuel ASTs which provide product to the Pre-Solv area (PAS-00084636).

TPH concentrations reported from the 1999 BCM SI Report ranged from non-detectable to a high of 13,700 mg/kg for the Historic Fill. TPH concentrations seemed to be highest in the central area of the site with TPH being present throughout the fill profile and with some of the highest concentrations present at 7 to 8 feet below grade (bgs) (PAS-00084638).

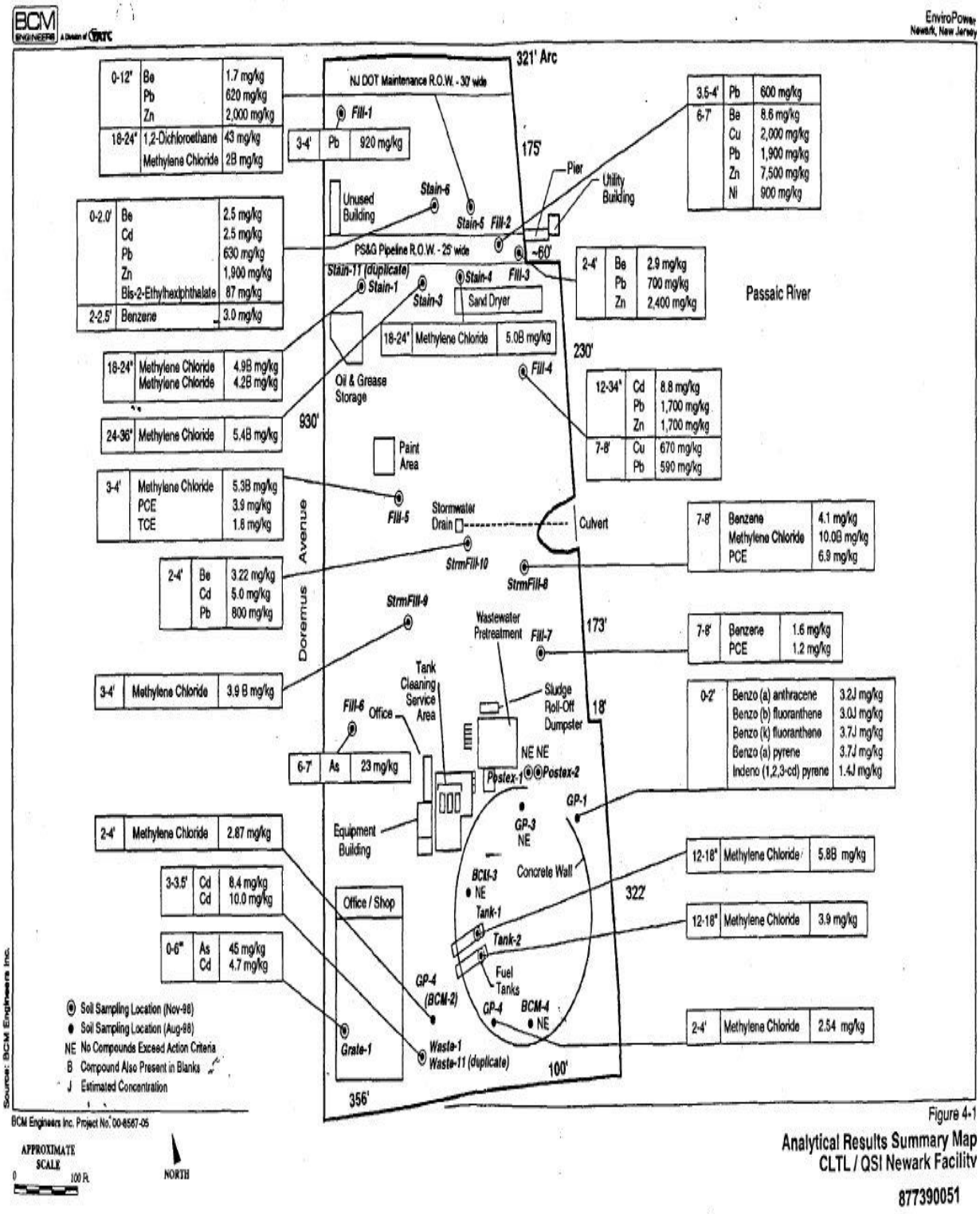
See the following Analysis Results Sampling Map from the 1999 BCM SI Report for the locations of the PAH samples discussed above.

Quality Carriers Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



(PAS-00084655)

Quality Carriers Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

In the *Supplemental Site Investigation Results Report* for Chemical Leaman Tank Lines, prepared by ENVIRON International Corporation, dated December 2000 (2000 ENVIRON Supplemental SI Report), further sampling was conducted as requested by NJDEP based on the 1999 BCM SI Report (PAS-00084493, 97).
The following table is a Summary of Soil Samples (highest concentration) taken for PAHs:

COC	Above Ground Storage Tanks mg/kg	Drum Storage Pad mg/kg	Staining near Trailer Staging Area mg/kg	Incident Spill Report mg/kg	Wastewater Handling System mg/kg	Historic Fill mg/kg
Depth	**4-4.5 feet bgs**	**1-1.5 feet bgs**	**0.-0.5 inches bgs**	**1.5-2 feet bgs**	**2-2.5 feet bgs**	**7-8 feet bgs**
Benzo(a)anthracene	2.87	4.44	29.7 g	1.52	0.141 (estimated)	7.17
Benzo(a)pyrene	2.54	5.11	25.4	1.44	0.255	5.23
Benzo(b)fluoranthene	2.57	4.31	27.6	2.11	0.218 g	4.48
Benzo(k)fluoranthene	1.7	3.93	11.1	1.45	0.132	5.96
Dibenzo(a,h)anthracene	0.641	1.16	8.72	0.639	NA	N/A
Chrysene	1.52	4.62	30.5	2.32	.177	6.81
Indeno(1,2,3-cd)pyrene	1.33	3.12	17.6	1.24	.014	2.01
Pyrene	2.3	7.9	57.4	2.18	1.61	

(PAS-00084545-61)

It was reported in the 2004 RIR that concentrations for Aroclor-1254 was at 1. 71 mg/kg (4 feet bgs) and Aroclor-1260 was 1.31 mg/kg (4 feet bgs) and 3.74 mg/kg (3 feet bgs). These results were from the eastern portion of the site (D11) as determined during the Doremus Avenue Roadway reconstruction and widening project (PAP-00328668-70). See Section 7 for further information on the sampling done for the Doremus Avenue Roadway project.

According to the 2009 RIR, redevelopment occurred on site with the demolition of site buildings and the removal of several concrete pads. Two areas that were affected were the Wash Bay Drainage System (AOC 9) and the Wastewater System Settlement Tank (AOC 10). Once the foundation was removed, soil was excavated to a depth of approximately 3 feet bgs and was designated at Pit No. 2 (PAP-00330037-38). The soil was analyzed for PAHs and the results can be found in the following table.

Sample Location	Sample Depth (fbgs)	Compound	Concentration In mg/kg	Non-Residential NJDEP Criteria Exceeded
Pit #2 W-NW	1.0-1.5	Benzo(a)anthracene	6.88	NRDCSCC
Pit#2 N-NW	1.0-1.5		5.43	NRDCSCC
Pit#2 N-NE	1.0-1.5		4.61	NRDCSCC
Pit #2 W-NW	1.0-1.5	Benzo(a)pyrene	5.10	NRDCSCC
Pit#2 N-NW	1.0-1.5		3.82	NRDCSCC
Pit#2 N-NE	1.0-1.5		3.84	NRDCSCC
Pit#2 W-SW	1.0-1.5		0.295	NRDCSCC
Pit #2 W-NW	1.0-1.5	Benzo(b)fluoranthene	5.01	NRDCSCC
Pit#2 N-NW	1.0-1.5		5.07	NRDCSCC
Pit#2 N-NE	1.0-1.5		3.37	NRDCSCC
Pit #2 W-NW	1.0-1.5	Dibenzo(a,h)anthracene	1.28	NRDCSCC
Pit#2 N-NW	1.0-1.5		1.07	NRDCSCC
Pit#2 N-NE	1.0-1.5		0.738	NRDCSCC
Pit #2 W-NW	1.0-1.5	Indeno(1,2,3-cd)pyrene	3.05	NRDCSCC
Pit#2 N-NW	1.0-1.5		2.42	NRDCSCC
Pit#2 N-NE	1.0-1.5		2.21	NRDCSCC
Pit#2 S-SE	1.0-1.5	Ethylbenzene	148	IGWSCC
Pit#2 S-SE	1.0-1.5	PCE	1.61	IGWSCC
Pit#2 S-SW	1.0-1.5		1.52	IGWSCC
Pit#2 W-SW	1.0-1.5		2.48	IGWSCC
Pit#2 S-SE	1.0-1.5	Xylenes	190	IGWSCC

(PAP-00330039)

Wastewater System Settlement tank was removed along with the soils surrounding the tank and designated as Pit No. 1 (PAP-00330041). The results for SVOCs were reported as no exceedances and no further delineation of the constituents was provided.

Additional soils were removed east-southeast of the tank as part of the construction of a building foundation and designated as Pit No. 3 (PAP-00330042). The following results for PAHs were taken at a depth of 1-1.5 feet bgs:

- benzo(a)anthracene (1.08 mg/kg),
- benzo(a)pyrene (1.22 mg/kg),
- benzo(b)fluoranthene (1.33), and
- indeno(1,2,3-cd)pyrene (0.959) (PAP-00330092)

According to the 2016 OBG Final RIR, further sampling was conducted in 2014. The PAH results are shown in the following table. RI-08 is located on the eastern edge of the site bordering the river; RI-17 is located on the northeast corner of the site; RI-18 is located north of the truck cleaning site; RI-19 is west of RI-18; RI-20 is near the Paint Center; and RI-21 near the PS&G Right of Way in the northern part of the site.

PAH Concentrations (mg/kg)					
COC	**RI-08 1-1.5 feet bgs**	**RI-17 1.5-2 feet bgs**	**RI-19 1-1.5 feet bgs**	**RI-20 2.5-3 feet bgs**	**RI-21 1.5-2 feet bgs**
Benzo(a)anthracene	2.39	0.769	3.0	3.06	0.249
Benzo(a)pyrene	2.66	0.649	2.3	3.25	0.293
Benzo(b)fluoranthene	2.54	1.32	3.5	5.99	0.31
Benzo(k)fluoranthene	1.11	0.461	1.13	1.07	0.101
Indeno(1,2,3-cd)pyrene	1.55	0.581	1.38	2.03	.154

(PAP-00145636-37)

DDx

According to the 2000 ENVIRON Supplemental SI Report further soil sampling was conducted as requested by NJDEP based on the 1999 BCM SI Report (PAS-00084493, 97). The following table is a Summary of Soil Samples (highest concentration) taken for Pesticides.

DDx Concentrations (mg/kg)		
COC	**Drum Storage Pad 1-1.5 feet bgs**	**Wastewater Handling System .5-1 feet bgs**
4,4'-DDD	0.0016	0.0046
4,4'-DDE	Not available	0.0016
4,4'-DDT	0.0011	0.0226

(PAS-00084552-54)

Copper

The 1999 BCM SI Report stated the following results (0-4 feet bgs) for the soil sampling done in 1998. See the Analysis Results Sampling Map from the 1999 BCM SI Report located in the previous PAHs section.

Location	Depth	Results
Fill 1 - northwest corner of property	2-3 feet bgs	30 mg/kg
Fill 1 - northwest corner of property	3-4 feet bgs	300 mg/kg
Fill 2 - northeast corner in the PS&G pipeline	3.5-4 feet bgs	110 mg/kg
Fill 3 - south of Fill 2	2-4 feet bgs	520mg/kg
Fill 4 - southeast of sand dryer	12-34 inches bgs	440 mg/kg
Fill 5 - south of the Paint Center	3-4 feet bgs	140 mg/kg
Fill 6 - southwest part of property	2-3 feet bgs	120 mg/kg
Fill 7 - southeast of culvert	2-4- feet bgs	70 mg/kg
Strmfill 8 - south of culvert	2-4 feet bgs	160 mg/kg
Strmfill 9 - southeast of storm drain	3-4 feet bgs	9.1 mg/kg
Strmfll 10 - south of storm drain	2-4 feet bgs	360 mg/kg

Location	Depth	Results
Stain 5 - north of the PS&G pipeline near eastern border of property	0-12 inches bgs	340 mg/kg
Stain 6 - center of property and north of the PS&G pipeline	0-2 feet bgs	500 mg/kg
Grate 1 - in the Office Building located in the southwest corner of property	0-6 inches bgs	42 mg/kg
Post Ex-1 - north of the tank farm	0-6 inches bgs	130 mg/kg
Post Ex-2 - north of the tank farm	0-6 inches bgs	50 mg/kg
Waste 1 - southwest of tank farm	3-3.5 feet bgs	21 mg/kg
Waste11 - southwest of tank farm (Duplicate)	3-3.5 feet bgs	25 mg/kg

(PAS-00084647-51)

According to the 2000 ENVIRON Supplemental SI Report further soil sampling was conducted as requested by NJDEP based on the 1999 BCM SI Report (PAS-00084493, 97). The following table is a Summary of Soil Samples (highest concentration) taken for copper:

ASTs depth 4-4.5 feet bgs	Former 250-Gallon Waste Oil UST) depth 3-3.5 feet bgs	Drum Storage Pad depth 1-1.5 feet bgs	Wastewater Handling System 0.5-1 feet bgs
43.5 mg/kg	8.3 mg/kg	93.5 mg/kg	142 mg/kg

(PAS-00084545-61)

Lead

The 1999 BCM SI Report stated the following results (0-4 feet bgs) for the soil sampling done in 1998. See the Analysis Results Sampling Map from the 1999 BCM SI Report located in the previous PAHs section.

Location	Depth	Results
Fill 1 - northwest corner of property	2-3 feet bgs	90 mg/kg
Fill 1 - northwest corner of property	3-4 feet bgs	920 mg/kg
Fill 2 - northeast corner in the PS&G pipeline	3.5-4 feet bgs	600 mg/kg
Fill 3 - south of Fill 2	2-4 feet bgs	700 mg/kg
Fill 4 - southeast of sand dryer	12-34 inches bgs	1,700 mg/kg
Fill 5 - south of the Paint Center	3-4 feet bgs	180 mg/kg
Fill 6 - southwest part of property	2-3 feet bgs	180 mg/kg
Fill 7 - southeast of culvert	2-4 feet bgs	90 mg/kg
Strmfill 8 - south of culvert	2-4 feet bgs	310 mg/kg
Strmfill 9 - southeast of storm drain	3-4 feet bgs	Non-detect (ND)
Strmfll 10 - south of storm drain	2-4 feet bgs	800 mg/kg
Stain 5 - north of the PS&G pipeline near eastern border of property	0-12 inches bgs	620 mg/kg

Location	Depth	Results
Stain 6 - center of property and north of the PS&G pipeline	0-2 feet bgs	630 mg/kg
Grate 1 - in the Office Building located in the southwest corner of property	0-6 inches bgs	99 mg/kg
Post Ex-1 - north of the tank farm	0-6 inches bgs	300 mg/kg
Post Ex-2 - north of the tank farm	0-6 inches bgs	140 mg/kg
Waste 1 - southwest of tank farm	3-3.5 feet bgs	ND
Waste11 - southwest of tank farm (Duplicate)	3-3.5 feet bgs	ND

(PAS-00084647-51)

According to the 2000 ENVIRON Supplemental SI Report further sampling was conducted as requested by NJDEP based on the 1999 BCM SI Report (PAS-00084493, 97). The following table is a Summary of Soil Samples (highest concentration) taken for lead:

Above Ground Storage Tanks	Underground Storage Tank - South End of Site	Drum Storage Pad	Wastewater Handling System	Historic Fill
34.8 mg/kg depth 4-4.5 feet bgs	128 mg/kg depth 0.5-1.0 feet bgs	101 mg/kg depth 1-1.5 inches bgs	282 mg/kg depth .05-1 inches bgs	727 mg/kg

(PAS-00084545-61)

The 2000 ENVIRON Supplemental SI Report stated that additional soil sampling for lead at the Stained Soil near Red Storage Area post excavation was conducted. The sampling results for lead were POSTEX1 (727 mg/kg) and POSTEX2 (2,060 mg/kg) at a depth of 0.5 - 1 inch (PAS-00084518; PAS-00084555).

Mercury

The 1999 BCM SI Report stated the following results (0-4 feet bgs) for the soil sampling done in 1998. See the Analysis Results Sampling Map from the 1999 BCM SI Report located in the previous PAHs section.

Location	Depth	Results
Fill 4 - southeast of sand dryer	12-34 inches bgs	1.5 mg/kg
Fill 5 - south of the Paint Center	3-4 feet bgs	2.1 mg/kg
Stormfill 10 - south of the stormwater drain	2-4 feet bgs	3.6 mg/kg
Grate 1 - in the Office Building located in the southwest corner of property	0-6 inches bgs	1.0 mg/kg

(PAS-00084647-51)

According to the 2000 ENVIRON Supplemental SI Report further soil sampling was conducted as requested by NJDEP based on the 1999 BCM SI Report (PAS-00084493, 97). The following table is a Summary of Soil Samples (highest concentration) taken for mercury:

ASTs 4-4.5 feet bgs	Drum Storage Pad 1-1.5 feet bgs	Wastewater Handling System 2-2.5 feet bgs
0.07 mg/kg	0.23 mg/kg	0.17 mg/kg

(PAS-00084545-61)

Historic Fill

The Allocation Team has determined that the facility site is located on regional historic fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and PAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,900 mg/kg
Copper	2,000 mg/kg
Mercury	2.1 mg/kg
Benzo(a)anthracene	7.17 mg/kg
Benzo(a)pyrene	5.23 mg/kg
Benzo(b)fluoranthene	4.48 mg/kg
Benzo(k)fluoranthene	5.96 mg/kg
Dibenzo(a,h)anthracene	2.01 mg/kg

As reported by the 1999 BCM SI Report, the site consists largely of fill material brought in to create land at a location formerly occupied by the Passaic River regime. Results of the fill material investigation also show that materials were likely obtained from more than one source. Evidence of this is provided by observations of fill characteristics made during the soil sampling program and in the results of chemical analyses. Because of the varying characteristics of the fill material, it is also probable that filling of the majority of the site was not performed at one time (PAS-00084639).

Also the 1999 BCM SI stated that the majority of the site was constructed via historic filling activity prior to 1908. Subsequently, filling of the northeast corner of the site occurred between 1908 and 1931 and a former stream channel was primarily filled between 1951 and 1961, and completely filled between 1969 and 1974. Observations made during the BCM fill material investigation performed in November 1998, reported that the site is largely composed of a thick layer (up to 14.5 feet thick) of fill material (PAS-00084612).

5. COC Pathways

Storm Sewer

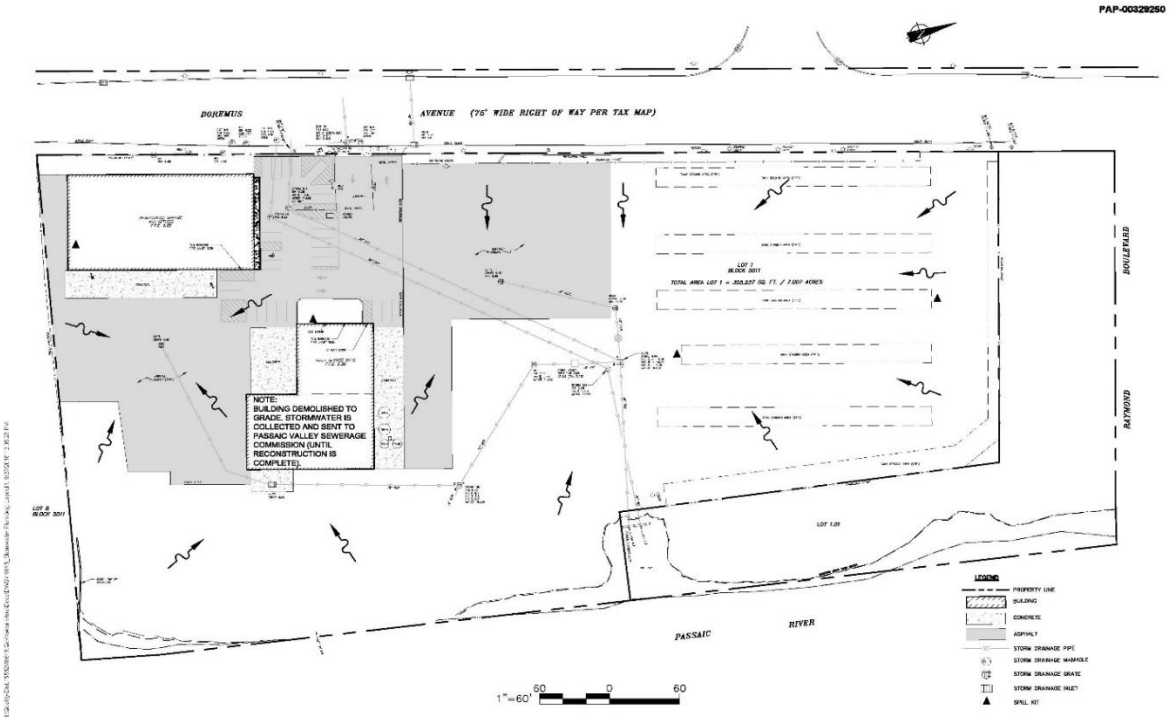
According to the 1998 BCM ISRA PA Report, stormwater was discharged to the Passaic River via an open-end pipe discharge. The facility has provided measures to contain stormwater as much as possible by conducting truck wash operations in an enclosed building, providing concrete dikes for the drum storage pads and observing good management practices (PAS-00084733).

Two storm water drains are located at the Site. One is present in the center of the truck parking area and drains stormwater from the parking area and the areas north of the building. The second stormwater drain is located near the former tank cleaning building.

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the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Only the stormwater drain in the center of the site drained to the outfall in the Passaic River. While tank washing activities at the Site were ongoing, stormwater from a small portion of the Site east of the maintenance building was also processed through the on-site wastewater pretreatment facility (PAP-00329227). Since 2015, all stormwater on Site has drained to storm drains or been collected and discharged directly to the sewer system (PAP-00329250). See drawing below.



Sanitary Sewer

The Facility is located at 80 Doremus Avenue in Newark. The City of Newark sewers are part of the PVSC system, but only serve the City of Newark. The sewer line serving Doremus Avenue is reported as a “Separate Sewer” and is differentiated from the Combined Sewer along Roanoke Avenue (PAP-00329827) The Facility permit documents show a wastewater connection to the Sanitary Sewer running along Doremus Avenue (PAP-00328859; PAP-00328892). The Doremus Avenue sewer has been a sanitary sewer at least as far back as 1973. (PAP-00329977)

Wastewater System

It is believed that prior to 1951 wastewaters from the northern Doremus Avenue area were directed to the Roanoke Avenue regulator system during surcharging of the sewer system. Any process wastewaters flowing to the Roanoke Avenue regulator were discharged to the Passaic River at the Roanoke Avenue outfall. The facility operations in place at the site prior to/as of 1951 were the operations of Public Service Coordinated Transport (PAS-00124548). Note that Quality Carriers operations at the site began in 1970 (PAP-00145606).

Quality Carriers Inc.

Diamond Alkali OU2 Allocation

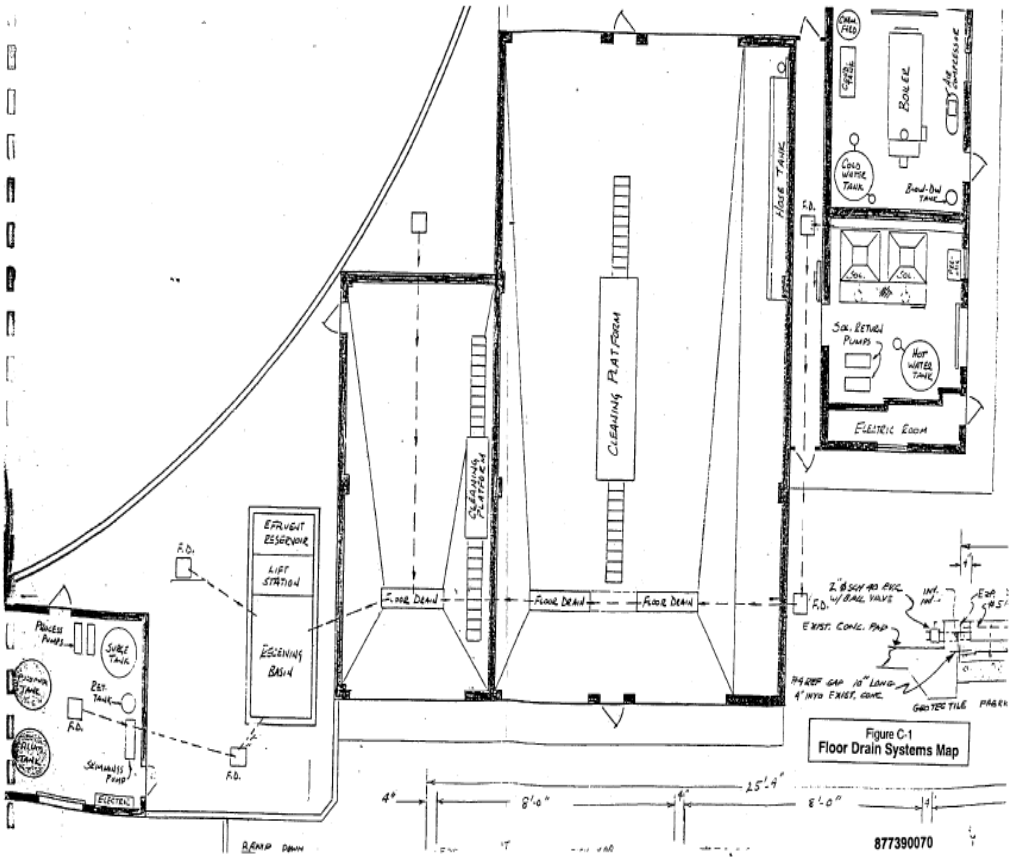
ADR Confidential

Facility Data Report

The following description of the Wastewater System was taken from the QSI Accident Spill Prevention Plan dated 1994:

> "The cargo tank cleaning facility consists of a metal building enclosing three concrete wash bays. Each cleaning bay is sloped to an individual sump where wastewater first collects and then gravity flows through a pipe to a 2,000-gallon steel collection tank. After an oil separation procedure, the wastewater is pumped to a 20,000-gallon steel equalization and blending tank. After equalization and blending, the wastewater is pumped to a 10,000-gallon steel chemical batch reactor. At this stage of the process, chemicals are added to separate out emulsions, precipitate solids, adjust pH, and if necessary, oxidize organics. The chemically-conditioned wastewater is then transferred to a primary clarifier where floating and settleable solids are removed. Air lift pumps are utilized to transfer sludge to the aerobic sludge digester. Oil and grease skimmed from the water surface is also transferred to the aerobic sludge digester. The clarifier effluent overflows the double-edged effluent weir and into an effluent pump tank. The effluent is then pumped through overhead piping to the city sewer system" (PAP-00328873-74).

A diagram of the floor drain system which shows historic discharges to a settlement basin and on-site WWTP is presented below (PAS-00084674).



On November 17, 1994, QSI notified PVSC of the proposed increased average daily flow from the current rate of 15,000 to 25,000 gallons to the proposed rate of 25,000 to 35,000 gallons. It stated that additional equipment which served as slug prevention were the 20,000-gallon holding tank and the 10,000-gallon chemical batch reactor. All process drains in the tank cleaning and wastewater treatment areas were connected directly or indirectly to the 20,000-gallon holding tank. Any slug entering the system would then be isolated in the 10,000-gallon chemical batch reactor. It was proposed that to detect a slug occurrence would be the daily process testing in the chemical batch reactor (PAP-00328866-67).

6. Regulatory History/Enforcement Actions

Inspections

An inspection of the facility was performed by NJDEP on September 28, 1998. According to the report of inspection the following deficiencies were noted:

- Heavy staining and evidence of oil around the 250-gallon aboveground waste oil tank located in the maintenance/office building inside and outside of the containment area (PAS-00084668).

- Inside the maintenance building, on the left rear side closest to Doremus Avenue, is a metal grate in the floor. It appeared to be a sewer cleanout, however, there was exposed soil below the grate which appeared to be heavily stained (PAS-00084668-69).

- The areas on both sides of the diesel fuel oil pumping station were heavily stained. One area is where the pumping occurs, the other area is the fill intake pipe which transports the fuel to the tank via gravity (PAS-00084669).

- There was a spill of diesel fuel when a tank line was ruptured in January 1996. There is no mention of any sampling occurring as a result of this spill. In addition, since the tanks have been in service since the 1930s and do not have secondary containment, the area of the two 20,000-gallon diesel fuel tanks including the piping to the boiler room was to be investigated (PAS-00084669).

- The floor drains associated with the tank wash operations were filled with liquid and could not be checked (PAS-00084669).

- The concrete settlement tank associated with the rinsate collection and wastewater treatment system was filled with liquid and therefore the construction and integrity could not be checked. In addition, the preliminary assessment report (PAR) states that the settlement tank was installed in 1993, a year after QSI started operations at the site. It is not clear where the rinsate discharged prior to the installation of the settlement tank (PAS-00084669).

- The drum storage pad located next to the oil skimmer was filled with approximately three inches of oily liquid waste. The integrity of the pad could not be determined (PAS-00084669).

- There was a stained soil area between the red storage shed and the waste water pretreatment area (PAS-00084669).

- The former 1000-gallon underground waste oil tank was not sampled in accordance with N.J.A.C. 7:26E. In addition, it is not clear if this tank was replaced by the 250-gallon aboveground waste oil tank present in the maintenance room (PAS-00084669).

A summary of the investigations performed for the above listed areas is found in the Characterization Activities located in Section 7 Response Actions.

Violations

According to the 1998 BCM ISRA PSA, the following summary of PVSC rule violations occurred:

- Between April 26, 1989 and August 6, 1997 - Multiple violations of discharging corrosive waste

- July 31, 1990 - pH monitoring equipment was not operating in conformance with its intended use.

- Between January 30, 1991 and May 8, 1995 - Multiple violations of Petroleum Hydrocarbons results exceeding limits.

Permits

According to a letter prepared by CLTL addressed to US EPA, dated January 29, 1982, CLTL submitted an application for a hazardous waste permit in November 1980. The application was approved and given the following EPA generator number: NJD 040743072 (PAS-00084676).

On September 6, 1987, PVSC issued a Sewer Connection Permit (No. 20404240) authorizing CLTL to discharge into the PVSC system. The effective date was September 6, 1987 until September 6, 1992. A 24-hour composite sampler on Outlet No. 1 was to be installed by CLTL with acceptance by PVSC. In addition, CLTL was to install a water consumption meter on Outlet No. 2 (PAP-00328836-38, 41, 46).

The renewal application for Sewer Connection Permit No. 20404240 was submitted by CLTL on March 6, 1992 for continuation to discharge to the PVSC sewerage. Process wastewater was to be discharged to a Combined Sewer on an intermittent basis (PAP-00328855-57).

According to the 1998 BCM ISRA PA Report, CLTL held a sewer connection permit with the PVSC since at least September 6, 1987 through at least September 6, 2002~~2007~~. They also held a hazardous materials facility permit with the Newark Fire Department from January 29, 1997 through January 29, 2002 (PAS-00084779).

A Sewer Use Permit Number 20200022 was granted to Quala Systems, Inc. effective September 6, 2002 with the expiration date of August 31, 2007 (PAP-00329025). According to a September 6, 2007 QSI letter to PVSC, all discharges from outlet 20200022-1 had ceased and the process to dismantle the existing wastewater pretreatment plant had begun. It was requested that Permit Number 20200022 be retained with modifications (PAP-00329195).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- NJDEP and Energy Division of Responsible Party Site Remediation, ISRA Preliminary Site Assessment, Quala Systems Inc./Chemical Leaman Tank Lines dated April 1998 (PAP-00147645)
- Site Investigation Results Report, Quala Systems Inc./Chemical Leaman Tank Lines dated January 1999 (PAS-00084605)
- Supplemental Site Investigation Results Report, Quala Systems Inc./Chemical Leaman Tank Lines dated December 2000 (PAS-00084493)
- ISRA Revised Remedial Investigation Work Plan, dated February 2002 (PAP-00328578).
- Remedial Investigation Results Report, Chemical Leaman Tank Lines, Inc. dated July 2004 (PAP-00328639).
- Remedial Action Report, Doremus Avenue Improvements, May 2007, The Louis Berger Group, Inc. (PAP-00328606).
- Addendum to the Supplemental RI Work Plan, June 2007, (PAP-00445912).
- Remedial Investigation Report, Chemical Leaman Tank Lines, Inc. dated July 2009, ISRA Case Number E98308, Volume 1 of 2 (PAP-00329995).
- Remedial Investigation Report, Chemical Leaman Tank·Lines, Inc. dated July 2009, ISRA Case Number E98308, Volume 2 of 2 (PAP-00330307)
- Final Remedial Investigation Report, Quality Carriers Incorporated, dated May 2016 (PAP-00145600)

The 1998 BCM ISRA PSA provided a narrative for several areas of concern which were subsequently investigated during an 18-year ISRA investigation process, culminating in the 2016 OBG Final RIR. A brief summary of the areas of concern follows:

Bulk Storage Tanks

Aboveground tanks and piping

- Two elevated 20,000-gallon tanks used for storing diesel fuel; one used by CTLT and one used by QSI Environmental Services. The tanks are approximately 10 feet bgs off the ground, within the perimeter of a 226-foot diameter circular containment wall. At the time of the site assessment the tanks were in good shape.

- A three million-gallon steel storage tank used for storing No. 4 Fuel Oil was stored at one time in the 226-foot containment wall. It was reported that the tank was removed in the 1980s. No physical evidence of its existence was visible, and no information of removal or spills was obtained so further investigation was recommended.

- Five tanks for storing reagents for the on-site WWTS. Four were stored in the Reagent Building on concrete pads with a concrete dike perimeter: 1,000-gallon tank for storing sulfuric acid; 500-gallon tank intended for storing polymer reagent (not currently use); 1,000-gallon tank for storing aluminum sulfate; 1,000-gallon tanks for storing sodium hydroxide solution. The fifth tank containing sodium hydroxide was located outside of the Reagent Building on a concrete pad. At the time of the site assessment the tanks were in good shape.

- A horizontal 250-gallon aboveground storage tank used for storing waste oil was located at the southwest corner of the maintenance building. At the time of the site assessment the tank appeared to be in good condition.

Underground Tanks and Associated Piping

- In October 1987, CTLT removed a 1,000-gallon steel underground storage tank. Excavation samples were taken and analyzed for TPH. Based on the test results the levels of PAHs were acceptable. No further action was recommended.

- Sanborn maps dated 1931, 1950, and 1973 show that three underground gasoline storage tanks existed at the site at these times and were located along the southwest side of the concrete wall of the three million-gallon storage tank area. During the site visit no visible signs of vent pipes were found to document the tanks existence. No further information was found on these tanks, therefore; further investigation on the status of the tanks was recommended.

Pits

- In 1993 one concrete settlement tank associated with the rinsate collection and WWTS was installed. It was located adjacent and to the east of the truck washing facility. The tank did not appear to have any deficiencies therefore no further action was recommended.

Storage Pads and Drum/Waste Storage Area

- CLTL stored used empty 55-gallon drums and 55-gallon drums containing motor, transmission, and hydraulic oil lubricants and antifreeze coolant on a concrete floor along the north side of the maintenance building. During the site assessment about 20 drums were being stored (11 empty). Evidence of oil staining was seen in this area as well as along the nearby floor seam. Since no significant level of contamination was observed, no further investigation was recommended.

- QSI maintained three contiguous storage areas for 55-gallon drums containing liquid waste or semi-liquid residues that are drained from tank trucks brought in for washing at the wash building. The storage areas were constructed with impermeable concrete pads and dikes and visual observation determined to be adequate. No further investigation was recommended.

Dumpster

- A10 cubic-yard steel dumpster was located beside the modular WWTS. It was used for the collection of the dewater sludge from the WWTS. The practice of using the dumpster had been in effect for five years. No odor from the dumpster was observed so no further investigation was recommended.

Drainage Systems and Areas

Floor Drains

- Three floor drains were observed in the truck washing building and one in the reagent room. No cracking and clogging were observed so no further investigation was recommended.

Discharge and Disposal Areas

Open Pipe Discharge

- Stormwater is discharged to the Passaic River via an open-end discharge. Visual inspection did not show oil sheen or signs of discolored areas. Corporate management stated that EPA had issued a company-wide general storm discharge permit but at the time an NJDEP stormwater permit was not in effect.

Other Areas of Concern

Discolored Areas of Spill Areas

- The facility used diesel fuel as a “Pre-solv” material for truck washing. The diesel fuel was taken by gravity via a discharge pipe from a 20,000-gallon tank that belongs to QSI to five-gallon pails. The filling area appeared to have been

heavily stained suggesting that spills could have occurred. The extent of possible contamination is not known, therefore further investigation is required.

- During the site assessment the ground within the circular wall containment for the former three million-gallon storage tank was observed to be grayish in color. The area had been in existence since 1931 and since no evidence of what caused the discoloration was found, further investigation was required. (PAS-00084730-34).

According to 2000 ENVIRON Supplemental SI Report, 15 potential areas of environmental concern (AOCs) were characterized (PAS-00084541) based on the 1998 ISRA PSA discussed above. These areas were subsequently investigated further, as reported in the subsequent reports prepared in 2002, 2007, 2009, 2011, and 2016. The long term remedy proposed for the site includes an engineering control (cap) with respect to the continued presence of historic fill, an institutional control (deed notice), and establishing two groundwater classification exception areas (CEAs). The following is a summary of the investigations and conclusions for each AOC.

Areas of Concern

Former No. 4 Fuel Oil AST (AOC 1)

During August 1998, BCM Engineers Inc. (BCM) collected four surface soil samples to characterize soil quality in the area surrounding the former No. 4 fuel oil AST location. In their November 23, 1999 correspondence, NJDEP requested that additional soil sampling be completed to delineate the vertical and horizontal extent of the impacted soils at soil boring GP-1, located northeast of the concrete retaining wall associated with the former AST. NJDEP also requested that additional soil borings be completed within the former secondary containment area at locations around the perimeter of the former AST. In July 2000, ENVIRON completed soil borings and soil sampling in the vicinity of prior sample location GP-1 and around the perimeter of the former No. 4 fuel oil AST. Based on the results of the supplemental site investigation, ENVIRON proposed that further soil borings and sampling was required (PAS-00084501-03).

On October 4, 2002, ENVIRON completed seven soil borings (GP1I through GP1O) to delineate the horizontal and vertical extent of TPHC-impacted soils and further evaluate free-phase hydrocarbons identified at soil boring SB-5. Each soil boring was completed to 12 feet bgs, with the exception of vertical delineation soil boring GP1I which was completed to 16 feet bgs (PAP-00328647). The sample results for the horizontal and vertical delineation were reported for TPHC concentrations only (PAP-00328648, 84).

Further soil investigations was performed and the results were reported in the 2009 RIR by Science Applications International Corporation (SAIC). According to the 2009 RIR, the investigation was to confirm the 123 mg/kg TPH concentration in sample SB-5 (4.5 to 5 feet bgs) and provide TPH concentration data below formerly identified free product (PAP-00330016).

The AOC 1 soil borings had been delineated to the extent of TPH impact exceeding 10,000 mg/kg to an area of approximately 4,000 cubic feet located northeast of the former AST. In addition, there appeared to be an area with a smear zone of petroleum hydrocarbon northeast of the former AST and delineated by the installed soil borings to an area approximately 800 square feet in size (PAP-00330017).

Note: PAHs were not delineated in the sample results for AOC 1.

Two 20,000-Gallon Diesel Fuel ASTs (AOC 1A)

During November 1998, BCM collected one surface soil sample and one shallow subsurface soil sample from beneath each of the two 20,000-gallon diesel fuel ASTs which provided product to the Pre-Solv Area (PAS-00084504).

It was concluded that soil sampling activities completed at the two 20,000-gallon diesel fuel ASTs during the supplemental site investigation in 2000 and remedial investigation in 2004 did not identify VOC concentrations at levels above the analytical laboratory detection limit; therefore no further action was recommended (PAP-00328651; PAS-00084504)

Waste Oil AST (AOC 2)

During an NJDEP site inspection on September 23, 1998, staining was noted on concrete surfaces in the vicinity of the 250-gallon waste oil AST located inside the Maintenance Building. Following NJDEP's inspection, CLTL cleaned all concrete surfaces in the vicinity of the AST and BCM visually inspected the integrity of the concrete during the site investigation. BCM's inspection of the concrete floor did not identify cracks or pitting that would compromise the integrity of the floor. In their June 15, 2000 correspondence, NJDEP requested additional sampling be completed in the area outside of the Maintenance Building (PAS-00084505).

On November 7, 2000, ENVIRON completed one soil boring (SB30) outside of the Maintenance Building, in the vicinity of the waste oil AST. The reported TPHC concentration of 14,300 mg/kg exceeded NJDEP's 10,000 mg/kg health-based criterion for total organic contaminants. Reported VOC, BN, and PCB concentrations did not exceed the most stringent NJDEP soil cleanup criteria. It was recommended that three soil borings be completed in the vicinity of soil boring SB30 to delineate elevated TPHC (PAS-00084505).

According to the RIR report, Chemical Leaman Tank Lines, Inc. dated July 2004 (2004 RIR), soil sampling activities were completed outside the Maintenance Building that delineated the horizontal and vertical extent of TPHC-impacted soils in the vicinity of the waste oil AST. A remedial action plan was to be prepared (PAP-00328652).

SAIC reported in the July 2009 RIR that NJDEP agreed that no further soil characterization was required based on the results of the previous sampling events. Remedial actions to address the soils with TPH concentrations above 10,000 mg/kg (immediately around SB-30 between 3 and 5 feet) were required (PAP-00330022).

Note: PAHs were not delineated in the sample results for AOC 2.

Former Gasoline USTs - South End of Site (AOC 3)

During August 1998, BCM completed a geophysical survey to determine whether USTs were present at the southwestern portion of the site. In addition, two soil samples were collected from one soil boring (GP-4[BCM-2]) and analyzed for TPHCs and VOC+10. The geophysical survey did not identify reflective signatures characteristic of a UST. In the November 23, 1999, letter, NJDEP requested that two additional soil samples be collected in the area and analyzed for VOC+10 and lead. Following review of the *Supplemental Site Investigation Work Plan*, NJDEP requested (in a letter dated June 15, 2000) that sampling in the area be completed in accordance with the Technical Requirements for Site Remediation. The revised scope of work was provided to NJDEP as an attachment to a letter from QDI dated July 26, 2000 (PAS-00084506).

On August 3 and September 11, 2000, ENVIRON completed a total of eight soil borings (SB-6, SB-7, and SB-24 through SB29) in the vicinity of the former USTs. Each soil boring was completed to 12 feet bgs, with the exception of soil borings SB-6 and SB-7, which were completed to 4 feet bgs. One soil sample was collected from each soil boring and analyzed for VOC+10 and lead (PAS-00084506). ENVIRON reported constituent concentrations in the soil samples collected during the supplemental site investigation were all below the most stringent NJDEP soil cleanup criteria. Lead was detected in four of the samples (11.6 mg/kg, 16.6 mg/kg, 29.9 mg/kg and 128 mg/kg (PAS-00084547-48).

According to the 2004 RIR, on March 1 and 2, 2004, ENVIRON completed a total of five soil borings to characterize soils below the former gasoline USTs (SB31 and SB32). Lead concentrations were reported for samples collected from soil borings SB31 at 12.9 mg/kg and SB32 at 12.8 mg/kg (PAP-00328653-54).

It was reported in the 2009 RIR that it was anticipated that the dissolved detections of benzene, PAHs, and metals would be addressed by establishing a CEA and deed notice prohibiting the use of groundwater for the site (PAP-00330025, 27).

Former 250-Gallon Waste Oil UST (AOC 4)

Site investigation activities performed by BCM during November 1998 included the completion of one soil boring near the former 250-gallon waste oil UST. One soil sample (Waste-1) was collected from the boring and was analyzed for VOC+10, BN+15, PCBs, Priority Pollutant metals, and TPHCs. NJDEP rejected the VOC, BN, PCB, and metals data based on QA/QC issues and required that additional sampling be completed (PAS-00084508).

On August 3, 2000, ENVIRON completed one soil boring at BCM's prior sampling location. The soil boring (WASTE-1) was completed to depth of 4 feet bgs. Analytical results reported that VOCs and PCBs were not detected in the soil sample and the reported bis(2-ethylhexyl)phthalate and di-n-ocryl phthalate concentrations were below the most stringent NJDEP soil cleanup criteria. Based on the results, ENVIRON recommended no further action for AOC 4 (PAS-00084509).

According to the 2004 RIR and the 2009 RIR, AOC 4 was approved by NJDEP for no further action for soil. This was based on the results of the site investigation and supplemental site investigation activities (PAP-00328646; PAP-00330028).

Former Gasoline USTs - North End of Site (AOC 5)

Historical Sanborn maps depict gasoline USTs in the vicinity of the northern site boundary. Activities completed during BCM's site investigation included the completion of a geophysical survey to identify the location of the gasoline USTs. Geophysical survey results were inconclusive due to surface and shallow subsurface interferences. In the November 23, 1999 correspondence, NJDEP requested that trench pits be excavated, and soil samples be collected to characterize soil quality in the vicinity of the former USTs (PAS-00084509).

In the 2000 ENVIRON Supplemental SI Report, it was determined that the former USTs are positioned beyond the northern Site boundary and are not part of the CLTL facility. No further action was recommended (PAS-00084509).

According to the 2004 RIR, AOC 5 was approved by NJDEP for no further action for soil. This was based on the results of the site investigation and supplemental site investigation activities (PAP-00328646).

The 2009 RIR reported that trench pits were excavated and soil samples collected. No impacted soils or USTs were discovered during the investigation. It was concluded that additional characterization or remediation was not necessary for this AOC.

Pre-Solv Filling Area (AOC 6)

During August 1998, BCM collected one surface soil sample and one shallow subsurface soil sample from one soil boring (GP-4) at the Pre-Solv Filling Area. Because this area was concrete-covered, additional samples could not be collected. However, the November 23, 1999, correspondence from NJDEP requested that one additional soil boring be completed at the Pre-Solv Filling Area due to the long operational period (PAS-00084509-10).

On August 3, 2000, ENVIRON completed one soil boring (SB08) to a depth of 4 feet bgs at the Pre-Solv Filling Area. Based on the results of the supplemental site investigation, it was proposed to complete 3 additional soil borings in the vicinity of soil boring SB08 to delineate the elevated TPHC and benzene concentrations (PAS-00084511).

According to the 2004 RIR, on March 1 and 2, 2004, ENVIRON completed three soil borings (SB08A, SB08B and SB08C) to delineate the horizontal and vertical extent of TPHC and VOC-impacted soils in the vicinity of the Pre-Solv Filling Area. Soil sampling activities completed in the vicinity of the Pre-Solv Filling Area during the remedial investigation delineated the extent of VOC. Further evaluation of the soil and ground water quality in the vicinity of the Pre-Solv Filling Area was needed (PAP-00328656). Note: The VOCs analyzed were for PAHs not relevant to the current allocation.

It was reported in the 2009 RIR, that the horizontal and vertical delineation for benzene was completed since benzene was detected at a concentration below the NJDEP criteria. Horizontal delineation for TPH results reported one sample at 18,800 mg/kg. Further sampling was necessary to delineate the extent of TPH in soils (PAP-00330031-32).

Drum Storage Pad (AOC 7)

The current drum storage pad was cleaned and inspected by BCM during the site investigation. The drum storage area was found to be intact and no visible cracks or pitting was observed in the concrete. The November 23, 1999 correspondence from NJDEP requested that additional sampling be completed to characterize soil quality in the vicinity of the former drum storage pad at the site. The former drum storage pad was located immediately east of the current pad at the location of the wastewater pre-treatment plant (PAS-00084511).

On August 10, 2000, ENVIRON completed two soil borings (SB15 and SB16) adjacent to the former drum storage pad to evaluate potential releases associated with the former drum storage pad (PAS-00084511). Reported PAHs in soils at AOC 7 included Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, chrysene, and Indeno(1,2,3-cd)pyrene (PAS-00084552). It was recommended that a deed notice be established to address the PAH concentrations in the historic fill material at the Site. Based on the results, it was also recommended that no further action was warranted with respect to the drum storage pad (PAS-00084512).

According to the 2004 RIR, AOC 7 was approved by NJDEP for no further action for soil. This was based on the results of the site investigation and supplemental site investigation activities (PAP-00328646).

Maintenance Shop Drum Storage (AOC 8)

In the November 23, 1999, correspondence, NJDEP requested that a sample be collected from the floor seam in the vicinity of the Maintenance Shop drum storage area. As the elevated TPHC concentration warranted removal of sediment from within the floor seam, additional characterization (i.e. VOC analysis) was not performed (PAS-00084513).

On August 1, 2000, one sample (SB17-SS01) was collected from the sediments present within the floor seam near the northern garage bay of the Maintenance Shop in the vicinity of the drum storage area. The reported TPHC concentration (23,200 mg/kg) exceeded the NJDEP health-based criterion of 10,000 mg/kg for total organic contaminants. As the elevated TPHC concentration warranted removal of sediment from within the floor seam, additional characterization (i.e. VOC analysis) was not performed. It was recommended that accumulated sediment be removed from the floor seam and transported for appropriate off-site disposal. Upon removal of the sediments, the floor seam was to have been visually inspected to characterize the integrity of the seam (PAS-00084513).

In the 2004 RIR, it was reported that the sediment was removed and disposed off-site. The visual inspection of the floor seam determined it to be in good condition with no significant cracks or pitting. No further action was recommended (PAP-00328657). According to the 2009 RIR, NJDEP agreed that no further action was required for the soils at this AOC (PAP-00330035).

Wash Bay Drainage System (AOC 9)

During NJDEP's September 1998 site inspection, the floor drains associated with the wash bays were filled with liquid and the integrity of the drains could not be assessed. Results of a subsequent visual integrity inspection completed by BCM described the floor drains as intact. In the November 23, 1999 correspondence, NJDEP requested that an additional investigation be completed to characterize the floor drains in accordance with the Technical Requirements for Site Remediation (PAS-00084513-14).

On August 4, 2000, ENVIRON completed three soil borings (SB09, SB10, and SB11) along the northern edge of the Tank Cleaning Building to characterize soil quality and identify potential releases associated with the floor drains. Reported PAHs in soils at AOC 9 included Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, chrysene, and Indeno(1,2,3-cd)pyrene and pyrene. The following pesticide concentrations (maximum detected) were reported for; 4,4'-DDD at .0046 mg/kg, 4,4'-DDE at .0016 mg/kg, and 4,4'-DDT at .0226 mg/kg. The highest concentration for Aroclor 126 was 0.0937 mg/kg. The reported highest concentrations of metals were; copper at 142 mg/kg, lead at 282 mg/kg, and mercury at .17 mg/kg (PAS-00084554). No further sampling was needed for the above discussed constituents since the concentrations results were below the NJDEP soil cleanup criteria. Based on the results of the supplemental site investigation, ENVIRON proposed to complete one boring in the area north of sample location SB10 to delineate the horizontal extent of the elevated phthalate concentration (PAS-00084515).

Vertical and horizontal delineation of bis(2-ethylhexyl)phthalate at AOC 9 was conducted in 2004 and 2007 (PAP-00328657-58; PAP-00330036).

It was reported in the 2009 RIR, that during the sampling event in 2007, the redevelopment of the site occurred. The demolition of the site buildings and the removal of several concrete pads in AOC 9 and the adjacent AOC (AOC 10 wastewater system settlement tank) took place. Additionally, soils were removed to allow for the

construction of a new building. Three different excavations were completed as part of the historic foundation excavation activities resulting in the generation of approximately 3,458 tons of soils/backfill material in total. The "Pit No. 2" excavation focused around AOC 9 and effectively remediated a portion of the previously characterized near-surface soils which were impacted by bis(2-ethylhexyl)phthalate. Upon the completion of the foundation removal, soil was excavated to a depth of approximately 3 feet bgs. Soil samples were collected from the sidewalls because groundwater flooded the excavation and eliminated access for bottom sample collection (PAP-00330038).

Sampling results reported the highest concentration at a depth of 1-1.5 feet for the following:

- Benzo(a)anthracene 6.88 mg/kg
- Benzo(a)pyrene 5.1 mg/kg
- Benzo(b)fluoranthene 5.07 mg/kg
- Dibenzo(a,h)anthracene 1.28 mg/kg
- lndeno(1 ,2,3-cd)pyrene 3.05 mg/kg (PAP-00330039)

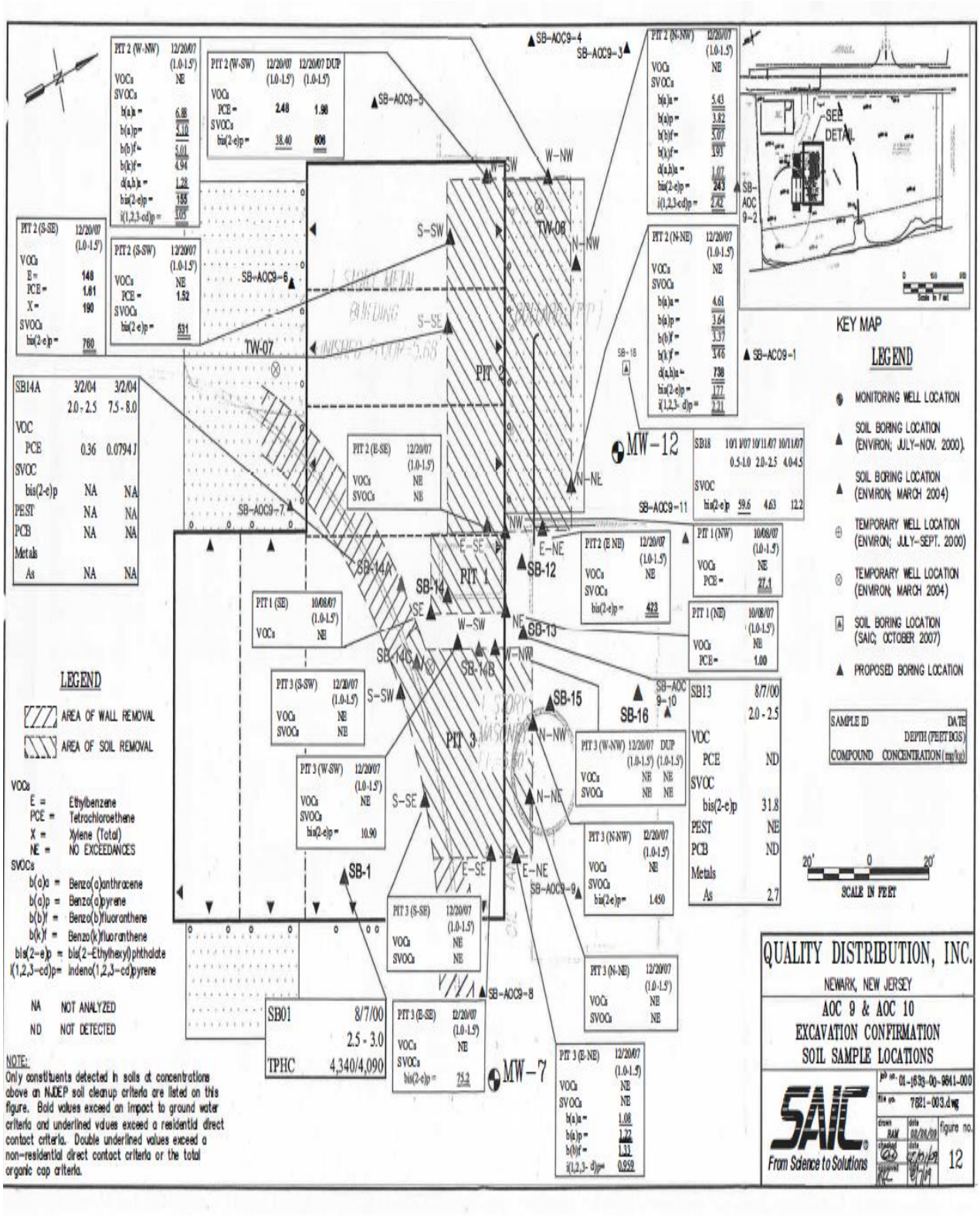
The location and sample results can be seen in the following figure.

Quality Carriers Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



(PAP-00330092)

Wastewater System Settlement Tank (AOC 10)

The wastewater settlement tank was visually inspected and photo-documented by BCM during the site investigation. The tank was noted to be lined with steel plating and no evidence of leakage from the steel lining was observed. The settlement tank was constructed in conjunction with the initial tank truck washing activities at the site and the steel lining was installed in the settlement tank during 1993. In the November 23, 1999 correspondence, NJDEP requested that sampling be completed to evaluate potential historic releases from the settlement tank (PAS-00084516).

To further assess potential releases associated with the wastewater system settlement tank, ENVIRON completed three soil borings (SB12, SB13, and SB14) around the perimeter of the settlement tank. Soil borings SB12 and SB13 were completed to approximately 8 feet bgs. Due to access restrictions, soil boring SB14 was completed to 5 feet bgs. Reported PAHs in soils at AOC 10 included Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, chrysene, Indeno(1,2,3-cd)pyrene and pyrene. ENVIRON concluded that with the exception of tetrachloroethane (PCE) concentration at soil boring SB14, all other PAHs were below the NJDEP soil cleanup criteria (PAS-00084516-17).

Additional soils were removed east-southeast of the tank as part of the construction of a building foundation and was designated as Pit No. 3. After completing the excavation to construct the building foundation, eight soil samples were collected from the perimeter based on visual staining and PID readings (PAP-00330042). One sample taken at the east-northeast corner, reported the following concentrations for PAHs; benzo(a)anthracene (1.08 mg/kg), benzo(a)pyrene (1.22 mg/kg), benzo(b)fluoranthene (1.33), and indeno(1,2,3-cd)pyrene (0.959). All other samples results for SVOC were reported as no exceedances (PAP-00330092). See figure above for location and analytical results.

Stained Soil Near Red Storage Area (AOC 11)

A small area of stained soil, measuring approximately 8 feet bgs by 15 feet bgs by 4 inches bgs deep, was excavated during November 1998, in conjunction with BCM's site investigation. Two post-excavation soil samples were collected, and each sample was analyzed for TPHCs and Priority Pollutant metals. NJDEP's November 23, 1999, and June 15, 2000, letters requested that additional samples be collected and analyzed for VOC+10 and Priority Pollutant metals as the reported TPHC concentrations exceeded 1,000 mg/kg in the post-excavation samples (PAS-00084517-18).

On August 1, 2000, ENVIRON completed two soil borings (POSTEX1 and POSTEX2) within the prior excavation area to further evaluate soil quality in the area. Each soil boring was completed to a depth of approximately 1 foot bgs. Reported lead concentrations for the soil samples collected at POSTEX1 (727 mg/kg) and POSTEX2 (2,060 mg/kg) exceed NJDEP's Residential Direct Contact and Non-Residential Direct Contact Soil Cleanup Criteria of 400 mg/kg and 600 mg/kg, respectively. Additionally, reported copper (772 mg/kg) concentrations in soil sample POSTEX2-SS01 exceed

NJDEP's Residential and Non-Residential Soil Cleanup Criteria. It was reported that the metals concentrations are within the range of concentrations typically detected in historic fill. Recommendation for a deed notice be established to address the metals concentrations in the historic fill material at the Site (PAS-00084518-19)

Per NJDEP request, additional soil sampling was completed during the remedial investigation to support a future establishment of appropriate institutional and engineering controls. On March 2, 2004, ENVIRON completed three soil borings (P0STEX2A, P0STEX2B, and P0STEX2C) within the vicinity of P0STEX2 to delineate the horizontal extent of copper-impacted soils. In addition, prior sample location P0STEX2 was re-sampled from a slightly deeper interval to delineate the vertical extent of copper-impacted soils. Horizontal delineation soil boring P0STEX2B was completed to 4 feet bgs, while vertical delineation soil boring POSTEX2 was completed to 8 feet bgs. Reported copper concentrations associated with the horizontal and vertical delineation soil samples collected in the vicinity of prior sample location POSTEX2 ranged up to 117 mg/kg. A remedial action plan was recommended to address the metals concentrations at levels above NJDEP soil cleanup criteria (PAP-0032861-62)

The 2009 RIR reported that NJDEP agreed that no further characterization was required at this AOC. An area of soils impacted by the metals antimony, copper, lead, and zinc had been delineated and were to be addressed in the remedial action work plan (PAP-00330045).

Staining Near Trailer Staging Area (AOC 12)

Five borings were completed at the north end of the site during BCM's site investigation to evaluate an area of potentially discolored soils that had been identified on a 1974 aerial photograph. Soil samples collected from each soil boring were analyzed for VOC+10 and TPHCs. Because TPHCs were detected, 25% of the soil samples were also analyzed for BN+15, PCBs, and metals. Based on the sampling results, , the site Investigation Report proposed to remediate soils in the vicinity of one stained area (Stain-5). NJDEP's November 23, 1999, correspondence requested that additional sampling be completed to delineate VOC and BN compounds detected in soil samples Stain-5 and Stain-6, and to characterize groundwater quality (PAS-00084519).

On July 19, 2000, ENVIRON completed three soil borings (Stain-5A, Stain-5B, and Stain-5C) in the vicinity of sample location Stain-5 and three borings (Stain-6A, Stain-6B, and Stain-6C) in the vicinity of sample location Stain-6 to delineate VOC and BN compounds detected in soil samples collected during BCM's site investigation. Each soil boring was completed to 8 feet bgs, with the exception of soil borings Stain-5 A, Stain-5B, and Stain-6C where Geoprobe refusal was encountered at depths ranging from 4.4 to 5.5 feet bgs. Analytical results associated with soil sampling conducted in the vicinity of Stain-5 and Stain-6 reported that benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene and VOCs were detected in soil samples at concentrations exceeding the NJDEP residential and non-residential soil cleanup criteria; however, the PAHs were within the range of

concentrations typically detected in historic fill material, and were not believed to be associated with historical releases or Site operations (PAS-00084520-21).

Additional soil borings were completed on August 8, 2000 to further delineate the impacted soils in the vicinity of Stain-5 (soil borings Stain-5D through Stain-5G) and Stain-6 (soil borings Stain-6D through Stain-6G). Soil sampling in the vicinity of soil boring Stain-6, did not detected benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene; however, the results identified VOCs at concentrations above NJDEP's corresponding Residential Direct Contact and Impact to Ground Water Soil Cleanup Criteria. It was recommended that a deed notice be established to address the VOC, SVOC, and metals concentrations above NJDEP's Residential Direct Contact Criteria in soils near soil boring Stain-6 (PAS-00084523-24, 558).

According to the 2004 RIR, a RAWP was recommended to address VOC and SVOC constituents in soil at levels above the most stringent NJDEP soil cleanup criteria (PAP-00328663).

According to the 2009 RIR, NJDEP agreed that no further characterization was required at AOC 12. A RAWP addressing the presence of VOCs and PAHs above the NJDEP's applicable soil cleanup criteria was required (PAP-00330047).

Incident Spill Report (AOC 13)

In June 1999, approximately 30 gallons of an oil-like substance were released in the parking area at the site. In a letter dated June 15, 1999, QSI included a confirmation report indicating that the impacted soils were excavated. According to QSI personnel, the excavation was completed to a depth of approximately 1.5 feet bgs. However, as there is no indication of post-excavation sampling activities, NJDEP requested in the November 23, 1999, correspondence that post-excavation sample be collected from the discharge area (PAS-00084524).

On July 19, 2000, ENVIRON completed three soil borings (SB18, SB19, and SB20) to characterize the remaining soil quality at the reported spill location. VOC's benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene were detected in the soil sample collected from soil boring SB18 at concentrations exceeding NJDEP's Residential and Non-Residential Direct Contact Soil Cleanup Criteria. However, ENVIRON concluded that the reported PAH concentrations were within the range of concentrations typically detected in historic fill material, and were not believed to be associated with historical releases or Site operations (PAS-00084525, 560).

On August 10, 2000, ENVIRON completed three additional borings (SB21, SB22, and SB23) in the vicinity of the former excavation to delineate the elevated VOC concentrations detected in soil sample SB18-SS01. It was reported that VOC concentrations in the soil samples collected at soil borings SB21 and SB22 were below the most stringent NJDEP soil cleanup criteria. VOCs were not detected in the soil sample collected at soil boring SB23. ENVIRON recommended that a deed notice be established to address the PAH concentrations in the historic fill material at the site (PAS-00084526, 560).

On March 1, 2004, ENVIRON completed two soil borings (SB18 and SB19) to delineate the horizontal and vertical extent of VOC-impacted soils at AOC 13. Analytical results associated with the soil sampling activities at AOC 13 reported that VOCs were not detected in the vertical delineation soil sample collected at SB18, with the exception of benzene. The reported benzene concentration of 0.0114 mg/kg is well below the most stringent NJDEP soil cleanup criteria. In addition, reported VOC concentrations for the soil sample collected at SB19 were below the most stringent NJDEP soil cleanup criteria. ENVIRON concluded that soil sampling activities completed at AOC 13 during the supplemental site investigation and remedial investigation delineated the horizontal and vertical extent of VOC concentrations at levels above the most stringent NJDEP soil cleanup criteria. A remedial workplan was to be prepared to address VOCs in soil at levels above the most stringent NJDEP soil cleanup criteria (PAP-00328664-65). According to the 2009 RIR, NJDEP agreed that no further characterization was required at AOC 13. A RAWP addressing the presence of TCE and cis-1 ,2-DCE above the NJDEP's applicable soil cleanup criteria was required (PAP-00330049).

Maintenance Building Concrete Vault (AOC 14)

During November 1998, BCM collected one soil sample (Grate-1) from below a metal grate in the Maintenance Building. The metal grate covers a concrete vault where the municipal water main enters the site. BCM's site Investigation Results Report proposed to remove all accumulated sediments from the concrete vault. In addition to the cleaning activities, NJDEP's November 23, 1999 correspondence requested that soil samples be collected from the base of the vault (PAS-00084526).

Investigations at this AOC did not detect any of the allocation COCs.

Unused Building (AOC 15)

Based on a review of Sanborn fire insurance maps for the site, an unused building at the northern end of the site was formerly used as an office in the 1950s and was vacant by 1973. No indication was given on the Sanborn maps as to a source of heat for the building. NJDEP requested that an investigation be completed to identify the former heat source for the building and identify any potential areas of environmental concern (PAS-00084528).

Investigations at this AOC did not detect any of the allocation COCs.

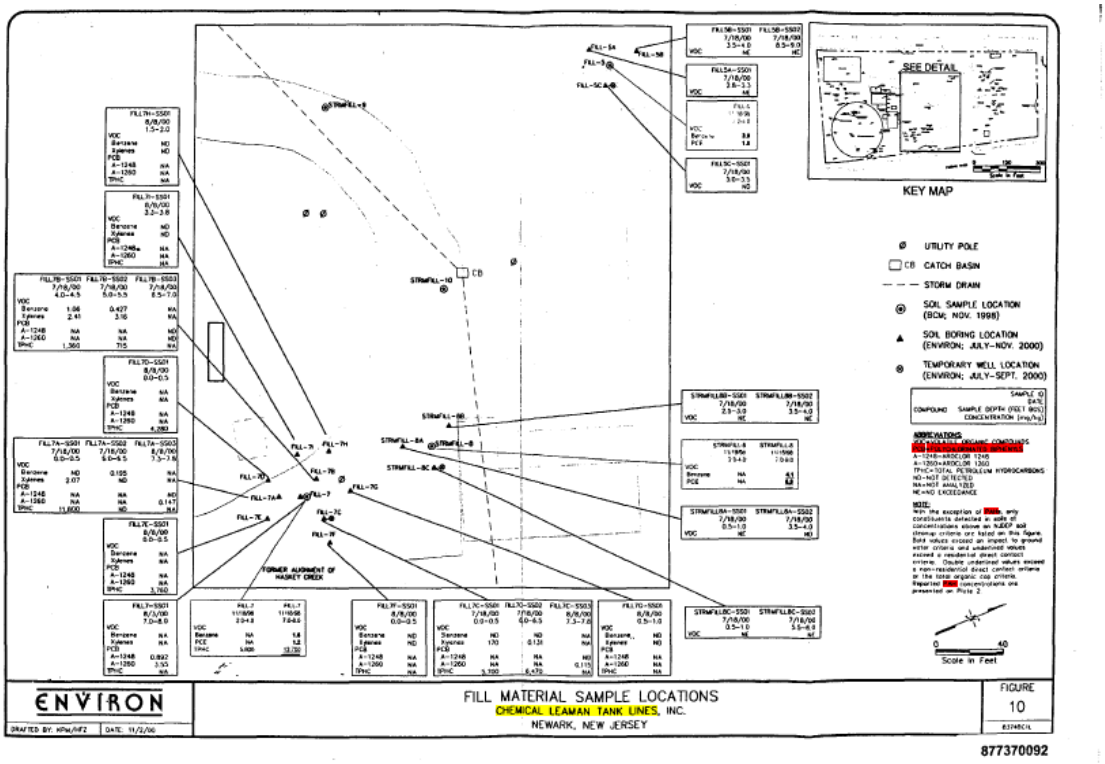
Historic Fill (AOC 16)

According to the 2000 ENVRON Supplemental SI Report, a total of 10 soil borings were completed during BCM's site investigation to characterize the quality of the historic fill material at the Site. Samples collected from each soil boring were analyzed for TPHCs and Priority Pollutant metals. Samples from two soil borings (Fill-6 and Fill-7) were also analyzed for PAHs and PCBs. Samples displaying elevated PID readings were analyzed for VOC+10. NJDEP rejected the BN and PCB data based on QA/QC issues. NJDEP's November 23, 1999 correspondence requested that additional soil sampling be completed to delineate the elevated VOC and TPHC concentrations and to provide valid PAH and PCB sampling data (PAS-00084529).

Soil sampling activities completed during the 2000 supplemental site investigation identified lead and zinc concentrations at levels above corresponding NRDCSCC and/or RDCSCC for soil samples collected in the vicinity of the red storage area; however, according to the report the reported concentrations were within the range of concentrations typically detected in historic fill (as defined in the Historic Fill Database presented in the Technical Requirements for Site Remediation). In addition, the reported copper concentrations for a soil sample collected at POSTEX2 during the supplemental site investigation exceeded the 600 mg/kg RDCSCC and NRDCSCC. NJDEP requested additional soil sampling completed during the remedial investigation to support a future establishment of appropriate institutional and engineering controls.

The additional sampling locations follow and are shown in the Fill Material Sample Locations map below:

- Sample Location Fill-5
- Sample Location Fill-6
- Sample Location Fill-7
- Sample Location Strmfill-8 (PAS-00084529)



(PAS-00084584)

In the 2004 RIR, the following conclusions were made for Historic Fill (AOC 16) sample locations:

Sample Location Fill-5

- Soil sampling activities completed during the remedial investigation delineated the extent of free-phase hydrocarbons previously observed at sample location Fill-5B and delineated the vertical extent of VOC concentrations at levels above the most stringent NJDEP soil cleanup criteria (PAP-00328667).

Sample Location Fill-7

- Soil sampling activities completed during the supplemental site investigation and subsequent remedial investigation have delineated the horizontal and vertical extent of VOC, TPHC and PCB concentrations at levels above the most stringent NJDEP soil cleanup criteria were detected (PAP-00328668).

Sample Location Strmfill-8

- Vertical delineation soil sampling activities completed at Strmfill-8 during the remedial investigation identified elevated VOCs concentrations for a soil sample collected from within the meadow mat immediately below the historic fill material (i.e., 11.5 to 12.0 feet bgs) (PAP-00328669).

Sample Location D11 and E8

In December 2001, the Louis Berger Group, Inc. completed a Property Acquisition Environmental Cost Estimate (PAECE) for the site, on behalf of New Jersey Department of Transportation (NJDOT), as part of the Doremus Avenue Roadway reconstruction and widening project. Analytical results associated with the PAECE were consistent with the prior site investigation and supplemental site investigation soil sampling results, as soil samples collected within historic fill material during the PAECE evaluation identified several PAHs and metals at concentrations exceeding NJDEP soil cleanup criteria.

It was reported in the 2004 RIR that based on the results of the PAECE evaluation, ENVIRON proposed to complete soil borings in the vicinity of sample location D11 to delineate the horizontal extent of PCB-impacted soil and E8 to delineate the horizontal and vertical extent of VOC, BN, PCB and selenium-impacted soils (PAP-00328669).

The results of the 2004 sampling showed exceedances of Aroclor-1254 and Aroclor-1260 for D11 and E8 (PAP-00328669-70).

The following conclusions and recommendations by SAIC for the sample locations discussed above, were reported in the 2009 RIR:

Sample Location Fill-5

- The sample analysis demonstrated that none of the samples collected exceeded any NJDEP action level. Therefore, the impacts around Fill-5 have been delineated with no additional characterization necessary. SAIC concluded that remediation to delineate the impact to soils which exceed the applicable NJDEP criteria for TCE, PCB, and benzene was not needed, since the property will be limited in industrial use as a result of deed restrictions to be imposed (PAP-00330054-55).

Sample Location Fill-6

- The previously conducted soil sampling events demonstrated that the detected PAH concentrations were within the range of concentrations typically detected in historic fill material and were not believed to be associated with historical releases or site operations. It was recommended that the PAH impacts to soils be addressed in a site-wide deed restriction with no additional characterization or remediation required for either soils or groundwater (PAP-00330056)

Sample Location Fill-7

- The NJDEP has agreed that no additional soil characterization was required for this location as all soil impacts have been delineated. An RA WP for addressing remediation of soils with TPH, benzene, xylenes, and PCBs with concentrations above the NJDEP criteria is not proposed due to the fact that the property will be deed restricted to prevent residential use (PAP-00330057-58).

Quality Carriers Inc.

Diamond Alkali OU2 Allocation

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Sample Location Strmfill-8

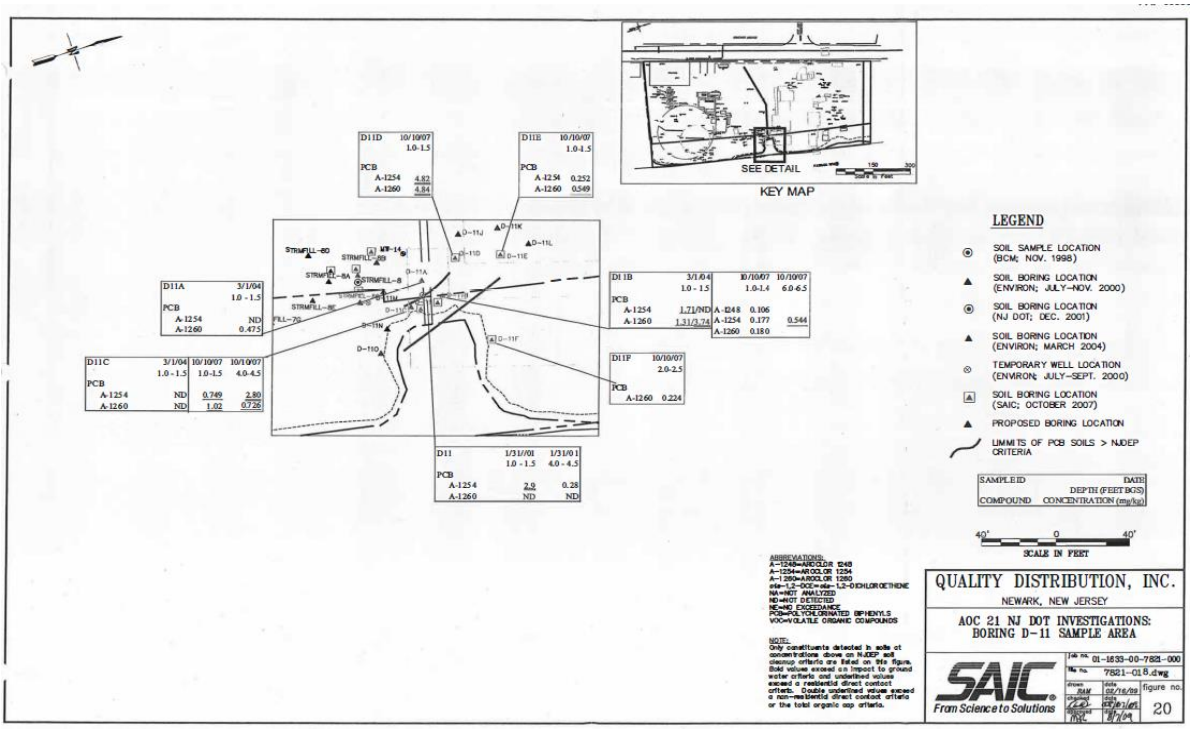
- Three additional borings were completed at formerly installed boring locations for horizontal delineation and were advanced to 16 feet bgs. . It was recommended that a remediation plan not be developed to address the delineated impact to soils which exceed NJDEP criteria for benzene and PCE due to the proposed deed restriction. The dissolved detections of VOCs will be addressed by establishing a CEA and deed notice prohibiting the use of groundwater for the site (PAP-00330061).

Sample Location D11 and E8

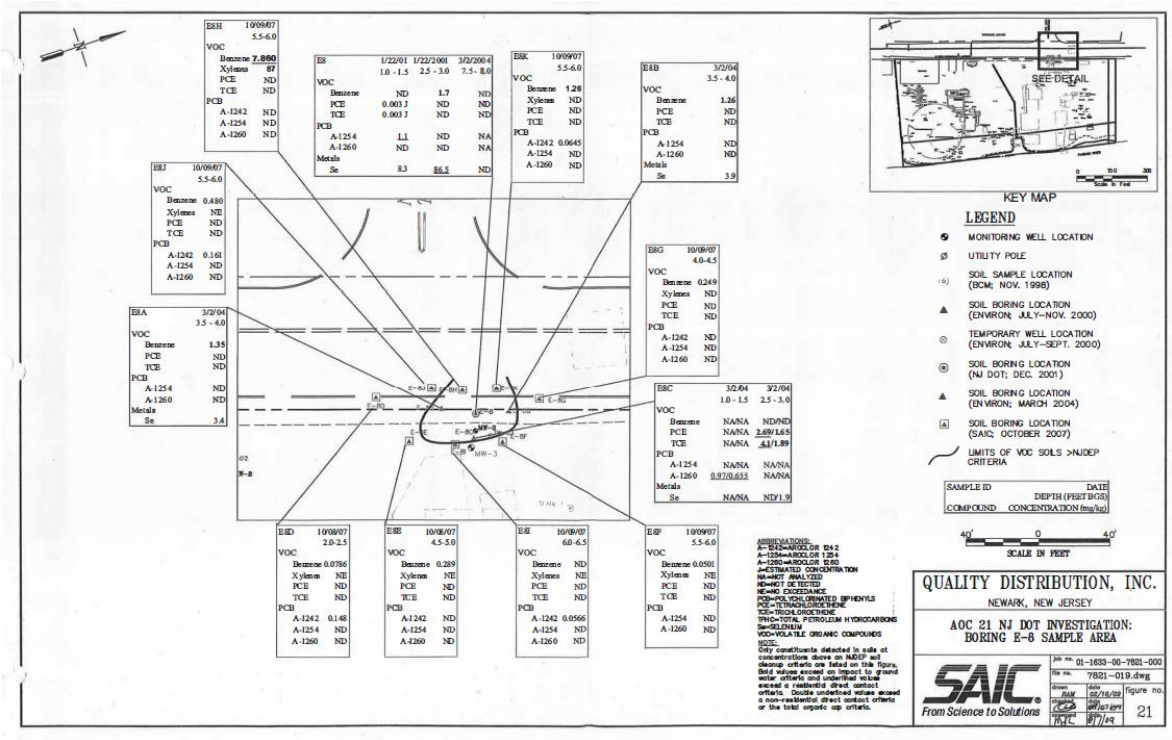
- At former boring location D-11B, two samples were collected at depth of 1.0-1.5 feet and 6-6.5 feet. The horizontal delineation borings were sampled at an interval of elevated PID measurements or from the 1-1.5 feet bgs interval to target the depth of the impacted zones in borings D-11 and D-11B (PAP-00330067).

- At former boring location E8, seven soil borings were completed to an approximate depth of 8 feet bgs to vertically and horizontally delineate VOC and PCB impacts (PAP-00330069). SAIC recommended a remediation plan to address the exceedances in the PCB impacted soils (PAP-00330070).

See the following figures for locations and results from the 2004 and 2009 sampling events for D11 and E8.



(PAP-00330100)



(PAP-00330101)

According to the 2009 RIR, a buried concrete structure measuring approximately 27 feet by 27 feet square was discovered while fencing was installed along the eastern side of the site during construction activities in the fall of 2008. This area was designated as AOC 22. The structure was in place prior to QDI's ownership and operation of the property and was identified in the early Sanborn® Maps. Upon removing the soils which covered the structure, it was observed to be filled with water. Excavation revealed a square concrete box, resembling a building footer, with a concrete top. The top was removed to expose the interior containing water, sediment, and discarded hoses. Results from the soil sampling showed that all four borings had detections for Benzo(a)anthracene; Benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, lndeno(1,2,3-cd)pyrene, and lead (PAP-00330073). SAIC recommended that further soil delineation was needed (PAP-00330075).

The 2016 OBG Final RIR concluded that PCBs, PAHs, EPH, and metals were found in soil above the RDCSRS. The PAHs and metals are being attributed to Historic Fill and are not Site related and the PCBs and EPH above the RDCSRS are not attributed to previous owner/operators at the site (PAP-00145617).

Remedial Activities

According to the 2002 Remedial Investigation Work Plan, in 2001 the CLTL property was part of the Doremus Avenue Roadway Improvement project conducted by the NJDOT. The reconstruction involved Wilson Avenue through Raymond Boulevard in the City of Newark, Essex County, to include one 12-foot lane and a 13-foot shoulder in each

direction. Based on concerns that past and current land use practices may have impacted the soil and ground water quality in the vicinity of Doremus Avenue, NJDOT conducted a Contamination Site Investigation (CSI). The conclusion of the CSI follows:

- Soil exceedances were likely associated with non-indigenous historic fill
- Approximately 1,080 cubic feet of contaminated soil will be excavated and if not able to reuse, appropriate off-site disposal will be required
- Since soil contamination above the NJDEP NRDCSCC exists on the subject property parcel, NJDEP will likely require engineering controls (i.e., impermeable asphalt concrete, concrete, or topsoil surface) and institutional controls (PAP-00328607). Note: The remediation results were not available for review for this allocation.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation

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Facility Data Report

REVERE SMELTING AND REFINING

Facility Name, Address and Size: Revere Smelting and Refining Corporation (Revere), 387 Avenue P, Newark, New Jersey (PAS-00051953). The site is four acres (PAP-00728419). Fourteen employees have been identified by Revere (PAP-00728524; PAS-00051953). The Declaration made by Mr. John A. De Paul stated the facility operated seven days per week (PAP-00728417).

1. **Business Type:** Secondary lead smelter and refinery (PAS-00051943).

2. **Time Period of Ownership/Operations**

   Operator: ~1964-December 1972 (PAS-00008100; PAS-00013085; PAS-0051943)
   Owner: ~1957- 1970 (PAS-00013085; PAS-00051950; PAP-00125848)

   Based on available references, site operations were conducted by two separate entities using variations of the name Revere Smelting and Refining between 1964 and 1972. The initial Revere Smelting & Refining Corp. was a New Jersey incorporated business that operated at the site from at least 1964, but potentially as early as 1953. Available references (e.g., the purchase agreement) state that Revere Holding Corp. owned the site and potentially some of the assets of the initial Revere Smelting & Refining Corp. until 1970, and the Housing Authority of the City of Newark owned the site from 1970 through 1972 when Revere-DE ceased operations. In 1970, a different Revere Smelting & Refining Corp. incorporated in Delaware acquired certain assets in Newark from two New Jersey Corporations, Revere Smelting & Refining Corp. and Revere Holding Corp., as well as four individual shareholders. (For simplicity, the original company will be referred to as Revere-NJ and the allocation party as Revere-DE, although Revere-DE has undergone subsequent corporate changes). Revere-DE's response to an EPA information request, dated April 3, 2003, and underlying asset purchase agreement stated that the corporations operated sequentially at the same Avenue P address, but Revere-DE was not the same company as the previous owners or parent companies of the New Jersey incorporated Revere Smelting & Refining Corp (PAP-00728413, PAS-00008100, PAS-00013085, PAS-00051957-61, PAS-00051953, PAP-00126184, 94-95, PAP-00126209-11). A Federal Trade Commission Opinion in 1976 supports this corporate history (PAP-00728423).

   As documented in the purchase agreement dated April 14, 1970, the Delaware incorporated Revere Smelting & Refining Corp. purchased fixed assets, including but not limited to all of the machinery and equipment, office furniture, fences, smoke stack, raw materials and finished goods, customer contracts, governmental licenses and permits, all trademarks, trade names, patents, applications for patents, and the use of the name "Revere Smelting & Refining Corp." at the 387 Avenue P address (PAP-00126184, 94-95).

The Delaware incorporated Revere Smelting & Refining Corp. changed its name to Revere Smelting and Refining Corporation of New Jersey in December 1971 (PAS-00051965-68). It then changed its name to Revere Smelting and Refining Corporation in November 1992 (PAS-00051975-76).

According to the response to an EPA Request for Information, dated April 3, 2003, Revere Smelting and Refining Corporation is a wholly owned subsidiary of RSR Corporation (RSR). For the purposes of this report, the term Revere-DE will be used to denote the site operator from April 1970 to December 31, 1972. Revere-DE ceased operations at the site in December 1972 (PAS-00051942-43), when operations were relocated to New York State (PAS-00051946; PAP-00728414).

The 2003 response to an EPA information request stated that The Housing Authority of the City of Newark owned the property in the early 1970s (PAS-00051950), and this statement is supported by the April 17, 1972 letter between Revere and the Housing Authority of the City of Newark identifying Revere-DE as a tenant on one of their parcels (Block 5020, Parcel 21) (PAP-00727633; PAP-00125807). Based on the Preliminary Assessment for the Avenue P site, the Newark Redevelopment and Housing Authority (NRHA) owned the property (Block 5020, Parcel 21) in 1988 (PAP-00727867). The *Remedial Investigation Report, Avenue P Landfill Site, 357-405 Avenue P*, dated January 2008, by GeoTrans, Inc., a Tetra Tech Company, (RIR) states that Mr. Anthony Cerone obtained title to the property in 2005 (PAP-00125848).

3. Operational History/COC Use and Presence at the Facility

As detailed in their April 3, 2003, response to an EPA information request, Revere-DE reclaimed scrapped lead-acid automobile batteries and recycled them into lead and lead alloys. Battery manufacturers shipped their waste/used automobile batteries, industrial batteries, battery plates, and scrap lead to Revere, and Revere reclaimed the metal for return to the battery manufacturers (PAS-00051944).

Revere processed and refined metal values from the batteries using one battery wrecker to separate metal values from the battery cases and the battery acid; a blast furnace which smelted metal values into bullion and slag; and a refinery which produced specification lead alloys. Lead dust, lead oxide, and other lead compounds were sold to companies in Japan. Battery acid was neutralized and discharged to a small storm sewer during at least 1970-1972. Revere-DE also stated that rainwater, surface waters, and treated sulfuric acid were discharged into the creek adjacent to the facility (PAS-00051944-47).

The April 3, 2003 response to an EPA information request also stated that battery acid was stored onsite in tanks and drums and an unlined surface impoundment. Drums were stored on a paved area (PAS-00051944-46). Lead dust was stored onsite in tanks and drums and then in a surface impoundment (PAS-00051945). It was noted in the 2018 Declaration made by Mr. John A. De Paul, the co-plant manager at the Avenue P location from 1970 to 1972, that lead dust was not stored in a surface impoundment, but was stored in drums until it was recycled. Lead dross (skimming from refining kettles)

was also stored in drums onsite and recycled (PAP-00728416). The location of the drum storage area was not available in the file material.

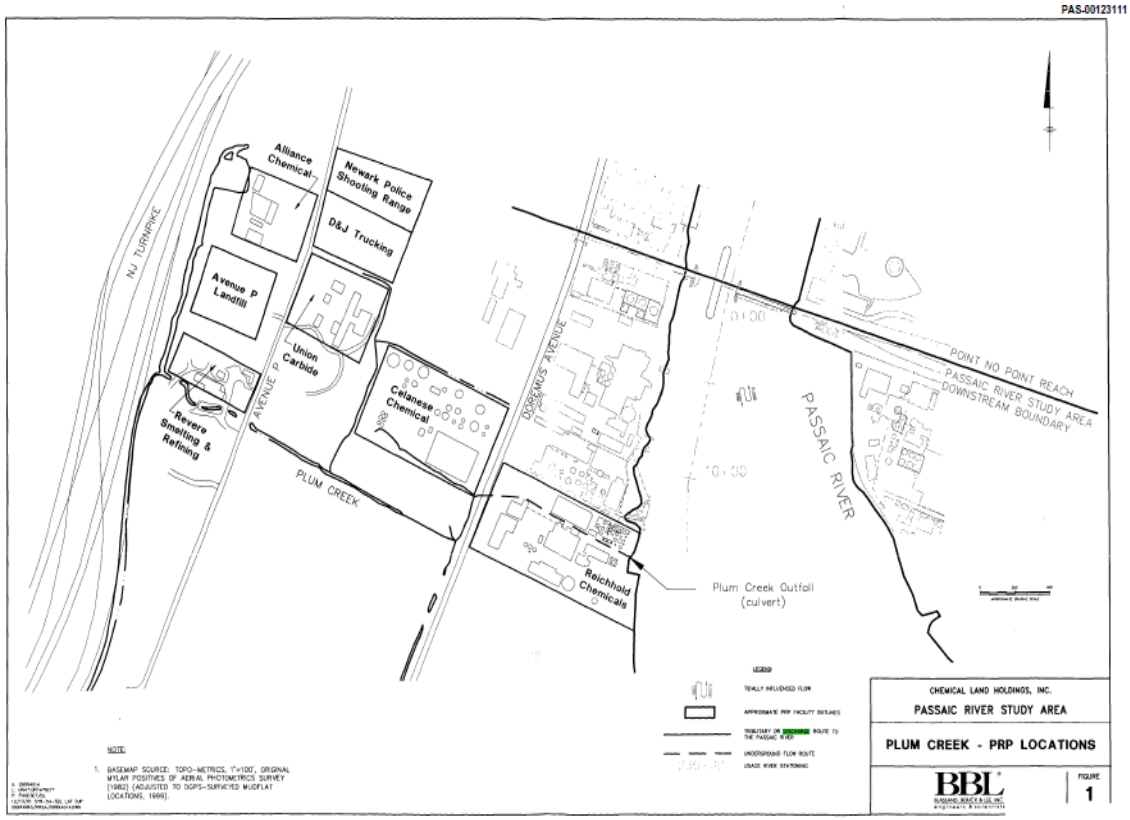
According to an Inspection Report from December 2, 1971, lead was reclaimed from batteries in a furnace where the lead scraps were melted down and purified. Residual solids from the acid waste and scrubber overflow were also introduced into the furnace. When the material in the furnace was primarily battery plates, iron borings were added to remove residual sulfuric acid and prevent sulfur dioxide emissions through the conversion of sulfuric acid to FeS, which was disposed in the slag from the furnace (PAP-00125798).

In their 2003 response to an EPA information request, Revere-DE stated that it manufactured an estimated 24 thousand tons of finished lead annually, 18 thousand tons of which came from scrap metallic lead, 3 thousand tons from whole batteries, and 3 thousand tons from battery plates (PAS-00051948).

As described in the 2018 Declaration made by former Revere plant manager Mr. De Paul, the smelting and refining processes were stated to be different than what was previously utilized by the prior operator at the facility and other smelting and refining operations during this time period (PAP-00728415). In addition, Mr. De Paul stated that lead smelting and refining operations were performed by other companies at the site as far back as 1941 (PAP-00728414).

A Pollution Report by the Passaic Valley Sewerage Commissioners (PVSC) stated Revere-NJ (the NJ incorporated entity) was polluting Plum Creek, a tributary of the Passaic River, with acid from its battery reclamation processes in 1969. The report stated that the batteries were broken up at an outdoor disassembly platform, where acid flowed across the ground into yard drains that reach Plum Creek. Lime pebbles were used on the ground to neutralize the acid, but the report states that this was completely inadequate (PAP-00126183). The RIR from 2008 noted that the current configuration of Plum Creek was a “man made drainage ditch that was designed to control and drain the surface runoff from the adjacent New Jersey Turnpike” (PAP-00125899).

As shown in the figure below from a Plum Creek PRP Investigation report, dated December 18, 2001, a drainage ditch/creek runs along the western and southern edges of the location at which Revere-DE operated from April 1970 to December 31, 1972. This water feature is identified in the report as Plum Creek, which discharged to the Passaic River (PAS-00123102).



(PAS-00123111)

NJDEP officials observed in an Elimination Report that Revere-NJ had ceased discharging to Plum Creek by March 1970, which is just prior to acquisition of the assets by Revere-DE (PAP-00126138-39). A 1971 Inspection Report by the New Jersey Department of Environmental Protection (NJDEP), noted that Revere-DE had updated the pollution control equipment by installing a new air pollution control apparatus and a neutralization tank immediately after purchasing the plant in April 1970 (PAP-00125798). A February 14, 1972 letter from NJDEP to Revere-DE formally concluded that the operation was in compliance. (PAP-00125802).

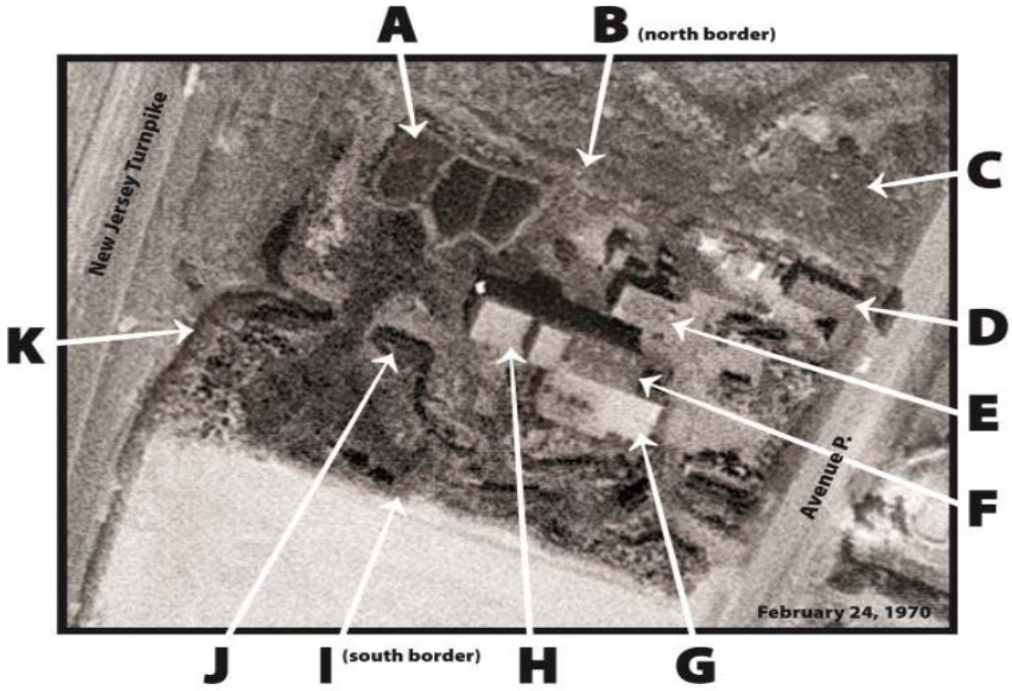
As discussed in the 1990 Avenue P Landfill Investigative Summary, aerial photographs taken on March 31, 1971 depict three lagoons at the rear of the facility. The Declaration of Mr. De Paul stated that the three impoundment lagoons were present on the property when Revere-DE's operations began in 1970 (PAP-00728419 and see 1970 aerial photograph used to document the site layout below). Subsequent photographs taken in 1974 (two years after Revere-DE operated at the location) showed a road leading onto the Avenue P landfill from the Revere Plant (PAS-00013085).

The following site layout was provided in the Declaration by Mr. De Paul and the Preliminary Expert Report titled *Potential Contribution of Selected Chemicals from the Revere Smelting & Refining Operation to the Lower Passaic River,* dated April 16, 2019, by Dr. Katherine von Stackelberg of NEK Associates LTD:

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A: Three aboveground storage lagoons (not subject to flooding and never overflowed)
B: Northern border of the land leased by Revere
C: Land not owned or used in the Revere operation. Area where open dumping was observed during the Revere operations
D: Office building
E: Maintenance building and limited battery crushing
F: Open-sided building with two kettles and limestone used for neutralizing battery acid outside
G: Smaller blast furnace and two kettles
H: Larger blast furnace and two kettles. Small white speck is the stack just adjacent to the impoundments or lagoons. The scrubber was later installed nearby.
I: Southern border of the leased property
J: Drainage ditch
K: Same drainage ditch after it flows under short bridge and flows south
(PAP-00728424; PAP-00728477)

According to the Declaration of Mr. DePaul, the report by Dr. Katherine von Stackelberg, and the 2008 RIR, there were illegal hazardous waste disposal operations in the vicinity of the Revere-DE operations, particularly to the north of the Revere-DE operations (PAP-00728421; PAP-00125846-53). Hazardous waste disposal in this vicinity occurred perhaps as early as 1926 in the Avenue P Landfill areas and evidence of landfilling activities is documented in aerial photographs from the 1940s (PAP-00125850-52, 97-98). The Avenue P Site History Analysis, dated March 17, 1986, reviewed the available records including aerial photographs and documented the illegal paint disposal activities. The Analysis stated a dump or landfill appeared to be operating at the Avenue P site in 1970 and 1972 aerial photographs (PAP-00008600-15).

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- DDx (detected)
- Mercury (detected)
- Copper (stored, detected)
- Lead (used, stored, detected)

PCBs

PCBs were detected in site media during the 2008 RIR. Soil sampling results stated PCBs were associated with the landfill material at the site (PAP-00125886; see discussion for Historic Fill below).

PAHs

PAHs were detected in site media during the 2008 RIR. Soil sampling results stated PAHs were associated with the landfill material at the site (PAP-00125885-86; see discussion for Historic Fill below).

DDx

According to the New Jersey Turnpike Widening Project: Interchange 11 to Route 14: Phase I Remedial Investigations Milepost [illegible] to Passaic River, by the New Jersey Turnpike Authority, dated May 1989 (Turnpike Phase I RI), DDE was detected in three of16 samples taken in September, 1988, from borings in sites 78/79. Sample depths and locations were not included in the sample results, and report text was not provided. Concentrations ranged from 160 J (estimated) to 620 µg/kg. DDD was detected in three of 16 samples with concentrations ranging from 61 J to 1200 µg/kg, and DDT was detected in two of 16 samples with concentrations ranging from 1500 to 6800 µg/kg (PAP-00728573-76).[1]

Metals – Mercury, Copper and Lead

In the April 3, 2003 response to an EPA information request, Revere stated that acids, arsenic, cadmium, copper, and lead were present at the site (PAS-00051943-4). The Declaration made by the Revere-DE former plant manager Mr. De Paul states that the smelted product was lead bullion, which was transported off site by truck, and then occasionally by train, to various locations as specified in the contractual arrangements. According to Mr. De Paul, copper was an impurity in the lead values that were smelted and refined, and would have been present at trace levels from copper battery wiring that stayed with batteries sent for recycling. The amount of copper was not commercially viable to recycle for sale. Any copper in the sludge, lead dust, or other solids was treated the same way as lead and recycled in the smelter furnace or sent offsite.

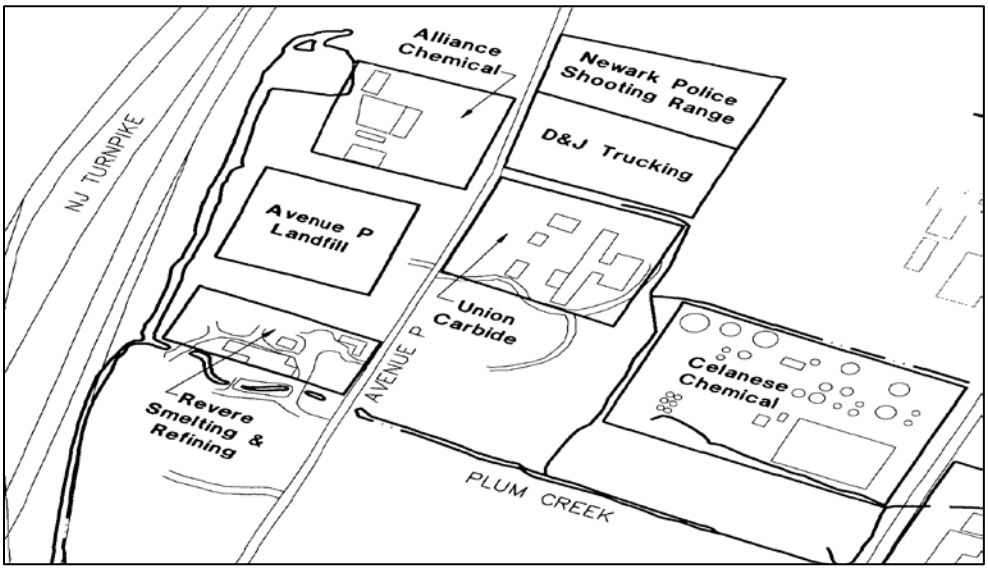
[1] A table of sample results from the *New Jersey Turnpike Widening Project: Interchange 11 to Route 14: Phase I Remedial Investigations Milepost [illegible] to Passaic River*, by the New Jersey Turnpike Authority, dated May 1989, was received as part of a submission of documents on May 14, 2020. This Report was revised to include detections of DDx and metals. The additional documents did not change Revere's previous certification.

Mercury was not part of the lead-acid battery or lead scrap feedstock or recycling process (PAP-00728416).

Based on the available file material, no soil sampling was performed during the period of the Revere-NJ or Revere-DE's operations. According to the Turnpike Phase I RI, mercury, copper, and lead were detected in each of 16 samples taken in September, 1988, from borings in sites 78/79. Sample depths and locations were not included in the sample results, and report text was not provided. Mercury concentrations ranged from 0.2 to 3.4 mg/kg, copper concentrations ranged from 444 to 3940 mg/kg, and lead concentrations ranged from 911 to 182,000 mg/kg (PAP-00728573-76).

The 1990 Avenue P Landfill Investigative Summary discussed exploratory excavations made on the southern portion of the site that noted coke waste extending from the surface to a depth of 13 feet. In addition, the summary states that concentrations of lead and antimony have been detected in soil samples obtained from the Avenue P site. The term "Avenue P site" refers to the eight acre Avenue P Landfill and adjacent properties that were used as an illegal dump. The Investigative Summary noted that lead and antimony contamination was found at the site, and both of these materials were reclaimed by the facility (PAS-00013063, 85-86).

The Plum Creek PRP Investigation, dated December 18, 2001, discussed the Revere location as south of the Avenue P landfill and abutting Plum Creek. The relative locations of Revere and nearby Avenue P companies are shown in the figure below from this report. The report states that Revere's historical operations used lead, copper, and zinc, which were also found at elevated concentrations in the Plum Creek and Passaic River sediments (concentrations in Plum Creek sediment of 1,550 ppm for lead and 6.6 ppm for copper) (PAS-00123109, 24). It is not clear when the sediment samples were collected relative to the operations of Revere-DE.



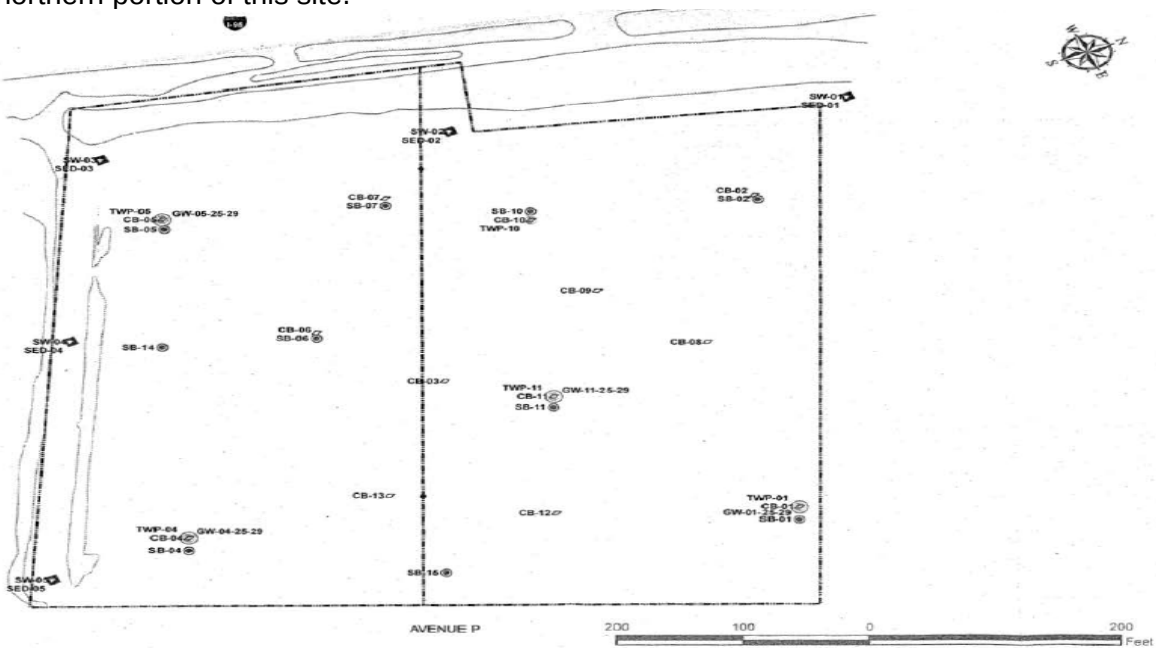
Locations of companies (PAS-00123111)

A NJDEP Inspection Report from 1971 included results from a water sample collected from coolant for the jacket of the furnace. This overflow from furnace cooling was intermittently discharged to the creek. The results stated lead was detected at 0.59 milligrams/liter (mg/L) (PAP-00125798-800).

Metals at Avenue P Landfill

A 1986 Avenue P Work Plan provides data for soil samples collected at the Avenue P Landfill site; however, the locations and depths of the samples were not provided. The maximum detections of lead and mercury in the Avenue P site soil were 63,007 milligrams/kilogram (mg/kg) and 137.5 mg/kg, respectively. A sample of "creek muck" was also collected and detected lead at 0.24 ppm and mercury at 3.8 ppm (PAP-00727906, 914).

The 2008 RIR states the Revere facility was located at the Avenue P landfill site, which consists of addresses 347-405 Avenue P (PAP-00125850). Based on the figure from this report below, the southern part of the site investigated by this report was the Revere location along the surface water features. It is assumed that the landfill occupied the northern portion of this site.



(PAP-00125928)

Several test pits were excavated on November 13, 2007, and the RIR states that the former building foundation found at TP-2 (located in the central portion of the southern rectangle above) could "possibly" be the Atlantic Metal and Refining Inc./Revere building (PAP-00125880). The RIR states that the landfill was used from the 1920s until the 1970s, and it was believed that the surrounding industrial companies and manufacturing plants used the landfill and adjacent areas beyond the property border of the site as an illegal dump to dispose of hazardous materials, manufacturing by-products, solid waste/junk and process wastes (PAP-00125850).

Soil samples were collected from one soil boring installed in the southern portion of the site (SB-05). A soil sample was collected from the landfill material (12.5-13 feet below ground surface [ft bgs]) and from just below the confining layer (24.5-25 ft bgs). The concentration of lead detected in the landfill sample was 6,470 mg/kg, while the deeper sample was 8.1 mg/kg. The concentration of copper was 2,220 mg/kg in the landfill sample and 54.5 mg/kg in the deeper sample. The concentration of mercury was 4.5 mg/kg and not detected in the deeper sample (PAP-00125884, 908).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[2]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[3] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[4] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[5]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00125905, 07-08, PAP-00728573-76).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	182,000 mg/kg
Copper	3,940 mg/kg
Mercury	4.5 mg/kg
Benzo(a)anthracene	0.750 mg/kg
Benzo(a)pyrene	0.660 mg/kg
Benzo(b)fluoranthene	0.544 mg/kg
Benzo(k)fluoranthene	0.738 mg/kg

[2] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 (NJDEP map identifying locations of recognized historic fill).

[3] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[4] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[5] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Dibenzo(a,h)anthracene	0.320 mg/kg
Indeno(1,2,3-cd)pyrene	0.152 mg/kg

The 2008 RIR stated the Avenue P Landfill Site included land upon which the Revere-DE operated from April 1970 to December 31, 1972 as well as additional adjacent properties for a total of eight acres. The Avenue P site was created by filling in salt marshes in the early 1900s (PAP-00125850). The RIR reported soil samples collected from the fill material and from soil just beneath the landfill confining layer. It was concluded that the marsh sequence present below the landfill material acts as a natural lithologic barrier to prevent migration of the heavily impacted landfill material (PAP-00125884). Concentrations of the fill material greatly exceeded the concentrations from the soil below as shown in the following table for the two samples collected at SB-05, located at the former Revere facility.

In addition, the RIR noted that the highest concentrations of metals were detected in samples collected at the base of the landfill, indicating that the ash and glass layer present at the landfill/marsh interface is a likely source. This debris was likely deposited on site at a time when the area was predominantly marshland (PAP-00125886). The RIR states that "[a]t the bottom of the landfill layer, at a depth ranging from 12.5' to 19.0' b.g. [below ground], is a layer of ash and glass assumed to be deposited at the site in the early to mid 1900s" (PAP-00125856).

Contamination was also found in a perched groundwater table at the site. The perched groundwater was in direct contact with the fill material and in communication with the surface water in a drainage ditch at the site (PAP-00125890, 99).

Maximum Detection in Perched Groundwater		
COC	**µg/L**	**NJDEP GWQS**
Lead	449,000	5
Copper	31,500	1,300
Mercury	7.1	2
Benzo(a)anthracene	0.55 J	0.1
Benzo(b)fluoranthene	3.5	0.2
Naphthalene	546	300
Aroclor-1254	5.9	0.5
Aroclor-1260	2.4	0.5

J- Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value (PAP-00125911-3)

The RIR noted that rainwater and leachate from the landfill collected in the drainage ditch that ran along the edges of the property. As shown in the figure in Section 3 (Operational History/COC Use and Presence at the Facility), this drainage ditch is part of Plum Creek, which discharges to the Passaic River. According to the 2008 RIR, the connection of the drainage ditch to adjacent surface water bodies and the Passaic

River/Newark Bay is assumed, but has not been confirmed because the drain pipe traveling beneath Avenue P appeared to have been entirely clogged and/or broken over time (PAP-00125860-61). No information for when it became clogged was provided. The Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor, dated November 1969, identified an open ditch from Revere-NJ as discharging to the Passaic River in 1969 (PAS-00058698). Surface water and sediment samples were collected from four locations to the south and west of the Revere site (see figure above; PAP-00125928) and also had elevated concentrations of COCs (PAP-00125890-91).

Surface Water and Sediment Concentrations		
COC	**Maximum detection in surface water (µg/L)**	**Maximum detection in sediment (mg/kg)**
Lead	383	12400
Copper	93.6	1580
Mercury	0.27	6.6
Benzo(a)anthracene	1.3 J	1.92
Benzo(a)pyrene	1.5 J	2.04
Benzo(b)fluoranthene	2.0 J	2.28
Benzo(k)fluoranthene	1.2 J	2.49
Dibenz(a,h)anthracene	ND	0.315 J
Indeno(1,2,3-cd)pyrene	1.4 J	1.10
Aroclor-1248	ND	1.44
Aroclor-1254	ND	6.61
Aroclor-1260	ND	9.36

ND- Compound was not detected in the surface water samples.
J- Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value (PAP-00125915-21).

5. COC Pathways

Sanitary and Storm Sewer

According to the April 3, 2003 response to an EPA information request, there were storm sewers present at the site that received discharges (PAS-00051946, 47). However, the Declaration by Mr. De Paul stated the storm sewer was likely the drainage ditch known as Plum Creek (PAP-00728418).

A PVSC Pollution report for 1969, dated March 30, 1970, stated the site had not connected to the Newark sewer system as it was not yet available in the area (PAP-00126183).

Lagoons

According to a 1971 NJDEP Inspection Report, Revere obtained a stainless steel tank in 1970. The tank was used to collect and neutralize the acid with sodium hydroxide prior

to discharging it into a lagoon. The treated waste was allowed to dry in the lagoon. Overflow from the air pollution scrubbers was also discharged to the lagoon, and any solids remaining were returned to the plant for reprocessing (PAP-00125798). The April 2003 response to an EPA information request stated that the lagoon was unlined (PAS-00051947).

However, Mr. De Paul stated that although the 1971 Inspection Report by NJDEP states the neutralized acid was discharged to the lagoons, he remembers this material as being discharged to the drainage ditch instead (PAP-00728417).

As discussed in the 1990 *Avenue P Landfill Investigative Summary*, aerial photographs taken on March 31, 1971, depict three lagoons at the rear of the facility (PAS-00013085). In addition, the 2018 Declaration by Mr. De Paul stated that the three surface impoundments were approximately 13% of the area leased (PAP-00728419). The Declaration describes the lagoons as unlined and aboveground, with berms approximately six feet above the surrounding land surface to confine and store the contents for recycling. The lagoons were cleaned out all the way down to the soil level at least once in the April 1970 to the December 1972 time period. The material pumped to the lagoons was from the Venturi high energy air pollution controls ("scrubbers"), which collected lead dust, lead oxide, metallic lead, sulfides, sulfates, and hydrocarbons. The solids from the surface impoundments were later recovered and recycled or sold (PAP-00728415-16).

Regarding the material left in the lagoons, the 2018 Declaration by Mr. De Paul stated, “Since lead and other metals had economic value, I directed that the material be recycled or removed from the impoundments prior to the end of use of the site. To the best of my knowledge, Revere recycled or sold all remaining material in the three impoundments before ending operations” (PAP-00728419).

Direct Release

Battery Acid Process

A 1969 PVSC Pollution Report stated that Revere-NJ (the previous NJ incorporated entity), was polluting Plum Creek, a tributary of the Passaic River, with acid from battery reclamation processes. The report stated that the batteries were broken up at an outdoor disassembly platform, where acid flowed across the ground into yard drains that reached Plum Creek. Lime pebbles were used on the ground to neutralize the acid, but the report states that this approach was completely inadequate (PAP-00126183).

As stated by a 1971 NJDEP Inspection Report, Revere-DE updated the battery acid treatment processes when it purchased the plant in 1970 (PAP-00125798). According to the 2018 Declaration by Mr. De Paul, the sulfuric acid from those batteries was neutralized with caustic soda in the tanks and then allowed to discharge from the tanks to flow over a bed of lime which provided further treatment. The neutralized battery acid was passed through settling tanks that served to remove the solids through gravity (PAP-00728416-17; PAP-00728478-82).

Revere stated in its 2003 response to an EPA information request that rainwater, surface waters, and treated sulfuric acid were discharged into the creek adjacent to the facility (PAS-00051947-48). However, the 2018 Declaration by Mr. De Paul stated that the liquid output from the neutralization process (typically called "neutralent") was discharged to the drainage ditch that flowed past the property (now known as Plum Creek). The pipe that discharged the neutralent was approximately 18-24 inches in diameter. Mr. De Paul stated that he believed little to no lead migrated with the neutralent, since the treatment process was designed to recapture all lead in the settling tanks prior to discharging the liquid neutralent. The solids from the settling tanks were fed directly into the furnace (PAP-00728417).

Releases from Furnace Coolant Overflow

The NJDEP Inspection Report from 1971 stated that overflow from furnace cooling was also intermittently discharged to the creek. The 1971 Report included results from a water sample collected from coolant for the jacket of the furnace. The results stated lead was detected at 0.59 mg/L (PAP-00125798-800).

According to the 2018 Declaration by Mr. De Paul, the cooling water did not contact the lead or furnace and was recycled (PAP-00728416-18). Occasional overflow of cooling water was discharged to the drainage ditch (PAP-00728418). Each of these potential sources should contain little or no lead, copper, or PAHs (PAP-00728415-16).

Flooding

Revere also stated in its 2003 response to an EPA information request that spills and leaks occurred, such as a burning of a stack, which caused process waters to be discharged on the ground (PAS-00051948). The response also stated that there were many incidents of flooding in the 1970-1972 time period (PAS-00051949). The Revere operation was located in an area where flooding was not likely except once every 500 years, according to government estimates (PAP-00728471). Mr. De Paul stated in his Declaration that he never observed the Passaic River overflowing its banks directly onto Revere's property during the period from April 14, 1970 to December 31, 1972 (PAP-00728420). During flooding, water flowed from the Passaic River up the drainage ditch, but this water never entered the three impoundments (PAP-00728420). Water in the drainage ditch occasionally flowed onto the site, but he never observed this water overflow the berms surrounding the three impoundment lagoons (PAP-00728420).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

Inspections of discharge to Plum Creek were performed and the continued pollution was documented in Stream Pollution Reports from January and February 1970 (prior to Revere-DE's operations) (PAP-00125840, PAP-00126085, PAP-00126178, and PAP-00126136). The final report, dated March 6, 1970, noted that the company had installed a dilution tank to collect and neutralize the acid prior to discharging it onto the ground, where it did not flow into Plum Creek (PAP-00126138).

An inspection for compliance with an Administrative Order was performed December 2, 1971. The inspection report stated that an Administrative Order was issued to Revere-NJ on August 15, 1969, to cease discharging by November 10, 1969. The inspection found that the sulfuric acid was no longer being discharged to Plum Creek, and instead a stainless steel tank was used to collect the acid. The acid was then neutralized with sodium hydroxide flakes and discharged to a lagoon where it was allowed to dry. Overflow from the air pollution scrubbers was also discharged to the lagoon, and any solids remaining were returned to the plant for reprocessing (PAP-00125798).

A letter dated February 14, 1972, regarding the Administrative Order to Abate Water Pollution from August 15, 1969, documented that the company (Revere-DE by February 1972) had corrected all of the deficiencies associated with the Administrative Order (PAS-00008123).

Violations

A 1990 Avenue P Landfill Investigative Summary states the site was found in violation of the Newark Air Pollution Control Ordinance on five occasions from 1965 through 1968 (PAP-00013085).

According to a PVSC Stream Contamination Report dated March 22, 1960, a violation and elimination was noted in 1966 for the location. The violation stated that acid waste was discharging into Plum Creek, but was eliminated November 4, 1966, when it was noted that steel drums were being used to collect the waste. The acid waste was then neutralized with limestone. Any spills were neutralized by lime spread on the ground (PAS-00026651).

A March 31, 1970, Pollution Report by the PVSC stated the site was polluting Plum Creek, a tributary of the Passaic River, with acid from their battery reclamation processes in 1969. The report stated that the batteries were broken-up at an outdoor disassembly platform, where acid flowed across the ground into yard drains that reach Plum Creek. Lime pebbles were used on the ground to neutralize the acid, but the report states that this was completely inadequate (PAP-00126183). No violations were noted in the file material after March 1970.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- The NJDEP issued an Administrative Consent Order, dated April 17, 1985, to the NRHA for remedial and investigatory measures to be taken at the Avenue P site, described as Block 5024, Lots 21, 22, and 23 in the City of Newark (PAP-00727863-67).
- A letter to NRHA dated October 24, 1985, from their contractor Cavanaugh Group regarding their removal of drums with PCB-contaminated product from the creek (PAP-00728629)
- A letter to NJDEP dated May 21, 1986 from the NRHA described the remedial activities taken at the Avenue P site (PAP-00728631-34).
- Avenue P Work Plan, dated October 1986, by the Cavanaugh Group (PAP-00727898)
- Preliminary Assessment for the Avenue P Site, 309-465 Avenue P, dated January 11, 1988 (PAP-00727867).
- New Jersey Turnpike Widening Project: Interchange 11 to Route 14: Phase I Remedial Investigations Milepost [illegible] to Passaic River, by the New Jersey Turnpike Authority, dated May 1989 (PAP-00728568)
- The 1990 Avenue P Landfill Investigative Summary discusses exploratory excavations made on the southern portion of the site, but it is unclear where these excavations were performed (PAS-00013085).
- A Passaic River Study Area Potentially Responsible Parties summary for the Newark Housing and Redevelopment Authority, dated September 1993 (PAS-00076956).
- A Remedial Investigation of the Avenue P Landfill Site is documented in the RIR, dated January 2008 (PAP-00125842).

Sediment

A 1986 Avenue P Work Plan provides data for a sample of “creek muck,” although it is unclear from where in Plum Creek this sample was collected. The results detected lead at 0.24 ppm and mercury at 3.8 ppm (PAP-00727906, 14).

The 2008 RIR collected four sediment samples from the drainage ditch located along the southern and western border of the Revere site; one additional sediment sample was collected from the ditch north of the Revere site. Concentrations of the four sediment samples ranged from 234 to 1,580 mg/kg for copper, 681 to 12,400 mg/kg for lead, and 1.2 to 6.6 mg/kg for mercury. PAH concentrations ranged up to 3.96 mg/kg (pyrene) and

total PCBs were detected from 1.27 to 15.97 mg/kg in sediment samples (PAP-00125874, 915-17, 925).

Soil

According to the Turnpike Phase I RI sample results Table 78/79, 16 samples were collected in September, 1988, from borings in sites 78/79. Sample depths and locations were not included in the sample results, and report text was not provided. DDE concentrations ranged from 160 J (estimated) to 620 µg/kg. DDD was detected in three of 16 samples with concentrations ranging from 61 J to 1200 µg/kg, and DDT was detected in two of 16 samples with concentrations ranging from 1500 to 6800 µg/kg. Mercury concentrations ranged from 0.2 to 3.4 mg/kg, copper concentrations ranged from 444 to 3940 mg/kg, and lead concentrations ranged from 911 to 182,000 mg/kg (PAP-00728573-76).

According to the 1990 Avenue P Landfill Investigative Summary, exploratory excavations noted coke waste extending from the surface to a depth of 13 feet. Coke was noted to be a byproduct of metal refining, such as lead. Concentrations of lead were detected in soil samples obtained from the Avenue P site (PAS-00013085).

As part of the 2008 RIR, 14 test pits and ten soil borings were installed. It was determined that landfill material was between 15 and 20 feet thick, with native marsh surface underlying the fill comprised of metal objects, concrete blocks, building debris, municipal waste, and ash and glass. Four soil samples were collected from the fill material and four samples were collected from the same borings just below the native material interface. Based on the elevated concentration of contaminants in the landfill material and lower concentrations in the native material, the RIR concluded that the boundary between the landfill and the native material has low permeability and minimizes the vertical migration of landfill constituents. The soil samples collected from the one soil boring installed in the southern portion of the site (SB-05) were collected at 12.5-13 ft bgs and from just below the confining layer at 24.5-25 ft bgs. The concentration of lead detected in the landfill sample was 6,470 mg/kg, while the deeper sample was 8.1 mg/kg. The concentration of copper was 2,220 mg/kg in the landfill sample and 54.5 mg/kg in the deeper sample. The concentration of mercury was 4.5 mg/kg and not detected in the deeper sample (PAP-00125872-873, 884, 898, 908).

Surface Water

The 2008 RIR collected four surface water samples from the drainage ditch located along the southern and western border of the Revere site; one additional surface water sample was collected from the ditch north of the Revere site. Concentrations ranged from not detected to 93.6 µg/L for copper, not detected to 383 µg/L for lead, and not detected to 0.27 µg/L for mercury. PAHs were detected up to 2.7 µg/L (pyrene) and PCBs were not detected in surface water samples (PAP-00125874, 919-21).

Remedial Activities

None of the remedial activities were demanded of or performed by Revere-DE. An Administrative Consent Order, dated April 17, 1985, between NJDEP and the NRHA initiated remediation at the Avenue P site, which included the former location of the Revere-DE plant (PAP-00727863-67). Remedial activities were performed, including dredging of the stream at the rear of the Revere-DE location of operations (Plum Creek) and removal of 3,000 gallons of waste water from the 1,800 drums found in the Creek, some of which contained PCB-contaminated product (PAP-00728629; PAP-00728631). According to the 1986 Avenue P Work Plan, soil was excavated and stockpiled in berms for removal (PAP-00727901). However, a letter from NRHA dated May 21, 1986, stated the funds for remediation had been depleted due to large amount of drums and other debris found at the site (PAP-00728632).

The 1988 Preliminary Assessment for the Avenue P site stated there were large quantities of hazardous wastes found at the site, but no subsurface explorations had been conducted to determine the nature or extent of subsurface contamination (PAP-00727868).

The 2008 RIR discussed the prior remediation performed at the site. Drums, cans, and other containers were found to be buried as discussed above, and when remedial activities were suspended in 1987, steel plate(s) were installed to contain leachate and prevent it from entering the adjacent surface water drainage ditch (PAP-00125851-52). The RIR stated a geophysical investigation was performed in 1999 and identified anomalies that could be buried metal or other large objects for investigation during the RI (PAP-00125851-52).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

ROMAN ASPHALT CORPORATION

Facility Name, Address and Size: Roman Asphalt Corporation (Roman Asphalt); 14 Ogden Street, Newark, New Jersey (PAS-00111327); approximately 1 acre (PAS-00111362); Roman Asphalt operated with between 20 and 65 employees, depending on the season, (PAS-00111350; PAS-00111362)

1. **Business Type:** Heavy highway and street construction contractor (PAS-00111327).

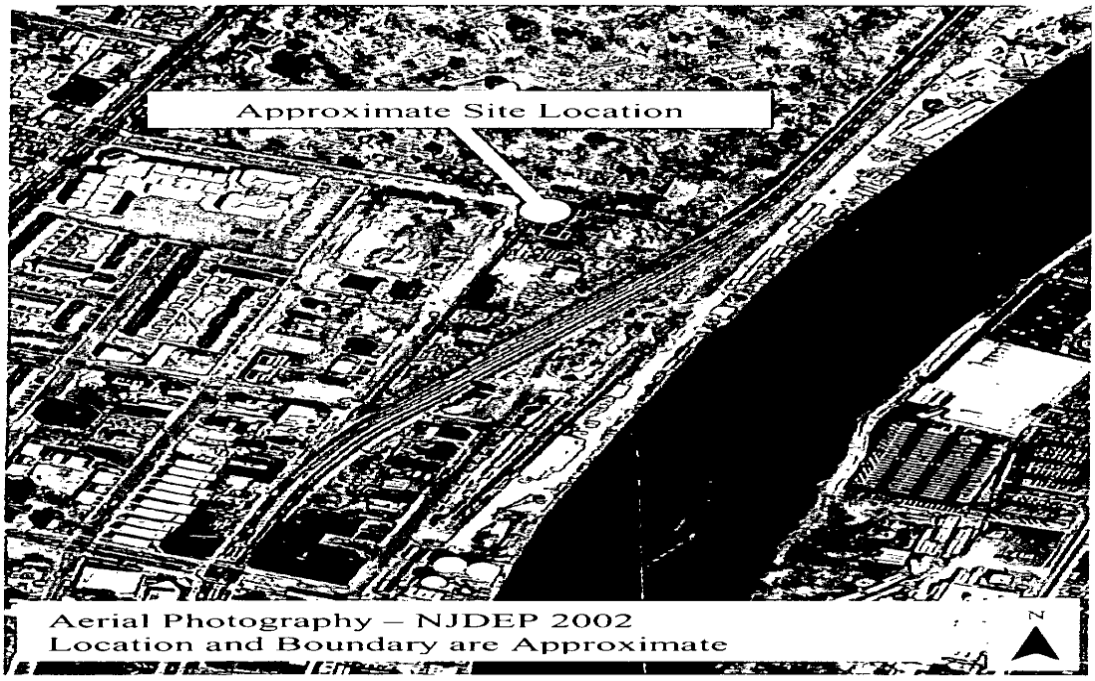
2. **Time Period of Ownership/Operations**

   Operator: 1964-At least 2006 (PAS-00111350; PAS-00111326)
   Owner: Leased from Michael Lamorgese (PAS-00111362)

   Roman Asphalt began operations in 1964; additional informational regarding ownership history was not available.

3. **Operational History/ COC Use and Presence at the Facility**

   Roman Asphalt began operations in 1964 (PAS-00111350). Operations include asphalt processing for highway and street construction (PAS-00052085). According to a Dun and Bradstreet report, the facility leased a 3,000 sq. ft. two-story brick building, yard space, which includes 1 acre of yard space with a 4,000 square-foot garage from its officer, Michael Lamorgese (PAS-00111362). Additional information on material handling was not available. A figure depicting the location of the facility is presented below (PAS-00111328).



4. Identified COCs

- PAHs (used)
- Metals (used)

PAHs and Metals

There is no information regarding sampling and raw material use in the available file material. However, releases of crankcase oil and waste oils have been reported as described below in Section 6 (PAS-00111340-41). PAHs and metals contamination may be associated with these materials.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

5. COC Pathways

Limited information on pathways through which contaminants could be discharged to the Passaic River was available. As discussed in Section 6 below, Roman Asphalt reportedly discharged waste oil to the storm sewer in 1986. According to the 2006 *PRP Data Extraction Forms and Evidence for Roman Asphalt*, an engineer with the City of Newark Sewers and Water Supply Division confirmed this storm sewer was connected to the Passaic River (PAS-00111330).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

6. Regulatory History/ Enforcement Action

Inspections and Violations

On July 25, 1983, the dumping of crankcase oils onto a slope at the facility by mechanics was reported in a Division of Waste Management *Investigation Report*. The area on which the dumping took place was 20 feet by 40 feet in size (PAS-00111334). According to a memo prepared by the New Jersey Department of Environmental Protection (NJDEP), the facility reported that the contaminated soil was removed on July 30, 1983 (PAS-00111335).

A Notice of Violation (NOV) was issued to Roman Asphalt on September 18, 1986, due to "hazardous substance discharge" which included reported "pooling oil in facility yard and running off to Rt. 21 drainage system and bank" (PAS-00111340). According to a memo filed by NJDEP on September 19, 1986, oil had been found pooling in a storm drain in the vicinity of State Highway 21. NJDEP representatives observed the following at the facility: "We found the southernmost end of the lot to be saturated with numerous oil pools. We found two points where the oil was running off Roman's lot, down the bank to the roadside and into the storm drain. The lot was full of heavy paving machinery. A few drums were also noted in and amongst the machinery. The source of the oil may have been leaking drums (damaged by heavy machinery)" (PAS-00111341). Another NOV was issued to Roman Asphalt on October 6, 1986, due to "discharge of hazardous substance." The NOV reported that "oil has run off property onto embankment of State Hwy 21 South" (PAS-00111343). On October 8, 1986, Roman Asphalt reported that they had excavated the contaminated soil and replaced it with "clean fill" (PAS-00111345). On December 17, 1986, NJDEP reported that oil stains were observed on the embankment, but no active runoff was observed and recommended that a NOV be issued to Roman Asphalt (PAS-00111346). No further information was available.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

There is no information regarding response actions except for the two above in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

ROYCE ASSOCIATES

Note: This Data Report has been written for Royce Chemical Company that operated on the site from 1929 to 1982. There is no documentation linking Royce Associates to Royce Chemical Company in the available file material.

Facility Name, Address and Size: Royce Chemical Company (Royce Chemical); 17 Carl Avenue, East Rutherford, New Jersey (PAS-00034489); site acreage not available; Available references did not provide information regarding the number of employees and work shifts at Royce Chemicals.

1. **Business Type:** Manufacturer of ingredients for the textile and rubber manufacturing industries (PAS-00008156).

2. **Time Period of Ownership/Operations**

   Operator: 1929-1982
   Owner: 1955-1964 (PAS-00008156; PAS-00008137)

   According to a March 26, 1982, *Hazardous Waste Inspection Report*, Virginia Chemical of Portsmouth, VA, bought all of Royce Chemical's major assets on October 1, 1981 and decided to close the manufacturing operations on February 12, 1982. Royce Chemical was noted to have changed its name to Royce Industries, Inc. and to have been operating another plant in Newark, NJ (PAS-00008156). A 1987 letter from the former Secretary of Royce Chemical states that the company discontinued business during October 1981, liquidated and was dissolved (PAS-00102199).

   According to a letter prepared by legal counsel for Royce Associates, LP, dated December 8, 2005, Royce Chemical Company was liquidated after its assets were purchased by Virginia Chemical. Royce Associates, LP was a newly formed entity in 1982. According to the letter, Royce Associates, LP, is an entirely different and distinct entity from Royce Chemical Company and there is no surviving or continuing corporation related to Royce Chemical Company (PAS-00034489).

3. **Operational History/ COC Use and Presence at the Facility**

   Royce Chemical manufactured sodium hydrosulfite, zinc oxide, sodium sulfoxalate formaldehyde, and zinc sulfoxalate formaldehyde as ingredients for the textile and rubber manufacturing industries. All of these materials were made through mixing, filtering and drying processes. The raw materials used did not include any COCs (PAS-00008156). A large portion of the raw materials and products left on site were shipped to Royce Industries in Newark after the plant shut down (PAS-00008157).

   According to a *Preliminary Assessment Report*, a review of industrial directories dating back to 1931 indicates that Royce Chemical was also involved with the production of other products including: water softeners, textile gums, finishes, sulphonated oils, royox, desizing agents, water repellents and concentrated cleaners. It is unknown what other raw materials may have been used for these processes (PAS-00008137-38).

According to the 1982 *Inspection Report*, when Royce Chemical was operating, they recycled all of their waste by reusing it in their products (PAS-00008157). The *Inspection Report* notes that the operator at the time was Royce Chemical Company and the owner of the property was listed as Carlton Hill Construction Co. (PAS-00008156).

The site was completely razed by the end of 1983 (PAS-00008141).

4. Identified COCs

- PCBs (used, detected)
- PAHs (used, detected)

PCBs

The 1982 Inspection notes that the only chemical waste sent off site were eight 55-qallon drums of PCB waste. This material was contaminated soil generated by a leaking transformer in an approximate 3-inch cement diked area with three transformers and a drain that led to the Passaic Valley Sewer Commission (PVSC) treatment plant. Analysis of the contaminated soil indicated greater than 50 ppm PCBs (PAS-00008157; PAS-00008159).

PCBs were detected at two sampling locations at <0.016 and <0.018 ppm (PAS-00008149-50; PAS-00102253-4).

PAHs

During the 1982 inspection by NJDEP, four 55-gallon drums of compressor oil remained onsite in the bottom floor of Building No. 2 (PAS-00008158). Also noted during the inspection was a black oily sludge next to unused subsurface fuel oil tanks (approximately 20 feet by 10 feet) in the rear lot of the facility and an oil spill of approximately 20 feet by 15 feet under old horizontal railroad car tanks in the rear lot of the facility (PAS-00008159).

An inspection of the facility was conducted on April 23, 1982 by NJDEP personnel to determine the progress and status of the cleanup operation noted that all tanks had been emptied, including 12 underground gasoline tanks. Approximately 20 drums of waste oil were being shipped off site (PAS-00008140).

Spills of No. 6 heating oil reportedly caused soil contamination at the site. Waste disposal manifests indicate that soils and oily waste were removed from the Royce Chemical facility in May and August 1983 (PAS-00008141).

Oil was visibly present in the on-site pond during February 1984 sampling (PAS-00102226-8).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

However, prior to construction of residential units, at the site location, soil borings were conducted at the site for engineering purposes. Materials recovered from the borings indicate that the site is underlain with mixed fill of thickness ranging from 5 to 10 feet. The fill is a fine to medium grained reddish-brown soil which may contain pebbles, gravels, pieces of brick, metallic debris or wood splinters (PAS-00008149).

5. COC Pathways

The *Preliminary Site Assessment* states that aerial photographs from 1941 to 1961 showed a large pond at the rear of the property. This pond received non-contact cooling water, the overflow of which was received by a drainage ditch (also referred to in NJDEP reports as an "unnamed tributary") along the southern border of the property and "ultimately discharging to the Passaic River." (PAS-00008138-9).

A 1971 PVSC Annual Report notes that Royce Chemical was pumping industrial waste into a storm drain on Carlton Avenue. The material was reportedly diverted to a sanitary line when the Inspector informed them of the violation (PAS-00034516; PAS-00034633). According to a 1973 PVSC Annual Report, in January and February 1973 materials from Royce Chemical were discharged to the Carlton Hill storm drain, and ultimately to the Passaic River. The material was referred to as a polluting material and white substance,

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

but no further information regarding its contents was provided (PAS-00034660; PAS-00034762-3). Twice in 1974 wastes were again noted to be flowing to the storm drain from a ditch and pond at Royce Chemical. The first was referred to as a foam and samples were taken; however, no specific substances were tested for. The second was noted to be a brownish material. The company noted that they planned to block off the storm sewer to prevent future releases to the Passaic River (PAS-00034785; PAS-00034904-5).

However, an August 1979 *Stream Pollution Report* states that Royce Chemical was using the Carlton Hill storm ditch leading to the Passaic River for disposal of caustic material (PAS-00008134).

An October 1981 NPDES Permit Application Certification states that there was one discharge point consisting of overflow from a non-contact cooling water pond with an average daily flow of 100,000 gallons. The receiving stream was noted to be an unnamed tributary of the Passaic River (PAS-00102190).

During the 1982 inspection a series of troughs were noted throughout the process building that Mr. Royce stated emptied into the PVSC. In addition, some flow was noted going to the sewer (PAS-00008158).

Spills

Spills of No. 6 heating oil reportedly caused soil contamination at the site. Waste disposal manifests indicate that soils and oily waste were removed from the Royce Chemical facility in May and August 1983 (PAS-00008141).

6. Regulatory History/ Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

Under NJPDES Permit No. 0002682, issued July 31, 1976, Royce Chemical discharged non-contact cooling water via a drainage ditch along the southern border of the property from its onsite pond/lake and ultimately into the Passaic River. Zinc was the only metal being monitored (PAS-00102191-5).

The company also had PVSC (pretreatment) Permit No. 06401173. Industrial process wastes were discharged from Royce Chemical to the PVSC system. The effective dates of the permit were November 2, 1981 through November 2, 1986, although as stated above the facility ceased operations in 1982 (PAS-00102216). No monitoring for specific chemicals was required.

7. Response Actions

On February 29, 1984 a series of soil samples were collected by Dan Raviv Associates of West Orange, New Jersey and analyzed for volatile organic compounds, metals, pH and PCBs to determine if contamination was present in preparation for sale of the site. Results included lead and mercury as follows:

1984 Sampling Concentrations (mg/kg)						
Metal	**RC-1S**	**RC-1SA**	**RC-2S**	**RC-3S**	**RC-4S**	**RC-7S**
Lead	82.2	37.1	9.83	197.0	273.0	6.49
Mercury	0.17	0.12	<0.055	2.52	7.08	<0.056

PCBs were detected at two sampling locations at <0.016 and <0.018 ppm (PAS-00008149-50; PAS-00102253-4).

During demolition activities at the site, a spill of 350 gallons of diesel fuel flowing to a southeast pond on the site was observed. Remedial activity relating to this spill reportedly occurred during the three days following the spill, as well as in September 1984, during the construction of townhouses at the site (PAS-00008140). A vac truck was mobilized to the site which removed in excess of 1,000 gallons of oil and water from the lagoon. Sampling of the pond in March and August 1984 revealed elevated levels of benzene, toluene, ethylbenzene and zinc in pond sediments. As a result, decontamination of the pond area was conducted on August 16, 1984 (PAS-00008153).

No information regarding sampling in the onsite unnamed tributary or "drainage ditch" to the Passaic River was located in the available documents.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Safety-Kleen Envirosystems Company
Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

SAFETY-KLEEN ENVIROSYSTEMS COMPANY/MCKESSON CORP.

Facility Name, Address and Size: Vulcan Facility/Inland Facility/Newark Facility/McKesson Facility; 600 Doremus Avenue, Newark, New Jersey (also associated with 500, 504, 504-508, and 604 Doremus Avenue); Currently 8.5 acres; 40 employees in 1982 (PAP-00189214). The facility ran 24 hours per day, 7 days per week, three shifts per day, at least up until and through April 16, 1979 (PAP-00187327). At some point in time between that date and March 22, 1982, the facility operated 24 hours per day, but only 5 days per week (PAP-00189214).

1. **Business Type:** Solvent recovery (PAP-00186363-65).

2. **Time Period of Ownership/Operations**

   Operator: 1975-1982 [Safety-Kleen Envirosystems, as successor to McKesson Envirosystems Company (MEC), successor by merger to Inland Chemical Company, after Nucer (Safety-Kleen Systems, Inc.) purchased MEC from its parent company, McKesson Corporation, in 1987]
   Owner: 1974-1987 (Safety-Kleen Envirosystems, as successor to MEC)
   1987-present (McKesson Corporation, after title transfer from Inland/MEC)

   1974: Inland purchased certain assets of Vulcan, including a chlor-alkali plant and real property on May 1, 1974. *See the Legacy Vulcan Facility Data Report for additional information on Vulcan.* This included agreements that Vulcan would continue operation of their former chlor-alkali facilities, as well as their chloromethanes plant at the site, in part using chlorine and other raw materials supplied by Inland (PAP-00186853; PAP-00186886-93; PAP-00188783-89; PAP-00187163-75).

   1975: On or about May 1, 1975, Inland shut down operations of the chlor-alkali plant, and Vulcan terminated operation of the chloromethanes plant on or about May 15, 1975 (PAP-00186853). After these chemical manufacturing operations were terminated, Inland solely conducted solvent recovery operations (PAP-00188225; PAP-00188236-37; PAS-00011254).

   1981: Inland and MEC merged in 1981 (PAS-00091937) when McKesson Corporation acquired the facility through a stock purchase of Inland (PAP-00365505).

   1982: On October 10, 1982, an explosion and fire destroyed much of the facility. The New Jersey Department of Environmental Protection (NJDEP) closed the site two days later (PAS-00091937).

   1987: In March 1987, McKesson Corporation sold all of the issued and outstanding shares of common stock of MEC to Nucer, a former wholly owned subsidiary of Safety-Kleen Systems, Inc. Subsequent to March 31, 1987, Nucer and MEC merged into a new corporation named Safety-Kleen Envirosystems Company. Upon such merger, Safety-Kleen Envirosystems Company succeeded to the rights and obligations of Nucer and MEC under the sale agreement (PAP-00187236).

According to certified statements by the Vice President and Assistant General Counsel of Safety-Kleen Systems, Inc., neither Safety-Kleen Systems, Inc., nor Safety-Kleen Envirosystems Company ever owned or operated the Doremus Avenue site. He states that title to the property was transferred to McKesson Corporation at the same time as MEC became Safety-Kleen Envirosystems Company. In addition, he states that McKesson Corporation agreed to indemnify Safety-Kleen Envirosystems Company for any claims related to the Doremus Avenue site (PAP-00187236; PAS-00129878). A letter prepared by McKesson Corporation, dated March 20, 1987, also states that McKesson Corporation sold its wholly owned subsidiary, MEC, but retained the Doremus Avenue site (PAS-00010384).

References state that Safety-Kleen Systems Inc. never operated the facility and the site has been inactive and vacant (PAS-00091937; PAS-00011077; PAP-00187236).

1998: In 1998, Safety-Kleen Systems, Inc. was acquired by, and became a wholly owned subsidiary of Laidlaw Environmental Services, Inc. At or about the same time, Laidlaw Environmental Services, Inc. changed its name to Safety-Kleen Corp. and renamed its newly acquired subsidiary Safety-Kleen Systems, Inc. (PAP-00187236).

3. Operational History/COC Use and Presence at the Facility

According to an undated NJDEP report prepared for EPA, a summary of general operations is as follows: Inland operated at the site from May 1974 to October 1981 (PAP-00187256). Under contracts with Inland, Vulcan operated the chlor-alkali facilities and chloromethane facility from May 1974 to May 1975 (PAP-00186886-93; PAP-00188783-89; PAP-00187163-75). The first year of operation included chemical manufacturing (chloromethane and chlor-alkali) operations; these operations were terminated in May 1975 (PAP-00186853) and replaced by solvent recovery operations. McKesson acquired the site in 1981 and continued solvent recovery operations until an explosion occurred on October 10, 1982 and the facility was ordered closed by NJDEP on October 12, 1982 (PAP-00187256; PAS-00091937).

According to a letter prepared by EPA, dated November 24, 1976, as of the January 31, 1975 effective date of the NPDES permit, Inland produced chlorine, caustic soda, methylene dichloride, chloroform, and bleaching agents, as well as associated by-products (PAP-00186109; PAP-00362242). According to a letter prepared by Inland, dated June 27, 1975, lead was generated as a result of the chlor-alkali process (PAP-00188223). An Inland memorandum, dated December 7, 1973, explains how lead was generated in this process. According to the memorandum, the tops of the anodes in which the chlorine was manufactured were cast from concrete. When a cell top was rebuilt, graphite anodes were bolted to a bus bar assembly in the cell top. The junction between the graphite and the bus bar assembly was fixed by pouring molten lead into the cell top. The lead was painted with asphalt to protect the lead from exposure to chlorine (PAP-00362239).

Solvent recovery operations commenced by Inland included the recovery of dimethylaniline and phenoxyacetic acid from penicillin manufacturing waste, as noted in a memo prepared by EPA dated October 6, 1975, and an *Engineering Plan for Inland Chemical Corporations' Existing Chemical Resource Recovery Plants in Newark, New Jersey*, dated April 16, 1979 (1979 Engineering Plan). The associated file materials do not state that COCs were used, handled, or generated as part of these processes (PAP-00187067; PAP-00186359; PAP-00188276; PAP-00188297-99; PAP-00365752; PAP-00366823-29). According to a memo prepared by McKesson, dated June 20, 1985, the dimethylaniline and phenoxyacetic acid were vacuum distilled out leaving behind in the still residue only inorganic sulfates, chlorides and phosphates (sodium sulfate, chloride and phosphates). This mixture, along with a small amount of fresh water for ease of transfer and wash out, constituted the bulk of the water generated at the facility. The balance of generated water was derived from the crystallization step of phenoxyacetic acid, where, after being converted to free acid, the product was crystallized, centrifuged, and washed with sufficient clean fresh water to remove residual color and dissolved salts. That centrifuged wash water, combined with the vacuum distillation residue "salts" solution, constituted the water shipped from the facility offsite. The memo goes on to state that wastewater would have contained salts, trace levels of phenoxyacetic acid, and dimethylaniline methanol (PAP-00188213).

Facility operations included other types of solvent recovery and processing (PAP-00186363-65). According to a memo prepared by NJDEP, dated December 14, 1979, Inland recovered and purified the following liquid chemicals and returned them to industrial use: trichloroethane, methylene chloride, dimethylaniline, isopropanol, methyl phenoxyacetate, methanol, toluene, aliphatic naphtha, acetone, butanol, heptane, perchlorethylene, trichloroethylene, siloxane, methyl ethyl ketone, xylene (PAP-00187208).

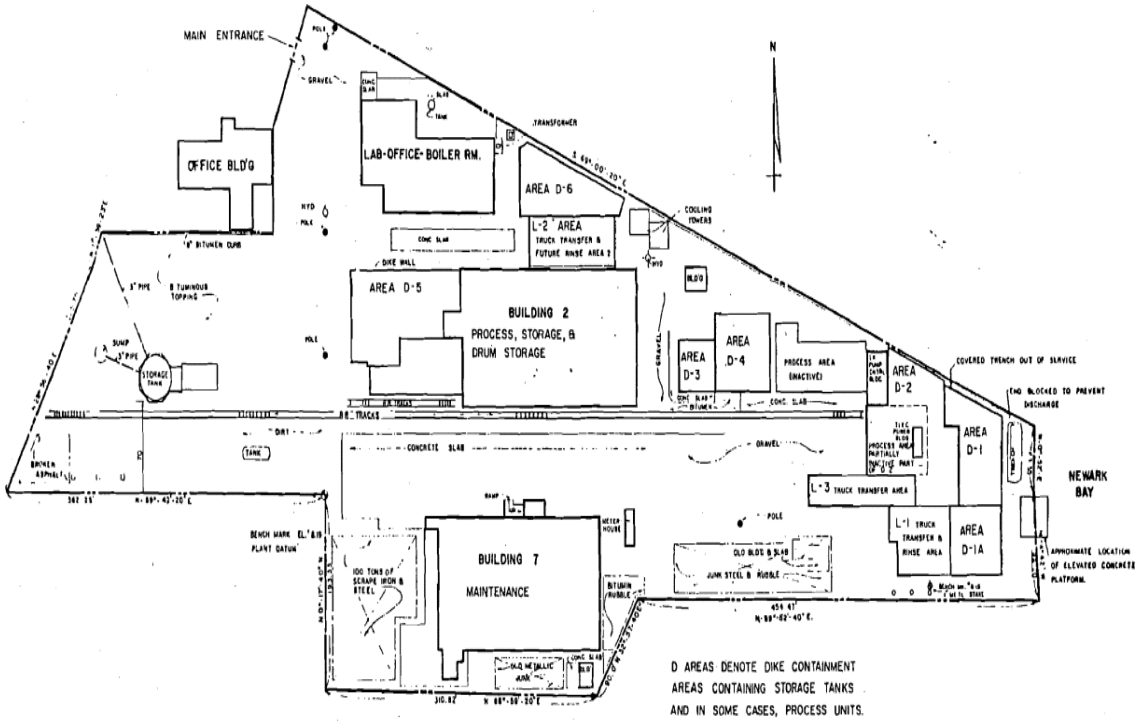
According to letters prepared by the facility dated July 9 and December 17, 1980, at that time, facility wastewater was being moved by tank truck to Modern Transportation Company's wastewater plant in Kearny, New Jersey, and had been since 1976. It was used as makeup water for making lime slurry which was used to neutralize mineral acids, which was then discharged to the Kearney sewer system. During this time, the Inland facility was attempting to obtain approval from Passaic Valley Sewerage Commission (PVSC) to discharge wastewater to the PVSC system via the Newark sewer system (PAP-00185373-74; PAP-00185455). A memo prepared by McKesson, dated June 20, 1985, also states that beginning in 1976, Inland shipped for disposal to Kin-Buc Landfill wastewater generated from the recovery and washing of pharmaceutical grade phenoxyacetic acid and dimethylaniline, which continued until 1977, when Kin-Buc Landfill closed. (PAP-00188213-4). Finally, the 1979 Engineering Plan states that when the chemical recovery process produced a residual liquid chemical waste, it was temporarily stored at the plant until it could be transported to the Modern Transportation Company of Kearny or to Inland's Kentucky plant for treatment and disposal.

The April 1979 Engineering Plan states that there were approximately 94 storage tanks within the plant ranging in capacity from 800 gallons to 230,000 gallons. Several pumps and pipe networks were used to transfer incoming wastes through the processing plants, and to transfer finished products and residual wastes into their respective storage tanks. Secondary piping was used to circulate filtered stormwater through a cooling system, and to provide fuel (PAP-00186370).

According to a memo prepared by NJDEP, dated December 14, 1979, all tank areas containing liquids were diked or curbed. At the time, all diked containments were to be provided with common sumps for the purpose of collecting and discharging spills, rain and wash waters (PAP-00187208).

According to the April 1979 Engineering Plan, the only waste produced at the site other than wastewater from the cooling system was a “considerable volume” of residual liquid chemical wastes approximating 384,000 gallons per month (PAP-00186371). According to a letter from the facility to PVSC, dated June 15, 1979, there were five sources of wastewater at the facility: “L/L Bottoms,” “Crystallizer,” “DMA Washer,” “Reactor,” and “Still boilout” (PAP-00185880). The 1979 Engineering Plan states that when the chemical recovery process produced a residual liquid chemical waste, it was temporarily stored at the plant until it could be transported to the Modern Transportation Company of Kearny or to Inland’s Kentucky plant for treatment and disposal. The document states that “at no time is waste or wastewater discharged into existing storm or sanitary sewers.” The document goes on to state that the plant's sanitary facilities consisted of septic tanks within the site, rather than service connections to the city sanitary sewer system (PAP-00186371).

A facility layout is presented below (PAP-00187144):



On October 10, 1982, an explosion and fire destroyed much of the facility. The NJDEP closed the site two days later (PAS-00091937).

According to a *RCRA Facility Assessment Narrative*, dated May 1987, a walk-through survey of the facility conducted on May 12, 1986, revealed that the site was being used by nearby industries as a parking lot and storage area for wastes and equipment. It is reported that there were fourteen trailers on the site, two of which contained drums, and that a black chemical resin was leaking out of the back of nine trailers. One of these trailers was labeled with a poison placard. One of five trucks parked on the northwestern side of the site contained drums. Twelve drums of oil were reportedly stored outside a maintenance building, and a pile of soil reported to be contaminated with a metallic residue and blue crystals was dumped next to these containers. Bottled chemicals were observed to be stored in a small building located in front of the storage tanks by Newark Bay. Soil on the eastern side of the plant near the former truck transfer area was observed to be discolored (PAP-00185895).

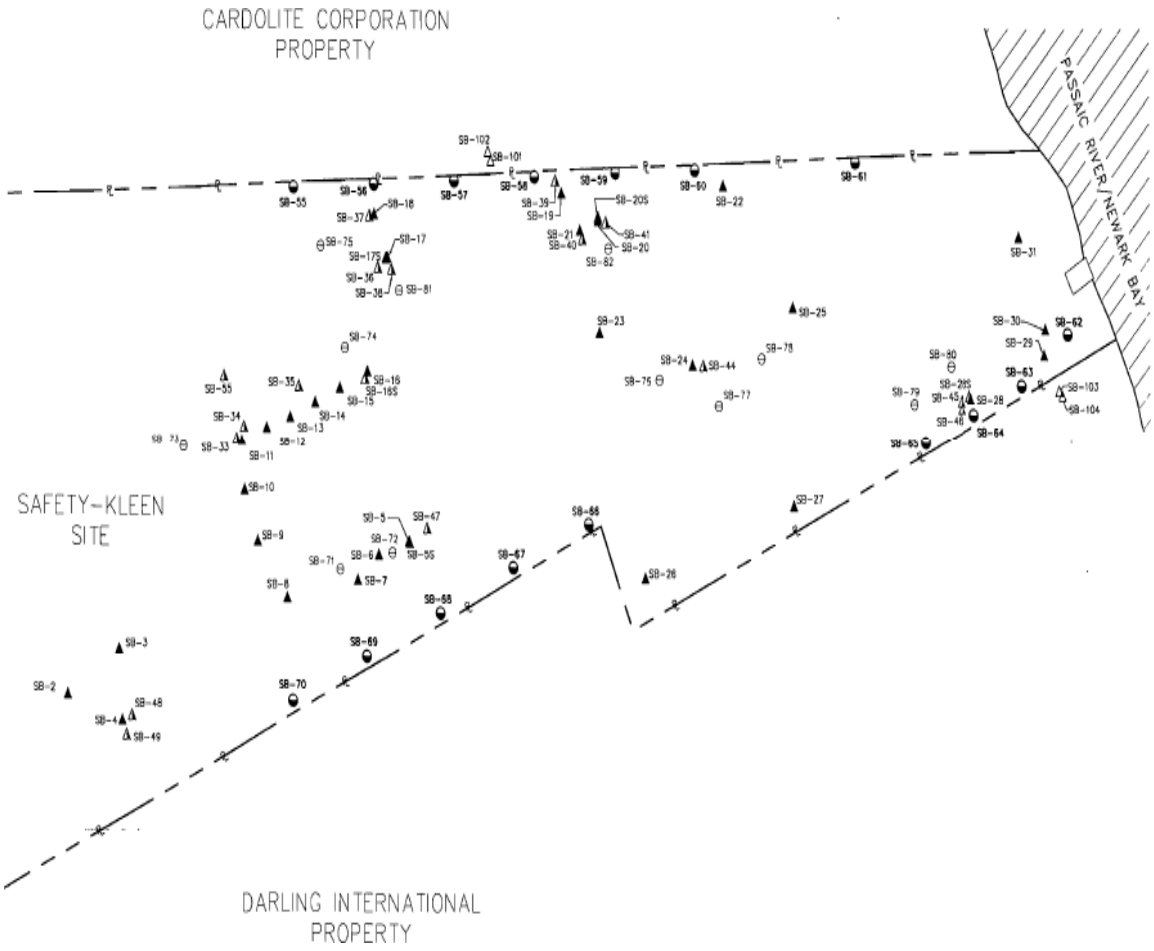
4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (detected)
- Lead (generated
- Mercury (detected)

It is noted that, according to an Administrative Consent Order, dated June 23, 1993, the site constitutes a portion of a larger tract of land on which Balbach conducted smelting and refining of lead, copper, and precious metal-based ores from at least the 1890s until 1938 (PAP-00186325-6). Balbach was reportedly one of the largest metals refiners in the world at the time (PAP-00186326), and according to a *Phase II Remedial Investigation Work Plan*, prepared by Blasland, Bouck, & Lee, Inc. (BBL), dated March 1995, Balbach processed “substantial quantities” of ores and generated a variety of “toxic” heavy metals, resulting in lead, copper, and mercury contamination attributable to Balbach’s operations (PAS-00011253-54; PAS-00091937; PAP-00362426, 35-38). In addition, according to a *Phase II Remedial Investigation Report*, prepared by BBL, dated December 1995 (1995 Phase II RI), Balbach filled the site with smelter slag (PAP-00364135; PAP-00188312, 52-3; PAP-00186325-6; PAP-00362426, 36). In 1993, an Administrative Consent Order was issued by NJDEP which exempted Safety-Kleen Envirosystems Company from responsibility for remedying conditions resulting from the former metal refining practices at the site, or from any other activities which pre-dated 1952 (PAS-00011257). Further, according to the 1995 Phase II RI, metallic constituents detected in soil during Safety-Kleen Envirosystems Company’s Phase I and Phase II remedial investigations were related to historical smelting operations conducted by Balbach, and were not related to post-1952 operations. This was confirmed by the results of statistical analyses performed on the Phase I RI soils data. The report states that the results of this statistical analysis were accepted by NJDEP in a May 3, 1995, Phase II RI Work Plan conditional approval letter (PAP-00364123; PAS-00010852-53). Data for lead and copper are discussed further in Section 8 below.

PCBs

According to a *Remedial Action Report*, prepared for Safety-Kleen Envirosystems Company, dated August 2001, concentrations of polychlorinated biphenyls (PCBs) in soils that exceeded 50 parts per million (ppm) were detected in the vicinity of one soil boring (SB-24). The extent of soils containing PCBs greater than 50 ppm was defined to be within a 50-foot by 20-foot rectangular area surrounding the soil boring (PAS-00010854). The highest concentration of PCBs (161 ppm) was detected in a soil sample collected from soil boring SB-24 at a depth of 0 to 0.5 feet below ground surface (PAS-00010899). The location of SB-24 (located in the east-central portion of the site) is depicted below (PAS-00010895):



With respect to stormwater runoff in the area of SB-24, it is noted that according to the 1979 Engineering Plan and a memo prepared by NJDEP, dated December 14, 1979, all precipitation and stormwater runoff was collected from “potentially contaminated areas” and contained within the site for storage and filtration via a system of drainage swales and pumps, and later use in the plant's cooling system. “Wasted" cooling water was pumped into storage tanks and transported to treatment and disposal facilities at the Modern Transportation Company. The cooling system wastewater was retained and stored for subsequent offsite treatment and disposal (PAP-00186369; PAP-00187208).

Soil that contained 50 ppm or more PCBs was excavated and disposed off-site (PAS-00010849). PCBs also were detected at several Areas of Environmental Concern (AECs). This is discussed further in Section 8 below.

It is noted that Kolker Chemical Company owned the site in 1952, and between approximately 1953 and 1962, it manufactured a number of organic and inorganic chemicals, including non-ferrous inorganic salts, chlorine, chloroform, methyl chloride, methylene chloride, and plasticizers (PAP-00188319; PAP-00366038-39; PAP-00366830). Kolker Chemical Company's use of PCBs at the facility is documented by sales records from Monsanto indicating they purchased at least 183,000 pounds of PCBs (including Aroclors 1242, 1248, 1254, and 1260) between 1958 and 1962 (PAP-00366041-53; PAP-00366040). Moreover, Inland's Temporary Operating Authority permits issued by NJDEP on May 9, 1978, and April 30, 1979, prohibited Inland from accepting any solvent effluent streams containing PCBs (PAP-00188259; PAP-00188271).

PAHs

According to a *Remedial Investigation Report* (1994 Phase I RI) dated August 1994, several polynuclear aromatic hydrocarbons (PAHs) were detected in soil at concentrations that exceeded the NJDEP "soil cleanup criteria" (PAP-00188353). These included high and low molecular weight PAHs (PAP-00188361-87). According to the 1994 Phase I RI, the pattern of organics, especially volatile organic compounds, in soil samples is consistent with organics being discharged from recent (post-1952) operations on the plant (PAP-00188353).

Based on a January 14, 1975, table of tank capacity and contents at the site, five fuel oil (No. 4 and No. 6) tanks were present at the boiler room ranging in capacity from 15,000 to 20,000 gallons (PAP-00185445).

Copper

The copper concentration in a wastewater sample collected on January 6, 1982, was 0.824 mg/L. According to a letter prepared by MEC, dated April 30, 1982, samples were collected in order to establish a set of baseline data for discharge into the PVSC system. The wastewater sample came out of tank "C-19," which is a 230,000-gallon tank on the property (PAP-00185787-88).

In addition, the copper concentration in a wastewater sample collected on February 25, 1982, was 0.445 mg/L. Based on the available references, it is unclear from where the sample was collected or with what discharge location/receiving body it was associated (PAP-00187534).

Copper was also detected in soil at concentrations at high as 8,400 milligrams per kilogram (mg/kg). This is discussed further in Section 8 below.

Lead

According to a letter prepared by Inland, dated June 27, 1975, lead was generated as a result of the chlor-alkali process (PAP-00188223). This operation was shut down in May 1975 (PAP-00188218). With the exception of lead generation prior to 1975, lists of hazardous substances at the facility state that operations did not involve lead after that date (PAP-00187242; PAP-00187498; PAP-00187507).

The following is a discussion of relevant available wastewater discharge data:

- Inland reported that on April 10, 1975, their wastewater discharge met all requirements of their National Pollutant Discharge Elimination System (NPDES) permit with the exception of lead (PAP-00188222). As mentioned above, the operation that generated the lead was shut down in May 1975 (PAP-00188218).

- Between February and May 1975, the facility reported a maximum of 71.5 pounds per day of lead in their effluent (for the month of May), with an intake level of 19.0 pounds per day, for a net discharge amount of 52.5 pounds per day. In February and April 1975, Inland reported net discharges of -2 lbs. and -21.5 lbs. per day of lead (i.e. water discharged contained less lead than intake water) (PAP-00188240).

- According to a NPDES discharge monitoring report, the maximum detected concentrations of lead in 1976 were as follows:

    - 0.49 mg/L for the first seven months of 1976 (PAP- 00185800; PAP-00185815);
    - 0.52 mg/L in September 1976 (PAP-00188983);
    - 0.19 mg/L in October 1976 (PAP-00186123);

    The original NPDES permit for the facility (No. NJ0001279) became effective on January 31, 1975, and allowed for a daily discharge of 38 pounds of lead per day (PAP-00362242; PAP-00189115). However, on October 22, 1976, EPA stated its intention to issue a modified permit, given that the effluent discharge flow was greatly reduced following the cessation of chemical manufacturing in May 1975, and Public Notice of the permit modification was published on December 3, 1976 (PAP-00189054; PAP-00186107-9). According to this public notice prepared by EPA, a maximum concentration limitation of 1.0 mg/L was imposed for total lead, and the effluent limitation for lead was reduced from 38 pounds/day to 1.20 pounds/day (PAP-00189198).

- According to a memo prepared by EPA, dated October 22, 1976, the facility was no longer discharging wastewater that contained lead in “excessive” amounts (PAP- 00186102). Ultimately, all discharges through Outfall 001 ceased on or before July 1, 1977 (PAP-00186120). Thereafter, surface water runoff was captured and used for cooling water, and was periodically disposed of off-site by truck (PAP-00187346, 48).

- A sample of facility wastewater collected on February 29, 1980, showed that lead was present at a concentration of 1.9 mg/L. Based on available references, it is unclear from where the sample was collected or with what discharge location/receiving body it was associated (PAP-00185448).

- A sample dated March 3, 1980, had a lead concentration of 2.4 mg/L. Based on available references, it is unclear from where the sample was collected or with what discharge location/receiving body it was associated (PAP-00185463).

- Lead was detected in a wastewater sample collected on January 6, 1982, at a concentration of 0.114 mg/L. According to a letter prepared by MEC, dated April 30, 1982, samples were collected in order to establish a set of baseline data for discharge into the PVSC system. The wastewater sample came out of tank "C-19," which is a 230,000-gallon tank on the property (PAP-00185787-88).

- Lead was detected in a wastewater sample collected on February 25, 1982, at a concentration of 0.872 mg/L. Based on available references, it is unclear from where the sample was collected or with what discharge location/receiving body it was associated (PAP-00187534).

Lead was also detected in soil at concentrations as high as 30,000 mg/kg. This is discussed further in Section 8 below.

Mercury

A sample of facility wastewater collected on February 29, 1980, showed that mercury was present at a concentration of 0.0025 milligrams per liter (mg/L). Based on the available references, it is unclear from where the sample was collected or with what discharge location/receiving body it was associated (PAP-00185448).

The mercury concentration in a wastewater sample collected on January 6, 1982, was 0.001 mg/L. According to a letter prepared by MEC, dated April 30, 1982, samples were collected in order to establish a set of baseline data for discharge into the PVSC system. The wastewater sample came out of tank "C-19," which is a 230,000-gallon tank on the property (PAP-00185787-88). The mercury concentration in a wastewater sample collected on February 25, 1982, was 0.0009 mg/L. Based on the available references, it is unclear from where the sample was collected or with what discharge location/receiving body it was associated (PAP-00187534).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	30,000 mg/kg
Copper	8,400 mg/kg
Mercury	23 mg/kg
Benzo(a)anthracene	17 mg/kg
Benzo(a)pyrene	27 mg/kg
Benzo(b)fluoranthene	26 mg/kg
Benzo(k)fluoranthene	12 mg/kg
Dibenzo(a,h)anthracene	6.1 mg/kg
Indeno(1,2,3-cd)pyrene	12 mg/kg
PCBs	161 mg/kg

It is noted that according to a memo prepared by NJDEP, dated December 14, 1979, three soil borings show compacted fill and cinder from 0 to 10 feet (PAP-00187208). According to the August 1994 Phase I RI, the entire site is covered with fill which dates back to before 1911 (PAP-00188312). In addition, according to a *Phase II Remedial Investigation Work Plan*, dated March 1995, surface soil extending to 7 to 10 feet is composed of fill material of variable composition (PAP-00362435). Finally, according to the 1995 Phase II RI, metallic constituents (including lead, copper, and mercury) detected in soil during Safety-Kleen Envirosystems Company's Phase I and Phase II remedial investigations were related to historical smelting operations conducted by Balbach, and were not related to post-1952 operations. This was confirmed by the results of statistical analyses performed on the Phase I RI soils data. The report states that the results of this statistical analysis were accepted by NJDEP in a May 3, 1995, Phase II RI Work Plan conditional approval letter (PAP-00364123; PAS-00010852-53;

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

PAP-00362437-38). In 1993, an Administrative Consent Order was issued by NJDEP which exempted Safety-Kleen Envirosystems Company from responsibility for remedying conditions resulting from the former metal refining practices at the site, or from any other activities which pre-dated 1952, and acknowledged that "most if not all" of the metals contamination at the site was attributable to fill (PAS-00011257; PAP-00188476).

5. COC Pathways

The facility is located at the mouth of the Passaic River where it enters Newark Bay (just north of River Mile 0.0) (PAP-00402573, 76).

Sanitary and Storm Sewer

The 1979 Engineering Plan document states that "at no time is waste or wastewater discharged into existing storm or sanitary sewers." The document goes on to state that the plant's sanitary facilities consisted of septic tanks within the site, rather than service connections to the city sanitary sewer system (PAP-00186371).

The facility filed a sewer connection application with PVSC on February 15, 1980, for intermittent discharge of 14,000 gallons of wastewater per day (PAP-00185459). According to a letter prepared by PVSC, dated August 18, 1982, the facility intended to install a sanitary sewer line to connect to the City of Newark sewer to handle approximately 1,200 gallons per day of domestic waste. This was in response to an Administrative Consent Order requiring resolution of septic tank overflows at the facility (PAP-00185368).

The facility also filed a sewer connection application with PVSC on February 4, 1983, for intermittent discharge of industrial waste to the sanitary sewer, after the October 1982 explosion and fire, and facility closure, but in anticipation of the facility being rebuilt and reopened. This application states that pumped groundwater would be mixed with industrial wastes from the reopened facility and the resulting mixture would be monitored to establish that the waste would be acceptable for to discharge to the PVSC. Documentation appears to show that discharges would occur temporarily through a neighboring property outfall, and then subsequently through facility tie-in to the PVSC system. A NJDEP construction and discharge permits form dated May 24, 1983, states that tie-in to the PVSC system would allow for discharge of stormwater, treated groundwater, and septic wastes into the PVSC system (PAP-00185469-72; PAP-00185776; PAP-00185877). The facility obtained a sewer connection permit from PVSC on May 13, 1983 (PAP-00186214).

The following information was available regarding the volumes of wastewater proposed to be discharged from the facility:

- According to a June 15, 1979, letter prepared by Inland, as part of their intent to obtain approval to discharge wastewater to the PVSC system, they estimated that they would discharge 400,000 gallons per month (PAP-00185880).

- The facility filed a sewer connection application with PVSC on February 15, 1980, for intermittent discharge of 14,000 gallons of wastewater per day (PAP-00185459).

- On February 10, 1982, the facility projected that they would generate 23,580 gallons of wastewater per day (PAP-00185856).

Direct Release

According to a September 27, 1976 National Pollutant Discharge Elimination System Application, the facility held a NPDES permit (No. NJ0001279) at least as early as December 30, 1972 (PAP-00185805).

According to a public notice NPDES fact sheet prepared by EPA, dated July 19, 1974, the facility had one discharge point to Newark Bay (Discharge 001) (PAP-00189108). Discharges were reported to consist of cooling water and process water. The point of discharge was approximately 50-100 feet north of Wilson Avenue (PAP-00189197).

According to a letter prepared by the facility dated August 2, 1977, the facility stopped discharging from Discharge 001 pursuant to their NPDES permit as of July 1, 1977 (PAP-00186120-1).

According to a letter prepared by the facility dated July 18, 1977, underground drains leading from the property to Newark Bay had been sealed off (PAP-00186857).

According to the 1979 Engineering Plan and a memo prepared by NJDEP, dated December 14, 1979, the site drainage system is completely overland. It is reported that underground pipelines and drainage structures were not used within the plant, nor did the plant discharge stormwater into a storm or sanitary sewer system. It was further reported that all precipitation and stormwater runoff was collected from “potentially contaminated areas” and contained within the site for storage, filtration, and later use in the plant's cooling system. A system of drainage swales and pumps collected and discharged the stormwater directly into a filtering system, and then into temporary storage. As the cooling facilities required additional water, the filtered stormwater was fed from storage into the cooling system. The entire cooling system water supply was replaced at “regular intervals” with the "wasted" cooling water being pumped into storage tanks and later transported to treatment and disposal facilities at the Modern Transportation Company. The cooling system wastewater was retained and stored for subsequent offsite treatment and disposal (PAP-00186369; PAP-00187208).

The following information was available regarding the volume of wastewater discharged from the facility:

- According to a memo prepared by EPA dated October 6, 1975, the facility was no longer performing the types of manufacturing activities they were when their permit was issued, and the effluent flow had been reduced from 14.4 million gallons per day (MGD) to 0.016 MGD (PAP-00187067).

- According to a memo prepared by EPA, dated October 22, 1976, average discharge flow was 0.092 MGD; however, the NPDES permit was based on an average flow of 10.5 MGD (PAP-00189054).

- According to a letter prepared by EPA, dated November 24, 1976, at the time the facility was issued a NPDES permit effective January 31, 1975, on average the facility discharged 10.5 MGD to Newark Bay (PAP-00186109; PAP-00362242).

- According to a public notice prepared by EPA, dated December 3, 1976, the plant had one discharge point to Newark Bay (Discharge 001), consisting of cooling water and process water, with average and maximum flows of 92,000 and 144,000 gallons per day, respectively (PAP-00189197).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections and Violations

According to a letter prepared by the facility dated July 3, 1975, the U.S. Coast Guard observed an “oil-like material” in Newark Bay, and it was determined to be coming from the facility sewer system (PAP-00187098). Investigation revealed material originated from the DMA-Phenoxy unit. The facility also reported that they discovered several leaks in the waste water system and, therefore, “the oils etc. from the phenoxy crystallization” were dripping on the concrete floor and migrating to the sewer. In addition, the facility reported that they washed down the entire area causing the material collected on the floor previously to flow to the main sewer (PAP-00187106).

At least 11 inspections conducted by NJDEP between January 18, 1980, and May 19, 1982, identified what was described as “leachate of an oil substance is presently entering Newark Bay” and/or “leachate into bay” and/or an “oil like material,” among other similar descriptions. The source of the discharge was documented as being unknown (PAP-00186512-21, 6530-1, 6881, 6908, 6913, 7305, 7310; PAP-00365518-9). In addition, on January 18, 1980, a “leak in wastewater holding tank” was observed (PAP-00186512-3). On January 28, 1980, a leak or spill associated with a wastewater holding tank was noted, as was “Waste water holding tank equalization not functioning resulting in spill” (PAP-00186514-5). On March 5, 1980, “several spills located around facility” was noted (PAP-00186884-5).

According to a NJDEP memo, dated March 10, 1981, at the time of a September 10, 1980 inspection at the facility, NJDEP personnel observed a purple discharge at the facility’s bulkhead along the Newark Bay (PAP-00185827). This was also noted during a September 2, 1980, inspection and one in September 1979 (PAP-00365518-19). Information as to whether COCs were present in the discharge was not provided in the cited document. The document also notes that dating back to 1979, NJDEP personnel had noted the following deficiencies at the facility: (1) poor, careless housekeeping

resulting in extensive spillage; (2) a contaminated stormwater discharge into Newark Bay; (3) open drums in deteriorated condition stored in improper storage areas; (4) an oily material surfacing in the Newark Bay near the facility's shoreline; and (5) a purple-colored groundwater discharge into Newark Bay (PAP-00185827).

According to an undated Inland Temporary Operating Authority Compliance Status document, the following had been noted at the facility:

- Inspectors have stated that Inland has not been responding as quickly as possible to excavate, remove, and properly dispose of soils contaminated by spills or leaks of waste materials or sludges (PAP-00185870).

- Inspectors have stated that there have been "a number" of unauthorized discharges of pollutants into the soils, surface water and ambient air at the facility, and that the facility failed to submit formal reports regarding these incidents. The document goes on to state that major discharges that should have been addressed in this fashion included the "long present" purple discharge into Newark Bay; the overflow and spillage of "DMA" out of the C-19 waste water tank on September 19, 1980; septic tank overflow out of the pipe at the rear of the facility; and, the chronic overflowing and spillage of water out of the cooling towers (PAP-00185870).

An inspection on October 10, 1982, following the facility explosion that day, identified contaminated runoff from the fire discharging at a rate of 500 to 1,000 gallons per minute to a storm drain on an adjacent property which drained to Newark Bay. The inspection report does not document if OU2 COCs were present in the runoff (PAP-00365540).

In November 1985, a RCRA Facility Assessment was performed by NJDEP, which identified "a number" of environmental concerns at the site. In addition, a site inspection conducted by NJDEP in 1987 stated that "a number" of surface units and structures (remaining after the explosion) were deteriorating and/or leaking (PAS-00091937).

According to a June 23, 1993, Administrative Consent Order, on October 30, 1979, the facility was issued an Administrative Order by the New Jersey Department of Environmental Protection and Energy (NJDEPE). The order stated that routine inspections conducted by NJDEPE on September 19, October 9, October 16 and October 24 revealed that the facility grounds were contaminated with various chemicals; therefore, the facility was to cease accepting waste and clean up all spills and contaminated soil (PAS-00011254).

According to a Civil Action brought by the State of New Jersey against Inland, dated March 19, 1980, Inland failed to comply with and implement all of NJDEP's requirements of Inland's Temporary Operating Authority; Inland since or from about October 30, 1979, had failed and continued to fail to comply with the October 30, 1979, Administrative Order; and, Inland's acts since or from about October 30, 1979, had constituted and continued to constitute pollution of the environment or a potential threat of pollution of the environment (PAP-00365511).

In August 1982, NJDEP issued an Administrative Consent Order due to the facility's failure to obtain authorization to conduct hazardous waste treatment and storage operations. The Administrative Consent Order also states that the facility was in need of maintenance and operational design changes, and materials accumulated from chronic spills and leaks needed to be removed from the site and properly disposed (PAS-00010424-25; PAS-00011254).

On October 10, 1982, a major explosion occurred on the company's premises destroying the hazardous waste processing area. Therefore, NJDEP ordered that the facility cease operations (PAP-00185865-66).

NJDEP issued an Administrative Consent Order to MEC in 1990 requiring them to conduct a remedial investigation and feasibility study of remedial action alternatives (PAP-00362286-87).

NJDEP issued an Administrative Consent Order to Safety-Kleen Envirosystems Company on June 23, 1993, requiring them to conduct a remedial investigation and feasibility study of remedial action alternatives (PAS-00011255).

Permits

It appears the facility held a NPDES permit (No. NJ0001279) as early as December 30, 1972; however, a copy of the permit was not available in the file material (PAP-00185805; PAP-00185375). This is the discharge point that received cooling and process wastewater containing the COC lead (PAP-00189106; PAP-000189197).

The original NPDES permit for the facility (No. NJ0001279) issued by EPA became effective on January 31, 1975 (PAP-00362242). The facility was required to sample for lead twice monthly (PAP-00362249).

On October 22, 1976, EPA stated its intention to issue a modified permit, given that the effluent discharge flow was greatly reduced following the cessation of chemical manufacturing in May 1975, and Public Notice of the permit modification was published on December 3, 1976 (PAP-00189054; PAP-00186107-9). According to a letter prepared by the facility dated August 2, 1977, the facility stopped discharging pursuant to their NPDES permit as of July 1, 1977 (PAP-00186120-21).

The facility filed a sewer connection application with PVSC on February 15, 1980, for intermittent discharge of 14,000 gallons of wastewater per day (PAP-00185459). This permit was not granted due to PVSC's contention that some of the wastewater originated from outside the PVSC service area (PAP-00185373).

The facility also filed a sewer connection application with PVSC on February 4, 1983, for intermittent discharge of industrial waste to the sanitary sewer, after the October 1982 explosion and fire, and facility closure, but in anticipation of the facility being rebuilt and reopened. This application states that pumped groundwater would be mixed with industrial wastes from the reopened facility and the resulting mixture would be monitored to establish that the waste would be acceptable for discharge to the PVSC.

Documentation appears to show that discharges would occur temporarily through a neighboring property outfall, and then subsequently through facility tie-in to the PVSC system. A NJDEP construction and discharge permits form dated May 24, 1983, states that tie-in to the PVSC system would allow for discharge of stormwater, treated groundwater, and septic wastes into the PVSC system (PAP-00185469-72; PAP-00185776; PAP-00185877). The facility obtained a sewer connection permit from PVSC on May 13, 1983 (PAP-00186214).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Preliminary Assessment conducted by EPA in 1983 (PAP-00365520).
- RCRA Facility Assessment conducted by NJDEP in 1985 (PAS-00091937).
- Several Remedial Investigation reports between 1994 and 1999 (PAP-00363061).
- *Remedial Action Selection Report*, dated January 1996 (PAP-00362984).
- *Remedial Action Report*, prepared for Safety-Kleen Envirosystems Company, dated August 2001 (PAS-00010843).
- *Supplemental Groundwater Remedial Action Selection Report,* dated November 2002 (PAP-00363273).
- *Supplemental Groundwater Remedial Action Work Plan*, dated October 2003 (PAP-00363048).
- *Addendum to the Supplemental Groundwater Remedial Action Work Plan*, dated October 2003 (PAP-00363048).
- *Remedial Action Report, prepared for Safety-Kleen Envirosystems Company*, dated September 2004 (PAP-00364590; PAP-00364973).

Sewer

There is no information regarding sewer sampling data in the available file material.

Soil

It is noted that in 1993, an Administrative Consent Order was issued by NJDEP which exempted Safety-Kleen Envirosystems Company from responsibility for remedying conditions resulting from the former Balbach metal refining practices at the site, or from any other activities which pre-dated 1952 (PAS-00011257). Further, according to the 1995 Phase II RI Work Plan, metallic constituents (including COCs lead, copper and mercury) detected in soil during Safety-Kleen Envirosystems Company's Phase I and Phase II remedial investigations were related to historical smelting operations conducted by Balbach, and were not related to post-1952 operations (PAP-00362426, 35–38). This was confirmed by the results of statistical analyses performed on the Phase I RI soils data (PAP-00362437-38). The report states that the results of this statistical analysis were accepted by NJDEP in a May 3, 1995, Phase II RI Work Plan conditional approval letter (PAP-00364123; PAS-00010852-53).

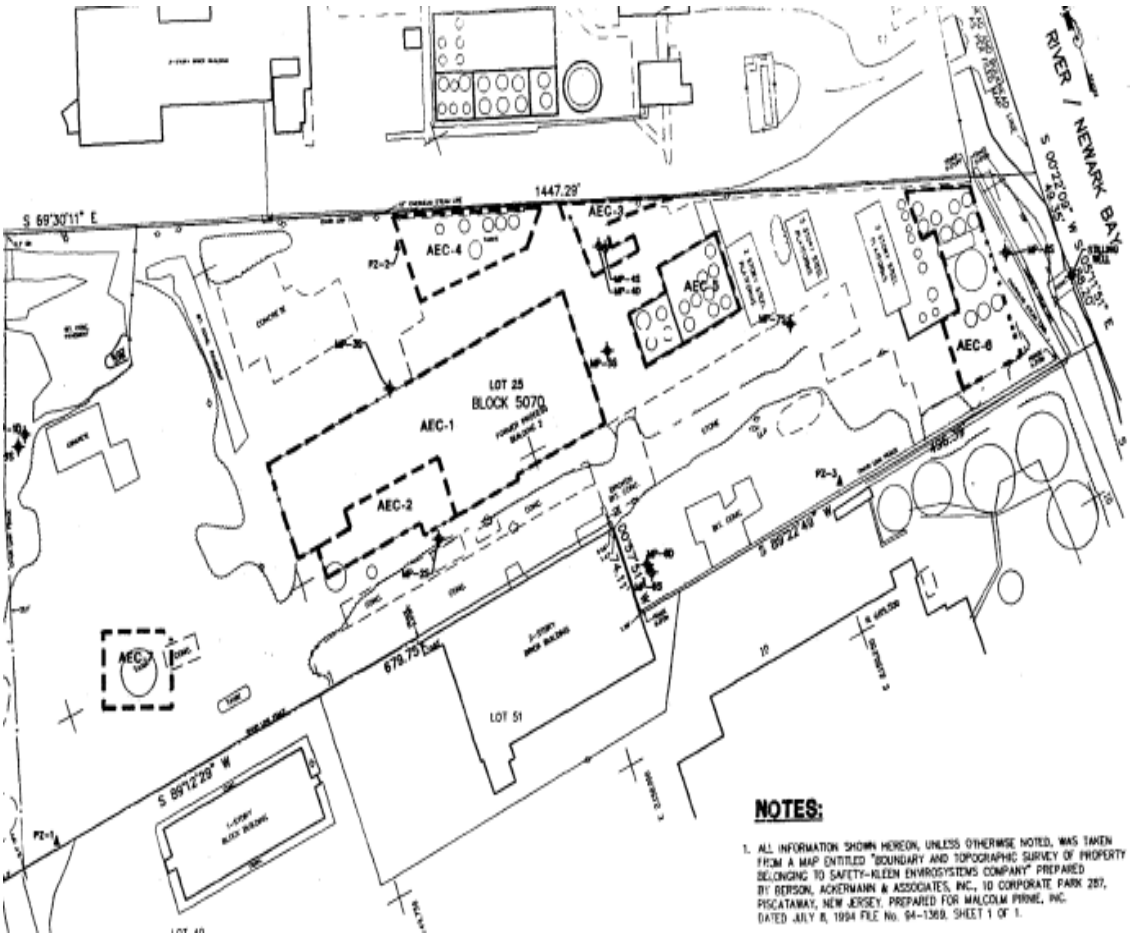
According to an NJDEP memorandum, dated March 10, 1981, between September 2, 1980, and January 8, 1981 NJDEP inspectors collected at least 33 samples at the facility. A sample from a spill on the ground near "tank farm 5" contained the COCs PCBs (670 ppm) and lead (10 ppm). It is noted that the memorandum states that "Unfortunately, our sample chain of custody, record keeping and storage procedures were probably not rigorous enough to meet court standards." (PAP-00185829).

In 1988, the COCs lead and copper were detected in soil at concentrations as high as 6,250 mg/kg and 13,600 mg/kg, respectively (PAP-00188322). According to the 1994 Phase I RI, the concentrations of metals were consistent with the use of the site for lead smelting and metal refining by Balbach (PAP-00188322).

According to a Documentation of Environmental Indicator Determination, prepared by EPA, dated September 27, 2001, seven Areas of Environmental Concern (AECs) were identified at the site (PAS-00091938-39). The following is a description of each AEC at which COCs were detected:

- AEC 1 contained several aboveground storage tanks (ASTs) which supported operations in the process building. From 1962 to 1974, the former process building housed operations to process benzoic acid and produce plasticizers.
- AEC 2 was used as a truck transfer area associated with transport of the materials in the ASTs at AEC 1 (PAS-00091945).
- AEC 3 contained two cooling towers that circulated 2,400 gallons per minute of water (PAS-00091938).
- AEC 4 was used as a loading dock and tank storage area for empty ASTs (PAS-00091946).
- AEC 5 contained approximately 12 ASTs situated within two adjacent berms. From 1962 to 1974, methylene chloride manufactured at the site was stored in this area (PAS-00091939).
- AEC 6 consisted of several tanks which were associated with chemical processing (PAS-00091946).
- AEC 7 contained a 225,000-gallon AST which contained mixed organics (PAS-00091946).

The location of each AEC is depicted below (PAP-00364294):



Maximum detected concentrations of metals and PCBs detected at each AEC, as reported in the 1994 Phase I RI and 1995 Phase II RI, are summarized below. In addition to metals and PCBs, low and high molecular weight PAHs were detected in soil samples collected at each AEC (PAP-00188348-52, 60-87; PAP-00364270, 4).

1994 Phase I RI and 1995 Phase II RI Maximum COC Concentrations in Soil							
COC	**AEC 1 mg/kg)**	**AEC 2 (mg/kg)**	**AEC 3 (mg/kg)**	**AEC 4 (mg/kg)**	**AEC 5 (mg/kg)**	**AEC 6 (mg/kg)**	**AEC 7 (mg/kg)**
Copper	4,700	4,700	8,400	8,400	2,800	1,000	4,900
Lead	14,000	8,700	30,000	5,700	4,600	4,500	6,800
Mercury	5.6	4.6	8.7	6.2	19	23	4.4
PCBs	5.7	34	1.2	0.93	161	14	3.2

According to the 1994 Phase I RI, the highest metals concentrations were detected at AEC-1 and AEC-2, adjacent to a former Balbach production building. In addition, the report states that the high concentrations of copper, lead, and other metals throughout the site are indicative of the filling of the site and adjoining areas by Balbach with materials from metal refining operations (PAP-00188352-53).

Remedial Activities

According to the *Remedial Action Report*, prepared for Safety-Kleen Envirosystems Company, dated August 2001, concentrations of PCBs in soils that exceeded 50 ppm were detected in the vicinity of one Phase I RI soil boring (SB-24). PCB concentrations in soils were subsequently delineated for concentrations of both 2 ppm and 50 ppm. The extent of soils containing PCBs greater than 50 ppm was defined to be within a 50-foot by 20- foot rectangular area surrounding soil boring SB-24 located in the east-central portion of the site (PAS-00010854, 95). Based on June 1999 PCB soil sampling results, the horizontal limits of the excavation were defined to be a 50-foot by 20-foot rectangular area surrounding SB-24. PCBs were not detected at concentrations greater than 50 ppm within this area at depths greater than one foot below ground surface (PAS-00010859). Soil that contained 50 ppm or more PCBs was excavated and disposed off-site (PAS-00010849). According to a *Supplemental Groundwater Remedial Action Work Plan*, prepared by BBL, dated May 2003, the volume of soil with concentrations of PCBs greater than 50 ppm was 137 tons (PAP-00363064).

According to the Documentation of Environmental Indicator Determination, prepared by EPA, dated September 27, 2001, each of the AECs discussed above were covered with an asphalt cap in 2000/2001 as part of a site-wide capping program implemented to prevent exposure to contaminated soil and prevent further infiltration of contaminants to groundwater (PAS-00091938-39; PAP-00363064). As part of installation of the cap, a stormwater runoff control system was installed with two outfalls to Newark Bay (PAP-00363064).

NJDEP issued a Conditional No Further Action Letter for site soil to McKesson Corporation on May 6, 2011, subject to continued implementation of institutional and engineering controls (PAP-00365990-1).

8. Summary of Asserted Defenses

McKesson intends to assert, if necessary, that its and Safety-Kleen Envirosystems Company's allocation, if any, should be reduced or eliminated based on a number of defenses:

- Because Inland acquired the facility after a valid NPDES permit application had been filed with the Army Corps of Engineers (ACOE) and accepted by the ACOE and EPA, any discharges from the facility in compliance with the limitations set forth in NPDES permit No. NJ0001279 covering Outfall 001 are subject to the federally permitted release exemption under CERCLA. 42 U.S.C. §9607(j) prohibits recovery for CERCLA response costs or damages resulting from federally permitted releases.

- Any non-background PAH contamination at the facility that could be associated with spills or leaks of fuel oil or diesel oil by Inland or MEC would not result in any CERCLA liability pursuant to the petroleum exclusion, 42 U.S.C. §9601(14).

- To its knowledge, McKesson did not employ, produce or discharge PCBs at the facility. Rather, the on-site PCB contamination was likely caused by prior facility owner and operator Kolker Chemical Company/Vulcan. McKesson further notes that the PAH contamination at the facility is most likely from background sources, as is the heavy metal contamination, given the Historic Fill onsite and the historic Balbach operations on and discharges to the facility. McKesson therefore intends to assert a third-party defense as to each of these COCs, 42 U.S.C. §9607(b)(3).

- Based on pertinent CERCLA case law, despite Inland's ownership of the chlor-alkali plant during 1974-75, the allocation should assign McKesson little to no responsibility for lead discharges exceeding NPDES permit limits during that period because it played no role in those discharges. McKesson should be allocated minimal or no responsibility for the 1974-75 lead discharges because, pursuant to the parties' Operating Agreement, Vulcan, rather than Inland, was entirely responsible for the plant's operation. Further, Vulcan had represented to Inland that the continued operation of the plant would not violate any pending or existing environmental law. Vulcan was responsible for all of the lead discharges from the plant, as Inland had no experience operating the chlor-alkali facility and relied on Vulcan to operate the plant in accordance with the law based on Vulcan's contractual representations. An operator whose actions are the sole cause of environmental damage must be allocated the majority of the responsibility. McKesson deserves a lesser allocation than Inland because it had limited knowledge about the chlor-alkali process, did not believe it to be an environmentally hazardous operation and did not accept lead discharge limit exceedances under the Purchase Agreement.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

SCHIFFENHAUS PACKAGING CORPORATION

Facility Name, Address and Size: Schiffenhaus Packaging Corporation (Schiffenhaus); 1909 to 1924: 49 Fourth Street, Newark, NJ (acreage unavailable)

1. **Business Type:** Manufacturer of pre-printed linerboard and corrugated and solid fiber boxes; specializes in corrugated boxes and corrugated display items, coated or laminated packaging paper or plastic film; manufactures non-wooden partitions, shelving or lockers. The facility manufactures corrugated sheets that are, in turn converted into corrugated cartons, displays and other corrugated products (PAS-00017806-07).

2. **Time Period of Ownership/Operations**

   Operator: 1909 - 1924
   Owner: 1909 - 1924

   Schiffenhaus was started by William and Max Schiffenhaus under the name "Schiffenhaus Bros" in 1895; it was incorporated in the state of New Jersey on February 4, 1926, as "Schiffenhaus Packaging Corporation" (PAS-00017804; PAS-00018007). On July 28, 1981, Schiffenhaus Industries, Inc. was incorporated in the state of New Jersey. Schiffenhaus Industries, Inc. purchased the outstanding capital stock of privately held Schiffenhaus Packaging Corp. on November 24, 1981 and continued the business as a subsidiary (PAS-00017804; PAS-00018005).

   In March 2006, Southern Container Corporation announced the acquisition of Schiffenhaus Industries, Inc. (PAS-00017804; PAS-00018063). Southern Container Corporation is also listed as having ownership of Schiffenhaus in a 2006 permit application (PAS-00017855). On January 1, 2009 Schiffenhaus Packaging Corporation was merged into Southern Container Corp. (PAS-00033644). According to a letter prepared by legal counsel for Schiffenhaus, dated May 11, 2010, Southern Container Corporation is a wholly-owned subsidiary of Rock-Tenn Company (PAS-00033644).

3. **Operational History/COC Use and Presence at the Facility**

   The facility manufactures corrugated sheets that are converted into corrugated cartons, displays, and other corrugated products (PAS-00017806). According to the "PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corporation," site operations have been consistent since they began in 1895 (PAS-00017809). However, it is noted that according to a letter prepared by Toner and DiBenedetto on behalf of Schiffenhaus, dated March 11, 2010, operations did vary over time as follows:

   1909: Schiffenhaus moved its operations to a facility located at 49 Fourth St.

   1909-1915: Schiffenhaus reported that they continued to use the same raw materials and manufacture the same products as was done at the Academy Street facility (PAS-00033645)

4. Identified COCs

There is no information regarding COCs in the available file material.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

5. COC Pathways

Sanitary and Storm Sewer

There is no information regarding sewers in the available file material.

Direct Discharge

According to the "PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corporation," between 1895 and 1924 wastewaters discharged from the facility were likely discharged directly to the Passaic River via the Delavan Avenue CSO until the municipal sewers were tied into the PVSC system in 1924 (PAS-00017809; PAS-00031298).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

There is no information regarding response actions in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

SCHIFFENHAUS PACKAGING CORPORATION

Facility Name, Address and Size: Schiffenhaus Packaging Corporation (Schiffenhaus); 1895 to 1908: 204 Academy Street, Newark, NJ (acreage unavailable)

1. **Business Type:** Manufacturer of pre-printed linerboard and corrugated and solid fiber boxes; specializes in corrugated boxes and corrugated display items, coated or laminated packaging paper or plastic film; manufactures non-wooden partitions, shelving or lockers. The facility manufactures corrugated sheets that are, in turn converted into corrugated cartons, displays and other corrugated products (PAS-00017806-07).

2. **Time Period of Ownership/Operations**

   Operator: 1895 - 1908
   Owner: 1895 - 1908

   Schiffenhaus was started by William and Max Schiffenhaus under the name "Schiffenhaus Bros" in 1895; it was incorporated in the state of New Jersey on February 4, 1926, as "Schiffenhaus Packaging Corporation" (PAS-00017804; PAS-00018007). On July 28, 1981, Schiffenhaus Industries, Inc. was incorporated in the state of New Jersey. Schiffenhaus Industries, Inc. purchased the outstanding capital stock of privately held Schiffenhaus Packaging Corp. on November 24, 1981 and continued the business as a subsidiary (PAS-00017804; PAS-00018005).

   In March 2006, Southern Container Corporation announced the acquisition of Schiffenhaus Industries, Inc. (PAS-00017804; PAS-00018063). Southern Container Corporation is also listed as having ownership of Schiffenhaus in a 2006 permit application (PAS-00017855). On January 1, 2009 Schiffenhaus Packaging Corporation was merged into Southern Container Corp. (PAS-00033644). According to a letter prepared by legal counsel for Schiffenhaus, dated May 11, 2010, Southern Container Corporation is a wholly-owned subsidiary of Rock-Tenn Company (PAS-00033644).

3. **Operational History/COC Use and Presence at the Facility**

   The facility manufactures corrugated sheets that are converted into corrugated cartons, displays, and other corrugated products (PAS-00017806). According to the "PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corporation," site operations have been consistent since they began in 1895 (PAS-00017809). However, it is noted that according to a letter prepared by Toner and DiBenedetto on behalf of Schiffenhaus, dated March 11, 2010, operations did vary over time as follows:

   1895-1908: Schiffenhaus manufactured paper hat boxes and wood boxes/cases for the shipment of the paper hat boxes. Paper and wooden boxes were cut and glued by hand using purchased sheets of paper, wood and small pots of glue. Manufacturing took place at 204 Academy Street. Reportedly, no printing was conducted at this facility (PAS-00033645).

   1909: Schiffenhaus moved its operations to a facility located at 49 Fourth St.

The company reported in December 1994 that its production of corrugated products averaged 42 million square feet per month (PAS-00017806-07). It is noted that according to a letter prepared by Toner and DiBenedetto on behalf of Schiffenhaus dated March 11, 2010, this description is only accurate for the time period 1980 to the present (PAS-00033647).

4. Identified COCs

There is no information regarding COCs in the available file material.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

5. COC Pathways

Sanitary and Storm Sewer

There is no information regarding sewers in the available file material.

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Direct Discharge

According to the "PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corporation," between 1895 and 1924 wastewaters discharged from the facility were likely discharged directly to the Passaic River via the Delavan Avenue CSO until the municipal sewers were tied into the PVSC system in 1924 (PAS-00017809; PAS-00031298).

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

There is no information regarding response actions in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

SCHIFFENHAUS PACKAGING CORPORATION

Facility Name, Address and Size: Schiffenhaus Packaging Corporation (Schiffenhaus); 1925 to 2007: 2013 McCarter Highway, Newark, NJ; Approximately 4 acres (PAS-00031298; PAS-00017835; PAS-00018010). In 2006, there were 150 employees working 250 days a year, 2 shifts a day (PAS-00017835).

1. **Business Type:** Manufacturer of pre-printed linerboard and corrugated and solid fiber boxes; specializes in corrugated boxes and corrugated display items, coated or laminated packaging paper or plastic film; manufactures non-wooden partitions, shelving or lockers. The facility manufactures corrugated sheets that are, in turn converted into corrugated cartons, displays and other corrugated products (PAS-00017806-07).

2. **Time Period of Ownership/Operations**

   Operator: 1925 - 2007
   Owner: 1925 - 2007

   Schiffenhaus was started by William and Max Schiffenhaus under the name "Schiffenhaus Bros" in 1895; it was incorporated in the state of New Jersey on February 4, 1926, as "Schiffenhaus Packaging Corporation" (PAS-00017804; PAS-00018007). On July 28, 1981, Schiffenhaus Industries, Inc. was incorporated in the state of New Jersey. Schiffenhaus Industries, Inc. purchased the outstanding capital stock of privately held Schiffenhaus Packaging Corp. on November 24, 1981 and continued the business as a subsidiary (PAS-00017804; PAS-00018005).

   In March 2006, Southern Container Corporation announced the acquisition of Schiffenhaus Industries, Inc. (PAS-00017804; PAS-00018063). Southern Container Corporation is also listed as having ownership of Schiffenhaus in a 2006 permit application (PAS-00017855). On January 1, 2009 Schiffenhaus Packaging Corporation was merged into Southern Container Corp. (PAS-00033644). According to a letter prepared by legal counsel for Schiffenhaus, dated May 11, 2010, Southern Container Corporation is a wholly-owned subsidiary of Rock-Tenn Company (PAS-00033644).

3. **Operational History/COC Use and Presence at the Facility**

   The facility manufactures corrugated sheets that are converted into corrugated cartons, displays, and other corrugated products (PAS-00017806). According to the "PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corporation," site operations have been consistent since they began in 1895 (PAS-00017809). However, it is noted that according to a letter prepared by Toner and DiBenedetto on behalf of Schiffenhaus, dated March 11, 2010, operations did vary over time as follows:

   1925: Schiffenhaus moved to its current location on McCarter Highway, and phased out the production of paper and wooden boxes. Similar to historical operations, the original corrugating machine employed at this facility used silicate of soda as an adhesive (PAS-00033646).

1930s: Schiffenhaus began performing a “very limited amount” of printing directly on corrugated boxes. The machines utilized for printing were "printer slotters" that creased, slotted and printed sheets to be made into boxes. Reportedly, all printing involved oil-based inks, which could not be removed with wash water. The printer slotters were cleaned by hand with rags. Schiffenhaus employed a service which laundered the rags on a regular basis. Reportedly, there was “very little waste (and no process wastewater)” associated with the early printing process (1930s-1965) (PAS-00033647).

1948: Schiffenhaus purchased a new corrugator machine which used a corn starch-based adhesive (PAS-00033647).

1965: Schffenhaus purchased its first flexographic printing machine. Printing was limited to only 10% coverage of a regular slotted carton box and was performed at slow speeds. At this point in time, Schffenhaus began purchasing water-based flexographic inks (PAS-00033647).

1965-1975: Schffenhaus used primarily red and black water-based inks. A greater variety of inks were introduced once Schffenhaus began manufacturing display boxes. A new “Langston” corrugator was purchased in 1972, which continued to use the same type of cornstarch-based adhesive (PAS-00033647).

1975: Schffenhaus purchased a new flexographic printing machine with increased printing capability. At this time, Schffenhaus also began producing display boxes for the display industry. Schffenhaus noted that any discharge of wastewater associated with the increased printing operations occurred at the same time a federal NPDES permit was issued to PVSC (It is reported that PVSC obtained a NPDES permit on February 28, 1975 (PAS-00018073).

1979/1980: Schffenhaus purchased its first preprint machinery in late 1979 and begin pre-print operations in 1980. According to Schiffenhaus, any wastewater associated with the preprint operations was discharged during the time period that PVSC was covered under the NPDES permit (PAS-00033648).

The company reported in December 1994 that its production of corrugated products averaged 42 million square feet per month (PAS-00017806-07). It is noted that according to a letter prepared by Toner and DiBenedetto on behalf of Schiffenhaus dated March 11, 2010, this description is only accurate for the time period 1980 to the present (PAS-00033647). With respect to wastewater treatment, since at least 1998, Schiffenhaus has employed a batch wastewater pretreatment process using filter presses. Wastewater is collected in a 5,000-gallon holding tank, which then undergoes alum flocculation to remove copper and zinc so that these contaminants can be filtered out of the wastewater. All wastewater, including condensate from the facility boilers, is routed to the pretreatment system prior to its discharge to the municipal combined sewers. Wastewater pretreatment processes employed prior to 1998 are unknown (PAS-00017808). This wastewater treatment process to remove metals was also reported by the facility in 2006 (PAS-00017840).

4. Identified COCs

- Copper (use and generated)
- Lead (generated)
- Mercury (generated)

Metals – Copper, Lead, Mercury

In 1995, Schiffenhaus determined that a source of copper in facility wastewater was printing inks utilized at the facility (PAS-00017999). Hazardous material use reported by the facility in 1996-1997 included "copper in pigments" (PAS-00017807).

Notices of violation and/or reports of non-compliance detailed in Section 7 below indicate that copper, lead, and mercury have been identified in facility wastewater at concentrations that exceed established compliance limits.

Historic Fill

The Allocation Team has determined that the 2013 McCarter Highway facility site is located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

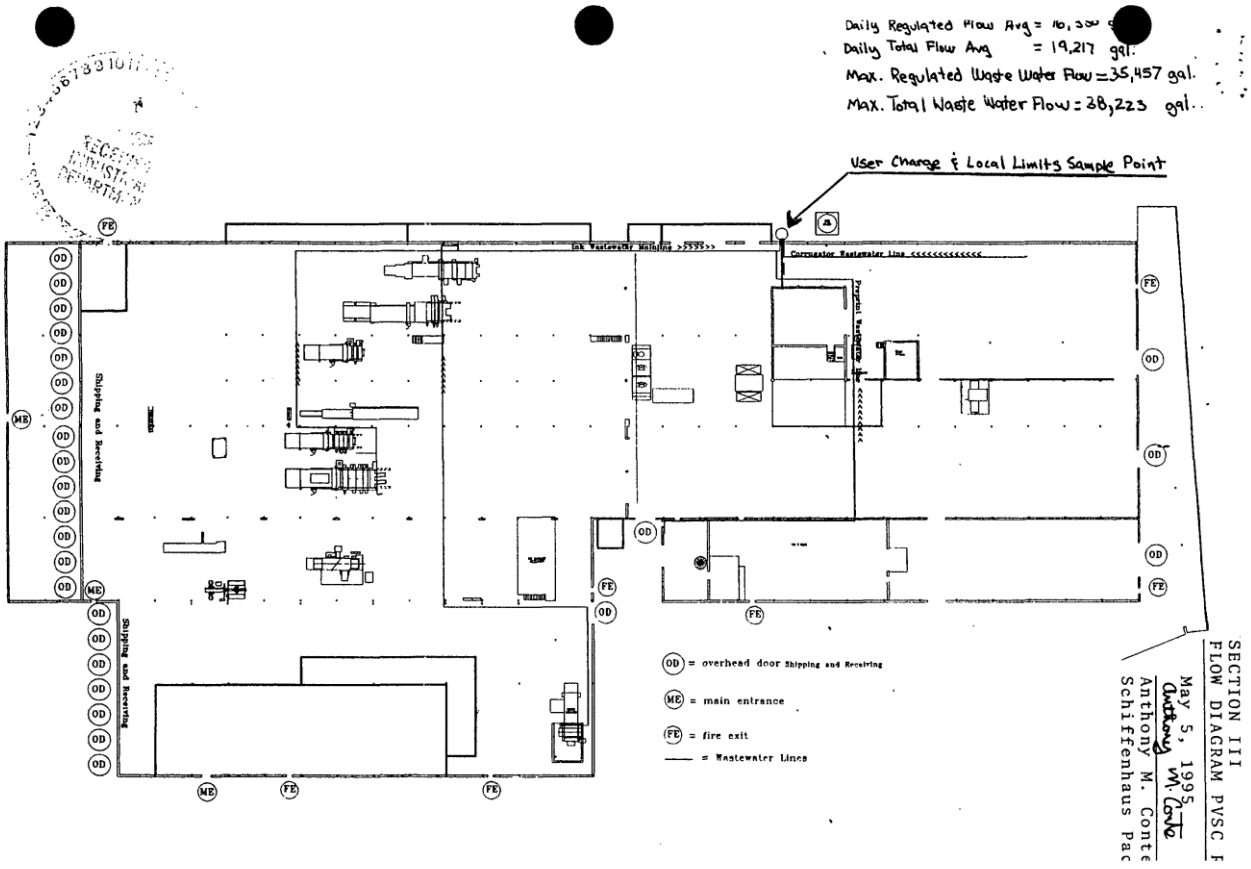
[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Sanitary Sewer

In 1996 and 2006, all sanitary and process wastewater was reported by the facility to be discharged to the sanitary/combined sewer. No stormwater discharges were reported (PAS-00017909**;** PAS-00017838). In 1998, the facility reported that stormwater was discharged to the sanitary sewer (PAS-00017961).

A facility layout is presented below (PAS-00017984).



Direct Discharge

PVSC documentation indicates that wastewater generated at the 2013 McCarter Highway facility, including its industrial wastewater, are routed into a combined sewer located on McCarter Highway along the eastern border of the site. The sewer tie-in is situated approximately 350 feet south of the intersection of McCarter Highway and Verona Avenue in Newark (PAS-00017809).

It is noted, however, that PVSC did not obtain a NPDES permit until February 28, 1975 (PAS-00018073). Therefore, it is reported in the "PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corporation" that between 1924 and 1975, the wastewater discharge from Schiffenhaus to the PVSC system and its Delavan Avenue CSO location was likely bypassed to the Passaic River from the municipal tie-in. Based on this, it is reported in the "PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corporation" that discharge from Schiffenhaus was released to the Passaic River over an approximately 51-year period without a NPDES permit (PAS-00017811); however, COC uses and releases from the facility were not documented in the available file material until the mid-1990s (PAS-00017807; PAS-00017812; PAS-00017999).

6. Regulatory History/Enforcement Actions

Inspections and Violations

The following Notices of Violation (NOVs) and/or reports of non-compliance with wastewater discharge permits are associated with Schiffenhaus:

According to a letter prepared by PVSC, dated January 10, 1997, a December 1994 Baseline Monitoring Report indicated Schiffenhaus was "out of compliance" for copper. A NOV was issued by PVSC to Schiffenhaus for this exceedance in October 1996. Schiffenhaus subsequently advised in a July 1996 letter that the copper source may be copper phthalocyanine pigments (PAS-00017812; PAS-00017942; PAS-00017954). Note that available references do not include copies of the Baseline Monitoring Report and sewer connection permits.

In May 1995, Schiffenhaus was "out of compliance" with "Local Pretreatment Limitations" for copper (PAS-00017986-87). Reportedly, the facility was over the "threshold limit" for cadmium, chromium, copper, mercury and lead (PAS-00017991).

Sampling conducted by PVSC in September 1996 indicated that Schiffenhaus was "out of compliance" for both copper and zinc. A NOV was issued by PVSC to Schiffenhaus for this exceedance in October 1996 (PAS-00017812; PAS-00017951; PAS-00017986-88).

In January 1997, a NOV was issued by PVSC to Schiffenhaus due to the facility's failure to meet compliance milestones established in its Sewer Connection Permit for "local limits" on metals. According to the NOV, Schiffenhaus had advised a PSVC inspector that it was considering the installation of either chemical filtration or membrane filtration systems, but had yet to do so by the stipulated compliance schedule. PVSC advised that "several other milestones" stipulated in the Sewer Connection Permit had not been met at the time of the January 1997 inspection. PVSC advised that Schiffenhaus was determined to be in "significant non-compliance" with PVSC rules and regulations (PAS-00017812; PAS-00017941-42).

On October 17, 1997, PVSC filed a complaint in the Superior Court of the State of New Jersey against Schiffenhaus. The complaint alleged that Schiffenhaus violated its PVSC discharge permit by not being in compliance with “local pretreatment limits” established by the permit. Schiffenhaus agreed to pay a fine of $1,000 to settle the PVSC legal action (PAS-00017813; PAS-00017933).

Permits

Available file material indicates Schiffenhaus held PVSC Sewer Connection Permit No. 20403642 from July 14, 1996, through July 14, 2001 (PAS-00017935). In approximately 2006, Schiffenhaus applied for a PVSC Sewer Use Permit for the McCarter Highway location (PAS-00017835); the permit (20220038) was effective April 1, 2006, through March 31, 2011 (PAS-00017886). The application states that there were 150 employees working 250 days a year, 2 shifts a day (PAS-00017835). There was an estimated 3,349,403 gallons of process wastewater released to the sanitary combined sewer in 2005 (PAS-00017838). Outlet 20210037 received 13,398 gallons per day of process wastewater (PAS-00017841). An analysis of the industrial wastewater showed 0.102 mg/l copper and <0.0005 mg/l mercury (PAS-00017842). In the application, copper is noted as known to be present in the wastewater (PAS-00017847).

7. Response Actions

There is no information regarding response actions in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

SEQUA CORPORATION

Facility Name, Address and Size: Sequa Corporation, 185 Foundry Street, Newark, New Jersey; Approximately 0.8 acres (PAS-00044626); Sun Chemical Company occupied Building Nos. 23, 31, 32, 33, 34 and 34A on Lot 22.01 from 1967 to 1991 (PAS-00000242).

9 employees as of 1975; Operated 2 shifts per day, 5 days a week (PAS-00111828)
11 employees as of 1976 (PAP-00049166)
16 employees as of 1978; Operated 24 hours, 5 days a week (PAS-00000672)
15 employees as of 1980 (PAP-00374549; PAS-00014623)
10 employees as of 1985; Operated 3 shifts per day, 209 days per year (PAS-00044688)

1. **Business Type:** Organic pigment manufacturer (PAS-00000672). The pigments are used in the automobile industry, printing inks, and plastics (PAS-00000190; PAS-00105580; PAS-00128904).

2. **Time Period of Ownership/Operations**

   Operator: 1967 to December 31, 1986
   Owner: KEM Realty (1962-1971)/Foundry Street Corp. (1971-1990)

   The site at 185 Foundry Street was owned by KEM Realty Company from May 17, 1964 to May 3, 1971; then by Foundry Street Corporation from May 3, 1971 to November 20, 1990 (PAS-00008259; PAS-00008343-48; PAS-00008356-57; PAS-00111410). However, according to a *Request for Information*, dated August 23, 1996, the site at 185 Foundry Street was owned by KEM Realty Company from May 17, 1962 to May 3, 1971 (PAS-00008307).

   The lessee and operator of the site was Sun Chemical Corporation from 1967 to December 31, 1986 (PAS-00008259-60; PAS-00008307; PAS-00044098; PAS-00044630; PAS-00045525; PAS-00047105; PAS-00111390; PAS-00111410).

   According to *the Sequa Corporation Nexus and Request for De Minimis Settlement*, dated September 9, 2016, in December 1986, Sun/DIC Acquisition Corporation (the entity that changed its name to Sun Chemical Corporation) acquired certain pigment operations, including those at the Foundry Street site, from Sun Chemical Corporation (the entity that changed its name to Sequa Corporation) in an asset transaction (PAS-00047084). Sequa Corporation's 1987 Annual Report lists the date of sale as December 30, 1986 (PAS-00053981). Sun Chemical Corporation changed its name to Sequa Corporation on May 8, 1987 (PAS-00053973; PAS-00053978).

3. **Operational History/COC Use and Presence at the Facility**

   According to the *Evaluation of Alleged Nexus of Sequa Corporation to Lower Passaic River Study Area Superfund Site*, prepared for Sequa Corporation, dated September 9, 2016, manufacturing operations did not include the use of OU2 contaminants of concern (COCs) (PAS-00044631-33). In addition, according to a *Sun/DIC Acquisition Corporation Site Evaluation Submission*, dated February 22, 1987, a 1987 chemical

inventory did not include any of OU2 COCs for the Passaic River site (PAS-00044731-32).

According to a *Responsible Party Investigation Memorandum*, dated April 3, 1991, the production of red pigment utilized glacial acetic acid. Spent acid generated from the process was pumped to a tank where it was neutralized with caustic soda and discharged to the Passaic Valley Sewerage Commission (PVSC) (PAS-00000190; PAS-00044721; PAS-00047107; PAS-00111740; PAS-00128852).

According to the *Responsible Party Investigation Memorandum*, dated April 3, 1991, effluent generated from the production of violet pigment consisted of alcohol and phosphoric acid and was pumped to a neutralization tank for treatment with caustic soda. After the pH was adjusted the effluent was discharged into the PVSC (PAS-00000191; PAS-00047107; PAS-00128852). Caustic soda was used to neutralize process effluent in two interconnected 1,500-gallon aboveground storage tanks situated between Building Nos. 23 and 31. The treated effluent was discharged into a sump connected to an industrial sewer located on the adjacent property (Lot 4) owned by Norpak Corporation. Sun Chemical Corporation discharged its effluent into the strip drainage system located on the west side of the site before the installation of the wastewater treatment unit (PAS-00000191; PAS-00044721; PAS-00047107).

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

According to the *Responsible Party Investigation Memorandum*, dated April 3, 1991, polychlorinated biphenyls (PCBs) were detected as part of the October 1986 Environmental Cleanup Responsibility Act (ECRA) sampling conducted at the site (PAS-00000191). The soil sample contained PCBs at 13 ppm and the swipe sample contained PCBs as PCB-1242 with a total concentration of 14 milligram per square foot (mg/ft^2) (PAS-00104286, 294; PAS-00111611). According to a letter prepared by NJDEP, dated October 11, 1995, NJDEP agreed with Sun Chemical Corporation's assessment that PCB contamination in soil was attributable to fill (PAS-00045465).

PAHs

According to the *Evaluation of Alleged Nexus of Sequa Corporation to Lower Passaic River Study Area Superfund Site*, prepared for Sequa Corporation, dated September 9, 2016, No. 2 fuel oil was used in the facility boiler (PAS-00044631).

According to the *Responsible Party Investigation Memorandum*, dated April 3, 1991, polynuclear aromatic hydrocarbons (PAHs) were detected as part of the October 1986 ECRA sampling conducted at the site (PAS-00000191, 203). Note: The results table for the October 1986 sampling only reported a total base neutral compound concentration of 1,700 ppm in the sediment rather than the individual PAH concentrations (PAS-00104294).

Metals – Cooper, Lead and Mercury

COCs found in discharges to the sewer include copper, lead, and mercury (PAP-00049170-75; PAP-00374554; PAS-00000682; PAS-00014611; PAS-00014626-28; PAS-00044679-81; PAS-00128871-73).

A December 3, 1976 Sun Chemical letter to PVSC stated that the sampling results of the effluent showed that minute quantities of mercury, copper, and lead could be residual contaminants in the sewer lines from previous chemical manufacturing at the site. It was stated that these chemicals were not used in any processes at the site and were not believed to be present as impurities in the chemicals Sun Chemical Corporation used (PAP-00049201). Note: The date of the sampling was not provided.

An August 1978 PVSC Industrial Wastewater Questionnaire reported previous sampling results for copper (0.16 milligrams per liter [mg/l]), lead (0.1 mg/l), and mercury (0.06 mg/l), with a daily flow of 46,100 gallons per day (PAS-00000682). It appears these data were collected over 16 hours on December 30, 1975 (PAS-00014611).

Results reported with a 1980 PVSC sewer connection application for samples collected on December 17, 1979 listed copper (0.16 mg/l), lead (0.90 mg/l), and mercury (<0.002 mg/l), with a daily flow of 55,000 gallons per day (PAP-00049170-75; PAP-00374554; PAS-00014626-28; PAS-00044679-81; PAS-00128871-73).

According to a *Responsible Party Investigation Memorandum*, dated April 3, 1991, in October 1986, sampling was conducted at the site as part of a preliminary investigation. One soil sample from adjacent to the solid waste dumpster, and one sediment sample from the catch basin were collected as well as one swipe sample taken of an oily stain on the boiler room floor. The sediment and soil samples contained priority pollutant metals (including copper, lead, and mercury) (PAS-00000191, 203). According to the *Results of Sampling and Analysis Plan and Clean Up Plan*, dated November 30, 1988, copper was detected at 3.0 parts per million (ppm) (sediment) and 5.4 ppm (soil); lead was detected at 150 ppm (sediment) and 380 ppm (soil); and, mercury was detected at 0.45 ppm (sediment) and 0.82 ppm (soil) (PAS-00104294). According to the *Responsible Party Investigation Memorandum*, dated April 3, 1991, contamination could have migrated onto the facility through the drainage system and leaks in the sewer system, and that recurring flooding of the drainage system may have distributed past sources of contamination throughout the facility (PAS-00000192).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the New Jersey Department of Environmental Protection (NJDEP).[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

However, according to a letter prepared by NJDEP, dated October 11, 1995, NJDEP agreed with Sun Chemical Corporation's assessment that PCB contamination in soil was attributable to fill at the site (PAS-00045465).

The levels of copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	380 mg/kg
Copper	5.4 mg/kg
Mercury	0.82 mg/kg

5. COC Pathways

Sanitary and Storm Sewer

According to a memorandum prepared by NJDEP dated April 3, 1991, the site is part of the Foundry Street Complex. Approximately 30 buildings were situated throughout the complex, separated by narrow driveways which had strip-like drains in the middle of the

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

lane. The drains were connected to an industrial sewer line on Roanoke Avenue and received surface water run-off and industrial discharge from companies in the complex (PAS-00000186).

A December 1975 Waste Effluent Survey for Sun Chemical Corporation reported that 4,196,337 gallons of water were discharged to the sanitary sewer system in 1974. No water was reported as being discharged to a storm sewer or ditch (PAS-00111828-29; PAS-00128843-44).

A November 1976 Waste Effluent Survey for Sun Chemical Corporation reported that 8,454,000 gallons of water were discharged to the sanitary sewer system in 1976. No water was reported as being discharged to a storm sewer or ditch. The survey included results for copper (0.16 mg/l), lead (0.1 mg/l), and mercury (0.06 mg/l) from a 16 hour timeframe sample collected on December 30, 1975 (PAP-00049166-68). According to a letter from Sequa Corporation to PVSC, dated December 3, 1976, copper, lead, and mercury were not used in any form in Sequa Corporation's processes and to their knowledge were not present as impurities in any chemicals used. The letter stated the COCs were possibly attributable to residual trace metals in the sewer lines from previous manufacturers (PAP-00049201).

As a result of an October 1978 discharge of red dye to the Passaic River (which was not documented to contain OU2 COCs), Sun Chemical Corporation's discharge was inspected (PAS-00044634; PAP-00374544). It was stated that a concrete channel covered with metal plates diverts the wastes to a catch basin on Foundry Street from whence it flows to a combined sewer (PAP-00374544). This combined sewer consists, in part, of outdoor surface trench drains at portions of adjacent operators Arkansas Chemical and Automatic Electro Plating and subsurface piping to Roanoke Avenue. The Roanoke Avenue sewer then connects to a sewer on Doremus Avenue, which flows to the PVSC treatment works. There is a combined sewer overflow outfall to the Passaic River at the foot of Roanoke Avenue (PAS-00044625-26). According to a October 23, 1978 letter prepared by PVSC, since the city sanitary line on Doremus Avenue does not have the capacity to accept all of the flow from Roanoke Avenue, it overflows into the storm sewer and enters the Passaic River (PAP-00374544). It was also stated that Arkansas Co. Inc. was a chemical company next door which also used the same concrete channel (PAP-00374545).

A June 1979 Effluent Neutralization and pH Control Report documents that all of Sun Chemical Corporation's production effluent was discharged to the PVSC system (PAP-00374547; PAS-00105476-77; PAS-00128867).

An Industrial Pretreatment Program Annual Report, dated September 27, 1984, covering the period August 1, 1983 to July 31, 1984, reported that Sun Chemical had an average daily flow of 0.080 million gallons per day (mgd) into the PVSC sewer (PAP-00120043).

An *Industrial Pretreatment Program Annual Report*, dated July 1987, covering the period August 1, 1986 to July 31, 1987, reported that Sun Chemical Corporation had an average daily flow of 0.043 mgd into the PVSC sewer (PAP-00123478).

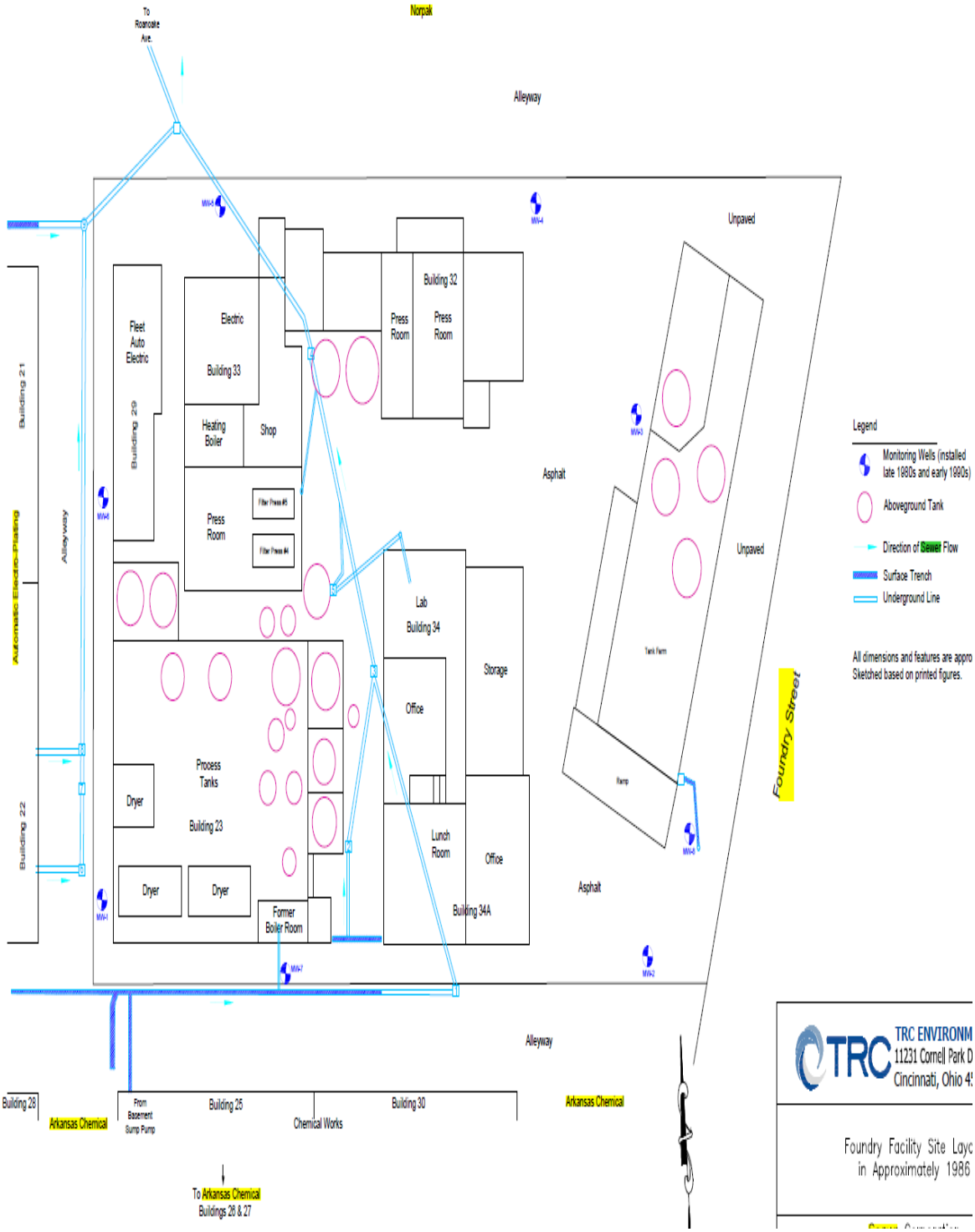
Sequa Corporation

Diamond Alkali OU2 Allocation

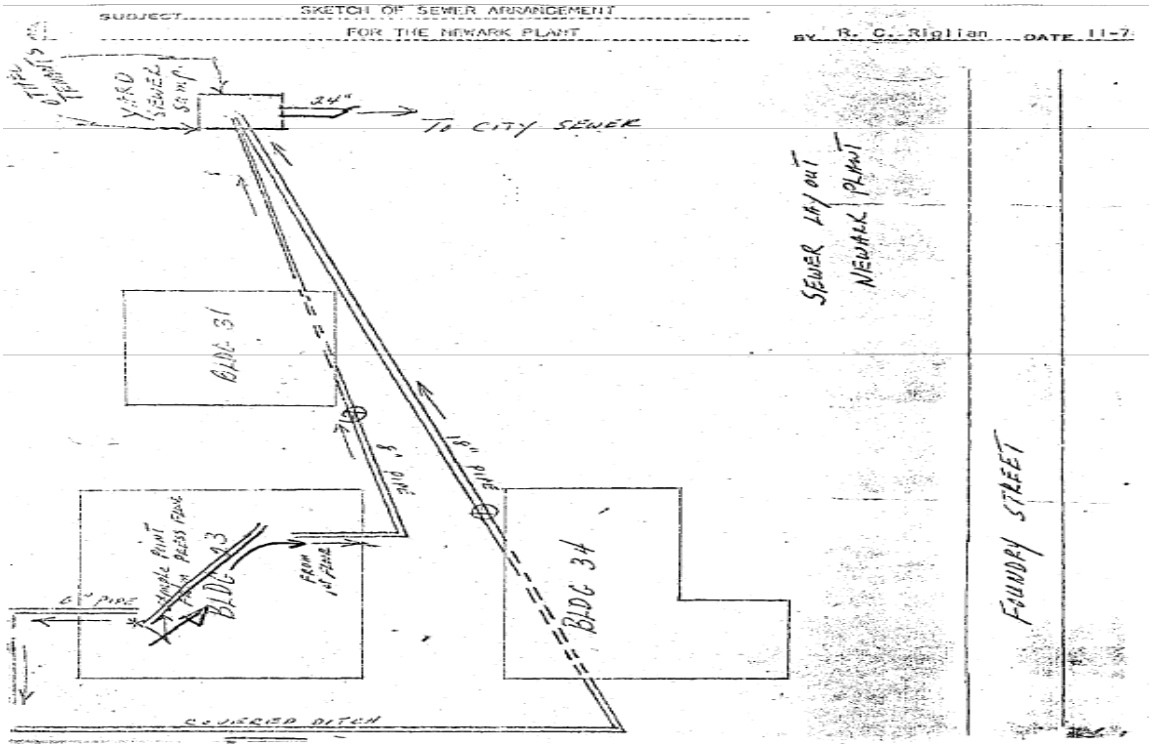
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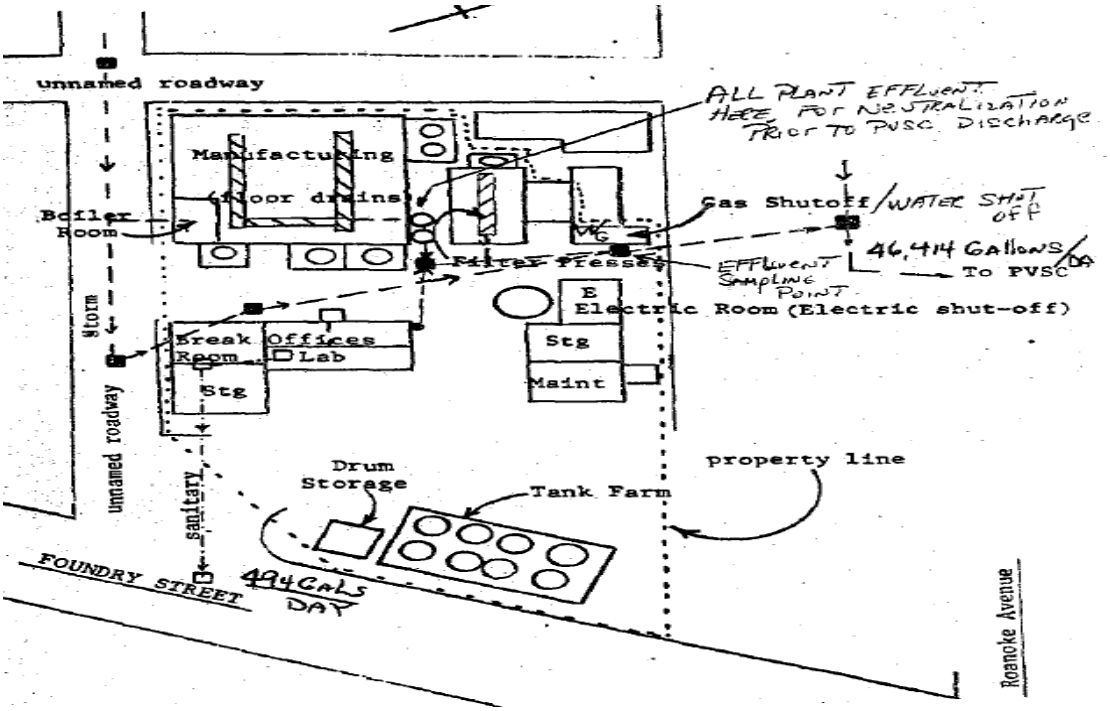
The following diagram illustrates the drainage system at Sun Chemical Corporation's site in 1986 (PAS-00044655):



A sewer layout from the 1970s is presented below (PAS-00044682):



A drainage plan in 1988 is presented below (PAP-00049180):



It is reported that the Roanoke Avenue combined sewer system and outfall to the Passaic River was documented by PVSC to have been inoperative in the late 1970s, allowing “polluting discharges” to enter the sewer system and discharge to the Passaic River. No discharges were specifically attributed to Sequa Corporation (PAS-00114295, 311, 320).

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations with respects to COCs in the available file material.

Permits

A June 1977 Industrial Sewer Connection Application for Sun Chemical reported a discharge rate of 37,000 to 45,000 gallons per day (PAP-00374662).

Residuals from the manufacturing process are processed through on-site wastewater treatment works for pH adjustment and discharged to the PVSC sewer system under permit No. 204-010-42 (PAS-00111371, 388, 395).

7. Response Actions

Characterization Activities

According to a *Responsible Party Investigation Memorandum*, dated April 3, 1991, in October 1986, sampling was conducted at the site as part of a preliminary ECRA investigation. One soil sample from adjacent to the solid waste dumpster, and one sediment sample from the catch basin were collected as well as one swipe sample taken of an oily stain on the boiler room floor. The sediment and soil samples contained PCBs and priority pollutant metals (including copper, lead, and mercury) in addition to VOCs and petroleum hydrocarbons. The soil sample contained PCB at 13 ppm. Copper was detected at 3.0 ppm (sediment) and 5.4 ppm (soil); lead was detected at 150 ppm (sediment) and 380 ppm (soil); and, mercury was detected at 0.45 ppm (sediment) and 0.82 ppm (soil) (PAS-00104294). PCBs were also detected in the swipe sample as PCB-1242 with a total concentration of 14 mg/ft^2 (PAS-00000191, 203; PAS-00104286; PAS-00111611). This initial investigation identified three areas of environmental concern: the catch basin and drain system; the soil adjacent to solid waste dumpster; and, the boiler room (PAS-00044892; PAS-00104286; PAS-00111691; PAS-00128962).

Remedial Activities

All remedial activities took place following the December 31, 1986 asset transfer from Sun Chemical to Sun/DIC Acquisition Corporation.

Soil sampling and remediation took place to remove PCB contaminated soils and groundwater from the site. A total of 1,400 cubic yards of PCB-impacted soils were removed from accessible exterior areas, which were generally excavated to a depth of two feet. A total of 165 cubic yards of PCB-impacted soils were removed from the former Boiler Room floor, which was excavated to a maximum depth of 5.5 feet (PAP-00124050). To accommodate excavation in the former Boiler Room, approximately 2,300 gallons of impacted groundwater was also removed (PAP-00124085).

On July 25, 1997, the NJDEP issued No Further Action letters for the soil and groundwater investigation and remediation activities conducted at the site under Industrial Site Recovery Act Case Numbers 86960 and 90690 (PAP-00382238-41).

8. Summary of Asserted Defenses

Sequa asserts that at most, Sequa is a de minimis party and should receive an allocation share that comports with its de minimis status. Specifically, under CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act], a party is de minimis when both of the following are minimal in comparison to other hazardous substances at the site: (i) the amount of the hazardous substances contributed by that party to the site, and (ii) the toxic or other hazardous effects of the substances contributed by that party to the site. 42 U.S.C. § 9622(g)(1)(A). Sequa satisfies both criteria.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

SETON COMPANY, INC. /SETON LEATHER COMPANY

Facility Name, Address and Size: Seton Leather Company (Seton); 10 acres (PAS-00124506)

- 62 Verona Avenue, Newark, New Jersey
- 349 Oraton Street, Newark, New Jersey
- 849 Broadway, Newark, New Jersey (PAS-00000628; PAS-00102324);

In 1980, a Sewer Connection Application with the Passaic Valley Sewerage Commission (PVSC) states that there were 450 employees, 5 days per week with 3 shifts per day (PAS-00102304-305).

1. **Business Type:** Leather tanning and finishing (PAS-00000628). The facility was primarily engaged in tanning and distribution of leather goods to the automobile and furniture upholstery industries (PAS-00008182).

2. **Time Period of Ownership/Operations**

   Operator: 1906-2006
   Owner: 1906-2006 (PAS-00124506)

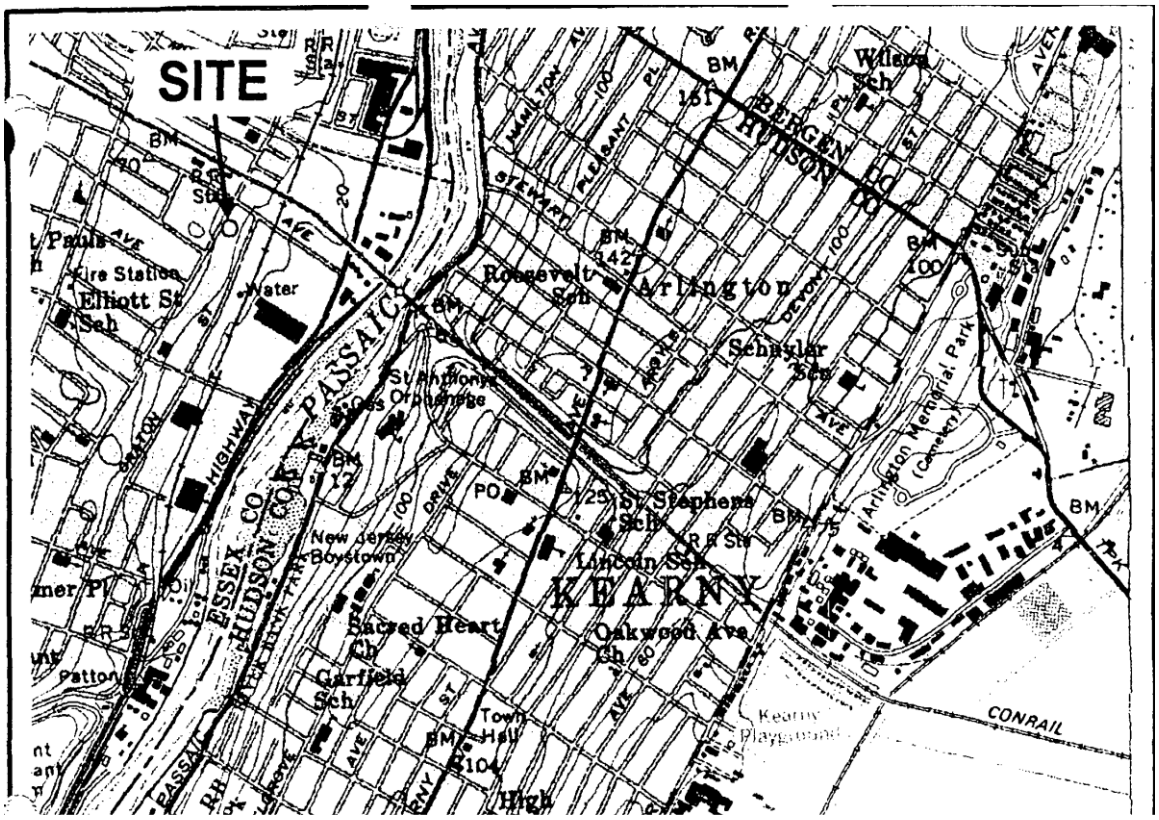
   Seton was founded by Joseph Kaltenbacher, Joseph V. Clark, and Philip Murray in 1906. It was originally located at 62 Verona Avenue. It is reported the company expanded twelve hundred feet down Oraton Street to Broadway. It appears that the Verona Avenue, Oroton Street and Broadway addresses are all contiguous to each other. Seton became a public company in 1927. Seton moved to 849 Broadway in the late 1950s (PAS-00102324). In 1990, Philip Kaltenbacher was identified as the chief executive officer of Seton (PAS-00008182).

3. **Operational History/ COC Use and Presence at the Facility**

   Seton began operations in 1906; this included patent leather manufacturing. In the 1940s, the facility produced leather for the shoe and handbag industries. In 1956, patent leather was reported to be 40 percent of annual output (PAS-00102324). In 1972, it was reported that salt-cured cowhides were dehaired, tanned and dyed and the resultant leather was dried and finished for offsite shipment (PAS-00102287). Cowhide byproduct processing was also reported in 1980 (PAS-00102304). The general location of the facilities is shown on the map below.

   A June 6, 1975 Waste Effluent Survey states that the 849 Broadway location had 350 employees working 5 days per week with 3 shifts per day (PAS-00102299). In 1974, 93,100,000 gallons of wastewater was released to the sanitary sewer (PAS-00102300).

   In 1980, a Sewer Connection Application with the Passaic Valley Sewerage Commission (PVSC) states that there were 450 employees, 5 days per week with 3 shifts per day (PAS-00102304-305).



(PAS-00102389)

4. Identified COCs

- PCBs (use and detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

According to a letter prepared by Metcalf & Eddy (Seton's environmental consultant), dated April 24, 1990, in September 1989, Metcalf & Eddy collected two soil samples from stained soil located adjacent to several transformers at the facility. The staining was reported to be the result of dripping valves. PCBs were detected at concentrations of 5.4 ppm and 39 ppm. The contaminated soil was excavated and disposed offsite (PAS-00008173).

Metals – Copper, Lead and Mercury

In 1972, raw materials used by the facility were reported to be cured cowhides, salt, sulfuric acid, calcium hydroxide, basic chromium sulfate, and various leather finishes (PAS-00102287). Trivalent chromium was the only contaminant listed as a component of wastewater (PAS-00102289). In 1975, a sample of waste effluent contained copper at a concentration of "less than 0.946" parts per million (ppm) (likely indicating that the result was "non-detect" for copper) and lead at 0.95-4.75 ppm; these results were

described as "semiquantitative" (PAS-00102293-PAS-00102294). A 24-hour flow-proportioned composite sample was collected in 1979, and lead was reported at a concentration of 4.08 mg/l and mercury was reported at a concentration of 0.135 mg/l (PAS-00102307).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

There is no information regarding sampling in the available file material.

5. COC Pathways

Combined Sewer Outlet

According to a letter prepared by Seton, dated February 12, 2007, Seton is located approximately 1,000 feet inland from the Passaic River. Seton stated that "the only alleged connection between Seton's former operations and the Passaic River are possibly some inadvertent discharges by the combined sewer outlet ("CSO") due to sewer overflows or otherwise heavy rain conditions" (PAS-00124505 - PAS-00124509).

No additional information on pathways through which contaminants could be discharged to the Passaic River were available. A facility layout is presented below (PAS-00102309).

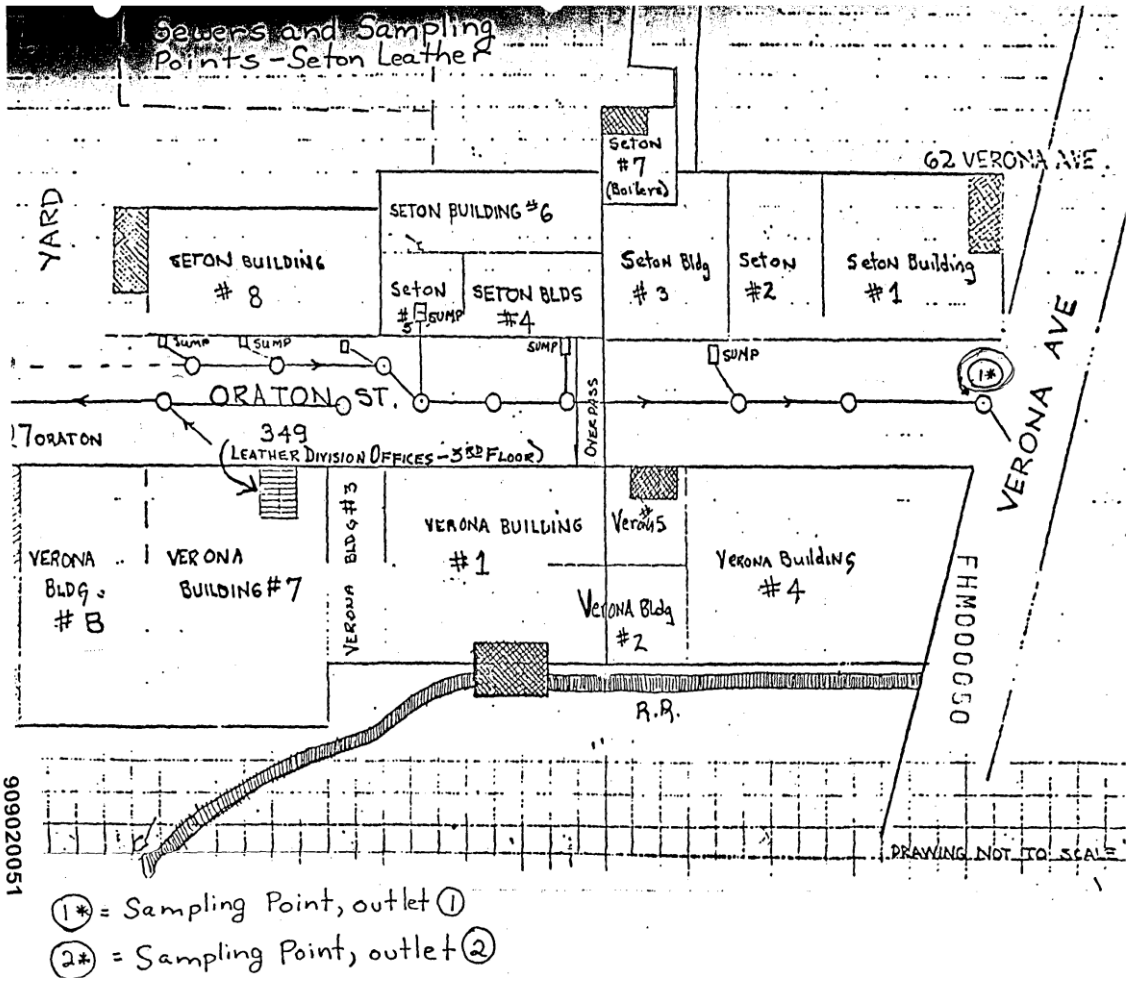
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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).



Sanitary Sewer

In 1971, 1974, and 1979, the facility reported that all wastewater was discharged to the sanitary sewer, and no water was discharged to the “storm sewer, river, or ditch.” Discharge was reported to be continuous over a 24-hour period (PAS-00102288-89; PAS-00102300-PAS-00102301; PAS-00102306).

6. Regulatory History/ Enforcement Actions

Inspections and Violations

There is no information regarding discharges of COCs or associated violations in the available file material; however, the following is noted:

- A letter prepared by PVSC, dated April 13, 1956, stated that on that same date PSVC had visited Seton to discuss “the problem of dumping solid industrial waste into the sanitary sewer.” According to the letter, Mr. Weldon, the plant

superintendent, “readily admitted dumping various solids into their sanitary sewer in the process of cleaning. He also stated that frequently his men have to clean out the Newark sewer outside their building because of clogging with their waste” (PAS-00102266).

- According to a memo prepared by PVSC, dated July 10, 1978, PSVC documented poor housekeeping and illegal industrial discharges to the combined sanitary and storm sewer system on Verona Avenue. Reportedly, the discharged material contained “high pH liquids as well as animal fats, greases and oils.” Seton representatives indicated that they could not afford the pre-treatment that was required (PAS-00008172).

- It was reported in 1990 that PVSC and Seton were engaged in litigation in Superior Court in Newark over the company's alleged violation of its sewer connection permit and its alleged violation of PVSC rules concerning the pre-treatment of discharge into the sewer system (PAS-00008182). According to the Civil Action Consent Order filed on May 2, 1991, Seton’s wastewater discharge continued to exceed “pretreatment effluent limitations” for chromium, sulfur, and pH (PAS-00102337-338).

- On December 11, 1990, the New Jersey Department of Environmental Protection (NJDEP) filed a “Duty Office Notification Report” stating that a blue liquid was observed discharging into the Passaic River; Seton was listed as the responsible party (PAS-00102267). According to a letter prepared by Seton, dated February 12, 2007, “the New Jersey Department of Environmental Protection's claims of direct discharge by Seton to the Passaic River on December 11, 1990 are incorrect. Specifically, an investigation on December 11, 1990 by the New Jersey State Police, the U.S. Coast Guard and the PVSC exonerated Seton as the discharger and identified a neighboring company as the true and actual source of direct discharge to the Passaic River” (PAS-00124506).

Permits

On February 12, 1980, Seton filed a Sewer Connection Application with the Passaic Valley Sewerage Commission (PVSC) (PAS-00102304-305). Analytical results of effluent showed lead at 4.08 mg/l and mercury at 0.0135 mg/l (PAS-00102307). There were two sewer outlets noted. One on Verona Street that had a daily flow of 810,660 gallons and one on Grafton Avenue that had a daily flow of 19,392 gallons. Both were noted to contain industrial wastes. The Verona outlet showed 0.025 mg/l mercury and 0.04 mg/l lead; and the Grafton outlet showed 0.0135 mg/l mercury and 4.08 mg/l lead (PAS-00102309- PAS-00102314).

According to an undated *Pretreatment Compliance Report*, Seton holds a New Jersey Pollutant Discharge Elimination System (NJPDES) permit (No. NJ0098582) and a PVSC Sewer Connection permit (No. 20401363) (PAS-00102335). Available references did not include the permits or information for permitted flow rates and effluent monitoring requirements

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

7. Response Actions

According to a letter prepared by Metcalf & Eddy, dated April 24, 1990, in September 1989, Metcalf & Eddy collected two soil samples from stained soil located adjacent to several transformers at the facility. The staining was reported to be the result of dripping valves. PCBs were detected at concentrations of 5.4 ppm and 39 ppm. The contaminated soil was excavated and disposed offsite (PAS-00008173).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

SHERWIN WILLIAMS COMPANY

Facility Name, Address and Size: Sherwin Williams Company (Sherwin Williams), 60 Lister Avenue, Newark, New Jersey 11.04 acres (PAP-00126535) to approximately 13 acres (PAP-00126441); 69 employees (August 17, 1990) to 230 employees (December 31, 1983) (PAP-00126265)

1. **Business Type:** Sherwin Williams has operated a paint manufacturing facility producing both interior and exterior paints (oil-based, solvent-based, latex and alkyd), lacquers, thinners, oils, solvents, and alkyl resins. Since 1984, Sherwin Williams has only produced water-based latex paint (PAS-00124574; PAP-00126442).

2. **Time Period of Ownership/Operations**

   Operator: 1901 to 1999 (PAP-00126589-90)
   Owner: 1900 to 2011 (PAP-00126589; PAP-00126557)

   Sherwin Williams operated at 60 Lister Avenue, Newark, New Jersey from 1901 to 1999. Sherwin Williams purchased the property west of Brown Street (Portion of Block 2437, Lot 62) in 1900. Production of paints and varnish began in 1901 (PAP-00126589-90). In September 1999, Sherwin Williams ceased operations (PAP-00126504; PAP-00126590). On January 14, 2011, the site was transferred from Sherwin Williams to Morris Lister Avenue Associates Urban Renewal, LLC (PAP-00126557).

3. **Operational History/COC Use and Presence at the Facility**

   According to a Waste Effluent Survey, dated May 16, 1972, the facility produced paints and varnishes using pigments, oils, and synthetic resins (PAS-00013182).

   According to a Hazardous Waste Investigation, dated February 4, 1982, the facility manufactured latex and alkyd resin (oil) based paints for consumer use only. Approximately 90% of production was latex material. Raw materials were received in dry or liquid forms. All materials were put into liquid forms on the third floor where pigments were dispersed into paint and blended. The paint then flowed to the second floor for cleaning. The first floor was used for filling. A facility representative stated at the time of inspection that no heavy metals were used in the paints. The main solvents used in the alkyd paints were mineral spirits and xylene. Small amounts of methyl ethyl ketone and toluene were also used (PAS-00123266).

   According to the Hazardous Waste Investigation, dated February 4, 1982, wastes produced from the latex manufacturing process included latex tank washes with water that was pumped into a settling tank where liquid was disposed into the sewer, and solids were removed for off-site disposal. Wastes produced from the alkyd manufacturing process included solvents used for tank wash, spent dirty solvent, and still bottoms from solvent distillation. Tank wash and spent solvents were reclaimed in a distillation process and still bottoms from distillation were disposed off site. Quality control lab wastes were put into 55 gallon drums and removed for off-site disposal or distilled on site (PAS-00123266).

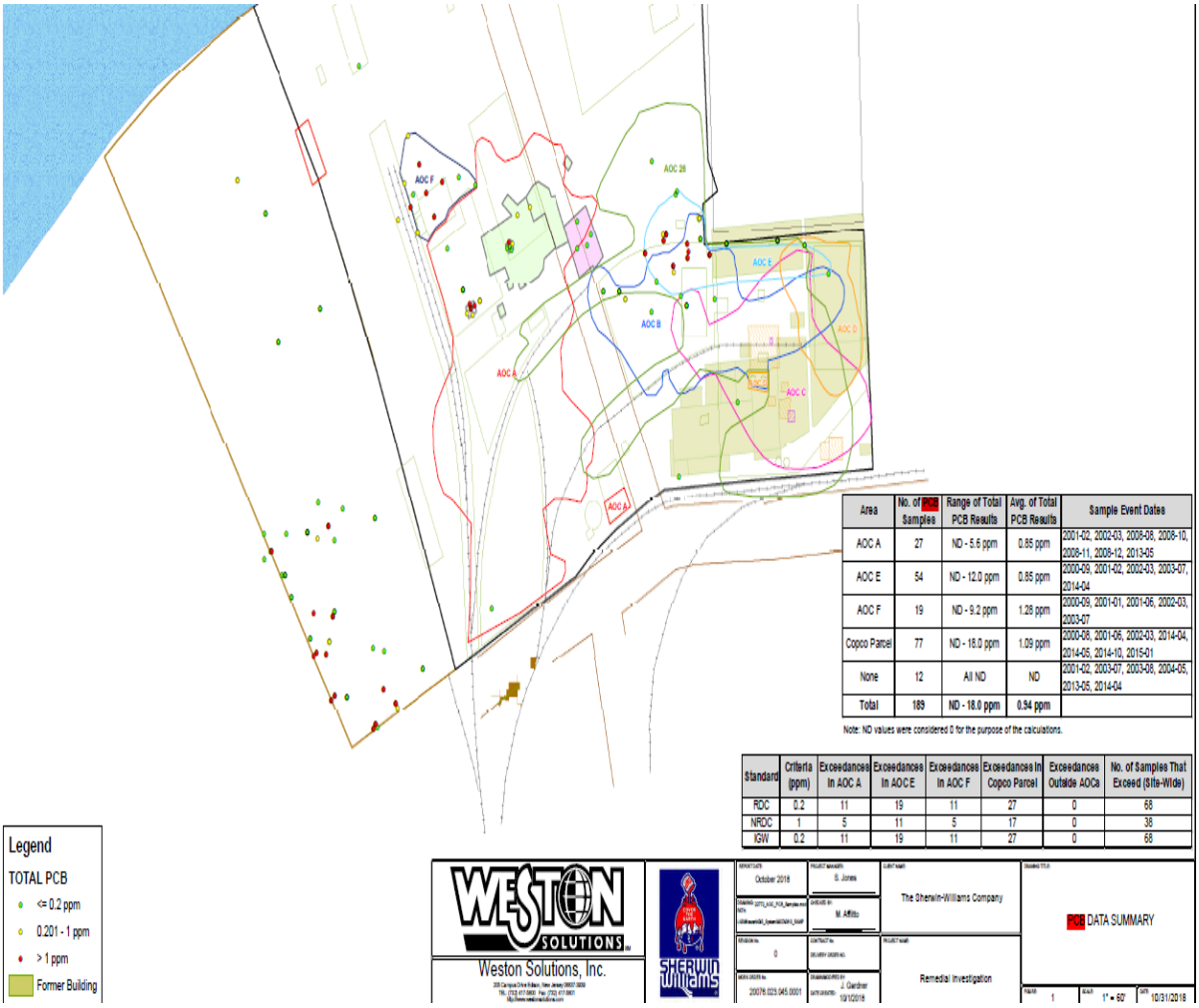
According to the Hazardous Waste Investigation, dated February 4, 1982, discharges to the Passaic Valley Sewerage Commission (PVSC) consisted of domestic sewage and wash water from latex manufacturing (PAS-00123266-67).

4. Identified COCs

- PCBs (detected)
- Dioxins (detected)
- PAHs (detected)
- DDx (possible use, detected)
- Copper (detected)
- Lead (possible use, detected)
- Mercury (detected)

PCBs

The following *PCB Data Summary for Project: Remedial Investigation* map, dated October 2018 (October 2018 Map) provides a graphical summary of PCB data on the Sherwin Williams site and the adjacent Copco parcel (PAP-00367461). Note: The complete remedial investigation report was not provided.



The October 2018 Map shows three areas of concern (AOC) within the Sherwin Williams site with detected concentrations of PCBs. AOC A encompasses a large area in the south central portion of the site and had an average concentration of 0.85 parts per million (ppm) from 27 samples collected during seven sampling events from 2001 to 2013. The highest concentration of PCBs in this area was 5.6 ppm. AOC E encompasses an area on the north side of the southeastern portion of the site and also had an average concentration of 0.85 ppm from 54 samples collected during five sampling events from 2000 to 2014. The highest concentration of PCBs in this area was 12.0 ppm. AOC F is a small area just north and adjacent to AOC A. AOC F had an average concentration of 1.28 ppm from 19 samples collected during five sampling events from 2000 to 2003. The highest concentration of PCBs in this area was 9.2 ppm (PAP-00367461).

According to a *Final Soil Remedial Investigation Report*, prepared for Sherwin Williams, dated February 2017, sampling was conducted to delineate PCB contamination at the site in 2014. According to the report, PCBs detected above NJDEP standards in the southwest portion of the site ranged from "non-detect" in the downgradient portion of the Copco Parcel to 18.0 mg/kg in the southwestern (upgradient) corner of the former Copco Parcel. The PCB contamination begins and is most elevated at the property boundaries along the southwestern margin of the parcel and decreases in a northeasterly direction across the Copco Parcel. According to the report, the contaminant gradient, along with site-specific data (topography, surface water and groundwater flow direction) and the lack of historic use of PCBs on the Copco Parcel, show that the PCB contamination is due to an off-site source. The report states that based on the available historic data, Acme, a former oil refinery, historically located along the southwestern boundary of the Copco Parcel, is the probable source (PAP-00126581-82).

Dioxins

The *Assessment of Potential Sources of Release of Dioxin to the Environment from Reported Manufacturing Operations and Activities at the Diamond Shamrock Facility*, dated May 1, 1987, prepared by Paulus, Sokolowski and Sparton for the “Defense Steering Committee” (May 1987 Report) included depositions which discussed reports of several rupture disc releases. These releases were safety features resulting from an excess in pressure in the autoclave. The Homer Smith deposition reported that after the 1960 explosion and reconstruction, one release occurred while the ground was covered with snow. As a result of the snow, Homer Smith was able to trace the trail of discharged materials into and beyond the Sherwin Williams parking lot which was adjacent to the 80 Lister Avenue site. (PAP-00148674).

PAHs

According to the *ISRA Investigation Report Addendum*, dated August 2002 (August 2002 ISRA), as part of the investigative activities at the site, a Historic Fill investigation was performed. A total of 619 borings were installed (PAS-00126541). The report states that semi-volatile organic compounds (SVOC) and metal analytes (excluding lead in the area of a former foundry) detected in the soils were related to the extensive

historic filling operations conducted and not site operations (PAS-00126542). Note: SVOCs can include PAHs.

In addition, the August 2002 ISRA reported the analytical results of the samples collected during the Historical Fill investigation show that “low levels” of base neutral contamination exist on the site. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, had occasional detections.The August 2002 ISRA concluded that PAH contaminants were not considered to be COCs at this facility as they were related to Historic Fill and not historic site operations (PAP-00126545).

DDx

According to an affidavit of a former employee (employed from 1945 to 1984) Sherwin Williams made and packaged DDT prior to his employment with Sherwin Williams and until the 1950s. The packaging of the DDT reportedly was performed in building No. 7 at the facility. Building No. 7 was removed after production of DDT ceased (PAS-00013180). A survey drawing of the facility in 1934 depicts a building that was used for storage of “thinner, reducer, roof paint, and insecticides,” but no building No. 7 was identified (PAP-00126219).

A Transcript of Proceedings concerning Diamond Shamrock Chemicals, dated October 1988 described an instance where DDT solution overflowed from a tanker at the adjacent, former Diamond Shamrock site and ran down the tracks onto the Sherwin Williams site (PAP-00145018-19).

No other documentation regarding the potential for DDT manufacture or use at the facility was identified. However, insecticides may have been stored at the facility in the 1940s through 1960s (PAP-00126219). According to an *ISRA Investigation Report*, dated October 2001 (October 2001 ISRA), an insecticide storage area was identified as an area of concern at the site; however, only a portion of the cited documented was available for review, and a description of the area of concern was not identified (PAP-00126497).

Metals – Copper, Lead and Mercury

According to a letter prepared by Sherwin Williams, dated August 31, 1972, facility waste effluent contained copper at 0.1 ppm, lead at 0.3 ppm, and no mercury (PAS-00013186).

An undated *Heavy Metals Source Determination Study,* conducted between 1976 and 1978, prepared by Killam Associates for PVSC, to study the sources of heavy metals in the influent to the PVSC's treatment plant reported a flow of 0.3250 million gallons per day (mgd) for Sherwin Williams with concentrations reported in pounds per day (lb/day) and milligram per liter (mg/L) for copper (1.480 lb/day or 0.546 mg/L), lead (0.347 lb/day or 0.128 mg/L), and mercury (0.0027 lb/day or 0.001 mg/L) (PAS-00052110-11).

An undated form titled *Industrial Waste Contribution to Municipal System* (possibly from May 1981) listing the characteristics of the wastewater discharged by Sherwin Williams reported copper (0.132), lead (1.16), and mercury (0.001) (PAS-00014648). Note: The units of the measurement were not provided.

A letter from Sherwin Williams to PVSC, dated April 28, 1995 regarding a Baseline Monitoring Report requested non-discharger status for five metals including copper and mercury (PAP-00126240-41).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to a *Final Soil Remedial Investigation Report*, prepared for Sherwin Williams, dated February 2017, the entire site has been reclaimed with historic fill which is heterogeneous in composition and texture and is approximately 10 feet thick (PAP-00126564). The report states that filling of the site began prior to 1892 to raise the grade prior to construction of the former paint manufacturing plant (PAP-00126562-63). In addition, the document notes that during Sherwin Williams's ownership, approximately 90% of the site was covered by pavement or building foundations, with the exception of two rail spurs and the former AST Farm No. 1 located in the southwest portion of the property (PAP-00126563).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below PAP-00367331-57).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	111,000 mg/kg
Copper	7,010 mg/kg
Mercury	6,030 mg/kg
Benzo(a)anthracene	200 mg/kg
Benzo(a)pyrene	210 mg/kg
Benzo(b)fluoranthene	250 mg/kg
Benzo(k)fluoranthene	89 mg/kg
Dibenzo(a,h)anthracene	24 mg/kg
Indeno(1,2,3-cd)pyrene	94 mg/kg

According to the August 2002 ISRA, as part of the investigative activities at the site, a Historic Fill investigation was performed. A total of 619 borings were installed (PAS-00126541). The report states that SVOC and metal analytes (excluding lead in the area of a former foundry) detected in the soils were related to the extensive historic filling operations conducted and not site operations (PAS-00126542). Note: SVOCs can include PAHs.

In addition, the August 2002 ISRA reported the analytical results of the samples collected during the Historical Fill investigation show that low levels of base neutral contamination exist on the site. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and lead had occasional detections. In addition, the report stated that other contaminants that had been detected during the course of the site investigation that were not associated with the Sherwin Williams operations were likely associated with the Historic Fill including copper (PAP-00126543).

Finally, the August 2002 ISRA concluded that PAH and metal contaminants, with the exception of lead, were not considered to be COCs at the Sherwin Williams facility as they were related to Historic Fill and not historic site operations (PAP-00126545).

5. COC Pathways

Sanitary Sewer

According to the Hazardous Waste Investigation, dated February 4, 1982, discharges to the PVSC consisted of domestic sewage and wash water from latex manufacturing (PAS-00123266-67).

In addition, a *PVSC Brown Street Branch Interceptor Evaluation*, dated July 1981, also states that the Brown Street Branch Interceptor was placed in service in the 1920s to intercept dry weather flows in the Polk Street, Freeman Street, and Brown Street combined sewers. Prior to construction of the interceptor these combined sewers discharged directly into the Passaic River. The interceptor enabled dry weather sewage

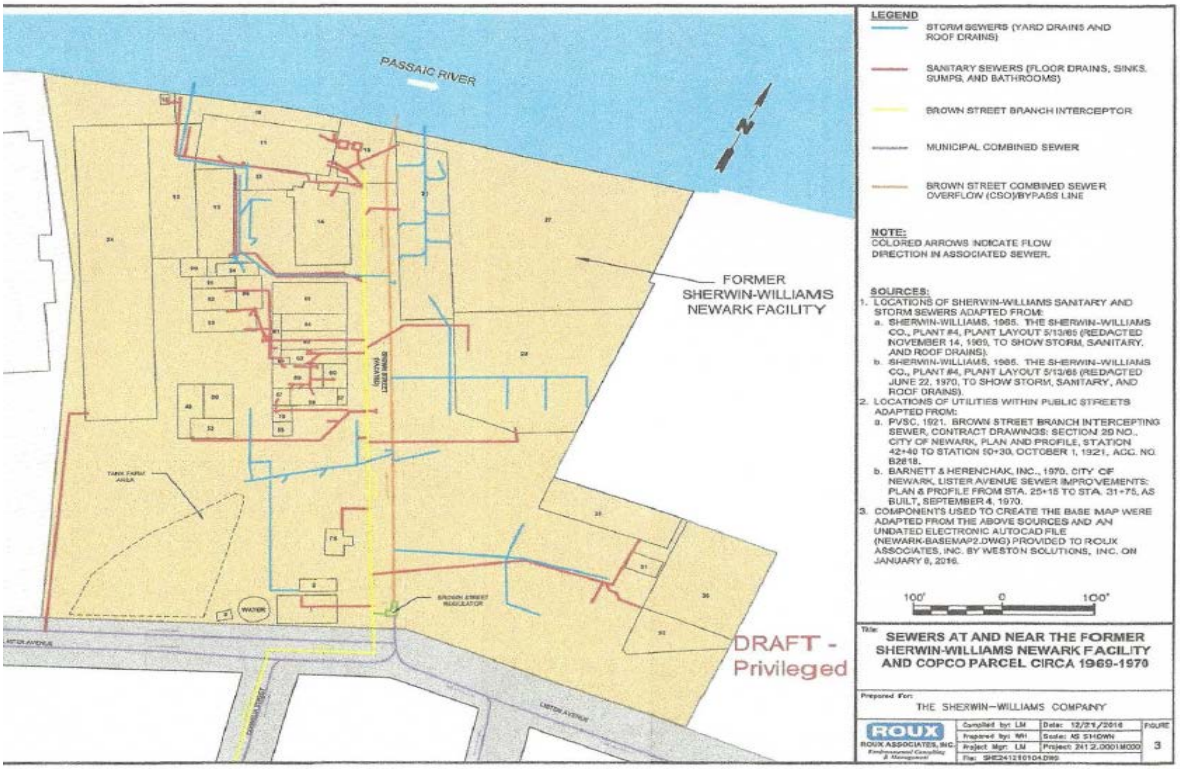
flows to be to the PVSC's Newark Bay WWTP (PAP-00056471). It also states there were no provisions for bypassing the interceptor during wet weather and that interceptor was a safeguard to water quality in the Passaic River (PAP-00056471-72).

Finally, Sherwin Williams provided diagrams PVSC prepared in 1921 and 1922 of the interceptor connection which show that the connection box was constructed by PVSC to explicitly prevent any process wastewater generated at the Sherwin Williams site from entering the PVSC CSO system. Therefore, Sherwin Williams's process wastewater reportedly did not discharge into the Passaic River during wet weather flows; all of Sherwin Williams' site process wastewater after 1924 entered the PVSC municipal sewer system (PAP-00367228-36).

According to a Waste Effluent Survey, dated May 16, 1972, in 1971, 64,429,000 gallons of water were discharged to the sanitary sewer; no water was discharged to the "storm sewer, river or ditch (PAS-00013183).

According to a Hazardous Waste Investigation, dated February 4, 1982, a facility representative estimated the average flow into PVSC at 150,000 gallons/day. Review of measurements kept by Sherwin Williams for the last six months stated a flow range of 60,000 to 250,000 gallons/day (PAS-00123267).

The following diagram shows the locations and pathways of the various sewer lines on the Sherwin Williams site:



(PAP-00367458)

Storm Sewer

According to an affidavit of a former employee (employed from 1967 to 1988), mixing tanks were used to make oil base paints and water based paints. Depending on the paint being made in the mixing tank, either a thinner or water solution was used to clean the mixing tanks. The cleaning solution was funneled into the sewer system that discharged directly to Passaic River. The discharging of the thinner solution to the Passaic River occurred primarily at night (PAS-00123255). Note: Details regarding the cleaner, the contents of the paint-contaminated solutions, and the quantities discharges are not provided. It is not documented that the discharges contained OU2 COCs.
As stated in the Affidavit of Raymond A. Cebulski, a former Sherwin Williams employee, the City of Newark installed a lateral connection between the Brown Street storm and sanitary sewer lines sometime between 1971 and 1981. He reported that wastewater could flow between the storm and sanitary sewers by way of this lateral connection (PAS-00123253). No documentation to support this affidavit was identified in the file material.

As reported in the *1971 Annual Report to the Passaic Valley Sewerage Commissioners*, the end of Brown Street Sewer at Lister Street was sealed during April 1971. The sewer now only drained stormwater from the Sherwin Williams site. Observations from April 19 to 26, 1971 by Inspector J. McLaughlin stated no discharge from the pipe (PAS-00034624).

Direct Release

There is no information regarding direct release in the available file material.

Spills

According to a *Newark Site Investigation Plant History and Example Areas of Concern*, dated May 21, 1999, a leak in an aboveground storage tank (AST) containing slurry and cracks in the AST pad resulted in a release to the Passaic River in March 1998. No known samples were collected from this area following the cleanup (PAP-00126438). The document does not state if OU2 COCs were associated with the slurry.

According to an affidavit of Raymond A. Cebulski, a former Sherwin Williams employee (from 1942 to 1981) emulsion paint spills occurred in building # 11 and some of the paint would wash down the storm sewer and over the bulkhead and into the Passaic River (PAS-00123253). The document does not state if OU2 COCs were associated with the spills.

6. Regulatory History/Enforcement Actions

Inspections and Violations

Correspondence from January and February 1986 discusses violations of PVSC regulations caused by the cleaning of Sherwin Williams's effluent discharge sewer on Brown Street. The cleaning was necessary as a result of an accidental in-plant chemical

spill, which caused blockages within their waste piping disposal system. The cleaning of this line caused an accumulation of gray viscous material in the PVSC sand catcher located at the entrance of the Sherwin Williams site (PAS-00014642-47). No specifics regarding the constituents of the material was provided. Therefore, it us unknown if it contained OU2 COCs.

NJDEP filed an Incident Notification Report on June 9, 1986 for a discharge of white paint pigment from a 12-inch storm drain into the Passaic River caused by cleaning a storm drain. An investigation was conducted by NJDEP on June 16, 1986, and noted that there were not any discharges evident at that time (PAS-00123288, 90). No specifics regarding the constituents of the material was provided. Therefore, it us unknown if it contained OU2 COCs.

On September 10, 1986, NJDEP issued a Notice of Violation of Title 23:5-28, NJ Revised Statutes for the reported discharge of paint pigments into the Passaic River. It had been determined during an investigation on June 9, 1986 and subsequent dates that the pigments had been released from the Sherwin Williams site during a cleaning operation. A fine of $300.00 was assessed (PAP-00367264-65; PAS-00008237; PAS-00008238-39; PAS-00123292-4). The notice did not state if any COCs were present or expected in the waste.

Correspondence from May and June 1987 discusses the continued problem of paint materials discharging from Sherwin Williams and clogging up the PVSC sand catcher located at the entrance of the Sherwin Williams site (PAS-00014638-41). No specifics regarding the constituents of the material was provided. Therefore, it us unknown if it contained OU2 COCs.

Permits

According to a Hazardous Waste Investigation, dated February 4, 1982, Sherwin Williams received Permit No. 20401500 to discharge to PVSC on May 29, 1981. This permit expired on May 29, 1986 (PAS-00123267).

There is no additional information regarding permits in the available documents.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- ISRA Investigation Report (October 2001)
- Site Evaluation of 80 Lister Avenue (February 1985)
- ISRA Investigation Report Addendum (August 2002)
- Remedial Action Report (December 2006)

Evaluation of Dioxin Contamination Attributed to Adjacent Diamond Shamrock

According to an *ISRA Investigation Report*, dated October 2001 (October 2001 ISRA), the first investigation conducted at the site in the mid-1980s was related to a reported chemical spill from a rail car tanker on a rail spur located on Sherwin Williams's site. The chemical spill was associated with production operations at the adjacent CLH Superfund site. An investigation of railroad tracks located on the Sherwin Williams site was performed by IT Corporation (PAP-00126513-14). The October 2001 ISRA reported that during June and July of 1983, 41 soil samples were collected from two railroad spurs adjacent to and in the vicinity of the Sherwin Williams site. The results of the sampling showed that elevated levels of dioxin above the NJDEP action level of 1.0 parts per billion (ppb) were present on the Sherwin Williams site. This contamination was limited to the railroad spur south of the Sherwin Williams site along Lister Avenue, the railroad spur located on the Sherwin Williams site, and a small paved area used for truck storage, loading and unloading of product and materials, respectively. Remediation activities, consisting of excavation and post-excavation sampling, were conducted in 1985 (PAP-00126514; PAP-00149957-58).

The April 10, 1984 *Evaluation of the 80 Lister Avenue 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD) Data in Conjunction with Available CDC Guidance Documents* reported the results of sampling conducted in 1983. Three of four composite soil samples collected from the Sherwin Williams site reported concentrations of 2,3,7,8-TCDD ranging from 0.88 ppb to 1.6 ppb. 2,3,7,8-TCDD was not detected in the fourth composite sample (PAS-00125463). Three of four "sweep" samples reported concentrations of 2,3,7,8-TCDD ranging from 0.11 ppb to 1.6 ppb. 2,3,7,8-TCDD was not detected in the fourth "sweep" sample. A soil sample also collected reported a concentration of 2,3,7,8-TCDD of 0.35 ppb (PAS-00125465).

According to the *Site Evaluation of 80 Lister Avenue*, dated February 1985, as part of the 1984-1985 remedial investigation of the adjoining Diamond Shamrock property, five samples at multiple depths were taken from the Sherwin Williams site and analyzed for dioxin and priority pollutants (PAS-00128232; PAS-00127089-90). 2,3,7,8-TCDD was detected in three samples at concentrations ranging from 1.2 (0-6 inches) to 5.1 ppb (6-12 inches), 2,3,7,8-tetrachloro-dibenzofuran was detected in one sample at 19.9 ppb (12-24 inches), and octachlorodibenzo-p-dioxin was detected in one sample at 15.7 ppb (12-24 inches) (PAS-00127967). Base neutral compounds detected included acenaphthene (1,600 μg/kg, 12-24 inches), fluoranthene (3,000-26,000 μg/kg, 0-24 inches), naphthalene (1,100 μg/kg, 12-24 inches), chrysene (3,700-27,000 μg/kg, 0-24 inches), acenaphthylene (290 μg/kg, 12-24 inches), anthracene, (330-4,300 μg/kg, 0-24 inches), benzo(a)anthracene (1,800-15,000 μg/kg, 0-24 inches), benzo(a)pyrene (18,000 μg/kg, 12-24 inches), benzo(b)fluoranthene (29,000 μg/kg, 12-24 inches), benzo(g,h,i)perylene (9,300 μg/kg, 12-24 inches), fluorene (2,200 μg/kg, 12-24 inches), phenanthrene (2,200-21,000 μg/kg, 0-24 inches), indeno(1,2,3-cd)pyrene (6,300 μg/kg, 12-24 inches), and pyrene (5,300-28,000 μg/kg, 0-24 inches) (PAS-00127970-72). The chlorinated herbicide 2,4-D was detected at 220-250 μg/kg (0-24 inches). Metals detected included lead (3.1-44 ppm, 0-12.5 feet), copper (71-180 ppm, 0-12.5 feet), and mercury (0.5-11 ppm, 0-12.5 feet) (PAS-00127974).

Sherwin Williams Company

Diamond Alkali OU2 Allocation

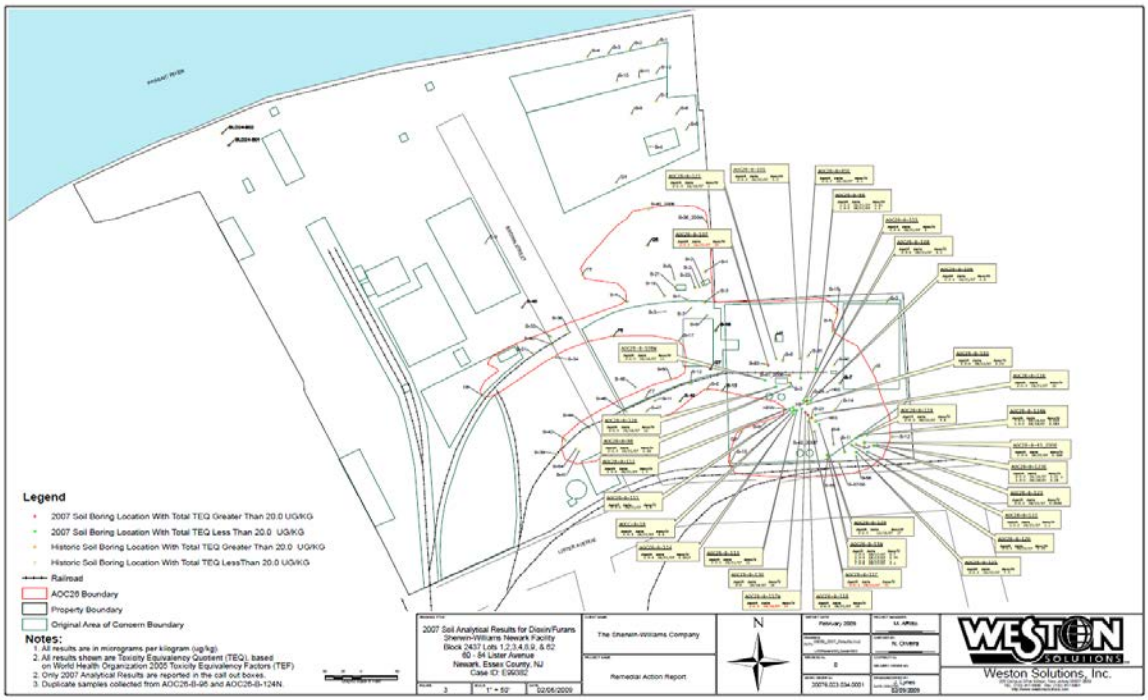
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Facility Data Report

The *Site Evaluation Addendum for 80 & 120 Lister Ave*, dated February 1986 reported that following the original remedial investigation of the adjoining Diamond Shamrock property, additional sampling was conducted. Soil samples were obtained from an additional seven borings located drilled in the spring and early summer of 1985 on the Sherwin Williams site (PAS-00126244).

The August 2002 ISRA concluded that all dioxin contamination is related to historic operations by CLH and that it was likely that a significant portion of the pesticide contamination identified at the Sherwin Williams site is related to CLH. PAH and metal contaminants, with the exception of lead, were not considered to be COCs as they were related to Historic Fill and not historic site operations (PAP-00126545).

According to the *Remedial Action Report to Address Soils Contamination in AOC 26, Former Sherwin-Williams Newark Facility*, dated February 2009, a comprehensive soil boring program was conducted in December 2006 to collect soil samples in an effort to determine both vertical and horizontal extent of any previously confirmed dioxin/furan-impacted soils at the site. In June, August, and October 2007, additional soil sampling activities were conducted to determine the vertical and horizontal extent of previously identified soil-boring locations where dioxin levels exceeded 20 μg/kg Toxicity Equivalency Quotient (TEQ). The soil sampling was done to prepare for the remedial action activities in AOC 26. The total TEQ concentration was above 20 μg/kg in three soil samples collected from the surface interval (PAP-00367375-77). All three of these sample locations were near the center of the southeastern portion of the facility (PAP-00367389). See figure on the next page:



(PAP-00367389)

Evaluation of Other COCs at Sherwin Williams Site

In September 1999, Sherwin Williams ceased operations. This cessation of operations triggered the requirements of the NJDEP ISRA under which the owner or operator must conduct remedial activities (PAP-00126504). Accordingly, a Preliminary Assessment (PA) was conducted in accordance with the NJDEP Technical Requirements for Site Remediation. The PA identified 26 areas of potential AOCs at the site. Several of the AOCs involved COCs including lead, dioxins, and PCBs. In addition, the AOCs which involved mostly VOCs also included the COC, naphthalene. Site Inspection (SI) activities were conducted at each individual potential AOC. The purpose of the SI was to determine the presence of contaminants at the AOC and characterize the contaminants, if necessary (PAP-00126497).

According to the October 2001 ISRA, lead contamination was a concern at a former lead foundry location and a portion of the former acid underground storage tank (UST) and AST location. The concentrations of lead exceed the Residential Direct Contact Soil Cleanup Criteria (RDCSCC), Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC), and the maximum Historic Fill concentrations as listed in the NJDEP Historic Fill Database. Lead concentrations exceeded the maximum Historic Fill values in four locations (PAP-00126500). Note: The concentrations of lead were not provided in the source document. The October 2001 ISRA states that there are two likely sources of lead contamination: historic filling activities that were performed to bring the site up to the current grade and/or a former lead foundry identified on historical figures. It was also noted that additional delineation would not be performed since the documented historic fill prevented delineation to RDCSCC (PAP-00126500).

According to the October 2001 ISRA, PCB contamination was a concern at the former transformer pad No. 1, former UST No. 1, and a portion of former drum storage area No. 4. The potential source of the PCB contamination identified at the former transformer pad No. 1 was the pad-mounted transformers formerly located south of Building 28. The PCB concentrations exceeded the RDCSCC in six samples. The NRDCSCC was exceeded in four samples. Additional PCB delineation was required at this area (PAP-00126501). Note: The concentrations of the PCBs were not provided in the source document.

According to the October 2001 ISRA, PCB contamination was also a concern at the former transformer pad No. 2, former varnish storage area, and the northern portion of the former railroad tracks. The potential source of the PCB contamination identified in this location was the pad-mounted transformers formerly located west of Buildings 92 and 93. The PCB concentrations at this location exceeded the RDCSCC in seven samples. The NRDCSCC was exceeded in three samples. Additional PCB delineation was also required at this area (PAP-00126501). Note: The concentrations of the PCBs were not provided in the source document. The October 2018 Map indicates this area had an average concentration of 1.28 ppm from 19 samples collected during five sampling events from 2000 to 2003. The highest concentration of PCBs in this area was 9.2 ppm (PAP-00367461).

The October 2001 ISRA concluded that PCB soil contamination was identified at the site but below EPA action levels. SVOC and metals contamination was also identified during the remedial investigation (RI), but this was attributed to historic fill underlying the site. Based on the results of the site investigation (SI)/RI activities, no further investigative action was required for several AOCs including the former insecticide storage area (PAP-00126498). Note: Concentrations were not provided in the source document.

According to the August 2002 ISRA, as part of the investigative activities at the site, a Historic Fill investigation was performed. A total of 619 borings were installed (PAS-00126541). SVOCS, PCBs, pesticides, and metals were detected above their respective NJDEP Soil Cleanup Criteria (SCC). The PCB, pesticide, and lead detections in the area of the historic lead foundry would be addressed as part of the soil remedial action. The SVOC and metal analytes (excluding lead in the area of a former foundry) detected in the soils were related to the extensive historic filling operations conducted and not site operations (PAS-00126542). Note: SVOCs can include PAHs.

Additionally, the August 2002 ISRA reported the analytical results of the samples collected during the Historical Fill investigation show that low levels of base neutral contamination exist on the site. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and lead had occasional detections.In addition, other contaminants that had been detected during the course of the site investigation that were not associated with the Sherwin Williams operations were likely associated with the Historic Fill including copper (PAP-00126543).

The August 2002 ISRA concluded that all dioxin contamination is related to historic operations by CLH and that it was likely that a significant portion of the pesticide contamination identified at the Sherwin Williams site is related to CLH. PAH and metal contaminants, with the exception of lead, were not considered to be COCs as they were related to Historic Fill and not historic site operations (PAP-00126545).

Remedial Activities

The *Remedial Action Report to Address Soils Contamination in AOC 26 Former Sherwin-Williams Newark Facility*, dated February 2009 described the remediation completed to treat dioxin/furan soil contamination present in AOC 26. AOC 26 is composed of several areas with known dioxin/furan contamination, including a former railroad track area and employee parking area in the southeastern portion of the property. The remediation was conducted from February 25, 2008 through March 3, 2008 and consisted of excavation and off-site disposal of approximately 406 cubic yards of contaminated soil with dioxin/furan concentrations above 20 μg/kg TEQ. Soil samples collected in 2007 and previous years served as in-situ remedial confirmation soil samples. The excavated areas were backfilled with certified clean fill. It was noted that soil sample locations with concentrations greater than 1 μg/kg TEQ would be addressed separately under the site-wide Remedial Action Work Plan which would include engineering and institutional controls for the re-development of the site as well as a draft deed notice (PAP-00367356-83).

Sherwin Williams Company

Diamond Alkali OU2 Allocation

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Facility Data Report

A May 4, 2018 Deed Notice for the former Sherwin Williams facility at 60 Lister Avenue described the remaining contamination which prevents unrestricted use. The Deed Notice includes the entire Sherwin Williams site as well as the adjacent Copco parcel. Maps were included showing the sample locations and sample results. The deed notice separated the sample results into four divisions based on the sample locations within the facility (PAP-00367278-355).

For the purpose of this report, these divisions are called North-half Main portion, South-half Main portion, Southeast Corner and Southern boundary.

The sample IDs were searched by the Allocation Team and located on the maps to determine the division to be assigned. Several sample IDs could not be located on the maps and are summarized separately. The ranges of reported concentrations for the COCs in each division were as follows:

North-half Main Portion

- Lead ranged from 18.6 mg/kg to 75,800 mg/kg (PAP-00367333, 337)
- Copper ranged from 21.4 mg/kg to 7,010 mg/kg (PAP-00367334, 337)
- Mercury ranged from not detected to 6,030 mg/kg (PAP-00367332)
- Benzo(a)anthracene ranged from 0.15 mg/kg to 160 mg/kg (PAP-00367330)
- Benzo(a)pyrene ranged from 0.14 mg/kg to 210 mg/kg (PAP-00367330)
- Benzo(b)fluoranthene ranged from not detected to 250 mg/kg (PAP-00367330)
- Benzo(k)fluoranthene ranged from not detected to 89 mg/kg (PAP-00367330)
- Dibenzo(a,h)anthracene ranged from not detected to 24 mg/kg (PAP-00367330)
- Indeno(1,2,3-cd)pyrene ranged from not detected to 94 mg/kg (PAP-00367330)
- Naphthalene ranged from 0.041 mg/kg to 26 mg/kg (PAP-00367326, 328)
- Dieldrin ranged from not detected to 0.093 mg/kg (PAP-00367341)
- 4,4'-DDE ranged from not detected to 0.23 mg/kg (PAP-00367342)
- 4,4'-DDD ranged from not detected to 0.15 mg/kg (PAP-00367342)
- Total PCBs ranged from not detected to 9.2 mg/kg (PAP-00367341)
- Dioxins/Furans (reported as Total TEQ) ranged from 0.120 μg/kg to 4.393 μg/kg (PAP-00367345, 46)

South-half Main Portion

- Lead ranged from 47.4 mg/kg to 9,540 mg/kg (PAP-00367335, 36)
- Copper ranged from 29 mg/kg to 6,020 mg/kg (PAP-00367334, 35)
- Mercury ranged from 0.08 mg/kg to 54 mg/kg (PAP-00367332, 34)
- Benzo(a)anthracene ranged from not detected to 160 mg/kg (PAP-00367328)
- Benzo(a)pyrene ranged from not detected to 150 mg/kg (PAP-00367328)
- Benzo(b)fluoranthene ranged from not detected to 160 mg/kg (PAP-00367328)
- Benzo(k)fluoranthene ranged from not detected to 66 mg/kg (PAP-00367328)
- Dibenzo(a,h)anthracene ranged from not detected to 16 mg/kg (PAP-00367328)
- Indeno(1,2,3-cd)pyrene ranged from not detected to 54 mg/kg (PAP-00367328)
- Naphthalene ranged from not detected to 96 mg/kg (PAP-00367325, 28)

- Naphthalene as VOC ranged from 9 mg/kg to 320 mg/kg (PAP-00367320)
  Note: Sample AOC3-04-5.5-6.0 could not be located on the maps. It is assumed to be located in the same general area as the other three AOC3 samples.
- 4,4'-DDE ranged from 0.087 mg/kg to 0.2 mg/kg (PAP-00367342)
- 4,4'-DDD ranged from 0.13 mg/kg to 0.15 J mg/kg (PAP-00367342)
- Total PCBs ranged from 0.37 mg/kg to 3.3 mg/kg (PAP-00367342)
- Dioxins/Furans (reported as Total TEQ) ranged from 1.964 μg/kg to 1.992 μg/kg (PAP-00367346)

Southeast Corner

- Lead ranged from 35 mg/kg to 111,000 mg/kg (PAP-00367331, 37)
- Copper ranged from 15.4 mg/kg to 564 mg/kg (PAP-00367331, 35)
- Mercury ranged from 0.15 mg/kg to 7 mg/kg (PAP-00367331, 35)
- Benzo(a)anthracene ranged from 0.18 J mg/kg to 200 mg/kg (PAP-00367324, 27)
- Benzo(a)pyrene ranged from 0.13 J mg/kg to 140 mg/kg (PAP-00367324, 27)
- Benzo(b)fluoranthene ranged from 0.25 J mg/kg to 160 mg/kg (PAP-00367324, 27)
- Benzo(k)fluoranthene ranged from not detected to 63 mg/kg (PAP-00367324)
- Dibenzo(a,h)anthracene ranged from not detected to 16 mg/kg (PAP-00367324)
- Indeno(1,2,3-cd)pyrene ranged from not detected to 60 mg/kg (PAP-00367324)
- Naphthalene ranged from not detected to 5.4 mg/kg (PAP-00367324, 27)
- Total PCBs ranged from 0.254 mg/kg to 12 mg/kg (PAP-00367341)
- Dioxins/Furans (reported as Total TEQ) ranged from 1.008 μg/kg to 15.378 μg/kg (PAP-00367346)

Southern boundary

- Lead ranged from 6.3 mg/kg to 5,060 mg/kg (PAP-00367332, 36)
- Copper ranged from 8.7 mg/kg to 1,530 mg/kg (PAP-00367332, 37)
- Mercury ranged from not detected to 36 mg/kg (PAP-00367335)
- Benzo(a)anthracene ranged from not detected to 29 mg/kg (PAP-00367323, 27)
- Benzo(a)pyrene ranged from not detected to 24 mg/kg (PAP-00367323, 27)
- Benzo(b)fluoranthene ranged from not detected to 28 mg/kg (PAP-00367323, 27)
- Benzo(k)fluoranthene ranged from not detected to 12 mg/kg (PAP-00367323, 27)
- Dibenzo(a,h)anthracene ranged from not detected to 3.9 mg/kg (PAP-00367323, 27)
- Indeno(1,2,3-cd)pyrene ranged from not detected to 13 mg/kg (PAP-00367323, 27)
- Naphthalene ranged from 0.043 mg/kg to 66 mg/kg (PAP-00367323, 29)
- 4,4'-DDE ranged from 0.017 mg/kg to 0.094 J mg/kg (PAP-00367342)
- 4,4'-DDD ranged from not detected to 0.018 mg/kg (PAP-00367342)
- Total PCBs ranged from not detected to 11 mg/kg (PAP-00367342)
- Dioxins/Furans (reported as Total TEQ) ranged from 1.057 μg/kg to 17 μg/kg (PAP-00367345)

The following results were reported on the Deed Notice but could not be matched up to corresponding locations on the maps:

- Lead ranged from 54.1 mg/kg to 35,000 mg/kg (PAP-00367336, 38)
- Copper ranged from 45.4 mg/kg to 633 mg/kg (PAP-00367336, 38)
- Mercury ranged from 0.1 mg/kg to 54.2 mg/kg (PAP-00367336, 38)
- Benzo(a)anthracene ranged from not detected to 1.5 mg/kg (PAP-00367330)
- Benzo(a)pyrene ranged from not detected to 0.76 mg/kg (PAP-00367330)
- Benzo(b)fluoranthene ranged from not detected to 0.54 mg/kg (PAP-00367330)
- Benzo(k)fluoranthene ranged from not detected to 0.19 mg/kg (PAP-00367325)
- Dibenzo(a,h)anthracene ranged from not detected to 0.2 mg/kg (PAP-00367330)
- Indeno(1,2,3-cd)pyrene ranged from not detected to 0.38 mg/kg (PAP-00367330)
- Naphthalene ranged from not detected to 7 mg/kg (PAP-00367325, 30)
- Total PCBs ranged from 0.23 mg/kg to 18 mg/kg (PAP-00367342)
- Dioxins/Furans (reported as Total TEQ) ranged from 0.450 μg/kg to 23.5 μg/kg (PAP-00367345)

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Spectraserv, Inc.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

SPECTRASERV, INC.

Facility Name, Address and Size: Spectraserv site; 75 Jacobus Avenue, Kearny, New Jersey; 6.5 acres (PAP-00457350) ; Information on number of employees and shifts per day not identified in available file material. The west side of the facility is adjacent to the Passaic River (PAS-00054936-37).

1. **Business Type:** Sludge treatment and dewatering (PAP-00206802)

2. **Time Period of Ownership/Operations**

   Operator: 1962 to present
   Owner: 1969 to present

   1962: Spectraserv, Inc. (Spectraserv) began operating the facility in 1962 (PAS-00009567; PAS-00124553)

   1969: Spectraserv became owner of the facility in 1969 (PAP-00457414). Note: Spectraserv was previously known as Modern Transportation (PAP-00457348).

3. **Operational History/COC Use and Presence at the Facility**

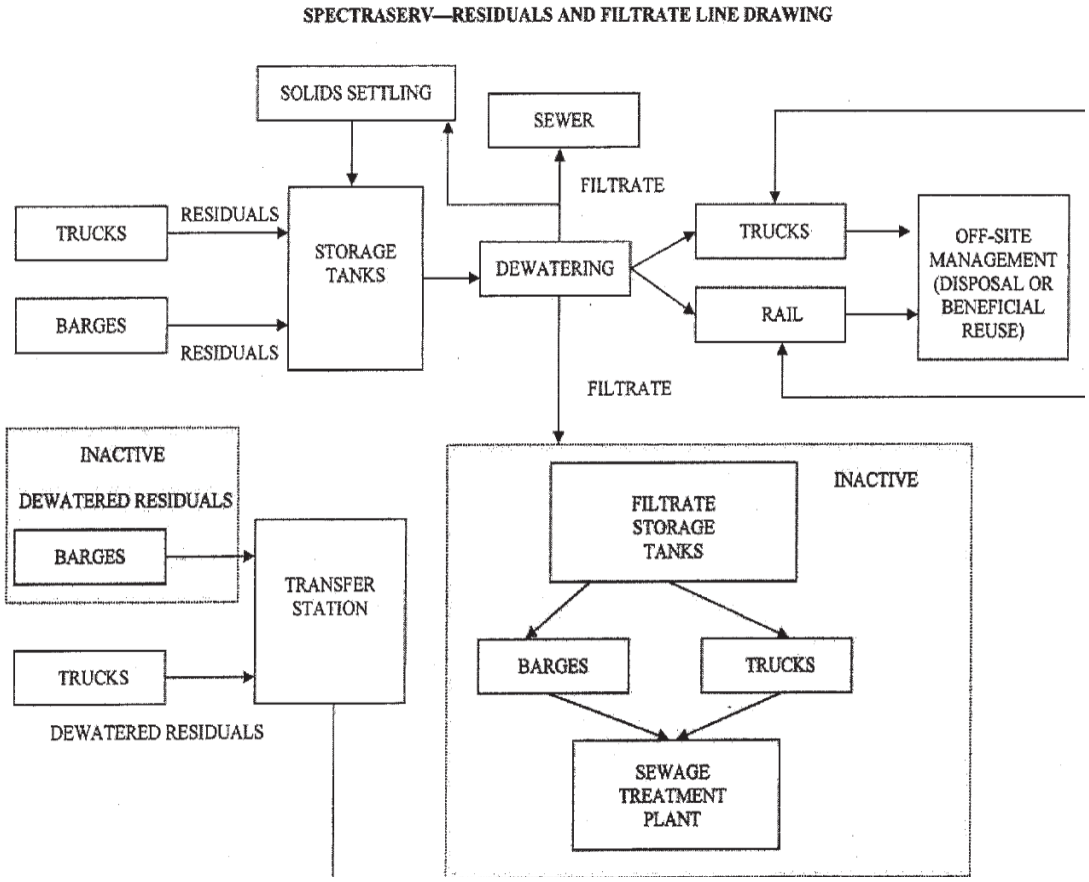
   Three types of operations historically took place at the facility based on review of the available file material: (1) sewage sludge processing; (2) acid/caustic neutralization; and (3) waste oil reprocessing. Each operation is described further below.

   Sewage Sludge Processing

   According to a New Jersey Pollutant Discharge Elimination System (NJPDES) permit, issued October 27, 2017, Spectraserv operates a residual storage, processing, and transfer facility under NJPDES Permit No. NJ0079570. Septage, liquid food processing residual, and liquid residual generated in the treatment of potable water and domestic wastewater are currently stored, consolidated, and dewatered at the facility prior to being managed off-site at approved sludge management sites. Dewatered sewage sludge and grit and screenings are also accepted and transferred in an enclosed transfer building before being managed off-site at approved sludge management sites (PAP-00206855). Prior to March 17, 1991, the sludge generated was disposed at sea (PAS-00124553).

   The residual process generates a wastewater that is pretreated at the facility and discharged to the Kearny sewer system under a Passaic Valley Sewerage Commission (PVSC) Sewer Use Permit (No. 15200004); ultimate treatment and disposal then occurs at the PVSC treatment facility (PAP-00206855-56; PAP-00192809-12; PAP-00193160). The pretreatment process consists of the filtrate (water removed from the residual via a belt filter press) flowing through a bioscrubber and two settling tanks/clarifiers prior to discharge (PAP-00206856).

A flow diagram for process residuals and filtrate disposal is presented below (PAP-00192741):



Acid/Caustic Neutralization

According to an *Administrative Consent Order* signed in 1993 and a *Remedial Investigation Report* prepared for Spectraserv, dated May 2014, between 1976 or 1978 and 1988, facility processes also included an acid/caustic neutralization operation, which involved the mixing of inorganic acid waste with inorganic caustic waste and lime slurry to achieve a neutral pH. After settling, the sludge was removed, dewatered, and disposed off-site, and the neutralized liquid was discharged to the Kearny sewer system under the facility's NJPDES permit (PAP-00216881; PAS-00009568). The Kearny Municipal Utilities Authority operated a combined sewer system (PAP-00193156). The related NJPDES permit was not identified in the available file material. No documentation of OU2 contaminants of concern (COCs) being potentially present in this waste stream was identified in the available file material.

According to a *Revised Report, Remedial Investigation, ACO Compliance*, prepared for Spectraserv, dated February 23, 1995, the acid/caustic neutralization operation was closed as certified by the New Jersey Department of Environmental Protection (NJDEP) on August 25, 1992 (PAS-00054897, 907).

Spectraserv, Inc.

Diamond Alkali OU2 Allocation

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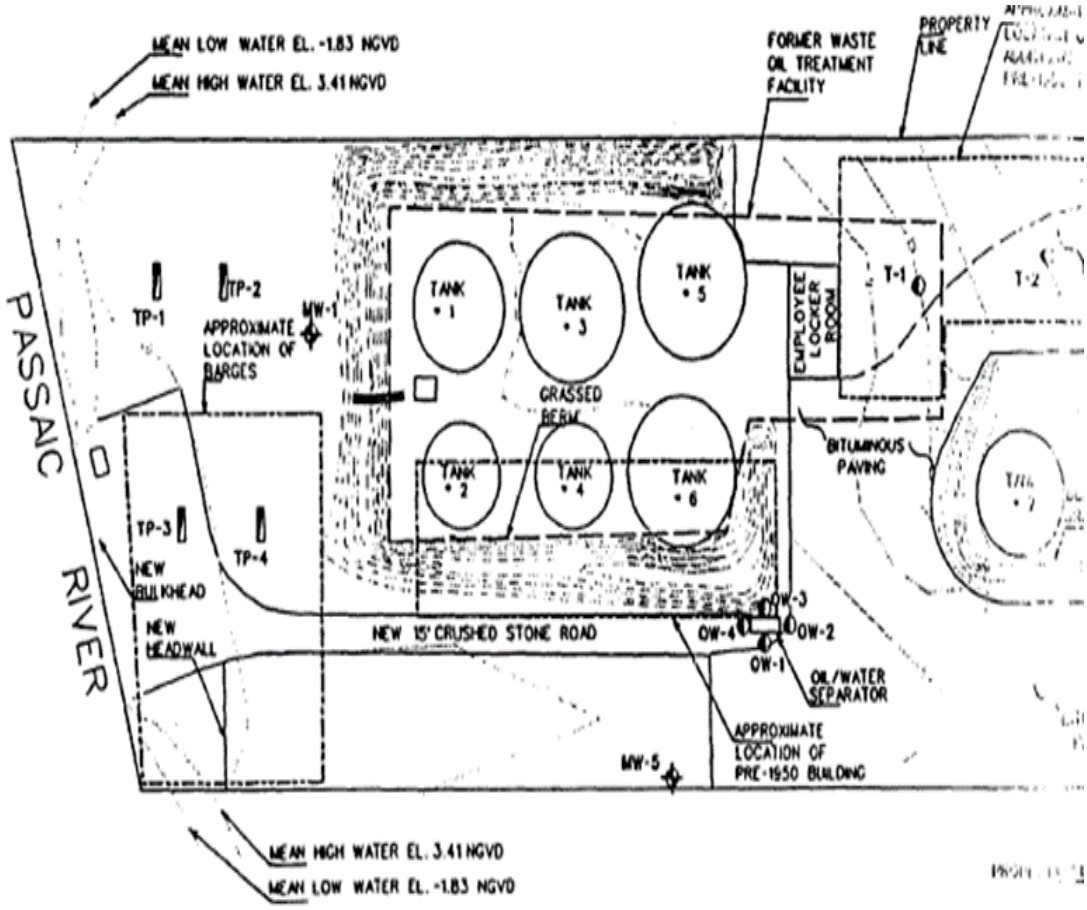
Facility Data Report

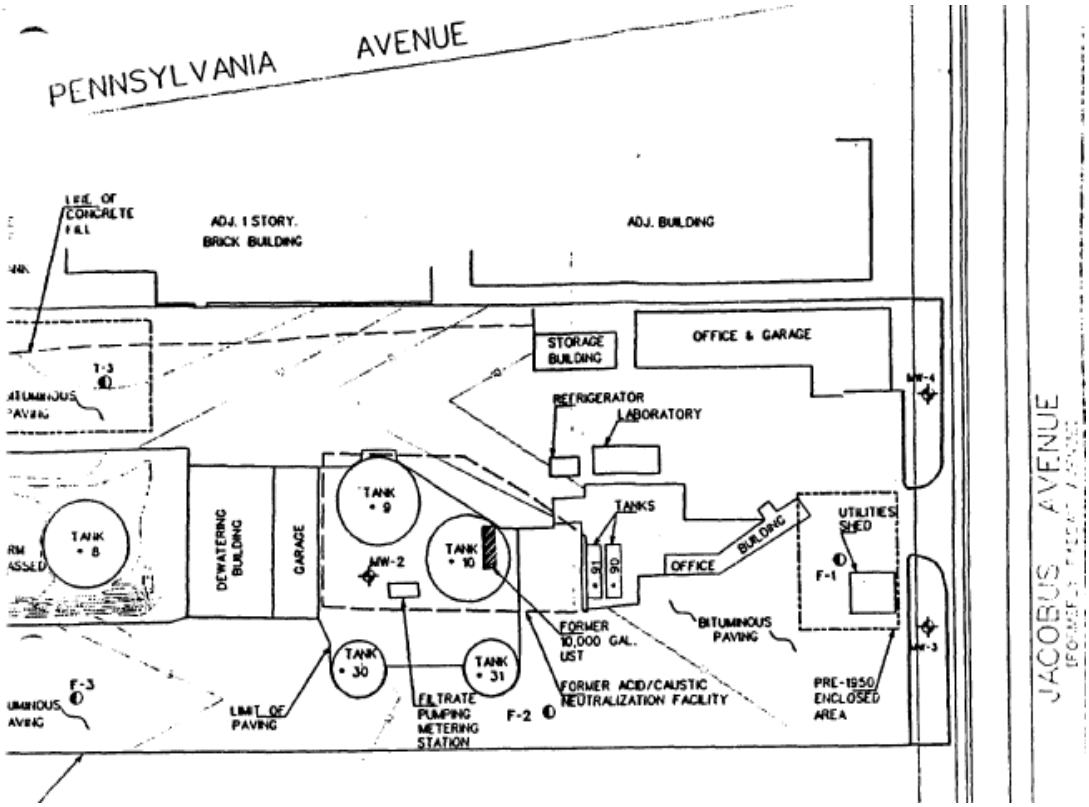
Waste Oil Reprocessing

According to the *Administrative Consent Order* signed in 1993, from 1978 to 1981, Spectraserv operated a waste oil reprocessing facility, whereby waste oil was treated through filtration, decanting, heating, and sedimentation via 16 aboveground storage and processing tanks. In addition, the facility reprocessed organic solvents, which were subsequently mixed with the reprocessed waste oil. The reprocessed waste oil was sold for use as fuel oil, motor oil stock, and forming oils, among others (PAS-00009568).

According to a *Revised Report, Remedial Investigation, ACO Compliance*, prepared for Spectraserv, dated February 23, 1995, the waste oil reprocessing facility was closed as certified by the NJDEP on August 25, 1992 (PAS-00054897, 907).

A site layout is presented below in two sections (west side, followed by east side) (PAS-00054936-37):





4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

According to a *Waste Oil Facility Soil Sampling Results* report, prepared for Spectraserv, dated October 10, 1990, soil sampling was conducted at the site in September 1990 following the withdrawal of the facility's application to operate the waste oil reprocessing facility (PAS-00054840). Samples were collected from an exterior receiving and treatment area and an interior storage area (PAS-00054841). All soil samples were collected from the surface depth present when the waste oil facility was in operation (zero to one foot) (PAS-00054842, 53). Polychlorinated biphenyls (PCBs) were detected in 6 of 21 samples collected at an interior storage area. Concentrations detected ranged from 1.4 parts per million (ppm) to 52 ppm (PAS-00054847). The report states that PCBs were found to have the highest concentrations in the area around storage tank T-18 on the northern side of the waste oil area near an adjacent SYNCON site. The report states that the concentrations suggest a gradient across the waste oil facility, with the gradient flowing from north to south from SYNCON toward Spectraserv, and the possibility that the PCBs migrated from an adjacent SYNCON facility is "high" (PAS-00054850-51).

PAHs

According to a *Waste Oil Facility Soil Sampling Results* report, prepared for Spectraserv, dated October 10, 1990, soil sampling was conducted at the site in September 1990 following the withdrawal of the facility's application to operate the waste oil reprocessing facility (PAS-00054840). Samples were collected from an exterior receiving and treatment area and an interior storage area (PAS-00054841). All soil samples were collected from the surface depth present when the waste oil facility was in operation (zero to one foot) (PAS-00054842, 53). High and low molecular weight polynuclear aromatic hydrocarbons (PAHs) were detected in all soil samples associated with the interior storage area (PAS-00054846-47).

According to a *Revised Report, Remedial Investigation, ACO Compliance*, prepared for Spectraserv, dated February 23, 1995, soil sampling was conducted at the facility in 1994 consistent with an *Administrative Consent Order* issued by NJDEP in March 1993 (PAS-00054902). High and low molecular weight PAHs were detected in one soil sample (TP-4) collected from a depth of 3.5 to 4 feet from the "Area of Passaic River Filling" (PAS-00054914, 19, 26). The report noted that the contaminants represented organic chemicals contamination (PAS-00054926-27) consistent with that found in historic fill (PAP-00216883-34). According to *Report Remedial Investigation ACO Compliance Spectraserv, Inc.*, by BEM Systems and dated November 21, 1994, four test pits were sampled, and sample TP-4 contained the highest concentrations of all constituents. They are as follows, in mg/kg: anthracene (16.67), fluorene (7.011), fluoranthene (103.2), phenanthrene (57.26), pyrene (96.95), benzo(a)anthracene (56.82), chrysene (50.69), benzo(b)fluoranthene (70.91), benzo(k)fluoranthene (14.19 J), benzo(a)pyrene (45.16), indeno(1,2,3-cd)pyrene (14.31), dibenz(a,h)anthracene (8.484) and benzo(g,h,i)perylene (13) (PAP-00457329).[1]

Copper

According to a *Waste Oil Facility Soil Sampling Results* report, prepared for Spectraserv, dated October 10, 1990, soil sampling was conducted at the site in September 1990 following the withdrawal of the facility's application to operate the waste oil reprocessing facility (PAS-00054840). Samples were collected from an exterior receiving and treatment area and an interior storage area (PAS-00054841). All soil samples were collected from the surface depth present when the waste oil facility was in operation (zero to one foot) (PAS-00054842, 53). The maximum copper concentration detected was 2,530 ppm. This concentration was reported in a sample collected from the interior storage area (PAS-00054863). The report noted that concentrations of metals were "consistent with the historically industrialized area and the ambient coal sources historically found in this area" (PAS-00054851-52).

[1] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Spectraserv 's previous certification.

According to *Report Remedial Investigation ACO Compliance Spectraserv, Inc.*, by BEM Systems and dated November 21, 1994, copper was detected in each of 17 subsurface samples collected in June 1994, at concentrations ranging from 9.53 to 354 ppm (in sample TP-4) (PAP-00457332-3).[2]

A Chemical Land Holdings *Executive Summary* dated October 31, 1996, compiled data indicating that the Passaic River sediment contamination in the vicinity of Spectraserv includes copper, (PAS-00054947-49). According to this summary report, copper was reported to have been discharged to soil at a concentration of 5,030 ppm (PAS-00054947); however, the summary report does not provide the source of the detection nor does it state if it was the result of a release related to Spectraserv operations. Additional details regarding this detection, including sample location and depth, were not identified in the available file material.

The facility holds a NJPDES permit (No. NJ0104167), renewed in 2015 and renewed again in draft form in 2017 for the discharge of stormwater to the Passaic River (PAP-00206941). According to a Fact Sheet prepared by NJDEP included in a draft Stormwater Discharge Renewal Permit Action dated July 20, 2017, NJDEP's review of all Discharge Monitoring Reports submitted by Spectraserv showed “significant excursions” from the existing individual permit design criteria, including copper on 17 occasions between 2008 and 2016 (PAP-00206942-43). Reported copper concentrations ranged from a minimum of 0.011 mg/L in 2009 to a maximum of 79.90 mg/L in 2015 (PAP-00206942). These findings served as a basis to move the facility from numerical stormwater standards, which NJDEP deemed to be “not feasible,” to a new, best management practice standard whereby stormwater discharges would be controlled by the implementation of a stormwater pollution prevention plan (PAP-00206944-45). It is unclear if the facility had discharge limits for copper between 2008 and 2016; however, in 2017, the draft permit limitation for copper was listed as ≤ 0.0048 mg/L (PAP-00206946). Discharge volumes were not included in the permit.

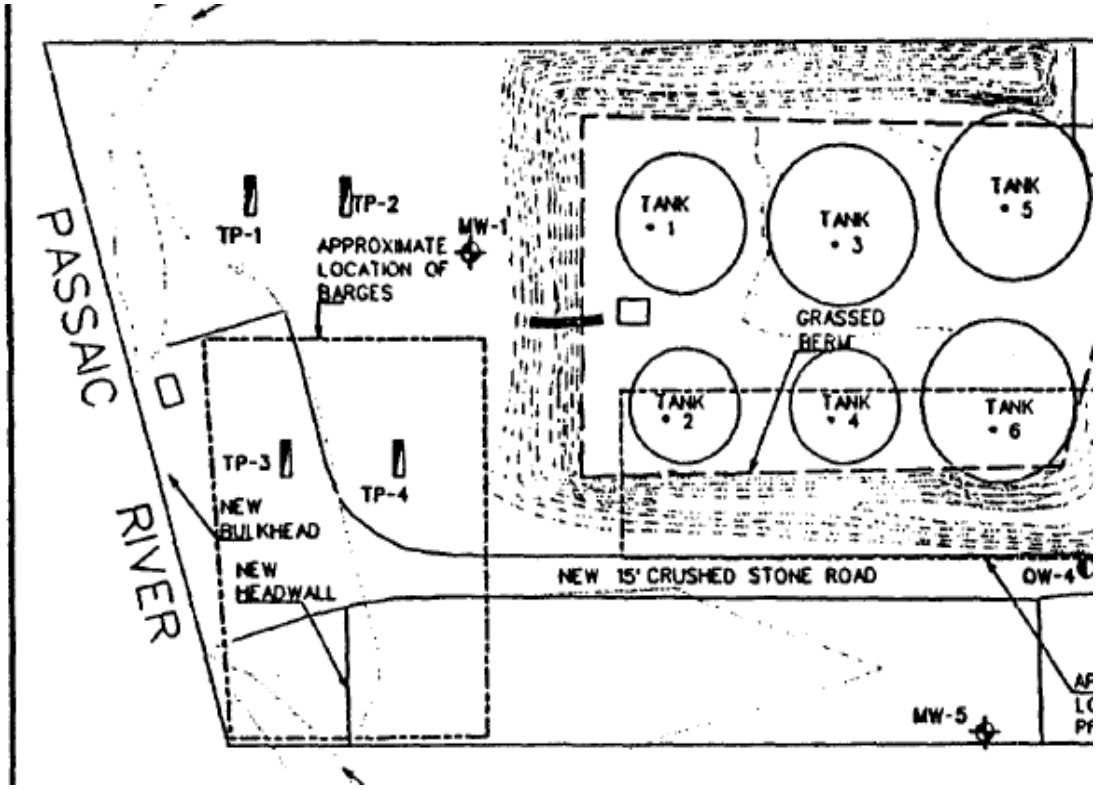
Lead

According to a *Waste Oil Facility Soil Sampling Results* report, prepared for Spectraserv, dated October 10, 1990, soil sampling was conducted at the site in September 1990 following the withdrawal of the facility’s application to operate the waste oil reprocessing facility (PAS-00054840). Samples were collected from an exterior receiving and treatment area and an interior storage area (PAS-00054841). All soil samples were collected from the surface depth present when the waste oil facility was in operation (zero to one foot) (PAS-00054842, 53). The maximum lead concentration detected was 3,770 ppm. This concentration was reported in a sample collected from the interior storage area (PAS-00054859). The report noted that concentrations of metals were “consistent with the historically industrialized area and the ambient coal sources historically found in this area” (PAS-00054851-52).

[2] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Spectraserv ’s previous certification.

According to *Report Remedial Investigation ACO Compliance Spectraserv, Inc.*, by BEM Systems and dated November 21, 1994, lead was detected in each of 17 subsurface samples collected in June 1994, at concentrations ranging from 23.6 to 1485 ppm (in sample TP-4) (PAP-00457332-3).[3]

According to a *Revised Report, Remedial Investigation, ACO Compliance*, prepared for Spectraserv, dated February 23, 1995, soil sampling was conducted at the facility in 1994 consistent with an *Administrative Consent Order* issued by NJDEP in March 1993 (PAS-00054902). Lead was detected in one soil sample (TP-4) at a concentration of 1,485 mg/kg at a depth of 3.5 to 4 feet in the "Area of Passaic River Filling" (PAS-00054914, 20, 26). The report noted that the contaminants represented metals contamination (PAS-00054926-27) consistent with that found in historic fill (PAP-00216883-34). A figure showing the location of sample TP-4 is presented below (PAS-00054937):



The facility holds a NJPDES permit (No. NJ0104167), renewed in 2015 and renewed again in draft form in 2017 for the discharge of stormwater to the Passaic River (PAP-00206941). According to a Fact Sheet prepared by NJDEP included in a draft Stormwater Discharge Renewal Permit Action dated July 20, 2017, NJDEP's review of all Discharge Monitoring Reports submitted by Spectraserv "significant excursions" from

[3] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Spectraserv 's previous certification.

the existing individual permit design criteria, including lead on seven occasions occurred between 2012 and 2016 (PAP-00206942-43). Reported lead concentrations ranged from a minimum of 5.1 mg/L in 2016 to a maximum of 60.46 mg/L in 2014 (PAP-00206942-3). These findings served as a basis to move the facility from numerical stormwater standards, which NJDEP deemed to be "not feasible," to a new, best management practice standard whereby stormwater discharges would be controlled by the implementation of a stormwater pollution prevention plan (PAP-00206944-45). It is unclear if the facility had discharge limits for lead between 2008 and 2016; however, in 2017, the draft permit limitation for lead was listed as ≤ 0.21 mg/L (PAP-00206946). Discharge volumes were not included in the permit.

Mercury

According to a *Waste Oil Facility Soil Sampling Results* report, prepared for Spectraserv, dated October 10, 1990, soil sampling was conducted at the site in September 1990 following the withdrawal of the facility's application to operate the waste oil reprocessing facility (PAS-00054840). Samples were collected from an exterior receiving and treatment area and an interior storage area (PAS-00054841). All soil samples were collected from the surface depth present when the waste oil facility was in operation (zero to one foot) (PAS-00054842, 53). Mercury was detected at the interior storage area and exterior receiving/treatment area (PAS-00054847; PAS-00104043). The maximum mercury concentration detected was 5.6 ppm. This concentration was reported in a sample collected from the interior storage area (PAS-00054863). The report noted that concentrations of metals were "consistent with the historically industrialized area and the ambient coal sources historically found in this area" (PAS-00054851-52).

According to *Report Remedial Investigation ACO Compliance Spectraserv, Inc.*, by BEM Systems and dated November 21, 1994, mercury was detected in each of 17 subsurface samples collected in June 1994, at concentrations ranging from 0.12 to 1.68 ppm (in sample TP-4) (PAP-00457332-3).[4]

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[5]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead,

[4] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Spectraserv 's previous certification.

[5] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

copper, and mercury.[6] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[7] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[8]

According to *Report Remedial Investigation ACO Compliance Spectraserv, Inc.*, by BEM Systems and dated November 21, 1994, surface and near surface soils on the Spectraserv property can be classified as fill material (PAP-00457263).[9]

A *Remedial Investigation Report*, prepared for Spectraserv, dated May 2014 states that Historic Fill is present at the facility, and contains lead and PAH contamination. It notes that findings suggested that specific soil contamination at the "Area Along Jacobus Avenue" (PAHs), "Southern Site Boundary Area" (PAHs), and "Passaic River Filling Area" (PAHs, lead) are attributable to regional Historic Fill contamination (PAP-00216883-4, 19-20).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00054863; PAS-00054947-48, PAP-00457184, PAP-00457281).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	3,770 mg/kg
Copper	5,030 mg/kg
Mercury	5.6 mg/kg
Benzo(a)anthracene	56.82 mg/kg [9]
Benzo(a)pyrene	58.11 mg/kg
Benzo(b)fluoranthene	70.91 mg/kg
Benzo(k)fluoranthene	35.3 mg/kg
Dibenzo(a,h)anthracene	8.484 mg/kg [9]
Indeno(1,2,3-cd)pyrene	38.65 mg/kg

5. COC Pathways

[6] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[7] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[8] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).
[9] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Spectraserv 's previous certification.

The facility is located adjacent to the Passaic River at River Mile 1 (PAP-00206802; PAP-00193151; PAP-00124669).

Sanitary Sewer

According to the *Killam Annual Inspection and Assessment Report for the Town of Kearny*, dated July 1998, a separate sewer and transport system service the area of the City known as South Kearny. This area is a tributary to the Kearny Municipal Utilities Authority Pumping Station which pumps flow directly to the PVSC WPCF in Newark through a joint force main owned and operated by Jersey City, Bayonne, and the Kearny MUA. The Kearny system under the control of the Utilities Authority does not have any CSO discharge points (PAP-00455848-49).

According to an Administrative Consent Order Letter from NJDEP, dated May 1, 1989, On November 17, 1986, the Town of Kearny entered into an Administrative Consent Order (ACO) with the NJDEP regarding the conversion of the Kearny Sewage Treatment Plant to a pumping station. Upon completion of this conversion, all sewage flows in the Kearny service area would be pumped to the PVSC treatment plant in Newark. On December 13, 1987, Neglia Engineering obtained the ACOE permit and completed the design of the pump station and force main (PAP-00455911-12).

Spectraserv held PVSC Sewer Connection Permit # 15406882 and was authorized to discharge to the PVSC Treatment Works in accordance with the following discharge limitations and monitoring requirements from September 16, 1991 to September 16, 1996 (PAP-00455914):

Outlet 1 (15406881-00000-0151)

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
		DAILY MAX	MEASUREMENT FREQUENCY	SAMPLE TYPE	REPORTING PERIOD
BOD (0310)	XXXXX	XXXX	Daily	24 hr. comp.	Monthly
TSS (0530)	XXXXX	XXXX	Daily	24 hr. comp.	Monthly
COD (0340)	XXXXX	XXXX	Daily	24 hr. comp.	Monthly
pH (9000)	XXXXX	5 to 10.5	Continuous	Recorder	*
Volume	XXXXX	XXXX	XXXXX	XXXXX	Monthly

* Permittee to store pH Recorder Charts and have available for review by PVSC personnel on demand.

(PAP-00455918)

Outlet 2 (15406882-00000-0151)

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EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
			MEASUREMENT FREQUENCY	SAMPLE TYPE	REPORTING PERIOD
BOD (0310)	XXXXX	XXXX	N/A *	N/A	XXXXX
TSS (0530)	XXXXX	XXXX	N/A *	N/A	XXXXX
Volume	XXXXX	XXXX	XXXXX	XXXXX	Monthly

* Concentration for User Charge to be determined from Residential Strength Standards.

(PAP-00455919)

According to PVSC Sewer Connection Permit # 15406882, Spectraserv was allowed to discharge lead at a monthly average of 0.43 mg/l with a max of 0.69 mg/l (PAP-00455921). The permit was issued for the annual discharge of 164,250,000 gallons (PAP-00455923).

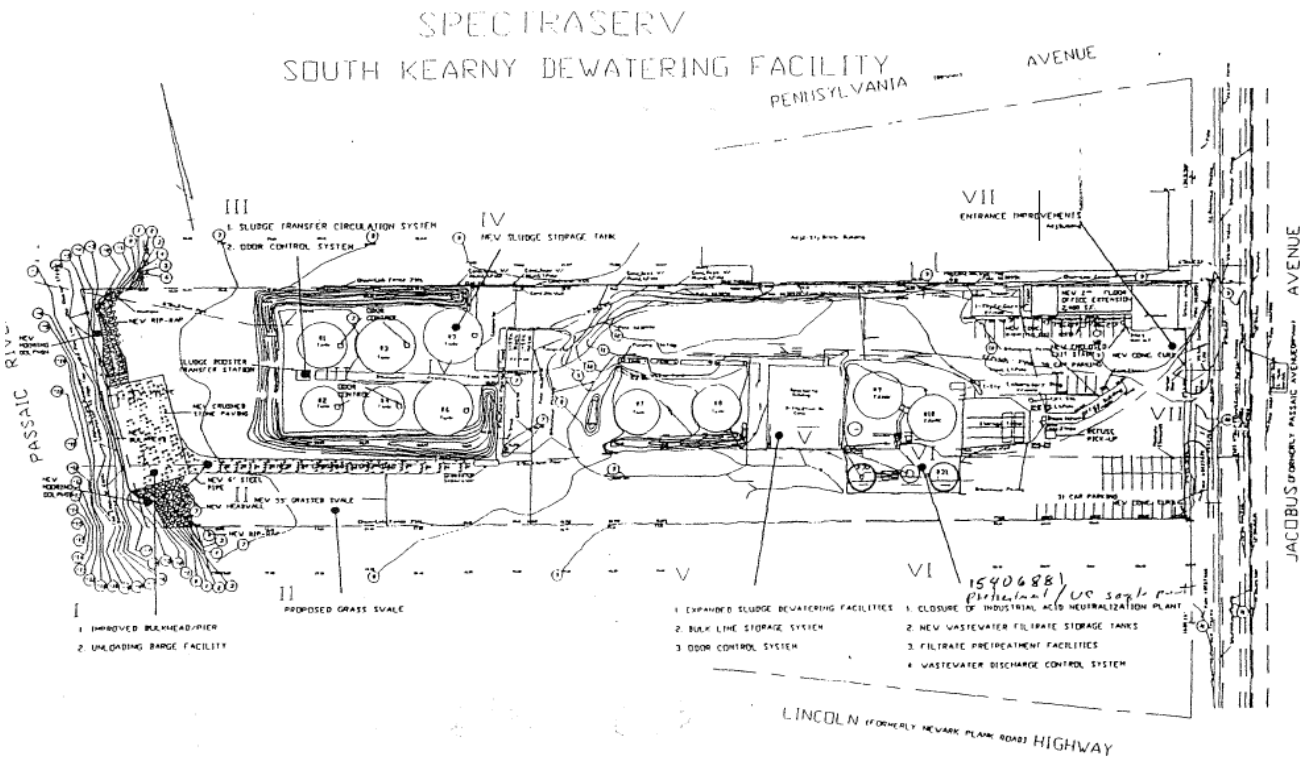
According to PVSC Sewer Permit # 15200004 effective September 01, 2015 – August 31, 2020, Spectraserv permit has the following parameters for outlet 15200004-1 (PAP-00192810).

PVSC LOCAL LIMITS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
PARAMETER	(a) mg/l DAILY MAXIMUM	mg/l THRESHOLD VALUE	MEASUREMENT FREQUENCY	SAMPLE TYPE	REPORTING PERIOD
Cu	3.98	XXXXX	Twice/Month	Composite	Monthly
Pb	1.3	XXXXX	Twice/Month	Composite	Monthly
Hg	*	XXXXX	Twice/Month	Composite	Monthly
Ni	3.12	XXXXX	Twice/Month	Composite	Monthly
Zn	*	XXXXX	Twice/Month	Composite	Monthly
Volume	XXXXX	XXXXX	Continuous	XXXXX	Monthly

* Permittee must meet 40 CFR 437 Categorical limit on Page 7of 15 for this parameter.

(PAP-0012818)

The residual process generates a wastewater that is pretreated at the facility and discharged to the Kearny sewer system under a PVSC Sewer Use Permit (No. 15200004); ultimate treatment and disposal then occurs at the PVSC treatment facility (PAP-00206855-56; PAP-00192809-12; PAP-00193160). The pretreatment process consists of the filtrate (water removed from the residual via a belt filter press) flowing through a bioscrubber and two settling tanks/clarifiers prior to discharge (PAP-00206856).



(PAP-00455930)

Stormwater

According to an October 24, 1990 NJDEP letter regarding Waterfront Development and Stream Encroachment Permits 0907-90-0006.1WD and 0907-90-0006.2SE, Spectraserv was authorized to construct a single stormwater outfall structure within Lots 10, 10R, 11 and 11R of Block 289 in the Town of South Kearny and required all fill and other earth work shall be stabilized to prevent eroded soil from entering the waterway at any time during and after construction (PAP-00455962, 64).

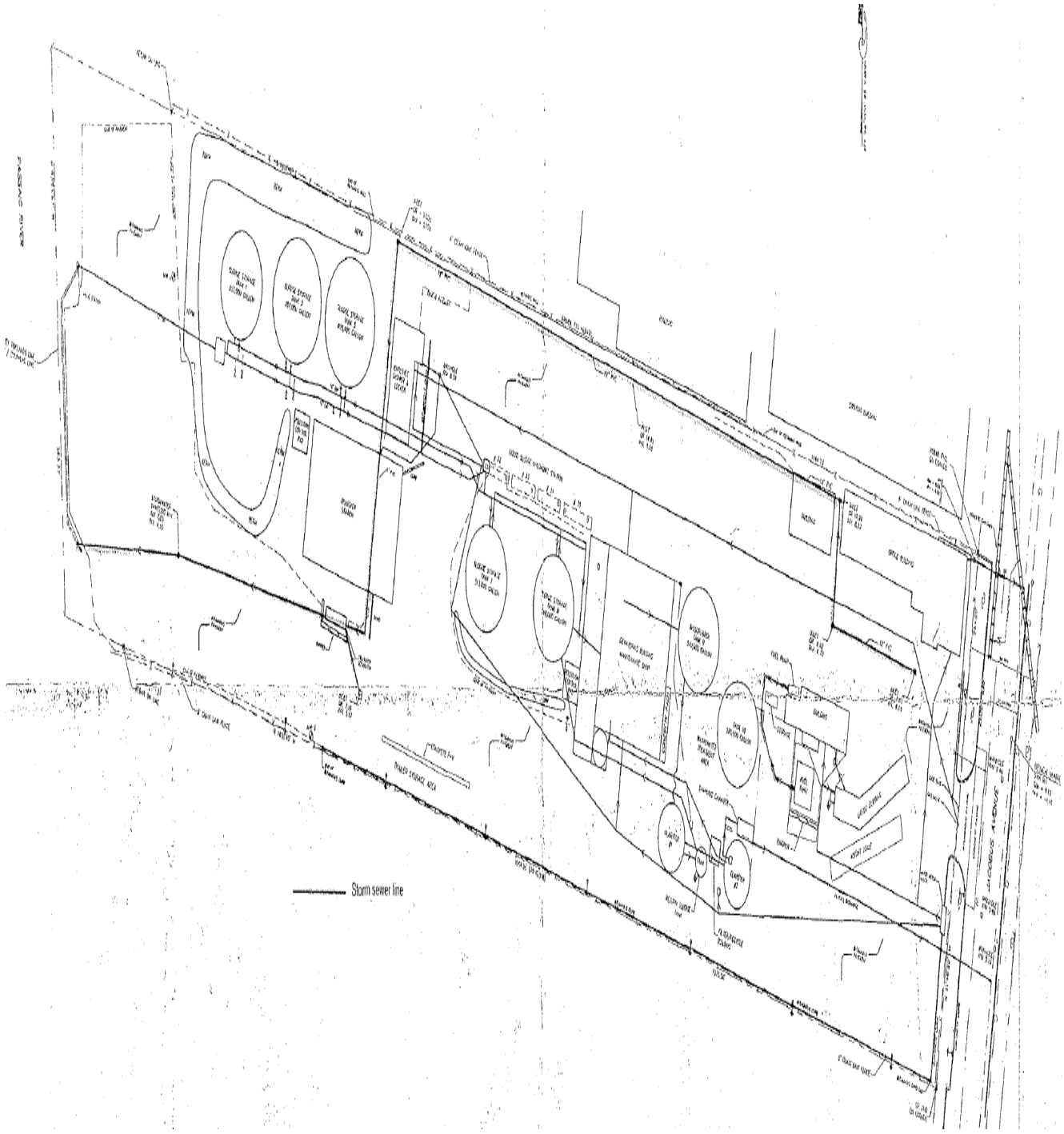
The 2007 Spectraserv Facility Improvements map below shows stormwater from the site does not discharge to the KMUA or PVSC sewer systems but a separate stormwater collection and conveyance system at the Facility with an outfall to the Passaic River. The image shows several inlets in the northeast part of the site (near the Office Building) which would capture stormwater from the northeast portion of the site, and a storm line heading west. After the Employee Shower and Locker Building, the line turns south, and then west again after the Transfer Station Building, goes through the oil / water separator and jogs a bit to the south at the sampling manhole and ends at the outfall on the river. There is another inlet just to the southeast of the oil / water separator that captures runoff from the southeast portion of the site. Stormwater from the westernmost portion of the site flows overland to the river (PAP-00455969).

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According to a July 20, 2017 NJDEP Discharge to Stormwater Discharge Renewal Permit Action Letter, Spectraserv holds permit NJ0104167 for outfall 001A (PAP-00206940-43).

According to a *Stormwater Pollution Prevention Plan* prepared for Spectraserv, dated February 2017 (2017 SWPPP), stormwater generated onsite is discharged either to the Passaic River via the onsite stormwater collection system, or to the combined sewer system operated by Kearny Municipal Utilities Authority; ultimate disposal is at the PVSC treatment facility (PAP-00193156-58). The 2017 SWPPP states that stormwater from the southeast parking area of the facility runs off to Jacobus Avenue and a Conrail railroad right-of-way and is discharged to the combined sewer system (PAP-00193159).

Direct Release

According to National Pollutant Discharge Elimination System Permit # NJ0022161 effective December 31, 1978 until December 31, 1983, the Town of Kearny Wastewater Treatment Plant which Spectraserv was connected to was authorized to discharge to the Hackensack River (PAP-00455933, 43).

The facility holds a NJPDES permit (No. NJ0104167) for the discharge of stormwater. It was renewed in 2015, and was renewed in draft form in 2017 (PAP-00206937, 40, 42). The receiving water body is listed as the Passaic River (PAP-00206941). According to the 2017 SWPPP, stormwater from the northern half of the facility, including administrative building roof drains, is collected in a series of interconnected inlets and pipes, and is sent to an in-line oil/water separator on the southern half of the property. The oil/water separator provides pretreatment and removal of potential pollutants prior to discharge to the Passaic River (PAP-00193159).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

NJDEP issued an *Administrative Consent Order* to Spectraserv in March 1993 requiring Spectraserv to prepare a remedial investigation and feasibility study (PAS-00009572).

The facility has received numerous notices of violation (NOV) from PVSC since 1999. However, the NOVs, which focus on biochemical oxygen demand and suspended solids, were resolved without admission of liability and without any adjudication of the facility's culpability for the allegations contained in the NOVs. The NOVs are as follows:

- On January 28, 1999, for petroleum hydrocarbon detections exceeding the PVSC "daily maximum limit" (PAS-00009592).

- On April 12, 2000, and August 13, 2002, for failing to provide a PVSC inspector proper access to the facility (PAS-00009615; PAS-00009624).

- On April 24, April 28, May 15, and May 25, 2000, for discharge of sludge to the sanitary sewer (PAS-00009610; PAS-00009609; PAS-00009606; PAS-00009599).

- On May 25, 2000, and on June 1, 2000, for use of water to dilute a discharge (PAS-00009604; PAS-00009598).

- On July 18, 2000, for discharge of floatable greases to the sanitary sewer. Two samples collected associated with this release had total petroleum hydrocarbon and oil and grease concentrations that exceeded the "daily maximum limit" (PAS-00009595).
- On October 19, 2000; June 6 and August 14, 2001; January 11, June 25, August 13, and October 3, 2002; and, January 17, 2003, for discharge of solids to the sanitary sewer (PAS-00009594; PAS-00009620; PAS-00009621; PAS-00009622; PAS-00009623; PAS-00009625; PAS-00009626).

- On April 30, 2003, for failing to maintain equipment to prevent solids from being discharged without being sampled (PAS-00009617).

- On June 10, 2003, for improper discharge monitoring (PAS-00009618).

- On March 31, 2005, for exceedance of the "daily maximum limit" for TPH (PAS-00009619).

No documentation of OU2 COCs being present in any of the above-listed discharges was identified in the available file material.

Permits

Spectraserv held PVSC Sewer Connection Permit # 15406882 and was authorized to discharge to the PVSC Treatment Works in accordance with the following discharge limitations and monitoring requirements from September 16, 1991 to September 16, 1996 (PAP-00455914)

The facility holds two permits with respect to the sewage sludge processing operation: a NJPDES Residual Transfer Facilities permit (No. NJ0079570) for process residuals and PSVC Sewer Use Permit (No. 15200004) for filtrate discharge (PAP-00206852, 56):

- The NJPDES Residual Transfer Facilities permit (No. NJ0079570) was issued to the facility (renewed) on October 27, 2017, effective December 1, 2017 (PAP-00206871). A permit modification was issued on December 15, 2017 to reduce the frequency of sampling in the transfer station as a response to the final permit. The effective date of the major modification is January 1, 2018 (PAP-00192743). It is noted that it appears the facility held the permit prior to this date, as the

December 1, 2017 permit was a renewal (PAP-00206871); however, the prior dates held are unclear based on review of available file material.

- The PVSC Sewer Use Permit (No. 1520004) is currently effective through August 31, 2020 (PAP-00192810).

The facility also holds a NJPDES permit (No. NJ0104167) for the discharge of stormwater. It was renewed in 2015, and it was renewed in draft form in 2017 (PAP-00206937, 40, 42). The receiving water body is listed as the Passaic River (PAP-00206941).

Additional details regarding these permits is presented below:

NJPDES Residual Transfer Facilities permit (No. NJ0079570)

Authorizations covered under the NJPDES Residual Transfer Facilities permit (No. NJ0079570) are listed as "Z – Residual Transfer Facilities." (PAP-00206871). The permit states that it contains the conditions necessary to regulate the operation of a residuals transfer station with a maximum capacity of 95 dry metric tons per day (PAP-00206852).

According to the permit, residual is off-loaded from barges and trucks via two sludge pump stations and held in six storage tanks. Dewatered residual produced via filter presses then falls onto a conveyor located inside the dewatering building that moves the material to a pug mill. There the residual can be mixed with lime of varying quantities as required by the ultimate management site. Dewatered residuals travel via belt conveyor from the dewatering building and are loaded into trucks in an enclosed loading area prior to transport to off-site management facilities. In addition, an enclosed cake transfer building receives dewatered sewage sludge and grit and screenings via trucks and containers. The dewatered sewage sludge is reloaded into empty dump trailers or rail containers stationed inside the cake transfer building (PAP-00206855-56).

The following "discharges" are monitored according to the NJPDES Residual Transfer Facilities permit (No. NJ0079570):

- Z001 Pug Mill Stabilized Cake: Lime-stabilized dewatered residual discharged from the pug mill. This discharge was required to be monitored for copper, lead, and mercury. Discharge limits were not listed, nor were discharge volumes (PAP-00206876, 78).

- Z002 Pug Mill Cake: Dewatered residual discharged from the pug mill in the dewatering building. This discharge was required to be monitored for copper, lead, mercury, PAHs, PCBs, dichlorodiphenyltrichloroethane, dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethylene, and 2,4,6-trichlorophenol. Discharge limits were not listed, nor were discharge volumes (PAP-00206881, 83, 85-92).

- Z003 Cake Transfer Building: Dewatered residuals and grit and screenings being transferred in the cake transfer building. This discharge was required to be monitored for copper, lead, and mercury. Discharge limits were not listed, nor were discharge volumes (PAP-00206894-95).

- Z004 Sludge Storage Tanks: The liquid sludge received for processing at the facility. This discharge was not required to be monitored for OU2 COCs (PAP-00206898).

- Z005 Total – Production: All residuals being transferred at the facility. This discharge was not required to be monitored for OU2 COCs (PAP-00206900).

Liquid discharges related to the above-referenced processes are discharged to the PVSC sewer pursuant to the PVSC Sewer Use Permit. Solids generated are removed from the facility by truck (PAP-00206855-56; PAP-00192812). Data related to monitoring of these discharges were not identified in the available file material.

PVSC Sewer Use Permit (No. 1520004)

According to the PVSC Sewer Use Permit (No. 15200004) renewed on September 1, 2015, the facility was permitted to discharge 0.082 million gallons of wastewater per day through one outfall (PAP-00192812). It is noted that at the time of a *Preliminary Assessment Report* prepared by EPA, dated June 15, 1986, Spectraserv discharged 50,000 to 100,000 gallons of dewatered supernatant per day (PAS-00054825).

The permit states that average monthly discharge limitations included that for copper (1.06 mg/L), lead (0.283 mg/L), and mercury (0.000739 mg/L) (PAP-00192816).

NJPDES permit (No. NJ0104167)

Spectraserv is required to monitor stormwater discharges for copper and lead (PAP-00206942). The draft permit limitations for copper and lead were listed as ≤ 0.0048 mg/L and ≤ 0.21 mg/L, respectively, in 2017 (PAP-00206946).

Discharge volumes were not included in the permit.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Waste Oil Facility Soil Sampling Results* report, prepared for Spectraserv, dated October 10, 1990 (PAS-00054837);
- *Report Remedial Investigation ACO Compliance Spectraserv, Inc.*, by BEM Systems, dated November 21, 1994 (PAP-00457243);

- *Revised Report, Remedial Investigation, ACO Compliance*, prepared for Spectraserv, dated February 23, 1995 (PAS-00054897);
- *Remedial Investigation Report*, prepared for Spectraserv, dated May 2014 (PAP-00216874);
- *Remedial Action Report*, dated September 2003 (PAP-00192841).

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

According to a *Waste Oil Facility Soil Sampling Results* report, prepared for Spectraserv, dated October 10, 1990, soil sampling was conducted at the site in September 1990 following the withdrawal of the facility's application to operate a waste oil reprocessing facility (PAS-00054840). Samples were collected from an exterior receiving and treatment area and an interior storage area (PAS-00054841). All soil samples were collected from the surface depth present when the waste oil facility was in operation (zero to one foot) (PAS-00054842, 53). PCBs were detected in 6 of 21 samples collected at an interior storage area. Concentrations detected ranged from 1.4 ppm to 52 ppm (PAS-00054847). The report states that PCBs were found to have the highest concentrations in the area around storage tank T-18 on the northern side of the waste oil area near an adjacent SYNCON site. The report states the concentrations suggest a gradient across the waste oil facility, with the gradient flowing from north to south from SYNCON toward Spectraserv, and the possibility that the PCBs migrated from an adjacent SYNCON facility is "high" (PAS-00054850-51).

In addition, according to the *Waste Oil Facility Soil Sampling Results* report, prepared for Spectraserv, dated October 10, 1990, lead, copper, and mercury were detected at both the interior storage area and exterior receiving/treatment area (PAS-00054847; PAS-00104043). The maximum lead concentration detected was 3,770 ppm; the maximum copper concentration detected was 2,530 ppm; the maximum mercury concentration detected was 5.6 ppm (PAS-00054859, 63). These concentrations were reported in samples collected from the interior storage area (PAS-00054863). The report noted that concentrations of metals were "consistent with the historically industrialized area and the ambient coal sources historically found in this area" (PAS-00054851-52). High and low molecular weight PAHs were detected in all soil samples associated with the interior storage area (PAS-00054846-47).

According to *Report Remedial Investigation ACO Compliance Spectraserv, Inc.*, by BEM Systems, dated November 21, 1994, work was conducted to fulfill the terms of the administrative consent order effective on March 28, 1993, and specifically to determine whether groundwater was impacted by contaminants originating from the former acid/caustic neutralization facility and waste oil treatment facility (RCRA closure areas) and to determine whether other areas of environmental concern exist (PAP-00457249).

Metals and PAHs were detected in subsurface soils, discussed in relevant paragraphs in Section 4, Identified COCs. PCBs were not detected in soils (PAP-00457330-1).[10]

According to a *Revised Report, Remedial Investigation, ACO Compliance*, prepared for Spectraserv, dated February 23, 1995, soil sampling was conducted at the facility in 1994 (PAS-00054896). The report states that previous soil sampling stated that site soils were primarily contaminated with metals (the metals were not specified), localized in the acid/caustic neutralization facility, and base/neutral organic compounds and PCBs, localized in the waste oil treatment area (PAS-00054908). PCB concentrations were not included in the report (PAS-00054920). In addition, the report states that high and low molecular weight PAHs and lead (at a concentration of 1,485 mg/kg) were detected in one soil sample (TP-4) collected from at a depth of 3.5 to 4 feet from the "Area of Passaic River Filling" (PAS-00054914, 19-20, 26). The report noted that the contaminants represented organic chemicals and metals contamination (PAS-00054926-27) consistent with that found in historic fill (PAP-00216883-34).

According to a *Remedial Investigation Report*, prepared for Spectraserv, dated May 2014, in 1995, two sediment samples were collected in the Passaic River to evaluate if historical activities at the site had impacted the river. One sample was collected at the approximate midpoint of the western boundary of the site adjacent to the river bulkhead, and another was collected from near the site's drainage effluent pipe. The two samples were analyzed for metals and base/neutral acids. The results were compared to a sample collected upstream of the site. With the exception of arsenic, it was reported that "all impacts were determined at or below average concentrations for the Passaic River." It is further reported that the NJDEP stated in a subsequent comment memorandum that the arsenic concentration "may be an indication that...the oil/water separator...impacting the surface water" (PAP-00216884). However, because Spectraserv agreed to remove the primary source of arsenic contamination around the oil/water separator, NJDEP did not require supplemental ecological studies of the Passaic River and the potential impact of the arsenic-impacted sediments (PAP-00216884).

Remedial Activities

According to a *Revised Report, Remedial Investigation, ACO Compliance*, dated February 23, 1995, as part of previous closure activities, an extensive soil sampling program was undertaken and the results of the soil sampling program stated that site soils were primarily contaminated with metals (the metals were not specified), localized in the acid/caustic neutralization facility, and base/neutral organic compounds and PCBs, localized in the waste oil treatment area. Based on the results of the soil-sampling program, approximately 800 cubic yards of soil were excavated from the former acid/caustic neutralization area and the former waste oil treatment area (PAS-00054908, 20).

[10] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Spectraserv 's previous certification.

Remedial activities to address impacts to site soils were undertaken in 2002 and 2003 in accordance with a February 1999 *Remedial Action Work Plan* (1999 RAWP), approved by NJDEP on April 15, 2002. These activities were summarized in a *Remedial Action Report*, dated September 2003, approved by NJDEP on September 2, 2010. A Deed Notice was recorded on November 5, 2010. Spectraserv was issued a remedial action permit on July 7, 2011, with a conditional "no further action" letter on August 24, 2011. It is reported that all soil remedial investigations were completed and approved by NJDEP in the 1999 RAWP. These actions included soil removal in the "Oil/Water Separator Area" and "Former Waste Oil Facility Area," and capping at the "Passaic River Filling Area" and "Former Waste Oil Facility Area". It is reported that a February 5, 2010 "Response to Comments" letter stated that residual soil contamination would be addressed by a Deed Notice (PAP-00216884-85).

According to *Remedial Action Report AOCs 8 and 10, Spectraserv Site*, dated April 15, 2020, NJDEP issued a site-wide soils NFA letter on August 24, 2011 (PAP-00460270). Remedial investigation and activity related to groundwater continued on the site, and it was concluded in *Preliminary Assessment Report, Spectraserv Site*, dated April 15, 2020, that the source of benzene and chlorobenzene was the neighboring Syncon Resins property (PAP-00457349).[11]

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

[11] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Spectraserv 's previous certification.

Stanley Black & Decker Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

STANLEY BLACK & DECKER INC.

Facility Name, Address and Size: Stanley Black and Decker; formerly known as The Stanley Works (Stanley), 139 and 140 Chapel Street, Newark, New Jersey. The site is comprised of two parcels of land separated by Chapel Street. The Western Parcel is approximately 1.8 acres; the Eastern Parcel approximately 4.4 acres (PAS-00085749). In 1975, the site had 282 employees working 3 shift per day, 6 days per week (PAP-00019267).

1. **Business Type:** According to the *Site Evaluation Submission*, dated May 24, 1985, Stanley Tools, a division of The Stanley Works, operated a site in Newark that manufactured hand tools. Products at this site included hammers, sledges, mauls, bars, and wedges (PAS-00085686; PAS-00085762). Products were forged, machined, ground, heat-treated, painted, polished, assembled, and shipped (PAS-00124577; PAP-00018774).

2. **Time Period of Ownership/Operations**

   Operator: 1875 – 1985
   Owner: 1875 – December 1997

   According to a *Response to EPA's Request for Information*, dated March 30, 2004, Stanley Tools (or its predecessors) manufactured hand tools at 140 Chapel Street, Newark, NJ from 1875 to 1985, when the site was closed (PAS-00085663).

   According to the May 2016 Remedial Investigation Report, the site was originally operated by the Atha Tool Company from 1875 to 1917 for the manufacture of hammers and sledges. Stanley Rule and Lever (SR&L) acquired the site in 1917 and merged with The Stanley Works in 1920 (PAP-00018960).

   According to the meeting minutes from an Atha Tool Board of Directors meeting, dated April 1, 1913, the stocks of Atha Tool were sold to SR&L pursuant to an agreement that excluded from the sale all accounts and bills receivable, moneys, bank deposits, and all choses of action generally of Atha Tool and such assets were to be held in trust to pay debts and liabilities of Atha Tool arising prior to April 1, 1913 (PAP-00728647).

   According to the *Baseline Ecological Evaluation of the former Stanley Tools Facility*, dated August 1999, the site was purchased by Ramida Rest Brown, Inc. in December 1997 (PAS-00086029).

3. **Operational History/COC Use and Presence at the Facility**

   According to a *Site Evaluation Submission (SES),* dated May 24, 1985, operational history included the following:

   Steel bars were received in fifteen-foot lengths and were stored outside in the paved courtyard east of Building 20. From there, the steel bars were brought inside and cut to length depending on the product to be manufactured. This was a dry operation which did not utilize any chemicals. After the shearing process, work in progress was sent to a

shot cleaning process to remove surface oxidation. The shot cleaning process involved tumbling part on part in an atmosphere of high velocity steel shot. This operation was performed in Buildings 21 and 51. Baghouse filters were located in the alleyway between Buildings 21 and 51, as well as along the east wall of Building 20 in order to collect any of the abrasive dust or particulate matter that resulted from the process. The collected material was handled as non-hazardous solid waste and was disposed of in an ID 26 sanitary landfill (PAS-00085686).

Lead pots were used in the manufacturing process until 1977. The pots were located in Building 21 (PAS-00085695). Stanley states that the pots were discontinued due to improvements in the methods used to manufacture products (PAS-00085665).

After the shot cleaning process, forging was performed in one of three separate buildings on site depending on the product involved. In Building 1, drop forging was performed utilizing oil-fired slot furnaces. In Building 51, parts were press forged utilizing either the oil-fired slot furnace or electric induction heaters. In Building 20A, impact forging was performed utilizing electrical resistance heaters. After the forging operations, all parts were mechanically trimmed regardless of the type of forging performed. Scrap was collected and placed in one of three 40 cubic yard containers stored on site. Material was sold to Schiavone and hauled offsite when the containers were full (PAS-00085687).

The trimmed parts were returned to the shot cleaning operations prior to being ground on a stone wheel or automatic belt grinders. All grinding operations were performed dry and took place in Buildings 21A and 51. Some grinding machines had small dust collectors attached to the machine. These materials were handled as non-hazardous solid waste and were disposed of in an ID 26 sanitary landfill (PAS-00085687).

At this point, parts that were to be drilled or milled were annealed in gas-fired furnaces located in Building 22. After annealing, the parts were machined using Castrol, a water-soluble coolant. Spent coolant was placed in 55-gallon drums. When feasible, spent coolant was filtered and reused. If this procedure was not possible, the drums were ticketed with internal hazardous waste tracking labels and moved to the basement of Building 24-A for storage. Coolants handled as waste may have been combined with waste oil generated from other manufacturing operations. Waste oil/coolant was hauled from the site in bulk by Hitchcock Oil Pollution Systems of Connecticut. The shipments were manifested and listed as New Jersey waste number X726 (PAS-00085687-88).

The next step in the manufacturing process was heat-treating. Heat treating involved heating a part to a desired temperature after which the part was quenched for proper hardness, and tempered for toughness. This operation was conducted in Building 21. Three of the heat-treat furnaces were gas-fired and operated under a nitrogen atmosphere utilizing an internal oil quench. Once per year, the quench oil was pumped from the tank into 55-gallon drums to allow for cleaning of the tank. If the oil was deemed acceptable, it was returned to the quench tank when the cleaning process was completed. Should the oil become contaminated with water and thereby unsuitable for reuse, the oil was ticketed with internal hazardous waste labels and moved to Building 24 for storage (PAS-00085688).

Parts were returned to Buildings 21 or 51 for shot cleaning after tempering. The shot cleaning process was required at this point to clean the surface prior to subsequent painting operations. Painting of the products was performed in both Buildings 20A and 51. This operation utilized a conveyorized dip line capable of coating the product with either black or red water reducible paint. Since this was a dip operation, paint loss was reported to be minimal. Whatever paint that might have dripped off the parts was collected on drip trays and directed back into the dip tank. The painted parts then entered a gas-fired baking oven. Semi-annually, paint was pumped from the dip tank and placed in 55-gallon drums to allow for cleaning of the tank. Should a color be discontinued from use, or should the paint become contaminated, the waste paint drums were labeled with an internal hazardous waste label and placed in Building 24 for storage (PAS-00085688-89).

Parts requiring assembly were transferred to the assembly area in Building 52. Wooden handles were attached to parts utilizing a hydraulic press and metal or wooden wedges. Fiberglass handles were brush coated and then pressed into the hammer head. The lower handle body was dipped into a general purpose nitrile rubber adhesive. The adhesive was then allowed to air dry. The adhesive was then activated by a solution containing 60% methyl ethyl ketone and 40% naphtha. The activation solution was introduced into a rubber handgrip to lightly coat the inside surface. Residual activation solution was removed from the grip and returned to a holding container for reuse. No waste was generated during this operation (PAS-00085690).

The polished surface areas of parts which did not require assembly were coated with a water reducible clear lacquer. This operation was performed in Building 24. The majority of the parts were coated in a dip application, with a minor amount of hand brushing. A small amount of thinner was generated during clean up procedures. This material was drummed and labeled with internal hazardous waste tickets prior to storage in Building 24. The final step for these products was packaging which was performed in Building 24 (PAS-00085690-91).

Assembled products were reground to remove run-off (i.e., drip marks, burrs, etc.). This operation was conducted in Building 52. Waste generated at this point was collected in the baghouse filter located along the east wall of Building 20. At this point, the parts were racked in a vertical position where the heads would then go through a finishing operation where they were dipped in a series of 20-gallon tanks.

The finishing operation was comprised of the following steps:

1. Mineral spirits - to remove oil or grease. Once per month the tank was drained into a 55-gallon drum and ticketed with an internal hazardous waste label and stored in the basement of Building 24.

2. Cold water rinse - to remove mineral spirits.

3. Ultrasonic cleaning - once per month this tank was drained to sewer. Note: The sewer utilized is not specified.

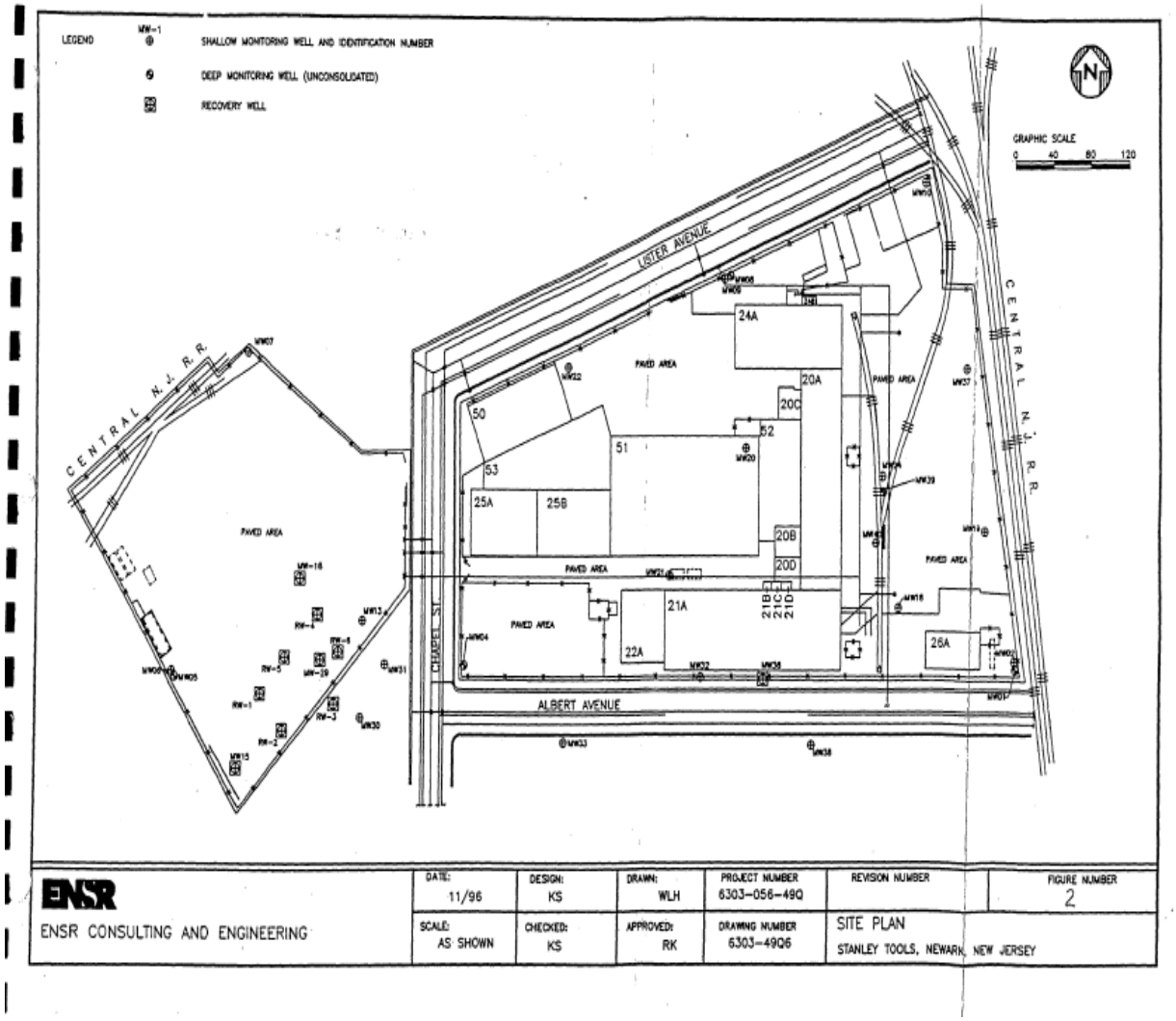
4. Cold water rinse - to remove traces of alkaline cleaner.

5. Isopropyl Alcohol dip - to remove residual water. Once per month this tank was drained to a 55-gallon drum ticketed with an internal hazardous waste label then stored in the basement of Building 24.

6. Solvent lacquer dip - Once per month this tank was drained to a 55-gallon drum ticketed with an internal hazardous waste label then stored in the basement of Building 24.

7. Air dry - cured the lacquer coating.

After the assembled parts are finished, they were transferred to Building 24 where labels were applied as required. Parts were then packaged and readied for shipment (PAS-00085691-92).



(PAP-00018740)

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

4. Identified COCs

- PCBs (use, detected)
- Dioxins (detected)
- PAHs (used, detected)
- DDx (detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (detected)

PCBs

According to a *Summary of Analytical Results for Soil, Sediment, Surface Water, and Wood Block Samples,* dated October 1986, polychlorinated biphenyls (PCBs) (Aroclor 1254) were detected in two samples. Sample 2701 contained 1.3 mg/kg and sample 2801 contained 1.8 mg/kg (PAS-00104507).

According to the 1987 ECRA, concentration of PCBs were detected in matrix soil samples ranging from 0.9 mg/kg to 10 mg/kg (PAP-00017115-55).

As reported by a *Site Evaluation Submission,* dated May 24, 1985*,* a PCB transformer caught fire in 1975. Cleanup did not take place since the release was limited to the area of enclosure. The transformer was repaired and placed back in service with non-PCB oil (PAS-00085703). According to the *Summary Tables of Analytical Results for Soil, Sediment, Surface Water and Wood Block Samples by Sampling Location*, PCBs were found in soil samples taken in this location (AEC 3) contained 2.90 mg/kg (in soil sample taken from 6.5-7.5 ft. bgs) and 1.3 mg/kg (in soil sample taken from 9.5-10 ft. bgs) (PAP-00017501).

The *Site Evaluation Submission,* dated May 24, 1985 also reported that in April 1985, an oil collection device caught fire and resulted in an oil spill outside Building 51 (PAS-00085705).

PCBs were used in a transformer (and possibly other electrical equipment) at the site (PAP-00018252, 257, 328, 332).

According to a *1993 Stanley Tools Report*, Stanley generated and shipped 9.86 tons of undrained electrical transformers containing PCBs in 1993 (PAP-00018238).

According to a *Remedial Action Report for the Stanley Tools Facility*, dated July 1995, PCBs were detected in samples DB0102, DBP315, and DBP316 with concentrations ranging from 52.7 to 110 mg/kg (PAS-00085984; PAS-00085977).

Dioxin

According to the 1987 ECRA, in AEC 3 (area of discolored soil located north of Building 51), dioxins were found only in the surface and 4.0-4.5 foot below ground surface (bgs) samples at concentrations below 0.003 mg/kg (PAS-00104514). According to the 1987 ECRA, 2,4,6-trichlorophenol was not detected in matrix soil samples (PAP-00017182-249).

PAHs

According to the *Phase II Sampling Results*, dated June 1990, analytical results showed that Base Neutrals (BNs) were detected in the upgradient site well MW9 (total BNs: 0.064 mg/kg) and three wells downgradient of the former underground storage tank (UST) locations at AEC22: MW21 (total BNs: 0.073 mg/kg), MW17 (total BNs 0.2

mg/kg), and MW12 (total BNs: 0.072 mg/kg). The BN compounds consisted of PAHs naphthalene, acenaphthalene, anthracene, phenanthrene, and pyrene (PAP-00017603).

According to a *Remedial Action Report for the Stanley Tools Facility*, dated July 1995, Phase III investigations determined that site surface soils at various Areas of Environmental Concern (AECs) were contaminated with PAH compounds. The contaminated soils were addressed by partial excavation, formulation of a cold catch asphalt mix using contaminated soils, and placement of an impervious cap (PAS-00085778). Samples collected in August 1993 contained the following concentrations:

Stanley Tools August 1993 Samples (ug/kg)							
PAHs mg/kg	**DBL702**	**DB0102**	**DBP301**	**DBP313**	**DBP314**	**DBP315**	**DBP316**
Acenaphthene	<144	<100	2360	<100	86	Not Tested	Not Tested
Acenaphthylene	<300	<300	1460	<300	71	Not Tested	Not Tested
Anthracene	<144	<100	7270	174	447	Not Tested	Not Tested
Benzo(a)anthracene	100	<600	32,700	1550	2130	Not Tested	Not Tested
Benzo(a)pyrene	<200	<200	27,400	1450	1820	Not Tested	Not Tested
Benzo(b)fluoranthene	<364	<300	30,900	2670	3180	Not Tested	Not Tested
Benzo(g,h,i)perylene	<300	<300	20,500	1750	1640	Not Tested	Not Tested
Benzo(k)fluoranthene	<189	<200	<167	<191	<191	Not Tested	Not Tested
Chrysene	<189	<200	28,700	2070	2540	Not Tested	Not Tested
Dibenzo(a, h)anthracene	<200	<200	5,670	410	555	Not Tested	Not Tested
Fluoranthene	<140	<200	49,700	2,880	4350	Not Tested	Not Tested
Indeno(1 ,2 ,3-cd)pyrene	<400	<300	25,000	1490	1500	Not Tested	Not Tested
Napthalene	<100	<100	1,800	245	263	Not Tested	Not Tested
Metals							
Copper	Not Tested	8,000	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
Lead	Not Tested	7,200	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
Mercury	Not Tested	57	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
PCBs							
Aroclor 1242	Not Tested	<52.7	Not Tested	Not Tested	Not Tested	<55.2	<53.9
Aroclor 1254	Not Tested	<105	Not Tested	Not Tested	Not Tested	<110	<108
Aroclor 1260	Not Tested	<105	Not Tested	Not Tested	Not Tested	<110	<108
Aroclor 1248	Not Tested	<52.7	Not Tested	Not Tested	Not Tested	<55.2	<53.9
Aroclor 1232	Not Tested	<52.7	Not Tested	Not Tested	Not Tested	<55.2	<53.9
Aroclor 1221	Not Tested	<52.7	Not Tested	Not Tested	Not Tested	<55.2	<53.9

(PAS-00085973-74; PAS-00085976-77; PAS-00085980-8, PAS-00085983-84)

According to a *Classification Exception Area/Well Restriction Area Fact Sheet Form*, dated July 2015, PAHs were above New Jersey Groundwater Standards for benzo(a)anthracene (0.155 mg/l), benzo(b)fluoranthene (0.53 mg/l), benzo(a)pyrene 0.251 mg/l) and indeno(1,2,3-cd)pyrene (0.407) (PAP-00019248, 51).

DDx

According to the *ECRA Sampling Plan Results,* dated April 1987 (1987 ECRA), concentrations of dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethylene (DDE), and dichlorodiphenyltrichloroethane (DDT) were detected in matrix soil samples ranging from 0.032 J milligram per kilogram (mg/kg) to 0.085 mg/kg. Chlordane was not detected (PAP-00017115-55).

Metals - Copper, Lead and Mercury

According to the *Phase II Sampling Results*, dated June 1990, Phase I and Phase II sampling results showed that lead was the most significant metal of concern at the site, occurring at significantly high levels throughout most of the eastern portion of the site. The detection of lead in soil samples was consistent with the manufacturing processes and materials used historically by Stanley. The general distribution of metals over the eastern part of the site and their concentrations in near surface soils probably resulted from a gradual accumulation of fugitive particles from vents, exhausts, and scrubbers located along the outside walls of nearby buildings (PAP-00017611-12).

According to the 1987 ECRA, concentrations of metals detected in matrix soil samples included: lead ranging from non-detect to 32,740 mg/kg; copper ranging from non-detect to 2,260 mg/kg; and, mercury ranging from non-detect to 1.72 mg/kg (PAP-00017081-110).

The *Phase II Sampling Results*, dated June 1990, also reported lead having been found in unfiltered water samples in monitoring wells (MW) 7, 18, and 21 at concentrations ranging from 82 ppb to 660 ppb. However, lead was not detected in any of the filtered groundwater samples (PAP-00017604).

According to a *Remedial Action Report*, dated July 1995, copper, lead, and mercury were detected at the site at maximum concentrations of copper (121), lead (369), and mercury (0.30) (PAS-00008246). Note: Units were not provided but it is assumed concentrations are in mg/kg.

The *Remedial Action Report,* dated July 1995 also noted widespread soil contamination throughout the site above the Residential and Non-Residential Direct Contract Soil Cleanup Criteria. The principal contaminants are metals (primarily lead) with selected areas of petroleum hydrocarbons (PAS-00085750).

As reported in an April 29, 1996 letter regarding Industrial Site Recovery Act (ISRA) Remediation, lead was detected on one or more occasion at concentrations above the New Jersey Department of Environmental Protection (NJDEP) Groundwater Quality Standards for Class II-A Groundwater between November 1986 and May 1995 (PAS-00008249).

Areas of Environmental Concern

According to a *Sampling Plan*, dated May 1985, revised in May and September 1986, Stanley AECs were as follows (PAS-00104508):

AEC 1 – A small area of slightly discolored soil near the discharge of a roof drain on the west side of Buildings 25A and 53 contained PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene above the NJDEP Direct Contact Soil Cleanup Criteria. The discoloration appeared to be associated with a roof drain that had discharged onto the area (PAS-00104509; PAP-00017866).

PAHs and BNs, detected in the *Remedial Action Report*, dated July 1995, were as high as 55.42 mg/kg and 145.30 mg/kg, respectively (PAP-00018356-7).

AEC 2 – An area of discolored soil between Building 50, the parking lot, and the fence line along Lister Avenue. Lead was detected above NJDEP Direct Contact Soil Cleanup Criteria in this area (PAS-00104509).

According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 988 parts per million (ppm) 0-12 inches bgs to 38 mg/kg 0-12 inches above the water table (PAP-00017636; PAP-00018358).

AEC 3 – An area of discolored soil located north of Building 51 in the vicinity of a transformer whose hatch failed during a fire (PAS-00104509; PAS-00104513). Lead was detected above NJDEP Cleanup Criteria in this area at 1,700 mg/kg. Mercury (0.57 mg/kg) and copper (65.0 mg/kg) were also detected at this AEC (PAS-00104532).

According to the 1987 ECRA, perched groundwater was identified at one foot bgs. Fill was also identified at the AEC and consisted of predominantly orange-brown to red-brown silt and sand with gravel. A hydrocarbon odor was noted below six feet bgs. PCBs were detected in the 6.5 to 7.5 and 9.5 to 10 foot samples, but in concentrations below cleanup guidelines. Dioxins were found only in surface and 4.0-4.5 foot samples at concentrations below 0.003 mg/kg (PAS-00104513-14).

According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in excess of 27,000 mg/kg were reported from this area during Phase I sampling. Excavation exposed stained soils as far as the water table, where an odor of petroleum could be discerned. BNs occurred at concentrations less than 5 mg/kg, and lead was found at concentrations less than 100 mg/kg in samples collected from immediately above the water table. Soil samples for this AEC included copper, lead, and mercury, ranging from 9.60 to 140 mg/kg for copper, 2 to 10,000 mg/kg for lead, and 0.03 to 0.57 mg/kg for mercury. Total BNs concentrations at this AEC were 3.6 mg/kg (PAP-00017579, 81; PAP-00017684-5).

Levels detected in the *Remedial Action Report*, dated July 1995, included copper ranging from 10 to 140 mg/kg, lead ranging from 2 to 27,740 mg/kg, mercury ranging from 0.05 to 1.72 mg/kg, and Total BNs ranging from 0.14 to 3.59 mg/kg. Slight concentrations of PCBs were also found at this location up to 2.90 mg/kg (PAP-00018362-69).

AEC 4 – An area of discolored soil in a drainage way for a former waste storage area. According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 481 mg/kg 0-12 inches bgs to 149 mg/kg 4-5 feet below ground surface (PAP-00017638).

Levels detected in the *Remedial Action Report*, dated July 1995, included total PAHs ranging from 3.07 to 22.48 mg/kg (PAP-00018370-71).

AEC 5 – An area of discolored soil along the north fence line, north of Building 24B. According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 109 mg/kg 6-18 inches bgs to 11 mg/kg 0-12 inches above the water table (PAP-00017638-39; PAP-00018373).

AEC 6 – An area of discolored soil along the north fence line, northeast of Building 24. According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 251 mg/kg 0-12 inches bgs to 8 mg/kg 0-12 inches above the water table (PAP-00017639; PAP-00018374).

AEC 7 – An area of discolored soil located at the former waste storage area. Lead was detected above New Jersey Department of Environmental Protection (NJDEP) Direct Contact Soil Cleanup Criteria in this area (PAP-00018294).

According to the *Phase II Sampling Results*, dated June 1990, lead occurred at concentrations ranging from 720 mg/kg at the surface to ~~7~~ mg/kg above the water table. Soil samples taken at this AEC included copper ranging from 8.3 to 94 mg/kg and mercury ranging from 0.06 to 0.46 mg/kg. Total BNs at this AEC occurred at concentrations as high as 7.0 mg/kg (PAP-00017582; PAP-00017686).

AEC 8, 9, 10, 11, and 43 – A strip of land east of Building 20A (PAP-00018294). PAH concentrations ranged from 0.020 mg/kg for anthracene to 4.0 J mg/kg for pyrene having a total identified compound concentration of 3,191 mg/kg. Metals were detected above NJDEP Cleanup Criteria in this area, copper concentrations ranged from 413 to 447 mg/kg, lead ranged from non-detect to 8,350 mg/kg, and mercury ranged from 0.39 to 3.6 mg/kg (PAS-00085999-86004; PAS-00086008-10).

According to the *Phase II Sampling Results*, dated June 1990, AEC 8 had additional soil samples screened for lead, six samples contained less than 10 mg/kg and the seventh sample contained lead at a concentration of 390 mg/kg (PAP-00017584).

According to the *Remedial Action Report*, dated July 1995, PAHs were detected above NJDEP Direct Contact Soil Cleanup Criteria at AECs 8, 9, 10, and 11 (PAP-00018294-95).

Levels detected in the *Remedial Action Report,* dated July 1995 included copper (320 mg/kg), lead (32,740 mg/kg), mercury (0.76 mg/kg), and Total BNs (207.93 mg/kg) (PAP-00018381-426).

According to a *Summary of Sump Structure and Clay Pipe Soil Sampling Summer/Fall 1994*, AEC 8 surface soil sample SP-1 contained copper at 413 mg/kg, lead at 8,350 mg/kg, and mercury at 3.6 mg/kg (PAP-00210985).

AEC 10 – According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 18,053 mg/kg 0-12 inches bgs to 6,536 mg/kg 0-12 inches above the water table and were above the NJDEP Direct Contact Soil Cleanup Criteria (PAP-00017642; PAP-00018295).

AEC 12 – A narrow strip of land (approximately 1,077 square feet) located south of Building 21A. Lead was detected above NJDEPE Cleanup Criteria in this area (PAP-00018295).

According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 4,870 mg/kg 0-12 inches bgs to 2 mg/kg 0-12 inches above the water table (PAP-00017643). It should be noted that Table 15 (Summary of Soil Results for AEC 12) shows AEC 12 contained lead ranging from 4870 mg/kg 0.5-1 feet bgs to 2.38 mg/kg 8.5-9.0 feet bgs (PAP-00018427).

AEC 14 – Small area of discolored soil located near the northwestern corner of Building 1. PCB Aroclor 1254 (39.4 mg/kg), benzene(a)pyrene (0.85 mg/kg), and lead (1,101 mg/kg) were detected above NJDEP Cleanup Criteria in this area (PAS-00104525). Total PAH concentrations sampled at this AEC were 6.13 mg/kg (PAS-00104533).

According to the *Phase II Sampling Results,* dated June 1990, lead concentrations in soil samples ranged from 1,101 mg/kg 0-12 inches bgs to 8 mg/kg 0-12 inches above the water table. Total BNs were 17.76 mg/kg (PAP-00017644). It should be noted that Table 17 (Summary of Soil Results for AEC 14) shows AEC 14 contained lead ranging from 8.36 mg/kg 10-11 feet bgs to 1101 mg/kg 0-1 foot bgs (PAP-00018429).

AEC 15 – An area of discolored soil near the northeast corner of Building 1. According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 573 mg/kg 0-12 inches bgs to non-detect 0-12 inches above the water table (PAP-00017645; PAP-00018432).

AEC 16 – An area of discolored soil northeast of Building 2A in the vicinity of a transformer. Soil samples analyzed contained PCBs at an estimated level of 42 mg/kg (PAS-00104529).

AEC 17 – An area of discolored soil on the southeastern side of Building 2C and adjacent to the former location of a 10,000-gallon fuel oil storage tank. Lead was detected above NJDEP Direct Contact Soil Cleanup Criteria (PAP-00018296).

According to the *Phase II Sampling Results,* dated June 1990, lead concentrations in soil samples ranged from 627 mg/kg 0-12 inches bgs to 671 mg/kg 12-15 inches bgs (PAP-00017647; PAP-00018438).

AEC 19 – Small area of discolored soil behind the pump house in the western portion of the site. Lead was detected above NJDEP Direct Contact Soil Cleanup Criteria (PAP-00018297).

According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 5,906 mg/kg 0-12 inches bgs to 545 mg/kg 18-24 inches bgs (PAP-00017648).

AEC 20 – Located in the western side of the site. Metals and PAHs were detected above NJDEP Direct Contact Soil Cleanup Criteria in this area (PAP-00018297).

Levels detected in the *Remedial Action Report,* dated July 1995 included copper ranging from 93 to 9,490 mg/kg; lead ranging from 140 to 3,300 mg/kg, mercury ranging from 0.21 from 2.15 mg/kg, and PAHs ranging from 0.37 to 20.45 mg/kg (PAP-00018444-48).

AEC 22 – Located in a driveway between Buildings 51 and 21A/22A. Lead was detected above NJDEP Direct Contact Soil Cleanup Criteria in this area (PAP-00018298).

According to the *Phase II Sampling Results*, dated June 1990, soil samples collected at this AEC contained copper (121 mg/kg), lead (2,610 mg/kg), mercury (0.45 mg/kg) and Total BNs in concentrations ranging from 31 mg/kg to 165.1 mg/kg (PAP-00017691-92).

Levels detected in the *Remedial Action Report*, dated July 1995 included lead (3,982 mg/kg) and Total BNs (123.99 mg/kg) (PAP-00018455-56).

AEC 24 – According to the *Phase II Sampling Results*, dated June 1990, AEC 24 contained two buried fuel oil storage tanks that were excavated, cleaned, and disposed of in October 1989. PAHs were detected above the NJDEP Direct Contact Soil Cleanup Criteria in this area. Contaminant of concern (COC) samples collected in this area were Total BNs (82.6 mg/kg), copper (9,490 mg/kg), lead (3,300 mg/kg), and mercury (2.15 mg/kg) (PAP-00017593; PAP-00017695-98).

Levels detected in the Remedial Action Report, dated July 1995 included copper (556 mg/kg), lead (976 mg/kg), mercury (0.62 mg/kg), and PAHs (230 mg/kg) (PAP-00018471-80).

AEC 26 – Area where two USTs were removed in December 1988.

According to the *Phase II Sampling Results,* dated June 1990, no evidence of free petroleum products in soil was observed during the removal (PAP-00017596). Total BNs sampled at AEC 26 ranged from 79.5 mg/kg to 241.7 mg/kg (PAP-00017701-02).

AEC 27 – An area of oil-stained wood block flooring in the western end of Building 21A. Three chip samples were obtained from the surface of the floor and were analyzed for PCBs. PCB (Aroclor 1254) was detected in one of the three samples at a concentration (1.30 mg/kg) below the Environmental Cleanup Responsibility ACT (ECRA) cleanup guidelines for PCBs in soils (PAS-00104515; PAS-00104534).

AEC 28 – A section of oil-stained wood block floor in the eastern end of Building 2A. One chip sample was obtained from the surface of this area and was analyzed for PCBs. PCB (Aroclor 1254) was detected at a concentration (1.30 mg/kg) below the ECRA cleanup guidelines for PCBs in soils (PAS-00104515; PAS-00104535).

AEC 32 – An unlined trench with discolored soil within Building 20A adjacent to the east wall. Metals were detected above NJDEP Direct Contact Soil Cleanup Criteria (PAP-00018301).

According to the *Phase II Sampling Results*, dated June 1990, lead concentrations in soil samples ranged from 2,030 mg/kg 0-6 inches bgs to 1,241 mg/kg 18-22 inches above the water table (PAP-00017621). Clayey sand fill was encountered in all five borings and at times, metal debris and a hydrocarbon odor were noted (PAS-00104515).

AEC 33 – A dry well into which non-contact cooling water from Building 25 was discharged. According to the *Remedial Action Report,* dated July 1995, BNs were detected above the NJDEP Direct Soil Cleanup Criteria in this area and ranged from non-detect to 52.56 mg/kg (PAP-00018301; PAP-00018496-99).

AEC 34 – A concrete reservoir next to Building 21A which was used for the storage of cooling water at the site. According to the *Phase II Sampling Results,* dated June 1990, samples taken at this location contained elevated levels of lead (1,084 mg/kg). Stanley proposed removal and proper disposal of the remaining water and sediment contained at this AEC (PAP-00017634).

AEC 35 – A former drum storage area north of Building 22A. Lead concentrations in soil samples ranged from 1,365 mg/kg 6-18 inches bgs to 11 mg/kg 0-12 inches above the water table. Copper was detected at 121 mg/kg and mercury was detected at 0.45 mg/kg (PAP- 00017622; PAP-00018503).

AEC 36 – A former drum storage area northwest of Building 2A. Lead concentrations in soil samples ranged from 578 mg/kg 0-12 inches bgs to 10 mg/kg 0-12 inches above the water table. PAHs concentrations levels were 102.7 mg/kg (PAP-00017623; PAP-00018507).

According to the *Remedial Action Report,* dated July 1995, elevated concentrations of PAH compounds were present in this area (PAP-00018302).

AEC 37 – An area located north of Building 2~~C~~6 in the location of a former drum storage area. Lead was detected above NJDEP Cleanup Criteria in this area. This area was paved (PAP-00018302).

According to the *Phase II Sampling Results*, dated June 1990, samples taken at this AEC contained lead ranging from 666 mg/kg 0-12 inches bgs to 128 mg/kg 0-12 inches above the water table (PAP-00017624). It should be noted that Table 37 (Summary of Soil Results for AEC 37) shows AEC 37 contained lead ranging from 666 mg/kg 0.5-1 foot bgs to 128 mg/kg 4.0-4.5 feet bgs (PAP-00018511).

AEC 38 – An area located in a former drum storage area north of Building 2C. According to the *Phase II Sampling Results*, dated June 1990, samples taken at this AEC contained lead ranging from 47 mg/kg 0-12 ~~9-15~~ inches bgs to 42 mg/kg 0-12 inches above the water table (PAP-00017624). It should be noted that Table 38

(Summary of Soil Results for AEC 38) shows AEC 38 contained lead ranging from 41.8 mg/kg 5.0-5.5 foot bgs to 47.4 mg/kg 3.5-4.0 feet bgs (PAP-00018516).

AEC 39 – An area located in a former drum storage area east of Building 2C. According to the *Phase II Sampling Results*, dated June 1990, samples taken at this AEC contained lead ranging from 853 mg/kg 9-15 inches bgs to 23 mg/kg 0-12 inches above the water table (PAP-00017625). It should be noted that Table 39 (Summary of Soil Results for AEC 39) shows AEC 39 contained lead ranging from 22.8 mg/kg 5.5-6.0 feet bgs to 853 mg/kg 0.75-1.25 feet bgs (PAP-00018517).

AEC 40 – An area located east of Building 24A and in the location of a former drum storage area. According to the *Phase II Sampling Results,* dated June 1990, additional samples taken at this location contained lead ranging from 493 mg/kg 0-12 inches bgs to 12 mg/kg 0-12 inches above the water table (PAP-00017626). It should be noted that Table 40 (Summary of Soil Results for AEC 40) shows AEC 40 contained lead ranging from 11.9 mg/kg 11.0-11.5 feet bgs to 1,411 mg/kg 4.0-6.048~~-72~~ feet bgs (PAP-00018520).

According to the *Remedial Action Report,* dated July 1995, soil samples collected reported decreasing concentrations of lead to levels below the NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (PAP-00018303).

AEC 41 – An area located in a former drum storage area northeast of Building 24B. According to the *Phase II Sampling Results,* dated June 1990, samples taken at this AEC contained lead ranging from 15 mg/kg 0-12 inches bgs to 213 mg/kg 0-12 inches above the water table (PAP-00017626). It should be noted that Table 41 (Summary of Soil Results for AEC 41) shows AEC 41 contained lead ranging from 14.6 mg/kg 0.0-0.5 foot bgs to 213 mg/kg 10.5-11.0 feet bgs (PAP-00018524).

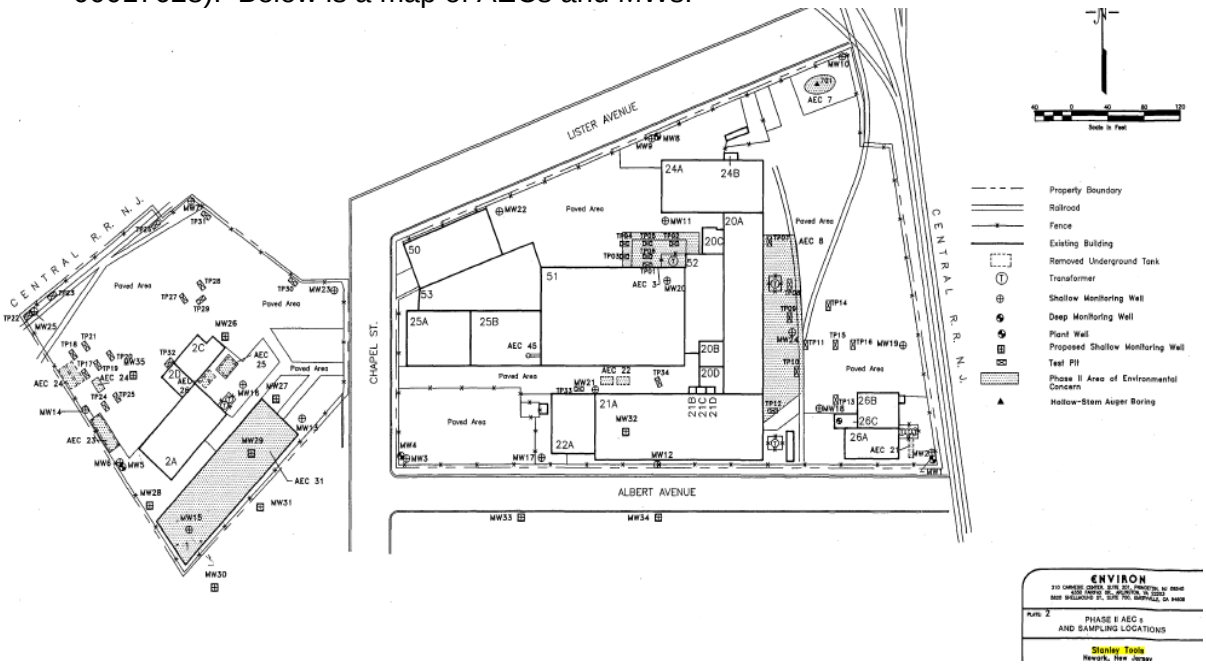
AEC 42 – An area located in a former drum storage area at the northeast corner of the site. According to the *Phase II Sampling Results*, dated June 1990, samples taken at this AEC contained lead ranging from 705 mg/kg 0-12 inches bgs to 22 mg/kg 0-12 inches above the water table (PAP-00017627). It should be noted that Table 42 (Summary of Soil Results for AEC 42) shows AEC 42 contained lead ranging from 13.03 mg/kg 6.0-6.5 foot bgs to 705 mg/kg 0.0-0.5 feet bgs (PAP-00018527).

According to the *Remedial Action Report*, dated July 1995, lead levels in this AEC were slightly elevated above the NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (PAP-00018303).

AEC 43 – An area located in a former drum storage area northwest of Building 26B. According to the *Phase II Sampling Results*, dated June 1990, additional samples taken at this AEC contained lead ranging from 19,620 mg/kg 0-12 inches bgs to 3 mg/kg 0-12 inches above the water table (PAP-00017627).

AEC 44 – An area reportedly contaminated with lead, north of the entrance to the western part of the site. According to the *Phase II Sampling Results,* dated June 1990,

samples taken at this AEC contained lead at 316 mg/kg 0-6 inches bgs (PAP-00017628). Below is a map of AECs and MWs:



(PAP-00017673)

Max Concentrations of COC in Monitoring Wells (mg/kg)							
	MW01	**MW03**	**MW05**	**MW07**	**MW08**	**MW10**	**MW11**
Cooper	121	17.30	2,260	659	61.50	67.90	119
Lead	369	40.70	722	776	190	401	532
Mercury	0.30	0.23	1.08	0.19	0.39	0.68	ND
Total cPAHs	9.08	ND	1.54	16.60	0.05	1.90	0.43
PCBs	ND	ND	ND	ND	ND	ND	ND
4,4 DDT	0.09	ND	ND	ND	ND	ND	ND

(PAP-00018530-57)

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 & No. 53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	32,740 mg/kg
Copper	9,490 mg/kg
Mercury	2.5 mg/kg
Benzo(a)anthracene	32.7 mg/kg
Benzo(a)pyrene	27.4 mg/kg
Benzo(b)fluoranthene	30.9 mg/kg
Benzo(k)fluoranthene	0.2 mg/kg
Dibenzo(a,h)anthracene	5.67 mg/kg
Indeno(1,2,3-cd)pyrene	25 mg/kg

According to the 1987 ECRA, the uppermost layer across the site is composed of fill containing a variety of materials, including coal slag, cinders, green glass slag, crushed bricks, assorted gravel, and brown-black sand and silt (PAP-00016872-75).

The *Remedial Action Report for the Stanley Tools Facility*, dated July 1995, reported that Historic Fill material had been documented at the site as well as the surrounding area, including two ISRA sites within one mile of the site. Fill material covers nearly the entire site, varying in depth from about two to 10 feet bgs. The Historic Fill material was believed to contain contaminants including, metals, PAHs, and PCBs. The nature of fill material was such that sporadic areas of contamination and hot spots make delineation of areas specifically impacted by site operations difficult, if not impossible. The entire site was remediated by capping (PAS-00085778). According to a September 10, 2019 Report of Compliance, the former Stanley facility established permanent stabilization of all disturbed areas in accordance with the certified soil erosion and sediment control plan (PAP-00456878).

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Stanley Black & Decker Inc.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

A Deed Notice in Book 5606 page 0001 was made on February 23, 1999 by Ramida Rest Brown, Inc. with engineering controls for total petroleum hydrocarbons (TPHCs), PAHs, lead, and copper (PAP-00210772-73, 84-98).

Max Concentractions under Deed Notice for AECs mg/kg										
PAHs	**AEC 1**	**AEC 2**	**AEC 3**	**AEC 4**	**AEC 5**	**AEC 6**	**AEC 7**	**AEC 8**	**AEC 9**	**AEC 10**
Benzo(a)anthracene	11.20	0.32	0.22	2.10	N/A	N/A	0.47	17.20	N/A	N/A
Benzo(a)pyrene	8.07	0.30	0.22	1.36	N/A	N/A	0.48	12.40	N/A	N/A
Benzo(b)fluoranthene	13.40	0.51	ND	2.44	N/A	N/A	0.93	14.60	N/A	N/A
Benzo(k)fluoranthene	ND	ND	0.22	ND	N/A	N/A	ND	ND	N/A	N/A
Chrysene	14.10	0.46	0.22	2.24	N/A	N/A	0.49	17.50	N/A	N/A
Dibenzo(a,h)anthracene	2.32	ND	0.22 J	ND	N/A	N/A	0.07 J	2.44	N/A	N/A
Indeno(1,2,3-cd)pyrene	6.28	ND	0.22 J	ND	N/A	N/A	0.38	7.48	N/A	N/A
Max Total PAHs	55.42	1.59	1.32	8.14	N/A	N/A	2.82	71.62	N/A	N/A
Metals										
Copper	N/A	N/A	140	N/A	N/A	N/A	94	320	N/A	N/A
Lead	N/A	988	27,740	481	109	251	720	32,740	9,470	18,053
Mercury	N/A	N/A	1.72	N/A	N/A	N/A	0.46	0.76	N/A	N/A
PAHs	**AEC 11**	**AEC 12**	**AEC 13**	**AEC 14**	**AEC 15**	**AEC 16**	**AEC 17**	**AEC 18**	**AEC 19**	**AEC 20**
Benzo(a)anthracene	N/A	N/A	N/A	1.54	ND	0.68 BMDL	N/A	0.27 BMDL	N/A	3.91
Benzo(a)pyrene	N/A	N/A	N/A	0.85	ND	0.41	N/A	ND	N/A	3.00
Benzo(b)fluoranthene	N/A	N/A	N/A	1.26	ND	0.59	N/A	ND	N/A	6.14
Benzo(k)fluoranthene	N/A	N/A	N/A	ND	ND	ND	N/A	0.53	N/A	ND
Chrysene	N/A	N/A	N/A	1.90	ND	0.79	N/A	0.38	N/A	5.51
Dibenzo(a,h)anthracene	N/A	N/A	N/A	ND	ND	ND	N/A	ND	N/A	ND
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	0.58	ND	ND	N/A	ND	N/A	1.89
Max Total PAHs	N/A	N/A	N/A	6.13	ND	2.48	N/A	1.18	N/A	20.45
Metals										
Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9,490
Lead	N/A	4,870	347	1,101	573	N/A	671	N/A	5,906	3,300
Mercury	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.15

Max Concentractions under Deed Notice for AECs mg/kg										
PAHs	**AEC 21**	**AEC 22**	**AEC 23**	**AEC 24**	**AEC 25**	**AEC 26**	**AEC 27**	**AEC 28**	**AEC 32**	**AEC 33**
Benzo(a)anthracene	10	12	6.20	29.40	17.00	21	N/A	N/A	N/A	4.66
Benzo(a)pyrene	ND	11	4.70	18.80	2.50 J	20	N/A	N/A	N/A	4.66
Benzo(b)fluoranthene	N/A	11	N/A	26.40	0.39 J	20	N/A	N/A	N/A	8.08
Benzo(k)fluoranthene	ND	8.60	0.08 J	0.53	0.39 J	16	N/A	N/A	N/A	ND
Chrysene	11.00	13	5.80	29.10	ND	24	N/A	N/A	N/A	4.72
Dibenzo(a,h)anthracene	1.60	0.04	ND	ND	ND	ND	N/A	N/A	N/A	ND
Indeno(1,2,3-cd)pyrene	6.40	6.20	4.60	9.86	0.51 J	12	N/A	N/A	N/A	2.65
Max Total PAHs	29.00	61.80	21.38	114.09	20.79	113	N/A	N/A	N/A	24.77
Metals										
Copper	N/A	N/A	N/A	556	N/A	N/A	N/A	N/A	N/A	N/A
Lead	N/A	3,982	N/A	976	N/A	N/A	N/A	N/A	2,030	N/A
Mercury	N/A	N/A	N/A	0.62	N/A	N/A	N/A	N/A	N/A	N/A
PAHs	**AEC 34**	**AEC 35**	**AEC 36**	**AEC 37**	**AEC 38**	**AEC 39**	**AEC 40**	**AEC 41**	**AEC 42**	**AEC 44**
Benzo(a)anthracene	N/A	ND	25.60	ND	N/A	ND	ND	0.33 BMDL	0.53 BMDL	N/A
Benzo(a)pyrene	N/A	ND	16.50	ND	N/A	ND	ND	0.24 BMDL	0.34	N/A
Benzo(b)fluoranthene	N/A	ND	27.70	ND	N/A	ND	ND	0.44 BMDL	0.87	N/A
Benzo(k)fluoranthene	N/A	ND	ND	ND	N/A	ND	ND	ND	ND	N/A
Chrysene	N/A	ND	25.40	ND	N/A	ND	ND	0.40	0.68	N/A
Dibenzo(a, h)anthracene	N/A	ND	ND	ND	N/A	ND	ND	ND	ND	N/A
Indeno(1,2,3-cd)pyrene	N/A	ND	7.50	ND	N/A	ND	ND	ND	0.49	N/A
Max Total PAHs	N/A	ND	102.7	ND	N/A	ND	ND	1.41	2.91	N/A
Metals										
Copper	N/A	121	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1084	2,610	578	666	47.40	853	1,411	213	705	316
Mercury	N/A	0.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

BMDL – Below method detection limits
J – Compound was not present above the minimum reportable detection limit.
N/A – Not analyzed
ND – Non-detect

(PAP-00210851-950, 1023-1096)

5. COC Pathways

According to a April 3, 2000 NJDEP Letter regarding the 1999 Baseline Ecological Evaluation, the Passaic River is located at its closest point to the former Stanley Tools Newark Facility approximately 400 feet (western parcel). However, because the site is located on the inside of a large meander bend along the Passaic River, the river is located approximately 1,200 feet from the downgradient boundary of the site (PAP-00700827).

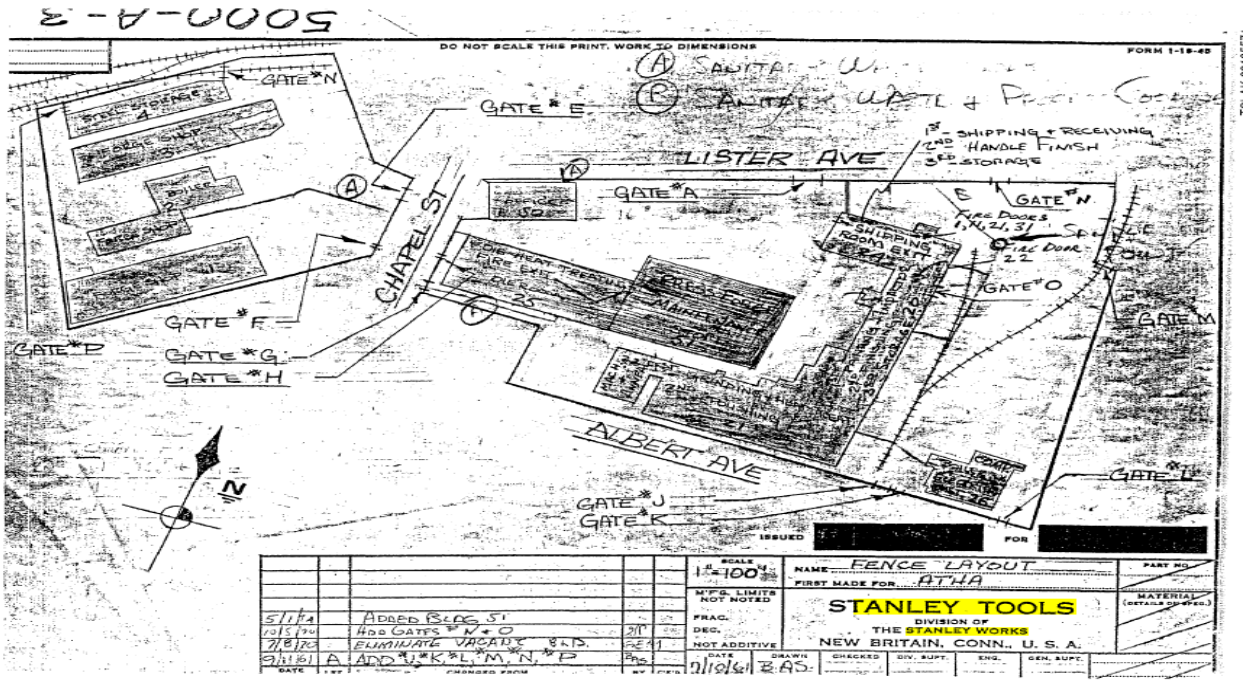
Sanitary Sewer

Stanley's Waste Effluent Survey's and PVSC applications document the following water usage (PAP-00019268; PAP-00019293; PAP-00019288; PAP-00019301; PAP-00713751).

Stanley Water Usage in gallons			
Reporting Year	***Sanitary Water***	***Storm Sewer***	***Total Water Use***
1971	8,500,000	0	10,000,000
1974	43,400,000	0	43,800,000
1979	39,186,656	6,000,000	46,566,656
1980	23,103,888	6,480,000	34,075,888
1981	3,963,388	7,826,400	17,455,588

According to a *PVSC Application*, dated April 8, 1980, COC concentration values reported were copper less than 0.009 milligram per liter (mg/l), lead less than 0.033 mg/l, mercury less than 0.0007 mg/l (PAP-00019285).

According to a PVSC Monitoring report for the period of April 1, 1984 thru July 31, 1984, Stanley Tools had an average sample concentration of 0.250 mg/L copper and 0.200 mg/L lead (PAP-00714352).



(PAP-00019290)

According to a *1980 PVSC Sewer Connection Application*, Stanley had eight outlets from the site, four sanitary outlets, two storm sewers, and two undefined outlets (PAP-00019295-96).

Stanley Black & Decker Inc.

Diamond Alkali OU2 Allocation

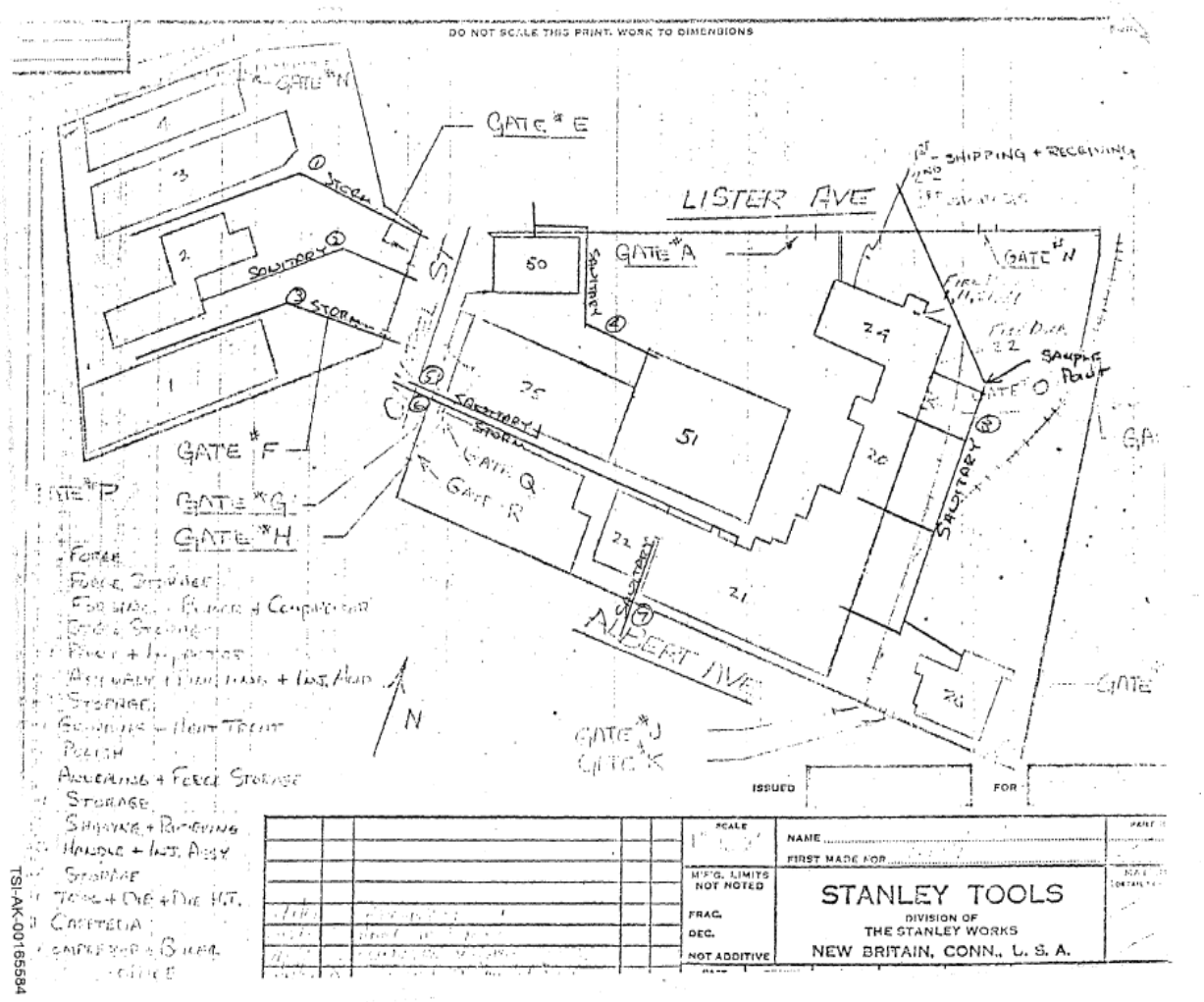
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Facility Data Report

OUTLET * NUMBER	SEWER SIZE (INCHES)	DAILY FLOW (GALLONS)	CONTAINS INDUSTRIAL WASTE (YES OR NO)
1	6	19230	No
2	4	1032	Sanitary Only No
3	6	NA Storm	No
4	4	355	No Sanitary only

OUTLET * NUMBER	SEWER SIZE (INCHES)	DAILY FLOW (GALLONS)	CONTAINS INDUSTRIAL WASTE (YES OR NO)
5	4	1412	Sanitary only No
6	6	NA Storm	No
7	4	550	Sanitary only No
8	8	125180	Yes

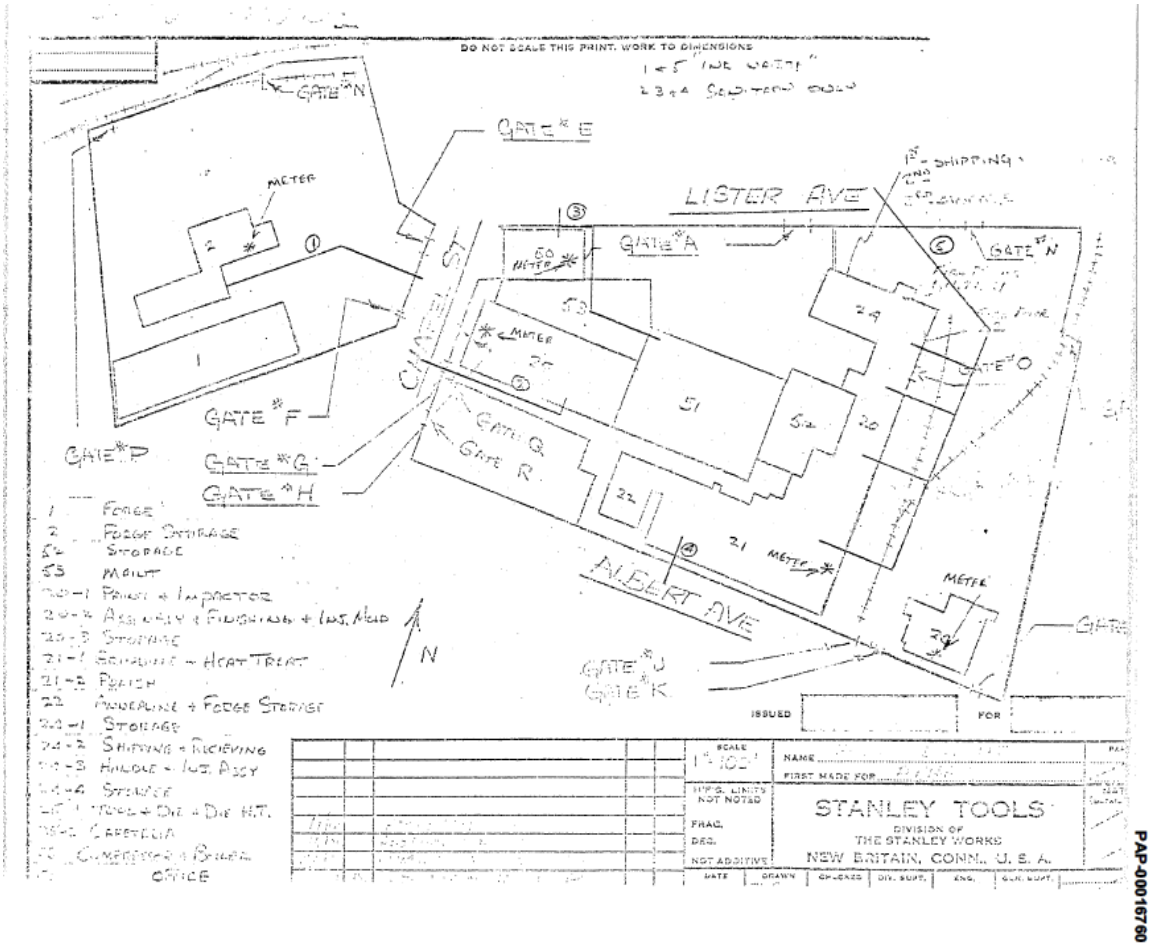
(PAP-00019295-96)



(PAP-00019299)

However, a January 27, 1982 letter to PVSC reports Stanley had five outlets from the site as detailed and depicted below (PAP-00016759).

Outlet #	Discharge Gal/day	Line size (in)	Discharge type
1	10970	4	Industrial
2	2553	4	Sanitary
3	120	4	Sanitary
4	120	3	Sanitary
5	33763	6	Industrial



(PAP-00016760)

According to a PVSC POTW Industrial Inventory for the period from August 1, 1983 through July 31, 1984 Stanley Tools had and average daily flow of 0.117 millions of gallons per day (mgd) (PAP-00714355, 92).

According to a June 29, 1995 response letter from PVSC, PVSC approved Stanley's one time discharge of approximately 7,500 gallons of well water (PAP-00210699-700).

Storm Sewer

According to a letter from NJDEP regarding ISRA Case No. E85178, dated April 8, 2000, Stanley stated that surface runoff either discharges to the site storm sewer located in the northeast corner of the site or to drains located in the bordering streets (PAS-00085744, 86020). According to the letter from NJDEP regarding ISRA Case No. E85178, dated April 8, 2000, surface run-off drains into the storm sewer systems in the center of the parking lot in the western lot while on the eastern lot run-off drains to the site's perimeter in each of the three large open areas i.e., west of Building 22A, north of Building 51, and east of Building 20A (PAP-00016872).

According to a July 30, 1999 letter regarding Effluent Sampling Results, Stanley had a groundwater treatment system (December 15, 1998 – October 1999) extracting and treating petroleum-impacted groundwater at two to three gallons per minute (gpm) from the aquifer beneath the site. Continuous treatment consisted of oil/water separation, filtration, and carbon/ anthracite clay absorption. Final discharge of two to three gpm was to the Passaic River via a storm sewer outfall No. 001A, in accordance with NJPDES permit No. NJ0132390 (PAP-00018703; PAP-00018769).

A January 9, 2001 letter reported that the primary effluent samples in December 2000 showed that Total Organic Carbon (TOC) (28 mg/l) and Total Suspended Solids (TSS) (43 mg/l) were above the permitted discharge limit. To demonstrate that a discharge violation had not taken place an effluent groundwater sample was collected on January 4, 2001. The concentration for TSS was 15 mg/l and below the permitted allowance of 20 mg/l (PAP-00018780, 82, 97).

As reported by a March 15, 2001 letter regarding an unanticipated bypass, discharge from a small leak on an equalizer tank between the oil/water separator and the liquid phase granular discharged for approximately two to three days (March 10-12 2001). The volume discharged was approximately 55 gallons. Based on analytical results collected on February 12, 2001, pollutants were reported as total petroleum hydrocarbon (TPH) (1,100 mg/l), volatile organic carbons (VOCs) (0.142 mg/l), and pH of 6.5. The receiving water would have been the permitted storm sewer system along Chapel Street (PAP-00018801).

Another July 30, 2001 letter, reported that samples required for Discharge Monitoring Repot of the Mobile Remediation System (MRS) were over the permit limit for TSS (49 mg/l). The permit limit was 40 mg/l and the water was discharged to the permitted storm sewer (PAP-00018831). It was estimated that the discharge occurred for approximately 1-2 weeks. The maximum volume discharged was approximately 42,000 gallons to the Passaic River via the storm sewer (PAP-00018833).

A September 4, 2002 letter reported that the MRS operated at the site at one gallon per minute. The recovered product was transported off site and recycled and the treated groundwater was discharged to the PVSC under Permit No. 20220084. On August 22,

2002, upon inspection of the malfunctioning MRS, it was determined that 3,000 gallons of groundwater had discharged to a nearby storm sewer as evidenced by the rust colored asphalt and unaccounted for 5,900 gallons. Constituents of interest in the groundwater were VOCs, TSS, and metals (PAP-00018842-45).

Direct Releases

There is no information regarding direct releases in the available file material.

Spills

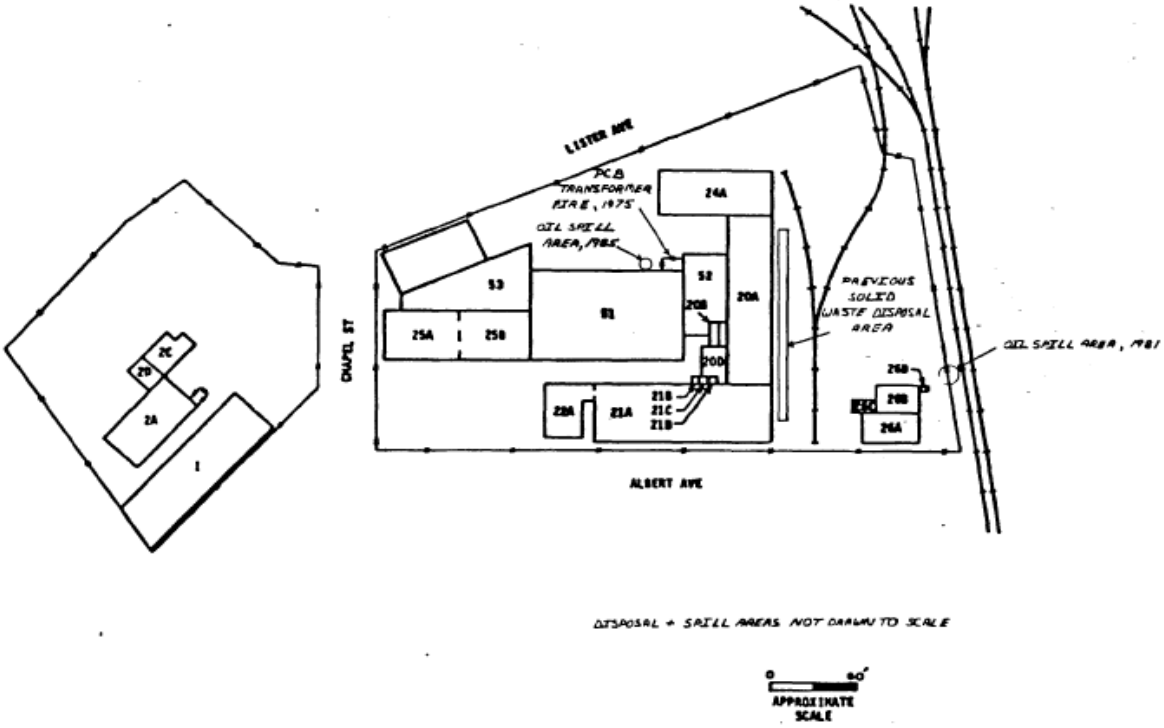
According to a *Site Evaluation Submission*, dated May 24, 1985, during the operations on the site, the following spills occurred:

- In 1975, a PCB transformer caught fire which resulted in the failure of the top hatch of the unit, clean up was not conducted since the release was limited to the area of the enclosure (PAS-00085703).

- In 1981, an operator error resulted in a spill of approximately 100 gallons of oil on the East side of the site while pumping waste oil from 55-gallon drums through a filter into new drums. All oil and soil was scraped up and placed in 20 partially full 55-gallon drums and transported for solidification and subsequent disposal. The spill was reported to the Office of Hazardous Management and assigned case No. 81-9-3-6 (PAS-00085703).

- In April 1985, an oil collection device caught fire and resulted in an oil spill outside Building 51. Since this area is in the direct vicinity of the PCB transformer incident, contaminated soils were not removed. Surficial oil was absorbed utilizing speedi-dri (PAS-00085704).

- The East side of Building 20A was used at one time for disposal of industrial solid waste, some areas of iron oxide scale and grinding swarf deposits were visible (PAS-00085704).



(PAS-00085705)

6. Regulatory History/Enforcement Actions

Inspections and Violations

According to a *Request for Information*, dated March 30, 2004, Stanley received wastewater treatment system violations associated with its remediation system initiated on December 15, 1998 (PAS-00085670).

As reported by a July 30, 1999 letter regarding effluent sampling, the results for the sample collected on July 3, 1999 from the groundwater treatment system effluent showed that TSS were present at 63.0 mg/l. The concentrations were above the daily permit limitation for TSS of 40.0 mg/l (PAP-00018703).

According to a September 16, 1999 letter regarding effluent sampling, groundwater samples taken on August 11 and 27, 1999 showed that TOC was present at 36.6 mg/l and 45.2 mg/l. The TOC concentrations for both samples were above the daily permit limitation for TOC (20.0 mg/l) (PAP-00018761).

According to a January 9, 2001 letter, effluent samples were above the permitted discharge limit of 20 mg/l for TOC and 40 mg/l for TSS. Concentration levels contained 28 mg/l TOC and 43 mg/l TSS (PAP-00018779-80, 82).

According to a May 30, 2001 letter, effluent samples collected on May 8, 2001 showed TPH at 140 mg/L (above the permitted discharge limit of 15 mg/l) and TSS at 46 mg/L (above the permit limit of 40 mg/kg). Stanley's consultant concluded that the elevated results were attributable to laboratory error at the time (PAP-00018807-09, 12).

According to a July 30, 2001 letter, TSS (49 mg/l) results were above the NJPDES NJ 0132390 permit limits of 40 mg/l. It was estimated that the discharge could have occurred for approximately one to two weeks and the maximum volume discharged was approximately 42,000 gallons (PAP-00018831, 33).

Permits

According to *Request for Information*, date March 30, 2004, the site discharged its wastewater to the PVSC under permit No. 20402922, issued February 4, 1983 – February 4, 1987 (PAS-00085668; PAP-00714400). Note: Copies of the permit from PVSC were unavailable.

An October 29, 2002 letter, reported that a PVSC permit No. 20220084 was issued for the mobile remediation system (MRS) that had been discharging to PVSC since January 3, 2002 (PAP-00018853).

Stanley held PVSC permit No. 20630009 from January 1, 2014 to December 31, 2018. (PAP-00361929).

As reported by a NJDEP letter, dated May 01, 1998, Stanley received NJDES permit No. NJ0132390. This individual General Permit Authorization allowed for the discharge of treated groundwater to the Passaic River via storm sewer from Discharge Serial Number (DSN) 001A which expired on November 30, 1998 (PAP-00018673-76). Stanley also held NJPDES permit No. NJ0102709 from October 29, 1993 to November 30, 1998 (PAP-00018680).

According to multiple NJDEP Monitoring Well Records filed in the 1980s and 1990s, Stanley held well permits 26-34386, 26-34387, 26-35021, 26-19005, 26-19799, 26-19800, 26-34990, 26-34991, 26-34388, 26-34391, 26-36586, 26-36587, 26-34989, 26-27419, 26-10407, 26-09705, 26-09674-9, 260965-7, 2609676-5, 2609677-3, 2609678-1, 2609679-0, 2609680-3, 2609681-1, 2609703, 2609705, 2609674-9, and 2610407 (PAS-00021467-93; PAS-00021695; PAS-00074406; PAS-00074412-21; PAS-00074568-69; PAS-00074406).

According to the *Request for Information*, date March 30 2004, the site did not have any permits issued from the Federal Water Pollution Control Act (PAS-00085663).

According to the May 2016 Remedial Investigation Report, Stanley's East site-wide CEA was approved on February 5, 1998 for a duration of 1,000 years, but was considered indeterminate. Stanley's West site-wide CEA was approved for a duration of 60 years (PAP-00018988; PAP-00019168).

According to the May 2016 Remedial Investigation Report, Stanley's consultant proposed an updated CEA for the Eastern Parcel for a duration of 30 years and Western Parcel for 9.27 years (PAP-00018989; PAP-00019169).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Remedial Action Workplan for Soils for the Former Stanley Tools Facility (October 1993) (PAS-00085927)
- Remedial Action Report for Stanley Tools (July 1995) (PAS-00085748)
- Remedial Action Workplan (1997) (PAP-00019003)
- Baseline Ecological Evaluation for the Former Stanley Tools Facility (August 1999) (PAS-00085809)
- Preliminary Report / Workplan, ISRA Case No. 85178 (February 2006 (PAP-00701670).
- Remedial Action Workplan Addendum – Western Parcel (October 200) (PAP-00702933)
- Remedial Investigation Report for the Former Stanley Tool Facility, Volume 1 (May 2016) (PAP-00018949)
- Remedial Investigation Report for the Former Stanley Tool Facility, Volume 2 (May 2016) (PAP-00019141)

According to the *Baseline Ecological Evaluation of the former Stanley Tools Facility*, dated August 1999, Stanley has been conducting investigations at the site pursuant to the ECRA and the ISRA since the site closed in 1985. The site has undergone extensive remedial activities including groundwater monitoring and remediation, soil sampling and excavation, soil treatment, installation of an asphalt cap and decommissioning of PCB equipment (PAS-00086029).

According to the *Remedial Investigation Report*, dated May 2016, remedial investigation and remedial action were conducted by various consulting firms on behalf of Stanley at the Eastern and Western Parcels. Remedial investigation activities were conducted by ENVIRON from approximately 1986 to approximately 1993; ENSR from 1993 to 2000; Arcadis from 2000 to 2003; and CB&I from 2003 to 2016. Below is a summary of remedial investigation and remedial activities (PAP-00018970; PAP-00019157).

Remedial Activities

Soil

ENSR Remedial Action Report (July 28, 1995): The remedial action at the Eastern Parcel (AEC 3-24, 26, 32-33) primarily involved the excavation and recycling of soils onsite using a cold batch processing technique. The soils were recycled into cold batch material and placed and compacted back into the excavations as a sub-base, utilizing

the cold batch material as a cap. A 2-inch thick asphalt topcoat was placed and compacted over the site to serve as the finish to the cap. The remedial phase also included: 1) removal and off-site disposal of selected soil "hot spots;" 2) removal and off-site disposal of VOC contaminated soil; and, 3) preparation and submittal of an Alternate Cleanup Level (ACL) proposal for VOC contaminated groundwater (PAP-00018970; PAS-00085776, PAP-00018293-301).

As noted by the *Remedial Action Report for the Stanley Tools Facility*, dated July 1995, remediation of soils containing metals and organic chemical constituents was conducted at the site. The remediation consisted of excavation and off-site disposal of 18 cubic yards of soils containing TPHC; excavation and off-site disposal of approximately 230 cubic yards of lead and VOC-contaminated soils; recycling of over 2,500 cubic yards of soils contaminated with metals, PAHs, and TPHC using cold batch asphalt processing; and, placement of a 2-inch asphalt final top course over the entire site (PAS-00085776).

Soil remedial investigations continued to delineate the extents of contamination in preparation for remedial action. Remedial investigations for soil were conducted in May 2010 and April 2012 (PAP-00018975).

According to a May 7, 2018 NJDEP letter, Stanley received No Further Action (NFA) for 55 of the 65 AOCs, six of which no sampling was triggered (PAS-00361922-26).

8. Summary of Asserted Defenses

Stanley asserts that it is not liable for discharges by Atha Tool. Atha Tool owned and operated the site starting in approximately 1875. SR&L purchased the capital stock of Atha Tool pursuant to an agreement that excluded from the sale all accounts and bills receivable, moneys, bank deposits, and all choses of action generally of Atha Tool and such assets would be held in trust to pay debts and liabilities of Atha Tool arising prior to April 1, 1913. Atha Tool continued to operate as a separate corporate entity until approximately July 16, 1917. On or about this date, SR&L acquired the assets of Atha Tool (including the Newark manufacturing facility). Atha Tool was reportedly dissolved on July 31, 1917. SR&L operated the facility from July 16, 1917 until SR&L merged with Stanley in 1920.

Stanley never assumed the liabilities of Atha Tool arising from the operation of the Facility. Stanley does not recognize itself as the successor to any potential Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liabilities associated with Atha Tool's operations and Atha Tool, as a dissolved corporation, is not subject to being sued. Therefore, Stanley is not responsible for the wastewater discharges to the Lower Passaic River during Atha Tool's ownership and operation of the site.

Lastly, PAHs discharged in wastewater by Stanley contained lubricating oils, grease and other petroleum products used in the manufacturing process. Based on the CERCLA petroleum exclusion, such PAHs should not be considered.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

STWB Inc. – Bloomfield

Facility Name, Address and Size: STWB Inc. (STWB) is the corporate successor to Lehn & Fink Products Co., the former property owner/operator (PAS-00032941); 192-194 Bloomfield Avenue, Bloomfield, New Jersey (the Lehn & Fink [L&F] Facility); approximately 10 acres (PAP-00431956); seven buildings were part of the L&F Facility (PAS-00028400, 419); Lehn & Fink Products Co. employed 625 people by December 1925, but no information was provided regarding the number of employees specifically working at the L&F Facility (PAS-00028419).

1. **Business Type:** Formulation, mixing, and packaging of cleaning products, disinfectants, and personal toiletry items (PAS-00028399).

2. **Time Period of Ownership/Operations**

Operator: Lehn & Fink Products Co. 1925 – 1965
Owner: Lehn & Fink Products Co. 1920 – 1965

1874: Lehn & Fink, Inc. was founded in New York City (PAS-00028400, 419).

1890: Lehn & Fink, Inc. introduced Lysol, the first universally branded disinfectant, to the United States by importing it from Schulke & Mayr of Hamburg, Germany (PAS-00028419).

1907: Lehn & Fink, Inc. acquired A.S. Hinds Company (PAS-00028400). A.S. Hinds Company manufactured Hinds' Honey and Almond Cream, a nationally known product. A.S. Hinds, which was founded in 1875, continued to operate independently (PAS-00028419).

1912: Lehn & Fink, Inc. began manufacturing Lysol under a licensing agreement in 1912, and in 1922 Lysol was purchased by the company (PAS-00028419, 423)

1925: In July, a new holdings company, Lehn & Fink Products Co., was created for the purpose of acquiring Lehn & Fink, Inc. and A.S. Hinds Company (PAS-00028400, 419).

1925-1965: Lehn & Fink Products Co. operated the L&F Facility located in Bloomfield, New Jersey from approximately 1925 through 1965 (PAS-00028399).

1926: Lehn & Fink Products Co. acquired the business of Dorothy Gray, consisting of the manufacture of toilet articles and cosmetics (PAS-00028400).

1929: Lehn & Fink Products Co. acquired control of Lesquendieu, Inc. through stock purchase, which was a manufacturer of perfume, cosmetics, and toilet articles (PAS-00028400).

1966: Lehn & Fink Products Co. merged into Sterling Drug Inc. (Sterling) and ceased to exist (PAS-00032941). Sterling later changed its name to Sterling Winthrop Inc. (PAS-00032943). Sterling did continue to use the name as a "doing business as" name and for an operating unit, the "Lehn & Fink Products Division" (PAS-00032941).

1994: On September 26, 1994 Sterling conveyed the assets of its Lehn & Fink Products Division to Kodak and Lehn & Fink Products, Inc., a subsidiary of Kodak, and those two entities conveyed the former Lehn & Fink Products Division assets and specified liabilities to Reckitt Colman plc (PAS-00032941; PAS-00033010). The environmental liabilities of Lehn & Fink were not transferred to Reckitt Colman plc (PAS-00032941). The facility at 192-194 Bloomfield Avenue was not among the properties or leasehold interests acquired by Reckitt Colman (PAS-00032944).

1994: Kodak sold the stock of Sterling Winthrop Inc. to SmithKline Beecham plc, which then sold the stock to Bayer AG. Sterling later changed its name to STWB Inc. STWB Inc., the corporate successor by merger to Lehn & Fink Products Co., continues to exist as a corporate entity, as a subsidiary of Bayer Corporation (PAS-00032941).

1997: Deed Notice filed for 192 Bloomfield Avenue, which appears to be owned and operated by The Hartz Mountain Corporation (PAP-00431976, 95-97). No information could be located in the available file materials regarding when the property was purchased by Hartz Mountain Corporation or how long Hartz Mountain Corporation has operated at this property.

1999: Reckitt Colman merged with Benckiser N.V. to form Reckitt Benckiser plc (PAS-00028400).

2010: EPA sent a General Notice Letter dated April 20, 2010 to STWB regarding the L&F Facility (PAP-00194929-32).

3. Operational History/COC Use and Presence at the Facility

The L&F Facility consisted of seven buildings that housed the product formulation and packaging areas, research laboratories, corporate administrative offices, and a machine shop. Lehn & Fink, Inc. formulated and packaged cosmetics and consumer products, specifically franchised or name brand cosmetics, acne remedies, and household cleaners, e.g., Dorothy Gray, Tussy, and Ogilvie; Stri-dex and Medi-quick; and, Lysol liquid and aerosol disinfectant, respectively.

The L&F Facility's product line in 1926 included toothpaste, disinfectant, drugs, and chemicals. Trade names included Pebeco Tooth Paste, Lysol Disinfectant and other Lysol products, and Hinds products. The L&F Facility's product line in 1936 included Pebeco tooth paste and powder, Lysol disinfectant, hygienic soap and shaving cream, Hinds cold cream and liquids, Dorothy Gray cold creams and skin lotions, Tussy cosmetics, Amphyl, Lygel, and Henna San (PAS-00028400). In the 1920s, the

formulation of Lysol contained cresols. Amphyl was also a phenol-based disinfectant (PAS-00028401). Another of Lehn & Fink's products starting in the 1950s, O-Syl disinfectant, contained isopropyl alcohol, ortho-benzyl para chlorophenol, and 2-phenylphenol (PAS-00028401-02; PAS-00028642-43).

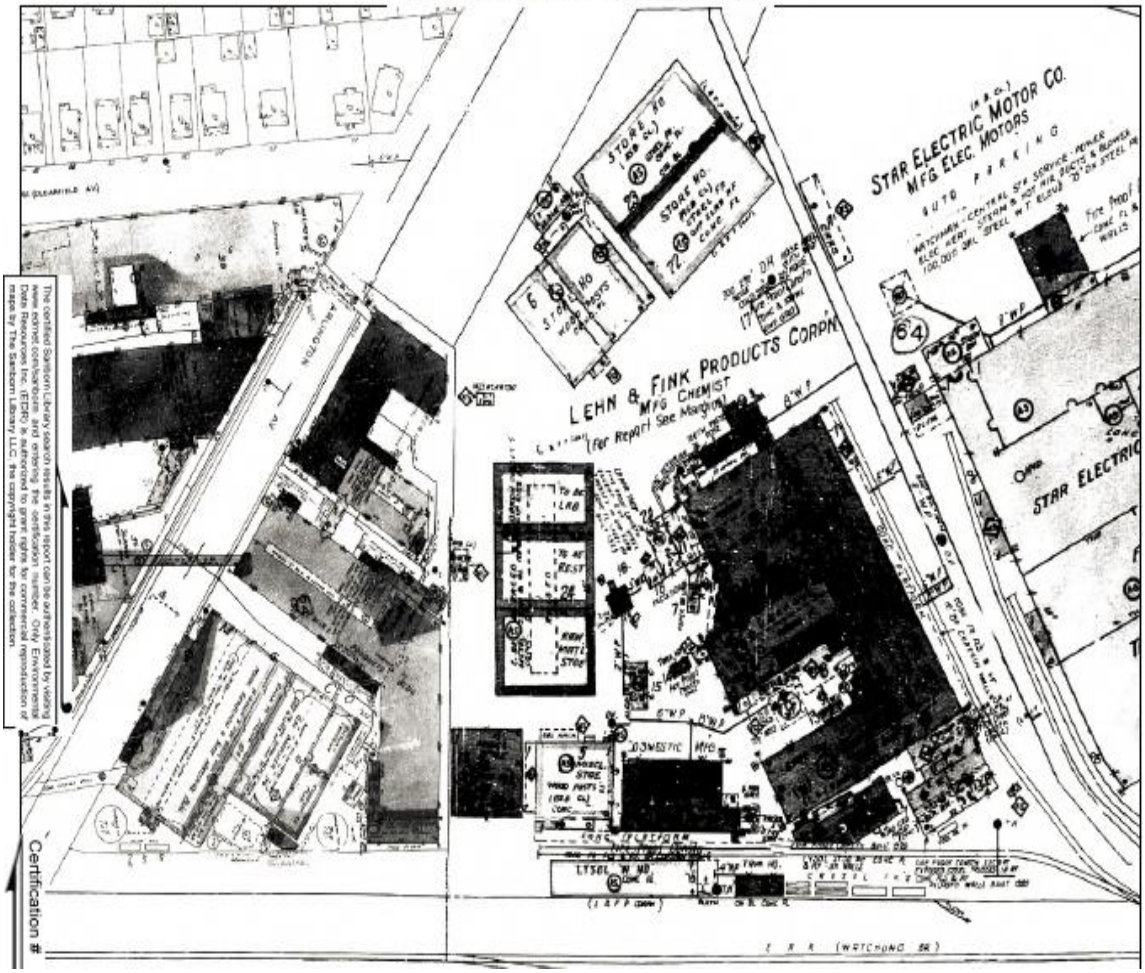
Initially the active ingredients for Lysol were cresol and soap (PAP-00194787). The current active ingredients in Lysol include: Ethanol/SD Alcohol 40, 1-3%; Isopropyl alcohol, 1-2%; p-Chloro-o-benzylphenol, 5-6%; potassium hydroxide, 3-4%; alkyl (C12-C18) dimethyl benzyl ammonium chloride, 0.08%; alkyl (C12-16) dimethyl benzyl ammonium chloride, 0.02%; Ethanol/SD Alcohol; and, Isopropyl alcohol (PAS-0028633). The file material does not include information regarding when use of the current formulation began.

The L&F Facility was served by two railroad sidings. One wing of the facility was used to manufacture and package Pebeco Toothpaste, while another wing was used to manufacture and package Lysol. A central wing was used for general pharmaceutical manufacturing, such as preparation of fluid extractions and ointments. A machine shop was housed in a separate building to make machinery for the facility. The L&F Facility manufactured and decorated its own collapsible tubes, made its own packing boxes, and printed its own labels and circulars (PAP-00194800).

The L&F Facility also included a laboratory department that tested all raw materials that went into Lehn & Fink products. A biological and chemical research laboratory was also located at the facility. Power was provided to the L&F Facility by an on-site power house served by oil-burning boilers (PAP-00194801).

The 1950 Sanborn Map depicting the L&F Facility layout is presented below (PAP-00431958):

1950 Certified Sanborn Map



No other information regarding Operable Unit 2 (OU2) contaminants of concern (COCs), including whether they were used or stored at the L&F Facility, could be located in the available file materials.

4. Identified COCs

- PCBs (detected)
- PAHs (detected)

PCBs

Data tables included in the Deed Notice filed by The Hartz Mountain Corporation on January 15, 2013 identify the presence of several isolated and sporadic low level detections of polychlorinated biphenyls (PCBs) (PAP-00431961, 91). PCBs were detected in on-site soils at concentrations above their NJDEP Residential and/or Non-Residential Direct Contact Soil Remediation Standards (DCSRS). PCBs were detected at concentrations ranging from 0.083 milligrams per kilogram (mg/kg) in sample L3-1 collected on 11/24/2008 from 10-10.5 ft. bgs to 1.4 mg/kg in sample L4-1 collected on 11/20/2008 from 8-8.5 ft. bgs (PAP-00431991).

According to the Second Supplemental Remedial Investigation Report and Remedial Action Workplan, dated February 24, 2009, the PCB results discussed above were detected in soil at AOC-19, Car Lifts, Lee Myles Building 7. The remains of the former hydraulic lift features were noted to be present in the floor of the northern half of Building 7. The soil samples were collected beneath six hydraulic lift systems after removal of the lifts, pistons, and piping in 2008 (PAP-00485437-9).[1]

No other information regarding PCBs, including whether they were used or stored at the L&F Facility, could be located in the available file materials.

PAHs

The Remedial Investigation/Remedial Action Report, dated January 2014, listed PAHs as COCs for three Areas of Concern (AOCs), including AOC-19 (Lee Myles Car Lifts), AOC-1 (Rail Cars), and AOC B1-1 (Above Ground Storage Tanks). It also stated that PAHs were detected in sediment samples collected in a trench containing utility lines at AOC B7-2 (Floor Drains, Trenches and Piping and Sumps). Concentrations were not included in the available summary table of AOCs from this report (PAP-00485418-23).[1]

PAHs were detected in on-site soils at concentrations above their respective NJDEP Residential and/or Non-Residential DCSRS. The levels of COCs detected included benzo(a)anthracene ranging from 0.61 mg/kg in sample AOC-1I1 collected on 7/24/2006 from 11-11.5 ft. bgs to 52 mg/kg in sample AOC-1I1 collected on 7/24/2006 from 9-9.5 ft. bgs, benzo(a)pyrene ranging from 0.23 mg/kg in sample AOC-1H1 collected on 7/24/2006 from 5-5.5 ft. bgs to 49 mg/kg in sample AOC-1I1 collected on 7/24/2006 from 9-9.5 ft. bgs, benzo(b)fluoranthene ranging from 0.61 mg/kg in sample AOCB1-1B3 collected on 7/24/2006 from 3-3.5 ft. bgs to 60 mg/kg in sample AOC-1I1 collected on 7/24/2006 from 9-9.5 ft. bgs, benzo(k)fluoranthene ranging from 6.5 mg/kg in sample AOC-1H collected on 4/11/2003 from 2.5-3 ft. bgs to 19 mg/kg in sample AOC-1I1 collected on 7/24/2006 from 9-9.5 ft. bgs, dibenzo(a,h)anthracene ranging from 0.21 mg/kg in sample AOCB1-1B collected on 11/17/2000 from 0-0.5 ft. bgs to 11 mg/kg in sample AOC-1I1 collected on 7/24/2006 from 9-9.5 ft. bgs, and indeno(1,2,3-cd)pyrene ranging from 0.62 mg/kg in sample AOCB1-1F4 collected on 7/24/2006 from 1-1.5 ft. bgs to 32 mg/kg in sample AOC-1I1 collected on 7/24/2006 from 9-9.5 ft. bgs (PAP-00431982-87). No other information regarding PAHs, including whether they were used or stored at the L&F Facility, could be located in the available file materials.

Historic Fill

The Allocation Team has determined that the property is located on regional Historic Fill as designated by the NJDEP.[2]

[1] This Report was revised to include documents received on May 31, 2020. The additional documents did not change STWB Inc.'s previous certification.
[2] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[3] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[4] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[5]

The levels of PCBS and PAHs detected at the site in soils are presented in the table below (PAP-00431986; PAP-00431991).

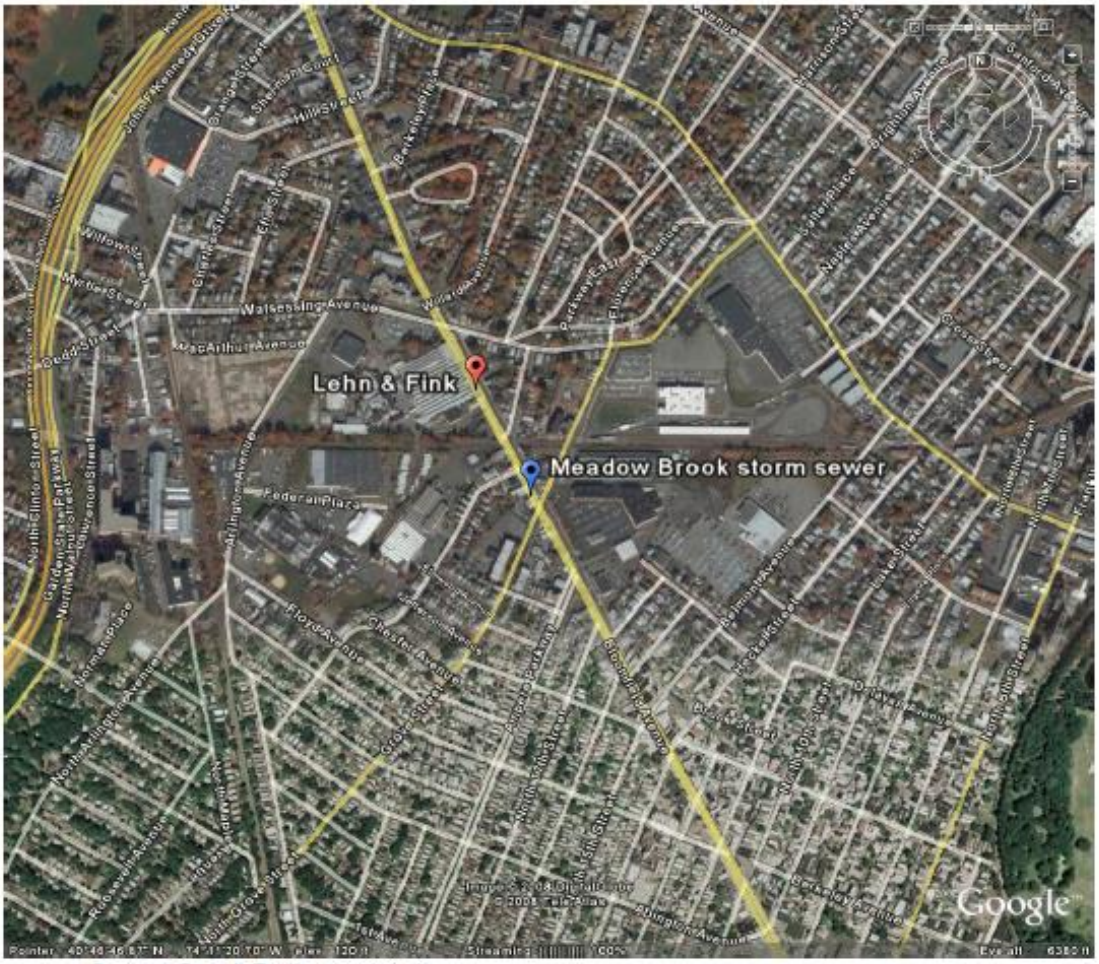
COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Benzo(a)anthracene	52 mg/kg
Benzo(a)pyrene	49 mg/kg
Benzo(b)fluoranthene	60 mg/kg
Benzo(k)fluoranthene	19 mg/kg
Dibenzo(a,h)anthracene	11 J mg/kg
Indeno(1,2,3-cd)pyrene	32 mg/kg
PCBs	1.4 mg/kg

5. COC Pathways

Sanitary and Storm Sewer

The L&F Facility discharged industrial wastewater through the Meadow Brook sewer, which discharged directly into the Second River (a tributary of the Passaic River) until 1931. After 1931, wastewater from the L&F Facility would have been discharged through the Union Outlet Sewer into the Passaic Valley Sewerage Commission (PVSC) system. The PVSC system is subject to bypassing into the Passaic River during overflow events, or to the Meadow Brook Storm Sewer (which continued to discharge into Second River) (PAS-00028399). The Google Earth image below depicts the location of the L&F Facility relative to the Meadow Brook storm sewer (PAS-00028401).

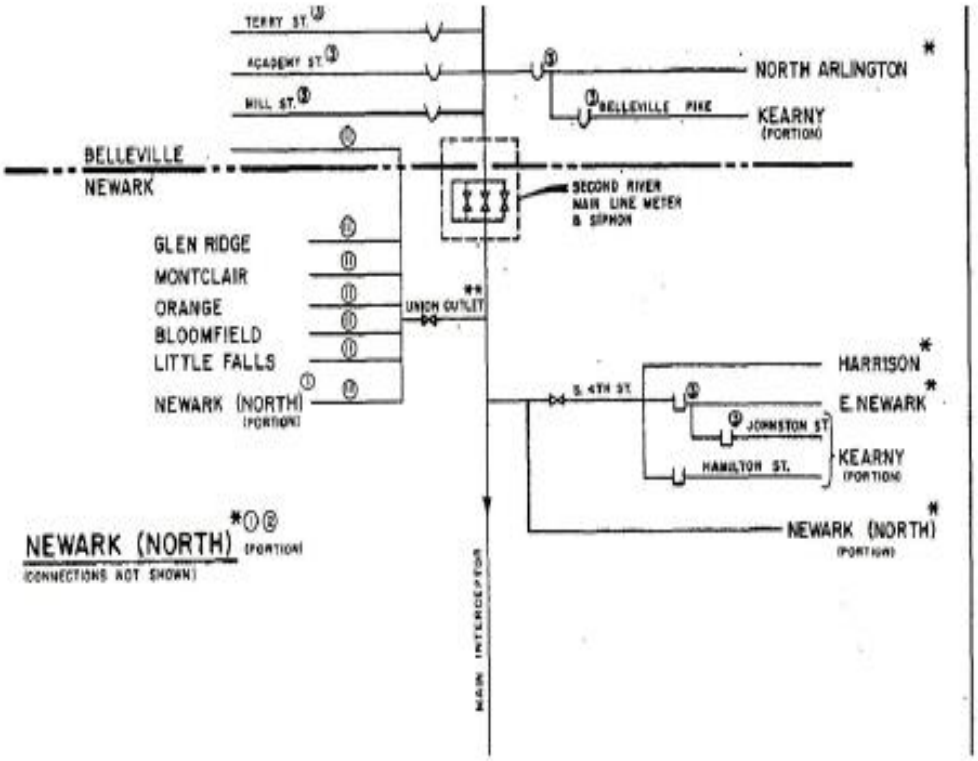
[3] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[4] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[5] NJDEP Table 4-2 (PAHS & lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).



Source: GoogleEarth, annotated

The Meadow Brook sewer was in use by parts of Bloomfield, including the L&F Facility, in 1927 (PAS-00028402).

In 1930, the municipalities of Newark, Bloomfield, Belleville and East Orange entered into a contract to build a sanitary sewer and a storm sewer, designated as the Meadow Brook Sewers. The sanitary sewer was connected to the Union Outlet Sewer at the Morris Canal, and the storm sewer was connected to the Second River in Belleville (PAS-00028402-3). The Union Outlet Sewer ultimately connects to the PVSC trunk sewer and was used by the PVSC as an overflow point to relieve excessive flow volumes farther down the system (PAS-00028404). On January 6, 1930, meeting minutes state that the connection between the Meadow Brook Sewer and the "new line" had been made. Both of these sewers still received industrial waste from various manufacturing plants as of 1947 (PAS-00028403). A schematic diagram of the PVSC sewer is presented below (PAS-00028404):



The L&F Facility was reported by the PVSC in 1927 for polluting Meadow Brook (a tributary of the Passaic River) with industrial waste containing hazardous substances (PAS-00028399). Industrial wastewater discharge from the L&F Facility was identified in a 1927 memo regarding pollution from municipal sewers as "large in volume." However, a memo dated April 4, 1927 states that the discharge from the L&F Facility contained "cresols and phenol in solution in small amount" (PAS-00028609). The industrial waste from the L&F Facility was discharged into a storm sewer which became an open brook known as Meadow Brook, which constituted a tributary of Second River. The culvert received the L&F Facility's industrial wastewater in the vicinity of where it crossed Bloomfield Avenue. The distance from the L&F Facility to the discharge point at Bloomfield Avenue is just over one-tenth of a mile (PAS-00028405). In May 1928, the L&F Facility was named as a contributor of chemical waste to the Meadow Brook culvert (PAS-00028406, 417). In June 1928, a letter on the same topic states that an investigation was done establishing that pollution entering the Meadow Brook storm culvert did not originate from any location above the L&F Facility (PAS-00028406).

There is no information regarding discharges of OU2 COCs in the available file material.

Direct Release

There is no information regarding direct release in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

The entire time period of Lehn & Fink's discharges from the L&F Facility occurred prior to the February 1975 effective date of PVSC's NPDES permit and, therefore, were not covered by a federal permit (PAS-00028405). A table of permit information for 192 Bloomfield Avenue for the period after Lehn & Fink Products Co. operations had ceased was located in the file materials (PAP-00194858):

Site Information

Discharge Period		Discharge Type	Discharge Location
From	To		
1965	Present	Sanitary/Industrial – Permit #02200003	Passaic Valley Sewerage Commissioners
1965	Present	Stormwater- NJPDES Gen. Permit #NJ0088315	Raritan River, via municipal storm sewer system

There is no additional information regarding permits in the available file materials.

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- *Third Supplemental Remedial Investigation Report and Remedial Investigation Workplan, The Hartz Mountain Facility, 192 Bloomfield Avenue*, Bloomfield, New Jersey, dated April 1, 2011 (PAP-00194815); and,
- *Preliminary Assessment Report, The Hartz Mountain Facility, Bloomfield, New Jersey*, dated June 2001 (PAP-00194857).

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

Soil sampling was conducted at 192 Bloomfield Avenue by Hartz Mountain Corporation in relation to their site use and operations (PAP-00194815); however, based on review of available file material, there was no soil sampling conducted to target site use and operations by Lehn & Fink Products Co.

Remedial Activities

A Deed Notice has been implemented as an institutional control for four areas of concern (AOCs) located at the Hartz Mountain Corporation facility located at 192 Bloomfield Avenue. The four AOCs are as follows:

- AOCB1-1, Former Cresol Aboveground Storage Tanks (ASTs) and AOC-1 Rail Spur – The deed notice addresses PAH concentrations in soil above NJDEP Residential DCSRS (PAP-00431996);

- AOCB2-1, PVC/DCA ASTs – The deed notice addresses bis-2(ethylhexyl) phthalate concentrations in soil adjacent to the ASTs. Excavation of soils was not deemed safe or feasible due to the presence of utility poles/guy wires, steep slopes, and the ASTs (PAP-00431996).

- AOC-19, Lee Myles Building (Building 7) – The deed notice addresses total petroleum hydrocarbons (TPH) concentrations in soil above 10,000 mg/kg in samples collected in November 2008. The area also contains five detections of PCBs, only one of which exceeds the NJDEP Non-Residential DCSRS (PAP-00431996).

- 1997 Declaration of Environmental Restrictions (DER) Area, Former Underground Storage Tank (UST) Case No. 91-11-13-1044 – The deed notice addresses PAH concentrations above the NJDEP Residential DCSRS (PAP-00431996-97).

The NJDEP issued a No Further Action Letter dated May 24, 1999 to Hartz Mountain Corporation for UST No. 0118857, Closure No. N98-2706, located at 192 Bloomfield Avenue, Bloomfield, Essex County (PAP-00194861).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

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Facility Data Report

STWB Inc.

Facility Name, Address and Size: Sterling Winthrop Inc., aka STWB Inc./Thomasset Colors Inc., 120 Lister Avenue, Newark, New Jersey (Block 2438, Lot 56); aka 104-112 Lister Avenue, Newark, New Jersey; 2.6 acres (PAP-00194934; PAP-00057548). In approximately 1980, there were 55 full-time employees working two shifts per day, five days a week (PAP-00431723). The site abuts the south side of the Passaic River.

1. **Business Type:** Manufacturing of organic and inorganic pigments for the automobile, textile, drug, and cosmetic industries (PAP-00057488).

2. **Time Period of Ownership/Operations**

   Operator: March 1957 to October 1986
   Owner: March 1957 to October 1986

   1957: On March 11, 1957, STWB Inc. acquired Thomasset Colors Inc. (TCI) (PAS-00002720).

   1983: On December 28, 1983, STWB Inc. transferred the assets of TCI to its subsidiary, The Hilton-Davis Chemical Company (Hilton-Davis) (PAS-00002720).

   1986: On October 23, 1986, the assets of Hilton-Davis were sold to H.D. Acquisition Corporation, which later changed its name to Hilton Davis Co., a division of Plastics Manufacturing Corp (PMC) (PAS-00002720).

   1986: TCI ceased operating at the site on October 23, 1986 with the sale of Hilton-Davis to PMC (PAS-00002720).

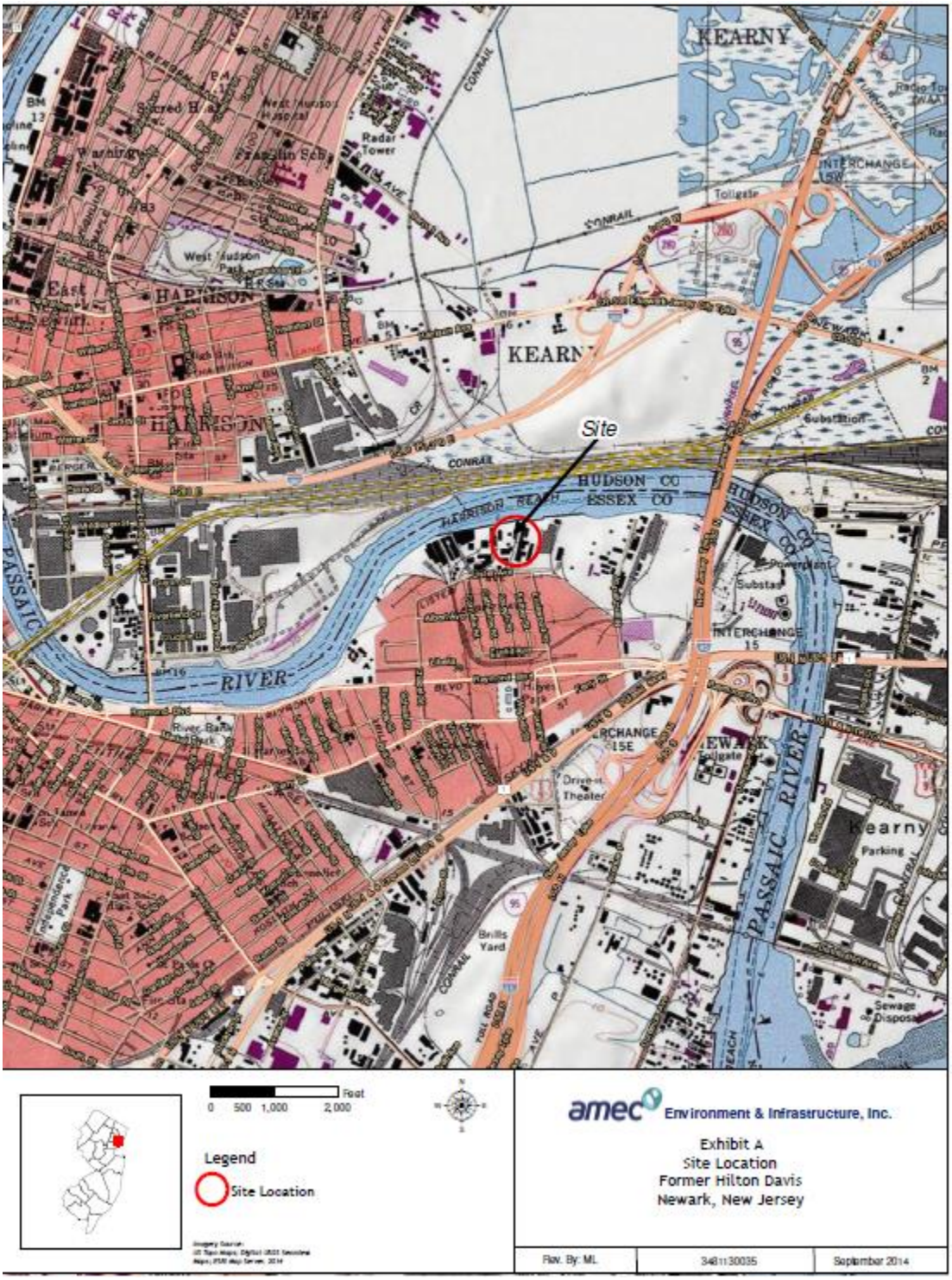
3. **Operational History/COC Use and Presence at the Facility**

   During the relevant time period, STWB Inc. conducted pigment manufacturing operations at the site that produced three types of pigments: (a) phthalocyanine ("phthalo") pigments for the automobile industry; (b) transoxide-based textile pigments for the textile industry; and, (c) pigments for the drug and cosmetics industries, referred to as D&C Colors (PAP-00057488). A review of available documents showed that the materials used in the production of these three pigments did not contain any of the Operable Unit (OU) 2 COCs, with the exception of a water-soluble form of copper sulfate, which was limited to manufacturing of the phthalo pigments (PAS-00002721-724; PAP-00057496-499). The production of phthalo pigments based on peer-reviewed literature could not generate polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), and/or polychlorinated dibenzofurans (PCDFs), as was possibly the case for other manufacturing methods (PAP-00208780-9). This is borne out by on-site groundwater samples that show that 2,3,7,8-tetrachlorodibenzodioxin (TCDD) and PCB congeners in groundwater samples are either below detection limits or non-detect (PAP-00057501-502; PAP-00057596).

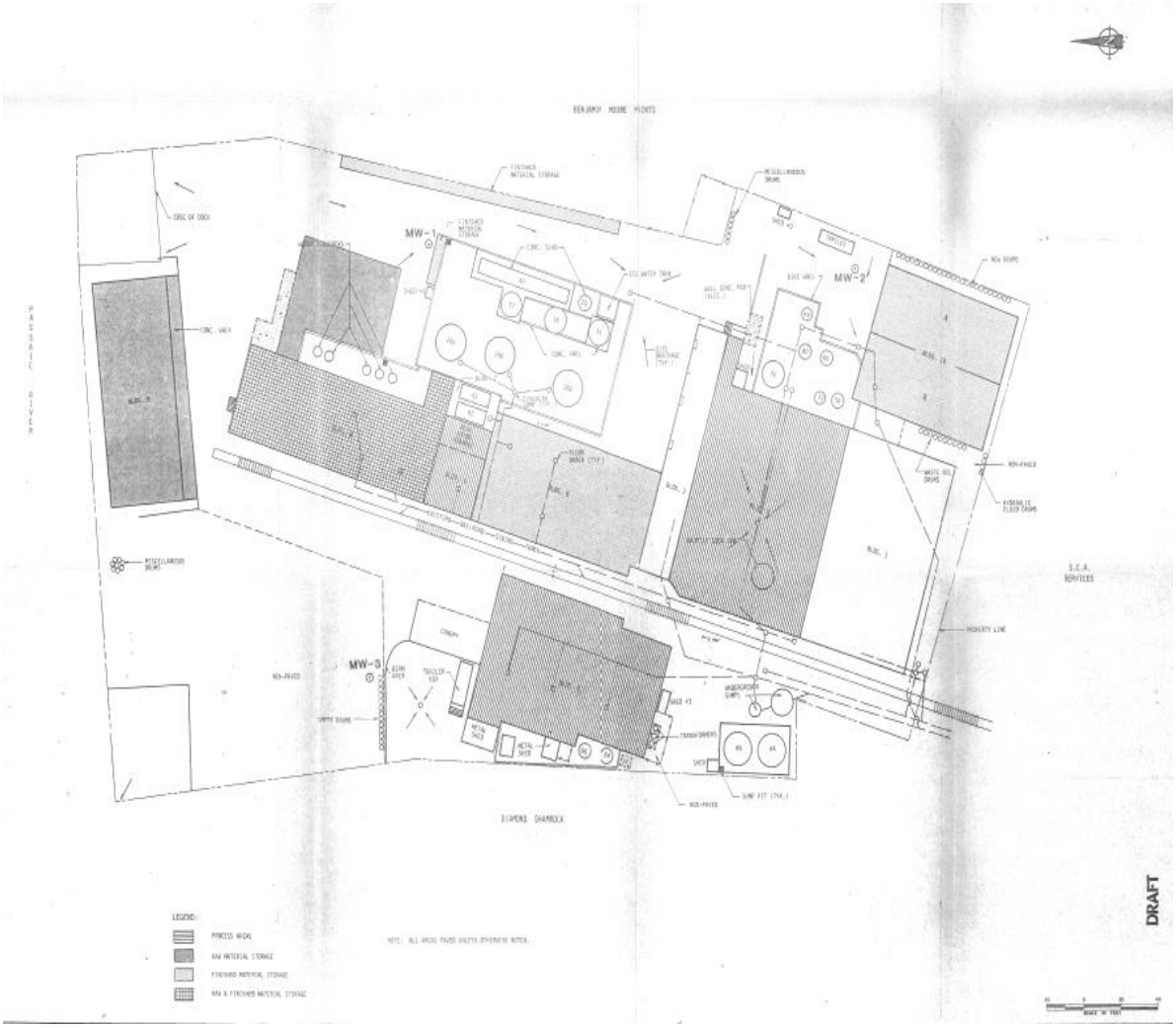
Diamond Alkali OU2 Allocation

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Facility Data Report



(PAP-00195021)



(PAP-00057500)

Production processes at the site included the following materials and methods:

Building 5 at the site was the production area where the raw materials for phthalo blue pigment were mixed in tanks and baked in ovens. Resultant solid product was ground and dissolved in 98 percent sulfuric acid and pumped into tanks where it was diluted with water to achieve a 10 percent sulfuric acid concentration slurry. The 10 percent slurry was neutralized with ammonia and pumped to filter presses located in Building 2. Filter press wastewater was discharged via floor sump to neutralizing tanks, which subsequently dischargedto the sewer. Finished filter cakes were milled, blended and stored in drums in Building 8 or 10 as the final product prior to off-site shipment (PAP-00057514-515, PAS-00002723).

Transoxide (metal oxide) pigments were also manufactured at the site. Raw material for transoxide included soda ash, ferrous sulfate, and water (PAP-00057515). The raw materials were mixed with air in tanks (Tanks 60, 66 and 69) located in Building 2 at the site. Two slurry batches were produced, transferred to tanks and boiled, and the resulting slurry was pumped to a filter press in Building 4. Wastewater generated from filter pressing was sent to the on-site neutralization tank system which subsequently discharged to the sewer. Filter cakes were extruded to a drying belt and heated and/or steamed to various temperatures depending upon the pigment desired (yellow or red). Final product was milled, blended, and drummed for storage in Building 8 or 10 prior to shipment (PAP-00057515, PAS-00002723).

Lastly, D&C Colors were produced at the site. Raw materials were para-toluidine-meta-sulfonic acid, beta-oxynaphthotic acid, aluminum chloride, sodium bicarbonate, sodium carbonate, and dyes (PAP-00057515). These materials were mixed in tanks in Building 2. Slurries were filter pressed in Building 2 and wastewater generated from filter pressing was sent to the on-site neutralization tank system, which subsequently discharged to the sewer. Filter cakes were dried in tray dryers, then milled in Building 4, blended, drummed, and stored as final product in Building 8 or 10 (PAS-00002722-3; PAP-00057489).

Wastewater containing trace amounts of unreacted water-soluble copper sulfate generated from filter pressing in Building 2 were pumped to the neutralization system which subsequently discharged the neutralized wastewater to the sewer (PAP-00057515, PAS-00002723). Note: Details regarding the offsite discharging location of the filter press wastewater were not provided in available references.

A raw material inventory conducted at the site included copper sulfate monohydrate (PAP-00057496-499).[1]

4. Identified COCs

- PAHs (detected)
- Copper (used, stored, released, detected)
- Lead (detected)
- Mercury (detected)

PAHs

According to the June 28, 1996, Declaration of Environmental Restrictions, PAHs have been detected at various locations in soils throughout the facility property. The Deed Notice for the facility includes PAH detections in areas believed to be located on Historic Fill. The table and map below provide maximum concentrations of PAHs and sampling locations (PAP-00194966-72).

[1] According to an American Elements website, copper sulfate monohydrate and copper chloride are water soluble. https://www.americanelements.com/copper-sulfate-monohydrate-10257-54-2, https://www.americanelements.com/copper-ii-chloride-7447-39-4

STWB Inc. - Lister Ave.

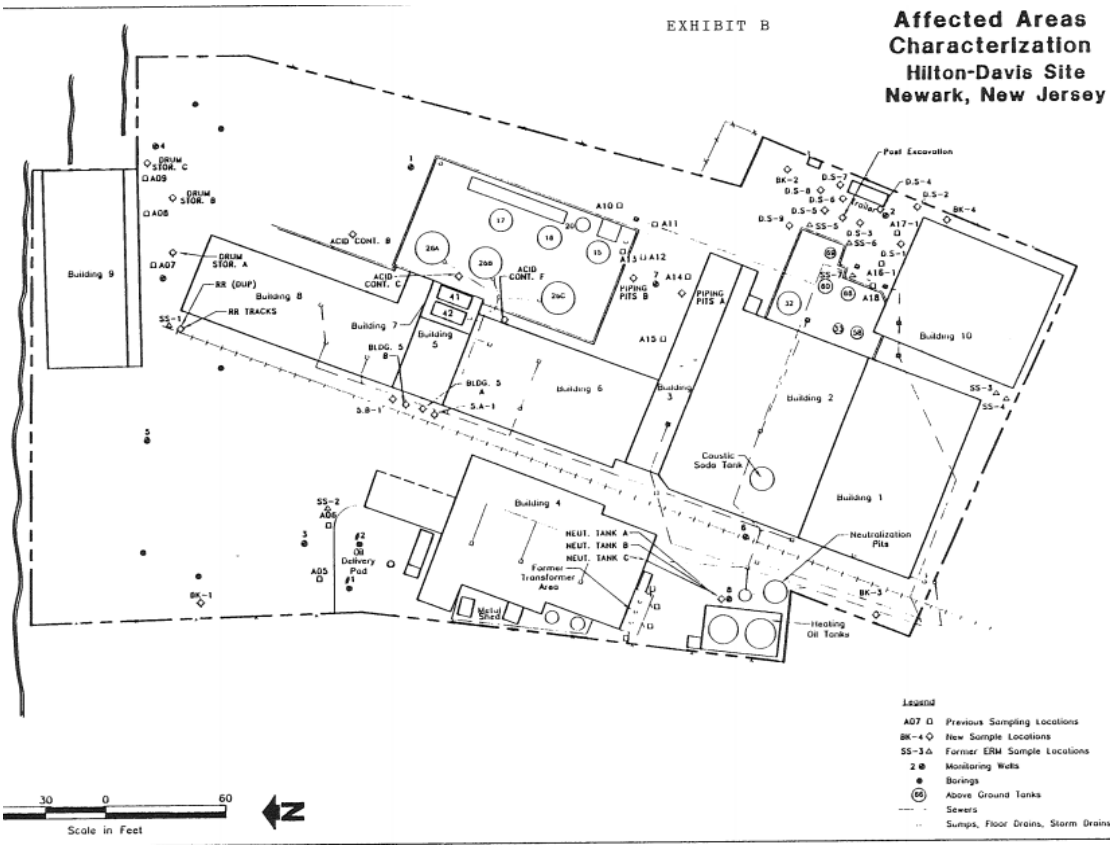
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Facility Data Report

Maximum PAH Concentrations (mg/kg)		
PAH	**Concentration**	**Sample Location**
Acenaphthene	31.529	A14-1
Acenaphthylene	3.294	A07-2
Anthracene	71.116	A14-1
Benzo(a)anthracene	408.81	A14-1
Benzo(a)pyrene	344.03	A14-1
Benzo(b)fluoranthene	317.09	A14-1
Benzo(g,h,i)perylene	321.669	A11-2
Benzo(k)fluoranthene	118.832	A11-2
Chrysene	404.251	A14-1
Dibenzo(a,h)anthracene	92.951	A11-2
Fluroanthene	200.938	A14-1
Fluorene	42.945	A14-1
Indeno(1,2,3-cd)pyrene	237.386	A11-2
Naphthalene	67.447	A16-1
Phenanthrene	242.894	A14-1
Pyrene	434.767	A11-2

(PAP-00194968-71)



(PAP-00194967)

Metals – Copper, Lead and Mercury

Small amounts of copper have been detected in on-site soils. All detections were below NJDEP Direct Contact Soil Remediation Standards and Default Impact to Groundwater Soil Screening Levels, and NJDEP issued a No further Action (NFA) letter in 1995 (PAP-00194944).

Metals (lead and mercury) have been detected at various locations in soils throughout the facility property. The Deed Notice for the facility includes lead detections in areas believed to be located on Historic Fill (PAP-00194956-972). Mercury and copper were not required to be included in the Deed Notice, as they were not detected at the facility above NJDEP Residential Direction Contact Soil Remediation Standards. The table and map at the end of this section provide maximum concentrations of metals and sampling locations (PAP-00194966-972).

Maximum Metal Concentrations (mg/kg)		
Metal	**Concentration**	**Sample Location**
Copper	1,950	Bldg. 5-A
Lead	1,360	Drum Stor. A
Mercury	5.9	Bldg. 5-B

(PAP-00194968-71)

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[2]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[3] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[4] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[5]

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[2] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[3] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[4] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[5] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,360 mg/kg
Copper	1,950 mg/kg
Mercury	5.9 mg/kg
Benzo(a)anthracene	408.81 mg/kg
Benzo(a)pyrene	344.03 mg/kg
Benzo(b)fluoranthene	317.09 mg/kg
Benzo(k)fluoranthene	118.832 mg/kg
Dibenzo(a,h)anthracene	92.95 mg/kg
Indeno(1,2,3-cd)pyrene	237.386 mg/kg

5. COC Pathways

Process and Sanitary Water

Discharges from the system to the sewer were monitored for pH, total suspended solids, and biochemical oxygen demand (PAP-00057488).

Waste streams from floor drains generated at the site during TCI's period of operation were discharged to a sanitary sewer. A wastewater neutralization system was constructed in June 1971 to neutralize process wastewater prior to discharge to the sanitary sewer (PAS-00002725). Stormwater catch basins and process wastewater were discharged to the City of Newark sanitary sewer in Lister Avenue through a combined 12-inch sewer line. In June 1971, a new 16-inch sewer was constructed to discharge treated process wastewater to the municipal sanitary sewer. At the same time, the existing 12-inch sewer line was converted for stormwater use only and was connected to a municipal storm sewer in Lister Avenue. In March 1972, the 12-inch sewer line was sealed off from the municipal storm sewer (PAS-00002725).

The Montrose Chemical Co. Wastewater and Stormwater Discharges Expert Report dated August 2017 reported the sanitary sewer line under Lister Avenue flowed westward and connected directly to the PVSC Newark Bay Waste Water Treatment Plant (NVWWTP) via the Brown Street Branch Interceptor (BSBI). The BSBI was constructed in 1921 and conveyed all its flow to the NBWWTP. Sewage in the BSBI did not discharge to the Passaic River, even during storm events. There was no hydraulic connection that would allow flow to the BSBI to discharge to the Brown Street Combined Sewer Overflow (CSO) or any other CSO (PAP-00027671).

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the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Diamond Alkali OU2 Allocation

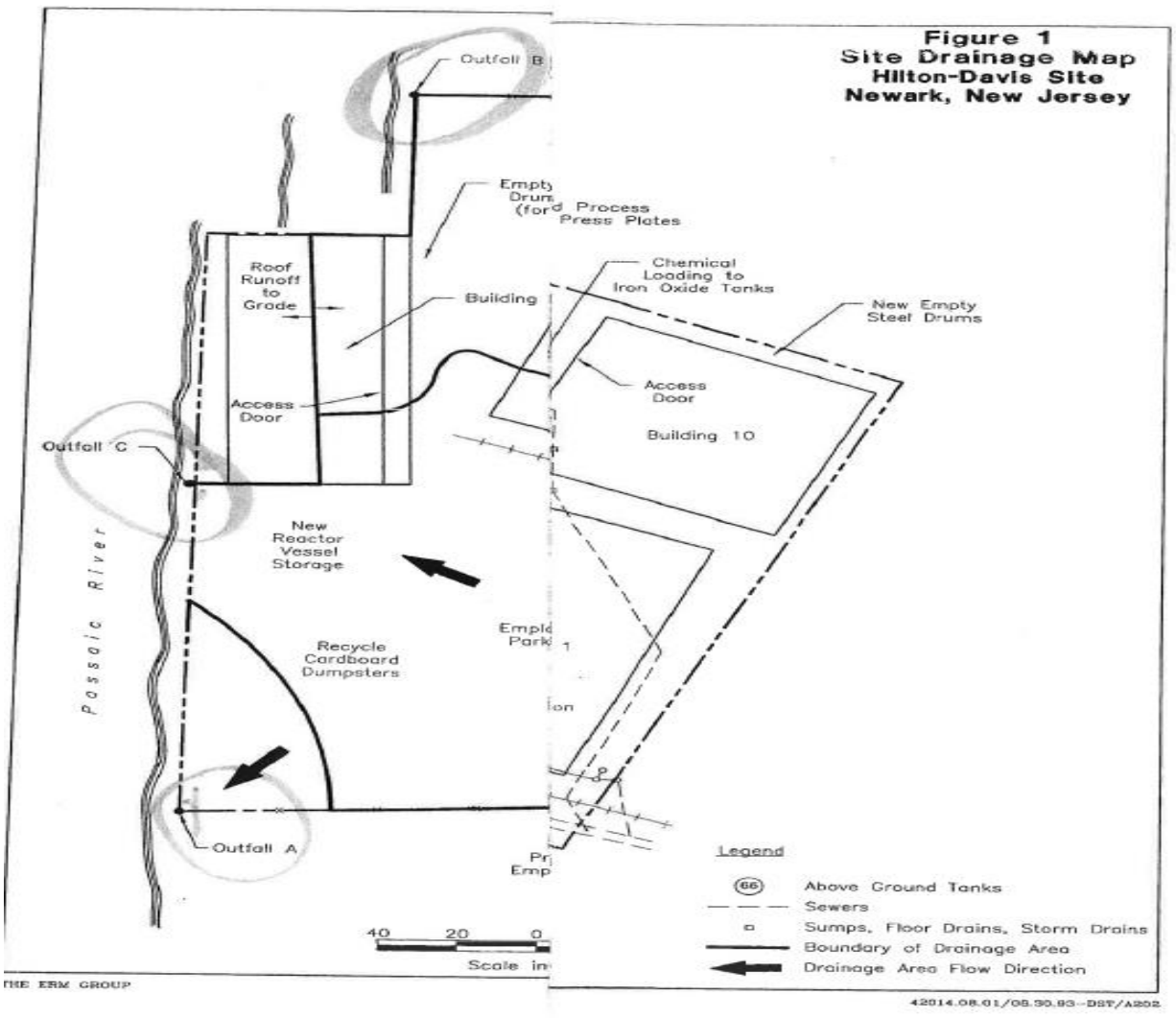
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Facility Data Report

Direct Release

A portion of wastewater generated during the production of phthalo blue pigment may have been reportedly discharged to the Passaic River from approximately 1956 to 1958 and then again from 1963 until July 1971 (PAS-00002723-24, 26). This waste stream contained inter alia, sulfuric acid, and trace amounts of unreacted water-soluble copper salts; however, insufficient information was available to accurately estimate the amount of decant water discharged to the Passaic River (PAS-00002726).

STWB Inc. reports that a topographic drainage divide segregated stormwater runoff on the north and south sides of the site. The northern portion of the site drained to the Passaic River through three drainage swales (A, B, and C) (PAP-00194989-991).



(PAP-00194991)

Spills

The table of contents of the *Supplemental Remedial Investigation Report,* Former Hilton-Davis Site, 112 Lister Avenue, Newark, Essex County, New Jersey, NJDEP Case No. E86941, Program Interest No. 192995, dated March 2016, identifies AOC 3 as "Phthalo Blue Discharge Spill Area", but only a few selected pages of response action documents were provided, and no more information about this spill was available (PAP-00057510, 12).

6. Regulatory History/Enforcement Actions

Violations

In a letter dated August 27, 1971, PVSC pointed out that during their inspection on August 19, 1971, a green material was noted in the Passaic River coming from the Lockwood Street storm sewer. Further inspection showed that an accident occurred at the site where a container of green fluorescein dye was discharged into a catch basin within the site area, which reached the Lockwood Street storm sewer and the Passaic River. In addition, PVSC pointed out during their inspection that due to poor housekeeping, pollution could occur not only from spills, but during any rainfall event, as the material lying on the ground could discharge to the storm sewer (PAS-00002739). The poor housekeeping was addressed by September 9, 1971 (PAS-00002740). In March 1972, the 12-inch sewer line was sealed off from the municipal storm sewer (PAS-00002725).

In February 1972, PVSC issued a notice of violation indicating that the sewer department took out a sample from the sewer line and found "chemical in the line." It was recommended that this condition be checked for a defective sewer line (PAS-00002741). Note: The specific "chemical in the line" was not identified.

On April 27, 1976, a $750 fine was imposed on TCI for violations of the Spill Prevention, Control, and Countermeasure (SPCC) regulations under Section 311 of the Federal Water Pollution Control Act (PAS-00002727). Note: No additional information was provided.

Permits

The Passaic Valley Sewerage Commission (PVSC) issued a sewer connection permit (No. 20402690) to the site for the period from May 15, 1981, through May 15, 1986, for discharge of effluent to PVSC. The permit was renewed by PVSC effective May 27, 1986, for a period of five years (PAS-00002721). Available references did not include the permit and a description of effluent flow rate and monitoring requirements.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Supplemental Remedial Investigation Report,* Former Hilton-Davis Site, 112 Lister Avenue, Newark, Essex County, New Jersey, NJDEP Case No. E86941, Program Interest No. 192995, dated March 2016 (PAP-00057510).
- *ECRA Cleanup Plan Implementation Report, Hilton Davis Site, Newark, New Jersey, ERA Case No. 86941,* dated December 1994 (PAP-00194984-8).
- *ECRA Cleanup Plan, Hilton Davis Site, Newark, New Jersey, ECRA Case No. 86941,* dated April 16, 1992 (PAP-00057585).
- *Environmental Cleanup Responsibility Act ECRA Initial Notice - Site Evaluation Submission (SES),* Hilton Davis Chemical Company-Thomasset Div., Enviro-Sciences, Inc., dated February 23, 1987 (PAP-00057486).

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

There is no information regarding soil sampling in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Sun Chemical Corp.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

SUN CHEMICAL CORPORATION

Facility Name, Address and Size: Sun Chemical Corporation, 185 Foundry Street, Newark, New Jersey and approximately 17,000 square feet (0.4 acres) (PAS-00008258). Sun Chemical Corporation occupied Building Nos. 23, 31, 32, 33, 34 and 34A on Lot 22.01 (PAS-00000242). In 1990, Sun Chemical Corporation had 30 employees working three shifts per day 238 days per year (PAP-00049181). One employee and several subcontractors remained at the site as of April 2, 2004 (PAP-00377198).

1. **Business Type:** Organic pigment manufacturer (PAS-00000672). The pigments were used in the automobile industry, printing inks, and plastics (PAS-00000190; PAS-00105580; PAS-00128904).

2. **Time Period of Ownership/Operations**

   Operator: December 31, 1986 to December 31, 2003 (PAS-00008260)
   Owner: November 20, 1990–November 5, 2004 (PAS-00008259)

   The site at 185 Foundry Street was owned by Foundry Street Corporation from May 3, 1971 to November 20, 1990. Sun Chemical Corporation owned the site from November 20, 1990 to November 5, 2004 (PAS-00008259).

NAME OF OWNER (185 Foundry Street)	DATES OF OWNERSHIP
Roanoke, Inc.	<1911 (estimated)–1939
Chemical Industries, Inc.	1939–1964
KEM Realty Company	1964–May 3, 1971
Foundry Street Corporation	May 3, 1971–November 20, 1990
Sun Chemical Corporation	November 20, 1990–November 5, 2004
Fleshment, LLC	November 5, 2004–Unknown

(PAS-00008259)

NAME OF OPERATOR (185 Foundry Street)	DATES OF OPERATION
H.A. Metz Laboratories	<1931–1950
Diamond Alkali	1950–1967
Sequa Corporation (formerly known as Sun Chemical Corporation)	1967–December 31, 1986
Sun/DIC Acquisition Corp. (changed its name to Sun Chemical Corporation in June 1987)	December 31, 1986–December 31, 2003

(PAS-00008260)

According to a *Response to Request for Information*, dated August 23, 1996, prior to purchasing the site, Sun Chemical Corporation leased the site from Foundry Street Corporation (PAS-00008307; PAS-00008350; PAS-00111410). The lease commenced on December 1, 1989 (PAS-00008350).

According to a *Response of Sun Chemical Corporation to "Report on Industrial Waste Streams Bypassed to the Passaic River,"* dated December 1, 1997 (1997 Response), on December 31, 1986, Sun/Dainippon Ink and Chemicals (DIC) Acquisition Corporation acquired certain pigment operations, including those at the Foundry Street site, from Sun Chemical Corporation in an asset transaction (PAS-00053968). Sun/DIC changed its name to Sun Chemical Corporation in June 1987. Sun/DIC Acquisition Corporation operated the site as Sun Chemical Corporation from December 31, 1986 to December 31, 2003 (PAS-00008260).

The 1997 Response states that the former Sun Chemical Company (the entity that changed its name to Sequa Corporation), as seller in the above-referenced asset transaction, agreed that it would remain responsible for off-site disposal, if any, that occurred prior to closing and Sun/DIC Acquisition Corp. (the entity that changed its name to Sun Chemical Corporation), as buyer in the above-referenced asset transaction, did not assume liability arising from such pre-closing disposal. There is no corporate relationship between Sequa Corporation (the former Sun Chemical Company) and the current Sun Chemical Corporation. The current Sun Chemical Corporation is not responsible for discharges, if any, that occurred before the December 31, 1986 acquisition (PAS-00053968).

3. Operational History/COC Use and Presence at the Facility

According to the *Evaluation of Alleged Nexus of Sequa Corporation,* dated September 9, 2016, the production of red pigment utilizes glacial acetic acid. Spent acid generated from the process was pumped to a neutralization tank, where it was neutralized with caustic soda, and discharged to the Passaic Valley Sewerage Commission (PVSC) system pursuant to a permit (PAS-00047107).

The *Evaluation of Alleged Nexus of Sequa Corporation,* dated September 9, 2016 also stated that the effluent generated from the production of violet pigment consisting of alcohol and phosphoric acid was pumped to a neutralization tank for treatment with caustic soda. After the pH was adjusted, the effluent was discharged into the PVSC system pursuant to a permit (PAS-00047107).

According to a *Responsible Party Investigation Summary*, dated April 1991 (1991 Investigation Summary), caustic soda was used to neutralize process effluent in two interconnected 1,500 gallon above ground storage tanks situated between Building Nos. 23 and 31. The treated effluent was discharged into a sump connected to an industrial sewer located on the adjacent property (Lot 4) owned by Norpak Corporation. Sun Chemical Corporation (the entity that changed its name to Sequa Corporation) discharged its effluent into the strip drainage system located on the west side of the plant before the installation of the wastewater treatment unit (PAS-00000191; PAS-00105581).

According to a February 22, 1987 *Site Evaluation Submission*, Sun/DIC Acquisition Corporation's (the entity that changed its name to Sun Chemical Corporation after acquiring assets from Sequa Corporation) chemical inventory did not include any of the contaminants of concern (COCs) for the Passaic River Site (PAS-00044732; PAS-00111848).

According to the *Response to Request for Information,* dated August 23, 1996, trace amounts of lead were present as stormwater contamination from runoff of adjacent upgradient property. It was believed to originate from Arkansas Chemical. Lead was also present in trace amounts in laboratory test paint solvent blend which was manifested offsite to a Resource Conservation and Recovery Act (RCRA) Treatment, Storage and Disposal Facility (PAS-00008294; PAS-00111397).

In a December 22, 2003 letter to PVSC, LFR Levine Fricke Inc. stated that Sun Chemical Corporation had ceased production at the site and planned to remove all raw materials, finished products, and wastes from the site prior to December 31, 2003 (PAP-00374789).

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

According to a February 22, 1987 Site Evaluation Submission, Sun/DIC Acquisition Corporation's chemical inventory did not include any of the COCs for the Passaic River Site (PAS-00044732; PAS-00111848).

PCBs

According to the *Evaluation of Alleged Nexus of Sequa Corporation,* dated September 9, 2016, Arkansas Chemical is the likely source of the PCB (Aroclor 1248) contamination detected at the site. This conclusion was based on the following:

- Arkansas Chemical manufactured textile chemicals including retardants and repellants that were early uses of PCBs, including Aroclor 1248;
- Arkansas Chemical had a historical footprint of operations at the Foundry Street Complex that extended beyond its subsequent property boundary;
- Arkansas Chemical was observed by NJDEP to have poor materials management practices that would release hazardous substances to the sewer and drainage system; and,
- The drainage system and frequent flooding at the Foundry Street Complex would have distributed any Arkansas Chemical PCB releases and likely accounts for the observed Aroclor 1248 contamination at and beyond the Foundry Street site (PAS-00047112-13).

According to a *Report on Industrial Waste Streams Bypassed to the Passaic River*, dated August 1994, contaminants detected onsite in sediment and soils between 1988 and 1993 included PCBs (PAS-00051217-18).

PAHs

An undated *Emergency Response Reference Guide for Sun Chemical Corporation* for the period January 1 to December 31, 1988 reported chemicals stored onsite which included No. 2 fuel oil stored in Tank No. 15 and petroleum oil (lube oil) stored in the maintenance shop (PAP-00381230). Note: PAHs may be present in oils.

According to a *Report on Industrial Waste Streams Bypassed to the Passaic River*, dated August 1994, contaminants detected onsite in sediment and soils between 1986 and 1993 included naphthalene, 2-methylnapthalene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene, and dibenzo(a,h)anthracene as well as other contaminants (PAS-00051217-18).

According to a *Preliminary Assessment Report for Sun Chemical Corporation*, dated April 2004, the hazardous substance/waste inventory for Sun Chemical Corporation included gear oil, hydraulic oil, mineral seal oil, waste oil, and No. 2 fuel oil (formerly used) (PAP-00377217; PAP-00377741). Note: PAHs may be present in oils.

Metals – Copper, Lead and Mercury

According to an April 28, 1988 letter from General Testing Corporation, effluent sampling in March 1988 detected the presence of lead at concentrations ranging from 0.084 to 0.219 milligrams per liter (mg/L) which were below the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) daily limit of 0.690 mg/L (PAP-00374563-68; PAS-00111619-24; PAS-00128876). The caustic soda used to pretreat the facility effluent, as required by a permit with PVSC, contained trace quantities of mercury, copper and lead (0.0000001%, 0.0001%, and 0.00005%, respectively, by weight) (PAP-00122260). The effluent samples were all non-detected for polynuclear aromatic hydrocarbons (PAHs) (PAS-00111625-46).

A 1990 PVSC Application for a Sewer Connection Permit for Permit No. 20401042 included results from effluent sampling conducted on September 17, 1990. Reported results included copper at 2.74 mg/L and mercury at 0.00109 mg/L (PAP-00049181, 97). The caustic soda used to pretreat the facility effluent, as required by a permit with PVSC, contained trace quantities of mercury, copper and lead (PAP-00122260).

According to a *Report on Industrial Waste Streams Bypassed to the Passaic River*, dated August 1994, contaminants detected in the effluent included mercury in 1976, and lead in 1988 and 1992. In 1990, it was noted that the sewer system onsite was contaminated with metals, polychlorinated biphenyls (PCBs), and base neutral compounds as well as other contaminants (PAS-00051217-18). Note: Concentrations of detected contaminants were not provided. According to the same report,

contaminants detected onsite in sediment and soils between 1986 and 1993 included copper, lead, and mercury (PAS-00051217-18).

Waste manifests from January 1, 1995 to July 6, 2000 from the New Jersey Department of Environmental Protection (NJDEP), Division of Hazardous Waste Management state listed hazardous wastes shipped from Sun Chemical Corporation included mercury on February 25, 1997 and lead on June 21, 1995. Quantities were listed as "5 P" for mercury and "55 G" for lead (PAP-00382258-59). Note: It is assumed "P" means pounds, and "G" means gallons.

Areas of Environmental Concern

A *Review of Past and Present Areas of Concern for Sun Chemical Corporation,* dated January 1993 divided the site into multiple sub-areas and discussed the sample results at each. It was noted that although some non-PCB contamination remained onsite subsequent to the cleanup of the 1/3-acre site, such contamination was generally from offsite sources. The areas of concern as related to the COCs were as follows:

Northeast Corner - Cleanup standards from two soil samples were exceeded for individual PAHs, concentrations are provided below (PAP-00381854; PAS-00045263). The *Review of Past and Present Areas of Concern for Sun Chemical Corporation,* dated January 1993, attributes the PAH detections in this area to offsite sources (Arkansas Chemical) (PAS-00045269). PCB concentrations were less than the site-specific soil cleanup standard of 5 parts per million (ppm) (PAP-00381854; PAS-00045263).

Northeast Corner Concentrations	
PAH	**Concentration Max (ppb)*** (sample collected at 18-24 inches bgs)
benzo(a)anthracene	19,000 J
chrysene	15,000 J
benzo(b)fluoranthene	26,000 (co-eluted)
benzo(k)fluoranthene	
benzo(a)pyrene	14,000 J
indeno(1,2,3-cd)pyrene	5,900 J
benzo(g,h,i)perylene	5,700 J

(PAP-00381874-75; PAS-00045281-83; PAP-00118573)

*Note that the cited reference (PAS-00045281) does not clearly identify the concentration units (ppm is in type, but "billion" is hand written at the top of the table); however, the units appear to be in parts per billion (ppb) based on the NJDEP cleanup standards listed in the table. In addition, the *Results of Phase II Sampling and Cleanup Plan*, dated May 23, 1991, states that the concentration of benzo(a)pyrene detected at this location is 14 ppm (equivalent to 14,000 ppb listed at PAS-00045283) (PAP-00118573).
bgs = below ground surface

Southeast Corner – PCB results from four soil samples were all less than the site-specific soil cleanup standard of 5 ppm. Cleanup standards were exceeded for individual PAH, concentrations are provided below (PAP-00381854-55; PAS-00045263-64). The *Review of Past and Present Areas of Concern for Sun Chemical Corporation,* dated January 1993, attributes the PAH detections in this area to offsite sources (Arkansas Chemical) (PAS-00045269-70).

Southeast Corner Concentrations	
PAH	**Concentration Max (ppb)*** (sample collected at 18-24 inches bgs)
benzo(a)anthracene	9,400
chrysene	8,700
benzo(b)fluoranthene	10,000 (co-eluted)
benzo(k)fluoranthene	
benzo(a)pyrene	8,300
indeno(1,2,3-cd)pyrene	4,300
dibenzo(a,h)anthracene	670 J

(PAP-00381881; PAS-00045289; PAP-00118572)

*Note that the cited reference (PAS-00045289) identifies the concentration units as ppm; however, the units appear to be in ppb based on the NJDEP cleanup standards listed in the table. In addition, the *Results of Phase II Sampling and Cleanup Plan*, dated May 23, 1991, states that the concentration of benzo(a)pyrene detected at this location is 8.3 ppm (equivalent to 8,300 ppb listed at PAS-00045289) (PAP-00118572).

Plant Area – PCB results from six soil samples were all less than the site specific soil cleanup standard of 5 ppm (PAP-00381855; PAS-00045264).

Boiler Room – One PCB sample result at 52 ppm exceeded the site specific soil cleanup standard (PAP-00381855; PAS-00045264).

Automatic Electroplating Alleyway – Of the two soil samples collected, only one PCB sample result at 10 ppm exceeded the site specific soil cleanup standard (PAP-00381856; PAS-00045265).

Walkway Behind Press Room – Of the two soil samples collected, only one PCB sample result at 5.8 ppm slightly exceeded the site specific soil cleanup standard. One sample exceeded cleanup standards for PAHs, concentrations are provided below (PAP-00381856; PAS-00045265). The *Review of Past and Present Areas of Concern for Sun Chemical Corporation,* dated January 1993, attributes the PAH detections in this area to offsite sources (Arkansas Chemical) (PAS-00045269, 72).

Walkway Behind Press Room Concentrations	
PAH	**Concentration Max (ppb)** (sample collected at 0-6 inches bgs)
benzo(a)anthracene	6,600 J
chrysene	8,100 J
benzo(b)fluoranthene	8,700 (co-eluted)
benzo(k)fluoranthene	
benzo(a)pyrene	5,700 J
indeno(1,2,3-cd)pyrene	3,400 J
dibenzo(a,h)anthracene	1,100 J

(PAP-00381906-07; PAS-00045312-15)

Norpak Alleyway – One PCB sample result at 35 ppm exceeded the site specific soil cleanup standard. PAH concentrations at this area of concern are provided below (PAP-00381857; PAS-00045266). Note: The PAH concentrations did not exceed cleanup levels.

Norpak Alleyway Concentrations	
PAH	**Concentration Max (ppb)*** (sample collected at 4-4.5 feet bgs)
benzo(a)anthracene	1,400
chrysene	1,300
benzo(b)fluoranthene	2,300 (co-eluted)
benzo(k)fluoranthene	
benzo(a)pyrene	1,300**
indeno(1,2,3-cd)pyrene	520
dibenzo(a,h)anthracene	210 J
benzo(g,h,i)perylene	470

(PAP-00381918; PAS-00045326; PAP-00118571)

*Note that the cited reference (PAS-00045326) identifies the concentration units as ppm; however, the units appear to be in ppb based on the NJDEP cleanup standards listed in the table and the data at PAP-00118571.
**Based on PAP-00118571, the concentration of benzo(a)pyrene is 520 ppb at this location.

New Tank Area in Front of Press Room – Of the two soil samples collected, two PCB sample results at 12 ppm and 74 ppm exceeded the site specific soil cleanup standard. One sample exceeded cleanup standards for PAHs, concentrations are provided below (PAP-00381856; PAS-00045265)

New Tank Area in Front of Press Room Concentrations	
PAH	**Concentration Max (ppb)** (sample collected at 0-6 inches bgs)
benzo(a)anthracene	110,000
chrysene	120,000
benzo(b)fluoranthene	240,000 (co-eluted)
benzo(k)fluoranthene	
benzo(a)pyrene	74,000
indeno(1,2,3-cd)pyrene	56,000
dibenzo(a,h)anthracene	17,000 J
benzo(g,h,i)perylene	35,000 J

(PAP-00381912-13; PAS-00045320-21)

Still Area – Two PCB sample results at 6.1 ppm and 50 ppm exceeded the site specific soil cleanup standard. One sample exceeded cleanup standards for copper at 762 ppm, and lead at 633 ppm. Cleanup standards were also exceeded for PAHs, concentrations are provided below (PAP-00381857, 926; PAS-00045266, 334).

Still Area Concentrations	
PAH	**Concentration Max (ppb)** (samples collected at 0-6 and 18-24 inches bgs)
benzo(a)anthracene	26,000 J
chrysene	28,000 J
benzo(b)fluoranthene	37,000
benzo(k)fluoranthene	9,600
benzo(a)pyrene	23,000 J
indeno(1,2,3-cd)pyrene	15,000 J
dibenzo(a,h)anthracene	1,200 J
benzo(g,h,i)perylene	14,000 J

(PAP-00381925; PAS-00045333)

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals,

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	690 mg/kg
Copper	762 mg/kg
Mercury	28 mg/kg
Benzo(a)anthracene	110 mg/kg
Benzo(a)pyrene	74 mg/kg
Benzo(b)fluoranthene	240 mg/kg
Benzo(k)fluoranthene	17 J mg/kg
Dibenzo(a,h)anthracene	56 mg/kg
Indeno(1,2,3-cd)pyrene	690 mg/kg

No information is available regarding when fill materials were placed on the site.

A *Response to Request for Information,* dated August 23, 1996 stated that PCBs were found in contaminated soils from historic fill. NJDEP confirmed that PCBs present in soil at Sun Chemical Corporation's site were due to the historic fill (PAS-00008293). The top two feet of soil from approximately half of the site was removed in 1992-1993 and transported offsite for disposal (PAS-00008298). According to a Memorandum, dated November 9, 1992, post-excavation sidewall samples collected in September 1992 contained PCBs above New Jersey Department of Environment Protection and Energy (NJDEPE) approved cleanup level of 5 ppm in 3 of 9 samples with results of 8.7 (PX-5), 19 (PX-6), and 250 ppm (PX-3) (PAS-00008287; PAP-00120254-60). Sample results exceeding 5 ppm were detected in the alleyway adjacent (PX-3) to the Norkpak property or along Foundry Street (PX-5, PX-6) (PAP-00120257, 60). Additional soil excavation was conducted to address the PCB concentrations at PX-3 (PAP-00120257). Supplemental soil excavation in January 1993 extended off the Sun Chemical Corporation property and onto the adjacent Norpak property. Post-excavation soil samples collected from the Norpak property (i.e., PX-34 through PX-39) reported PCB concentrations greater than 5 ppm (8.5 to 250 ppm). The cited report concluded that the PCB contaminant distribution was indicative of historic fill (PAP-00121513-16).

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a *Preliminary Assessment Report for Sun Chemical Corporation*, dated April 2004, soil sampling and impacted soil excavation performed during site-wide soil remediation activities confirmed the presence of historic fill material across the entire site. However, no specific information exists to document the period during which the fill was placed on the site (PAP-00377207; PAP-00377731).

5. COC Pathways

Combined Sewer

According to the *Results of Video Inspection at Sun Chemical Corporation*, dated June 1990, the 1991 Investigation Summary, and a *Report on Investigative Activities for Sun Chemical Corporation*, dated October 1990, the drainage system (strip drains) and sewer system were inspected in 1990 to determine its integrity. Video inspection of the sewer system revealed that the sewer lines contained numerous cracks and separations between the pipes. The inspection also noted that the strip drains were connected to the sewer system on the Sun Chemical Corporation site. The video inspection concluded that contamination could have migrated onto the site through the drainage system and leaks in the sewer system. It was also stated that recurring flooding of the drainage system may have distributed past sources of contamination throughout the site (PAP-00374539-41; PAS-00000192; PAS-00044943-45).

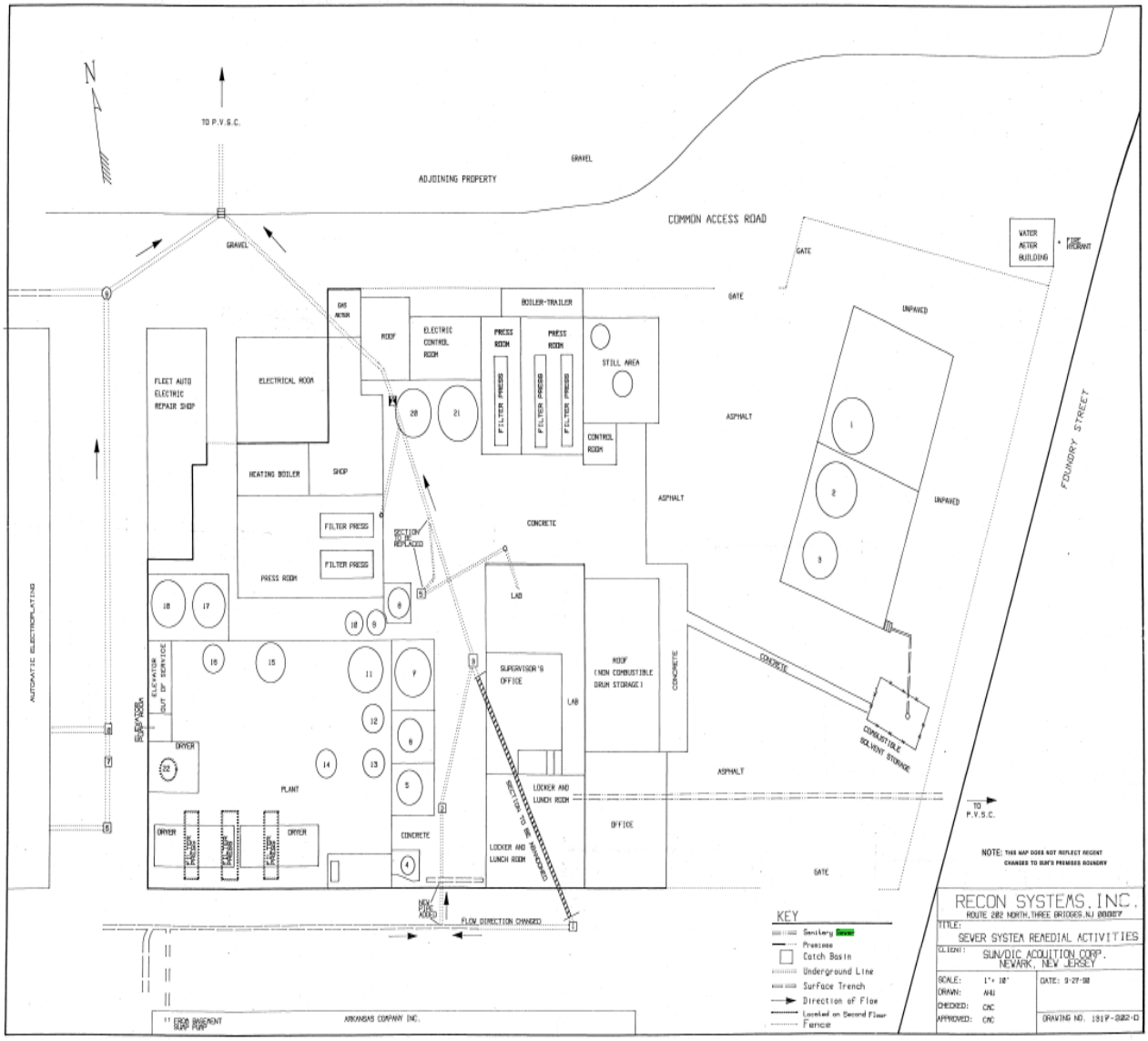
According to an August 1996 Request for Information response Letter, soil excavation was conducted at 185 Foundry Street to address the presence of PCBs in the soil. The soil removal was performed at the direction of NJDEP prior to the determination that PCBs were present in Historic Fill (PAS-00008293). According to the March 1992 Soil Erosion and Sediment Control Plan, during the sewer system repair, the sewer line will be plugged at the monitoring catch basin to prevent any sediments from clogging the sewer pipelines or entering the PVSC treatment plant. This line would remain plugged during all excavation, backfilling and sewer repair activates in this area (PAP-00374670). Sewer replacement and repair work is shown below (PAP-00374676).

Sun Chemical Corp.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report



According to a memorandum prepared by NJDEP dated April 3, 1991, the site is part of the Foundry Street Complex. Approximately 30 buildings were situated throughout the complex, separated by narrow driveways which had strip-like drains in the middle of the lane. The drains were connected to an industrial sewer line on Roanoke Avenue and received surface water run-off and industrial discharge from companies in the complex. According to PVSC Annual Reports the Roanoke Avenue sewer connects to a sewer on Doremus Avenue, which flows to the PVSC treatment works. There is a combined sewer overflow (CSO) outfall to the Passaic River at the foot of Roanoke Avenue (approximately River Mile 1.1). In 1969, the City of Newark constructed a dam near this CSO to increase flow to the Doremus Avenue sewer, and ultimately, the PVSC treatment works (PAS-00044625-626).

A *Preliminary Assessment Report for Sun Chemical Corporation*, dated April 2004 states, “Although all manufacturing operations had ceased and all raw materials and manufactured products had been removed from the site, the discharge permit remained active. Equipment cleaning and dismantling activities were still being conducted as part of the cessation of operations; therefore, some limited discharges would continue until the site was sold. In addition, stormwater discharges would continue during precipitation events. The PVSC permit would be terminated when the sale or the site facility was finalized or when the industrial discharges ceased and the facility site was no longer considered an industrial user, whichever came first” (PAP-00377198; PAP-00377723).

An undated *Industrial Pretreatment Program Annual Report* covering the period from August 1, 1986 to July 31, 1987, reported that Sun Chemical Corporation had an average daily flow of 0.043 million gallons per day (MGD) into the PVSC system (PAP-00123478).

A summary of wastewater sampling data is provided below :

Sample Date	Reported Average Flow Rate (GPD)	Wastewater Sample Concentrations				
		Copper (mg/L or ppm)	Mercury (mg/L or ppm)	Lead (mg/L or ppm)	PCBs (µg/L or ppb)	PAHs (µg/L or ppb)
12/17/1979	55,000*	0.16	0.002	0.9	-	
3/2/1988	80,000	-	-	0.084	-	ND
3/9/1988	80,000	-	-	0.188	-	ND
3/14/1988	80,000	-	-	0.219	-	ND
9/17/1990	-	2.74	0.00109	ND (<0.05)	ND	-
2/8/1991	-	-	-	ND (<0.05)	-	ND
2/26/1992	-	-	-	-	-	ND
4/21/1992	-	-	-	1.246	-	-
7/2/1993	-	-	-	-	-	ND
8/5/1993	-	-	-	-	-	ND
12-6/7-1993 (002)	-	-	-	0.0683	-	ND
12-6/7-1993 (004)	-					ND
Sept. 1995	80,549	-	-	-	-	-
Feb. 1996	102,432	-	-	-	-	-

* Average flow rate for the year 1979
- = Not analyzed

(PAP-00374550-54, 57-59, 650-655;PAP-00118313-15; PAP-00123073-80; PAP-00123093-94; PAP-00122965,74)

6. Regulatory History/Enforcement Actions

Inspections

As reported by a *NJDEP Report of Inspection*, dated December 10, 1987, proper New Jersey Pollution Discharge Elimination System (NJPDES) permits had not been obtained for the various discharge points found at Sun Chemical Corporation. These discharge points included the boiler blowdown, boiler condensate, the pipe located at ground level east of the operating building, the fire sprinkler system discharge, and the rubber hose emanating from the water booster room. NJDEP suggested that Sun Chemical Corporation either obtain the required permits, or discharge directly to the sanitary sewer with approval from the publicly owned treatment works (POTW) and remove and seal the discharge points (PAS-00111765-67).

According to a *Memo from NJDEP*, dated June 4, 1987, on April 29, 1987, a windshield survey of the Foundry Street site conducted by the Bureau of Planning and Assessment personnel noted that the ground, building surfaces and drums stored near the plant were stained purple. It was stated that it was believed these stains were from pigments manufactured by Sun Chemical Company. The contents of the drums stored near Sun Chemical Company were not known. It was also observed that although most of the ground surface at the site was covered by asphalt or concrete, much of the cover material was cracked or broken which would permit spill materials to enter the soil. Materials could then leach through the soil and contaminate groundwater in the area. Storm drains were also observed which would allow spill materials to migrate off site (PAP-00031574).

According to a *Foundry Street Complex Site Inspection Memorandum*, dated November 15, 1990, on November 7, 1990, the NJDEP Bureau of Compliance and Technical Services, Special Investigations Section conducted a site inspection of the Foundry Street site. It was reported that the driveway located between Arkansas Chemical and Sun Chemical Corporation was stained with a magenta colored substance, which also existed on Sun Chemical Corporation's site. A strip like drain running down the center of the driveway contained standing water with a noticeable sheen on it. Portions of the drain were exposed, because steel plates covering the drain had been removed or fallen into the drain (PAP-00031576-77).

According to a February 13, 1991 Memorandum, on November 26, 1990, a RCRA investigation was conducted at Sun Chemical Corporation to investigate “alleged dumping and sloppy housekeeping practices” at the site. The site tour confirmed the discoloration of the surrounding areas as reported in incident No. 90-10-24-1208. ·The Site Technical Manager stated that the site is subject to heavy flooding due to poor drainage over the entire area and that the extensive discoloration of the pavement was due to this (PAS-00044985; PAS-00111388).

Available information from the process and the material safety data sheets stated that the final product was not hazardous. Since discharges are handled through permit with PVSC, it was recommended that no further action be taken (PAS-00044985; PAS-00111388).

Violations

A May 11, 1992 Memorandum documented a lead violation for Sun Chemical Corporation for a sample collected on April 21, 1992. The result of 1.246 exceeded the daily limit of 0.690 (PAP-00374626; PAS-00111661; PAS-00128931). Note: The units were not included. It is assumed to be mg/L.

Permits

According to a *Preliminary Assessment Report for Sun Chemical Corporation*, dated April 2004, Sun Chemical Corporation discharged process wastewater, stormwater, and sanitary waste to the sanitary sewers under PVSC Permit No. 20200038 (PAP-00377198; PAP-00377723). The permit was approved May 28, 2001 and expired April

30, 2006 (PAP-00124255; PAP-00377206; PAP-00377730). According to *PVSC Permit No. 20200038*, revised August 2003, the monthly average local discharge limits were 3.02 mg/L for copper (threshold 0.092 mg/L), 0.54 mg/L for lead (threshold 0.029 mg/L), and 0.080 mg/L for mercury (threshold 0.001 mg/L) (PAP-00124254-60). Daily regulation limits, which were based on an average flow of 81,100 gallons per day, included total lead (88.23 grams per day), acenaphthene (6.83 grams per day), anthracene (6.83 grams per day), fluorene (6.83 grams per day), naphthalene (6.83 grams per day), phenanthrene (6.83 grams per day), fluoranthene (6.75 grams per day), and pyrene (6.14 grams per day) (PAP-00124262). Although lead was included on the list, Section A-3G (Schedule of Compliance) of the PVSC permit stated the site was exempt from monitoring for lead, based on the Categorical Standard for Organic Chemical Manufacturing 40 CFR 414 (PAP-00124263).

According to a *PRP Data Extraction Form*, dated March 3, 2006, residuals from the manufacturing process are processed through on-site wastewater treatment works for pH adjustment and discharged to the PVSC sewer system under permit No. 204-010-42 (PAS-00111371, 388). Note: A copy of Permit No. 204-010-42 was not provided.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Site Wide Soil Remediation Report for Sun Chemical Corporation, dated February 16, 1993 (PAS-00045399)
- Final Groundwater Activities Report for Sun Chemical Corporation, dated January 12, 1993 (PAS-00045242)
- Review of Past and Present Areas of Concern for Sun Chemical Corporation, dated January 14, 1993 (PAP-00381846; PAS-00045256)
- Preliminary Assessment Report for Sun Chemical Corporation, dated April 30, 2004 (PAP-00377193)

Soil sampling and remediation took place to remove PCB contaminated soils and groundwater from the site. A total of 1,400 cubic yards of PCB-impacted soils were removed from accessible exterior areas, which were generally excavated to a depth of two feet. A total of 165 cubic yards of PCB-impacted soils were removed from the former Boiler Room floor, which was excavated to a maximum depth of 5.5 feet. To accommodate excavation in the former Boiler Room, approximately 2,300 gallons of impacted groundwater was also removed (PAP-00124085).

According to the 1991 Investigation Summary, in October 1986, sampling was conducted at the site as part of a preliminary Environmental Cleanup Responsibility Act (ECRA) investigation. One soil sample from adjacent to the solid waste dumpster, and one sediment sample from the catch basin were collected as well as one swipe sample taken of an oily stain on the boiler room floor. The sediment and soil samples contained PCBs and priority pollutant metals (including copper, lead, and mercury). The soil sample contained PCBs at 13 ppm. Copper was detected at 3.0 ppm (sediment) and

5.4 ppm (soil); lead was detected at 150 ppm (sediment) and 380 ppm (soil); and, mercury was detected at 0.45 ppm (sediment) and 0.82 ppm (soil) (PAS-00104294). PCBs were also detected in the swipe sample (PAS-00000191, 203).

According to the *Results of Sampling and Analysis Plan,* dated November 30, 1988, the initial investigation identified three areas of environmental concern: the catch basin and drain system; the soil adjacent to solid waste dumpster; and, the boiler room (PAS-00044892). Additional sampling was conducted in 1988 to further delineate the PCB levels in and around the boiler room and underneath and around the manufacturing building (PAS-00044892-93). Laboratory results show that there are elevated levels of PCBs, petroleum hydrocarbons, base neutrals and priority pollutant metals (including copper, lead and mercury) scattered throughout the site. Copper concentrations ranged from 120 mg/kg to 762 mg/kg; lead concentrations ranged from 8.4 mg/kg to 633 mg/kg; and, mercury concentrations ranged from 0.2 mg/kg to 28 mg/kg. PCB concentrations ranged from 0.51 ppm to 390 ppm (PAS-00044905, 906). There did not appear to be a plume or any type of trend as to how the contamination migrated. The aboveground open drain system may have caused the distribution of past sources of contamination throughout the central part of the plant (PAS-00044896). Note: The base neutral compounds were reported as total concentrations; therefore, specific PAH concentrations are not known.

According to the *Review of Past and Present Areas of Concern for Sun Chemical Corporation,* dated January 14, 1993, sampling conducted in 1988 also found several base neutral compounds which exceeded NJDEP cleanup standards. These included the PAHs benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene (PAP-00381854-57; PAS-00045263-66). Sun Chemical Corporation believed that the contamination was from the adjacent Arkansas Chemical site which was known to have base neutral liquids and solids present at the site. Due to flooding problems on the site, Sun Chemical Corporation stated that the base neutral contamination had migrated onto their site (PAP-00381860-65; PAS-00045269-74). See Section 5 above for maximum concentrations detected.

The 1991 Investigation Summary additionally reported that on July 17, 1990, four sediment samples and one water sample were collected from catch basins and the sewer system on the site. The samples contained elevated levels of priority pollutant metals (including copper, lead, and mercury) and base/neutral compounds. PCBs were detected in one sediment sample at a concentration of 100 ppm (PAS-00000192, 203-04). The results were reported in the *Report on Investigative Activities,* dated October 5, 1990. Copper ranged from 56 ppm to 600 ppm, lead ranged from 28.9 ppm to 690 ppm, and mercury ranged from 0.28 ppm to 2.54 ppm in the four sediment samples (PAS-00044953). The base neutral and pesticide compounds were reported as total concentrations; therefore, specific PAH and pesticide concentrations are not known.

According to a *Report on Remedial Activities* dated October 5, 1990 by Recon Systems, in July 1990, remediation of the boiler room was conducted to remove PCB contaminated concrete and soils. Excavation of the soils below 5.5 feet was not conducted to prevent affecting the structural integrity of the building (PAS-00044968).

Post excavation sampling showed that some PCB and base neutral compound contamination were present in the soil under and around the boiler room (PAS-00044975). The concentrations of PCBs (Aroclor-1248) ranged from non-detect to 59.0 ppm (3-3.5 feet bgs) (PAS-00044977-78). The base neutral compounds were reported as total concentrations; therefore, specific PAH concentrations are not known.

According to *Results of Phase II Sampling and Cleanup Plan,* dated May 23, 1991, in April 1991, Phase II soil sampling was conducted to further delineate the extent of PCB contamination at the site. Additional sampling was conducted in May 1991 at the location of one sample due to results inconsistent with the previous sampling (PAS-00045047-48). Concentrations of PCBs ranged from non-detect to 8,100 ppm (in a waste classification samples composited from three borings) (PAS-00045068-69). In addition to PCBs, the base neutral compounds benzo(a)pyrene, dibenzo(a,h)anthracene, benzo(g,h,i)perylene, and 2-methylnaphthalene were also detected (PAS-00045070-79). Excavation of one hot spot to groundwater and capping the remainder of the contaminated site wide soils was proposed (PAS-00045053). It was also proposed that the cracked sewer system would be repaired (PAS-00045056).

According to correspondence concerning the waste profile for the estimated 1,500 tons of soil planned to be excavated, additional delineation sampling was conducted near the sample location which recorded the detection of 8,100 ppm. Analysis of these delineation samples showed levels of PCBs ranging from 2.3 to 910 ppm in the area of the original sample (PAP-00381762-63). These sample locations were in the northeast corner of the site (PAP-00381774).

Remedial Activities

As reported in the *Final Groundwater Activities Report,* dated January 12,1992, site wide soil excavation activities were performed between September 4 and 14, 1992 (PAS-00045245). As reported in the *Site Wide Soil Remediation Report* from 1993, soil was excavated to a depth of at least two feet in all areas of the site where buildings and other permanent structures made excavation possible (PAS-00045407).

As reported in the *Site Wide Soil Remediation Report* from 1993, during the remediation activities, approximately 1,400 cubic yards of soil was excavated and disposed of. During the excavation, almost all onsite sewer piping was removed and replaced throughout the site. The site was backfilled with clean fill and covered with six inches of reinforced concrete. Sun Chemical Corporation also excavated contaminated soils to the fence line in the common alleyway between Sun Chemical Corporation and the Norpak property. Following the excavation, six samples collected from the perimeter of the excavation (on the adjacent Norpak property) still had PCBs exceeding the cleanup criteria of 5 ppm with concentrations up to 250 ppm. These six samples were all collected from the north alleyway between Sun Chemical Corporation and the NorPack property (PAP-00123031-32; PAS-00045418-19).

According to an *Environmental Concerns Tracking Sheet,* dated April 20, 1993, during January 1993, the area with PAH contamination was excavated down to two feet to the perimeter of the site and covered with clean fill. A NJDEP letter dated October 24, 1994 stated no further action was required for this area (PAS-00104305).

A *Response to Request for Information*, dated August 23, 1996 stated that PCBs were found in contaminated soils from Historical Fill. The top two feet of soil from approximately half of the site was removed in 1992-93 and transported offsite for disposal (PAS-00008293, 98). NJDEP confirmed that PCBs present in soil at the site were due to the Historic Fill. The soil removal was performed prior to NJDEP confirming under ISRA that the PCBs were present due to historic fill (PAS-00008293).
In a letter dated October 11, 1995, NJDEP states that since it had been demonstrated that the contamination of the site appears to be due to contaminated historic fill, the zone of the fill contamination on the Sun Chemical Corporation site should be included in a Declaration of Environmental Restrictions. Since contamination also exists in the top two feet of the Sun Chemical Corporation site in various areas throughout the site, engineering controls were required in these areas (PAS-00045465).

The Declaration of Environmental Restrictions was filed with the township on March 21, 1997 and documentation received on May 22, 1997 (PAP-00382242-46; PAS-00045504-08).

According to a *Preliminary Assessment Report for Sun Chemical Corporation* prepared in April 2004, the NJDEP issued No Further Action (NFA) letters on July 25, 1997. The remediation activities performed at the site involved the excavation and offsite disposal of approximately 1,400 cubic yards of PCB-impacted soils from exterior areas and 165 cubic yards of PCB-impacted soil below the former Boiler Room floor (PAP-00377230; PAP-00377743; PAP-00382238-41).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

TATE & LYLE INGREDIENTS AMERICAS LLC

Facility Name, Address and Size: A.E. Staley Manufacturing Company and its former division Staley Chemical Company, 100 Third Avenue, Kearny, NJ (PAS-00108740); 5.5 acres (PAS-00108864). As of March 1975, there were 77 employees, working 5-7 days/week, 1, 2, and 3 shifts/day (differs with department) (PAS-00108801).

1. **Business Type:** Organic polymers, rubber-based adhesives, and leather finishes manufacturing (PAS-00108743).

2. **Time Period of Ownership/Operations**

   Operator: November 1968 to October 1978
   Owner: November 1968 to October 1978 (PAP-00208793)

   A.E. Staley Manufacturing Company is a part of Tate & Lyle North America (PAS-00108741).

   1968: A.E. Staley Manufacturing Company purchased the site on November 12, 1968 (PAP-00208793-801).

   1978: 100 Third Avenue was sold to Union Chemicals Division in October 1978 (PAS-00108862).

   1987: A.E. Staley Manufacturing Company merged into Staley Continental Inc. in December 1987 (PAS-00108848).

   1988: Tate & Lyle North America acquired Staley Continental, Inc. (PAS-00108848).



A.E. Staley Manufacturing Company
100 Third Avenue
Kearny, NJ

(PAS-00108743)

3. Operational History/COC Use and Presence at the Facility

The 100 Third Avenue site was used for the manufacture of organic polymers, rubber-based adhesives, and leather finishes. Monomers were polymerized into polymers whose emulsions were used by a wide range of other manufacturers as ingredients of other products such as waxes, polishes, paints, and coatings. Rubber was compounded, milled and dissolved in solvents to form adhesives. Pigments were dispersed in lattices to form products used in finishing leather (PAS-00108743-44).

An April 14, 1972, Waste Effluent Survey for the 100 Third Avenue site states that average production at the site was 350,000 gallons per month. The raw materials used included rubber, solvents (methyl ethyl ketone (MEK), acetone, toluene, etc.), monomers (styrene, various acrylates), butadiene latex, and pigments (PAS-00108864). The survey also notes that in 1971, 500,000 gallons of water were released to the sanitary sewer and 11,075,000 gallons of water were released to the storm sewer on Third Avenue and into Frank Creek (PAS-00108865).

A March 13, 1975, Waste Effluent Survey for the 100 Third Avenue site lists the same information with the exception that 44,800,000 gallons of wastewater were released to the storm sewer on Third Avenue and into Frank Creek (PAS-00108801-02).

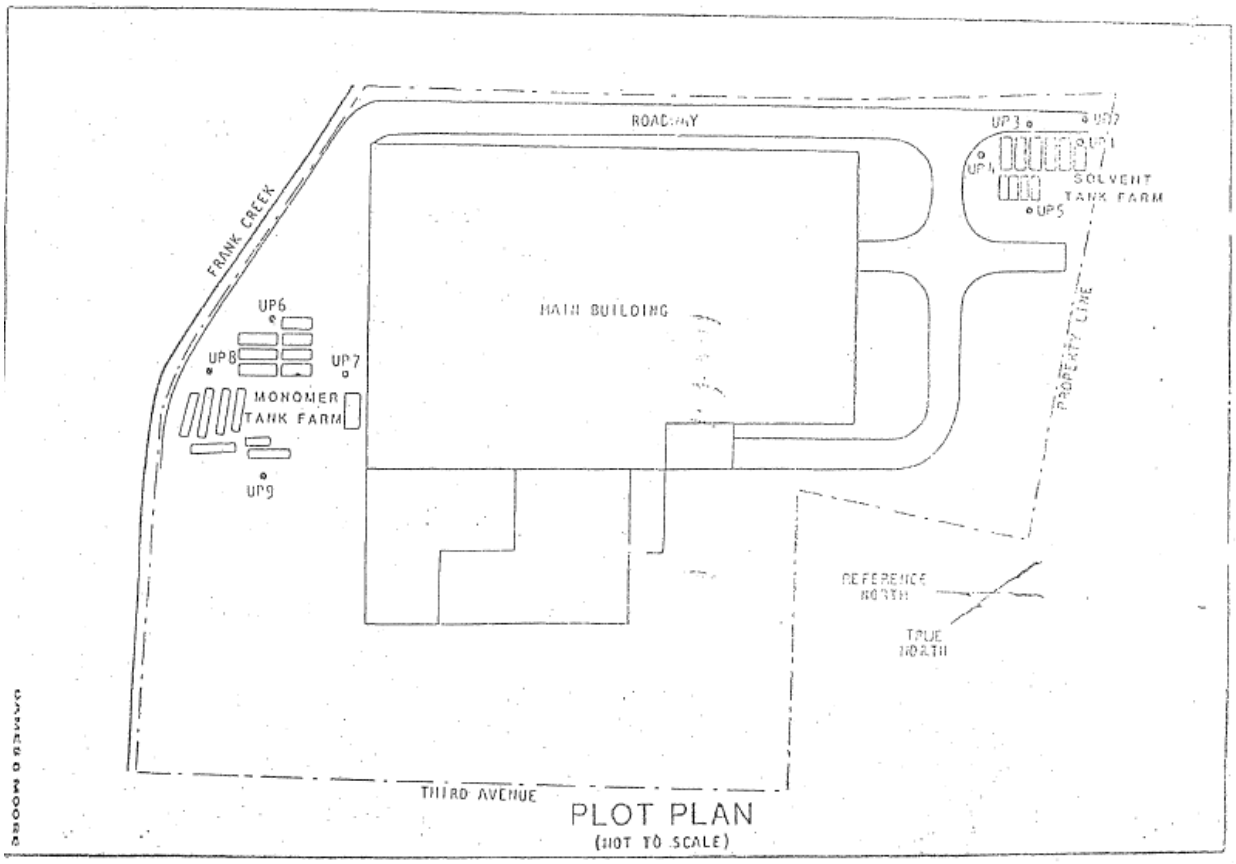
The Declaration of Lynn Elder, a former employee that served as the project manager for the relocation of Staley Chemical operations to New Jersey, notes that the manufacturing part of the Staley Chemical operation was conducted solely at the Third Avenue buildings in Kearny. Those buildings contained the process equipment, consisting of glass-lined reactor vessels, large holding tanks, and a boiler or boilers for generating process steam. Raw materials were delivered there and finished product was drummed off from the tanks into drums suitable for delivery to customers (PAP-00208510-11).

An October 4, 1978, Agreement of Sale of the Staley Chemical business by A.E. Staley Manufacturing Company confirms that manufacturing and selling of synthetic polymers of the emulsion variety which contained polymerized vinyl monomers, either alone or in combinations, including vinylidene chloride, acrylic and methacrylic acids and their esters, styrene, acrylonitrile and vinyl acetate, and the manufacturing and selling of synthetic polymers supplied in organic solvents was conducted at 100 Third Avenue (PAP-00208440).

According to a June 3, 1980 Selected Substance Report, K.J Quinn & Co., Inc. leased the warehouse at 100 Third Avenue in Kearny, NJ from November 1975 through August 1979 and manufactured coatings & polymers that used lead pigments as an ingredient in coatings stored in the warehouse. According to the report K.J Quinn brought 15,679 pounds of liquid lead onto the site and shipped 15,679 pounds per year off site as (or in) product (PAP-00722959-64). Note: It is unknown if K.J Quinn & Co. leased from Tate & Lyle.[1]

According to an August 30, 2007 Findings Letter and Request to Close Case No. NJDEP Case # 07-05-31-1440-01, two underground tank farms consisting of 33 USTs were present at the property. A solvent tank farm located on the southeast corner of the property had tanks ranging from 3,000 to 8,000 gallons capacity which held solvents, including ethyl acetate, toluene, ethyl alcohol, cyclohexane, methyl ethyl ketone (MEK) and acetone. All of these tanks were reportedly exposed, emptied, cleaned, sand filled and backfilled in 1981 by Dames & Moore. The second tank farm was reportedly located on the northern portion of the property and had tanks ranging from 8,000- to 15,000-gallon capacities. These tanks held monomers including methyl methacrylate, acronitrile, ethyl acrylate, styrene, 2-ethyl hexyl acrylate, lauryl methacrylate and vinyl acetate. All of these tanks were reportedly exposed emptied, cleaned, sand filled and backfilled in 1981 by Dames & Moore. All the tanks have been listed as closed with the NJDEP and no further action was required with regard to the former USTs at the property (PAP-00723055).[1]

[1] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Tate & Lyle's previous certification.



(PAP-00723071)

4. Identified COCs

- Copper (released)
- Lead (possibly used /released)
- Mercury (released)

Metals- Copper, Lead and Mercury

An April 14, 1972, Waste Effluent Survey for the 100 Third Avenue site states that wastewater was released to the sanitary sewer four times a day for 5 minutes at a rate of 4 gallons per minute between 7:00 a.m. and 3:30 p.m. A 24-hour sample collected on March 16, 1972 is stated in a typewritten list to contain these constituents: 32 parts per million (ppm) lead (0.0044 pounds per day) and 0.047-0.47 ppm (0.0000065-0.000065 pounds) of phosphorus, copper, tin, and calcium (PAS-00108864-68). The characteristics of the wastewater released to the storm sewer in a 24-hour sample collected on June 28, 1971, were stated in a separate typewritten list as containing these constituents: 10 ppm lead (0.002 pounds per day), 100 ppm (0.021 pounds per day) of copper, and 0.8 ppm (0.0002 pounds per day) of mercury (PAS-00108867-69). The same discharge information in the same typewritten lists was also attached to a March 13, 1975 Waste Effluent Survey. This survey included an additional page that reported 2,000 gallons a day of waste water continuously discharged six days a week into the municipal system (PAS-00108801-7).

April 17, 1972 and March 13, 1975 cover letters with a response to a "questionnaire" to Staley Chemical state that for discharge to the sanitary sewer "a fully quantitative analysis [was done] for lead and chromium since those are the ions that could possible [sic] be added to the water as a result of any washing of equipment." The letters also state that in answering the section on discharge to the storm sewer, Staley Chemical used the analysis done by its parent company, A.E. Staley Manufacturing Company, on water samples at the time that it made application to the Department of Army Engineers for a permit to discharge into Navigable Waters and their Tributaries (PAS-00108860; PAP-00208348). These are the only data identified in reviewed documents that reference the use and/or discharge of Operable Unit 2 (OU2) contaminants of concern (COCs) from the 100 Third Avenue facility. [2]

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[2] The Report and Certification of Richard L. Dickinson, Director of Environmental Sciences, Tate & Lyle Ingredients Americas LLC asserts that:

- Almost all the concentration data points about discharges to the storm sewer are in parts per million ("PPM") but should have been stated as parts per billion ("PPB"). This is based on several lines of evidence from analysis of the surveys, and a reasonable understanding of the Kearny municipal water supply, of Staley Chemical's operation, and of prevailing regulatory standards during Staley Chemical's operation from 1968 to 1978. If the constituents were in PPM, the water would have been highly toxic and lethal in short exposures and Staley Chemical would not have received the discharge permit it did. Concentration and mass data for discharge to the sanitary sewer are also mathematically inconsistent and unreliable (PAP-00208428);

- The lead concentration in 1972 and 1975 data was erroneously reported in ppm and that when it is corrected to 10 ppb, or 0.01 ppm, it was below the drinking water standards for lead in 1962 (PAP-00208435; PAP-00208367);

- The corrected concentrations of mercury of 0.0008 ppm and of copper of 0.01 ppm detected in site wastewater to the storm sewer were consistent with typical drinking water supplied by the City of Kearny, which was used as non-contact cooling water for site operations (PAP-00208435; PAP-00208433). The recommended drinking water limit for copper in 1962 was 1 mg/l (or 1 ppm) (PAP-00208366);

- The 1972 cover letters says lead "are the ions which could possibly be added to the water as a result of any washing of equipment" (PAP-00208430);

- There is no indication that mercury or copper were added to the discharge wastewater by Staley Chemical operations (PAP-00208430).

- "It is physically impossible for flows of cooling water through jackets around tanks to leach significant concentrations of ions as reflected in ppm in List "B," particularly given a pH of 7.65 that retards leaching of lead" (PAP-00208434);and,

- All the data about discharges to the storm sewer or the sanitary sewer is on a typewritten page without the original analytical report from which the data were taken (PAP-00208428).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[3]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, lead, and mercury.[4] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[5] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[6]

There is no information regarding soil sampling in the available file material.

In 1968 and 1969, a construction project to expand a building included the installation of foundation pilings (PAP-00432014-95). There is no information in the available files regarding migration via groundwater or rainwater.

According to a 1991 Site Evaluation Submission (SES) for Warner Universal Corporation, prior to Staley Chemical Companies ownership and operations in 1950 the site was undeveloped (PAP-00723151).[7]

According to an April 1991 Warner Universal Corporation Sampling Plan, the site is underlain with 2 to 9 feet of red to black miscellaneous fill material composed of medium, fine sands, silts, and clays (PAP-00723184-85). The lands to the south reportedly have been previously filled by Kearny with municipal waste such as leaves, household appliances, solid wastes, etc. (PAP-00723183).[7]

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[3] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[4] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[5] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[6] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

[7] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Tate & Lyle's previous certification.

5. COC Pathways

Sanitary Sewer

According to a September 26, 1977 Industrial Sewer Connection Application A.E Staley discharged 2.5 thousand gallons per day of waste to the PVSC system intermittently. (PAP-00724090). The following is a description of the waste discharged to the Sanitary Sewer.[8]

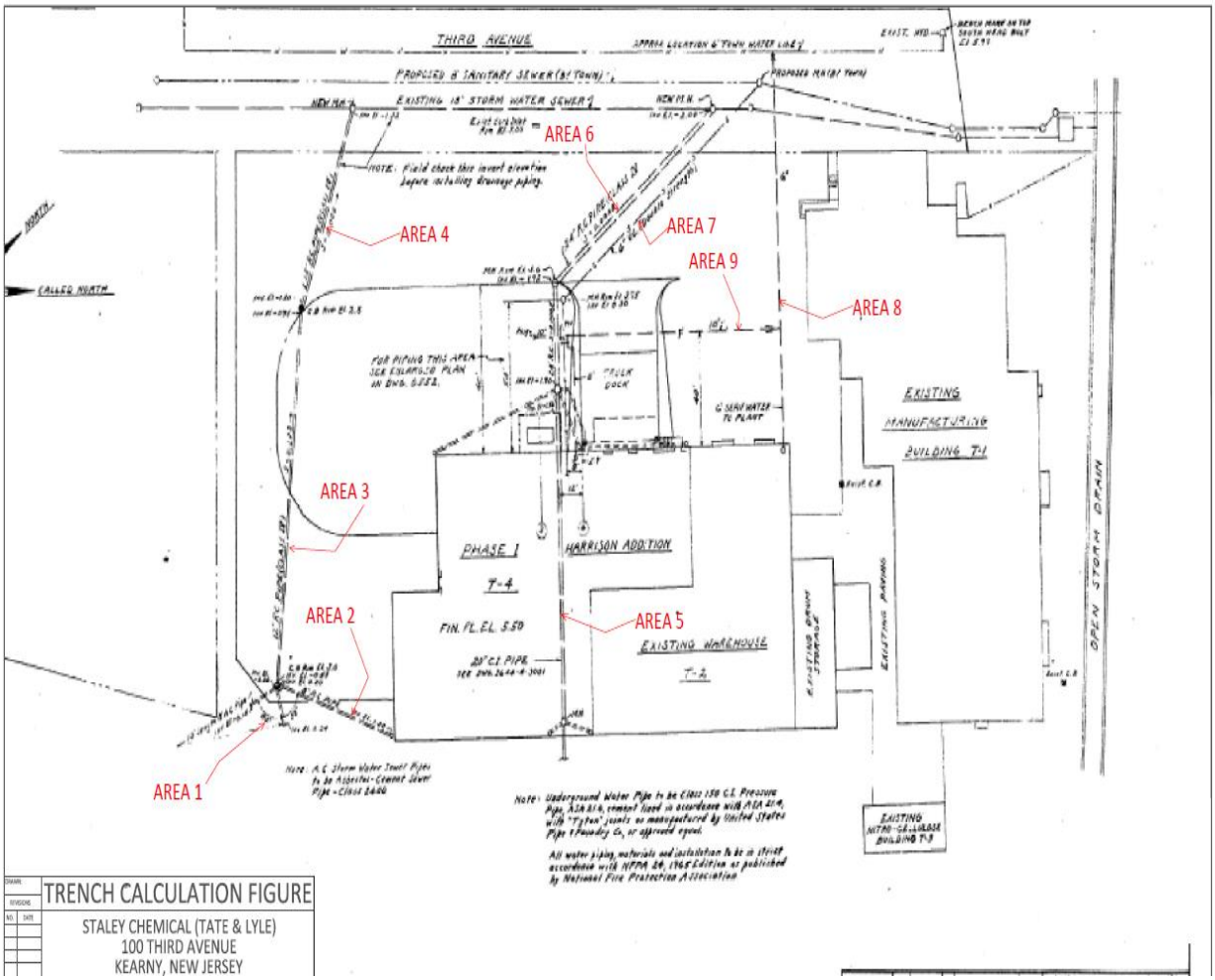
Wastes Discharged to Municipal Sanitary Sewer

	Waste Type	Daily Volume Est. Gal/Day	Max. Rate, Duration Est. Gal/Min.& Min.
1)	Sanitary Wastes	120	10 GPM - 2 min.
2)	Boiler Blowdown	200	10 GPM - 10 min.
3)	Reactor, Hold Tank, and Storage Tank Rinses	2,000	40 GPM - 10 min.
4)	Water Demineralization Waste	150	15 GPM - 10 min.

(PAP-00724093)

According to an April 18, 1978 PVSC Industrial Wastewater Questionnaire, in that calendar quarter Staley consumed 501,600 gallons of water of which 98% was used in the actual process, <1% of water discharged from process and 1.5% of water discharged from sanitary conveniences (PAP-00724136-37).[8]

[8] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Tate & Lyle's previous certification.



(PAP-00723693)

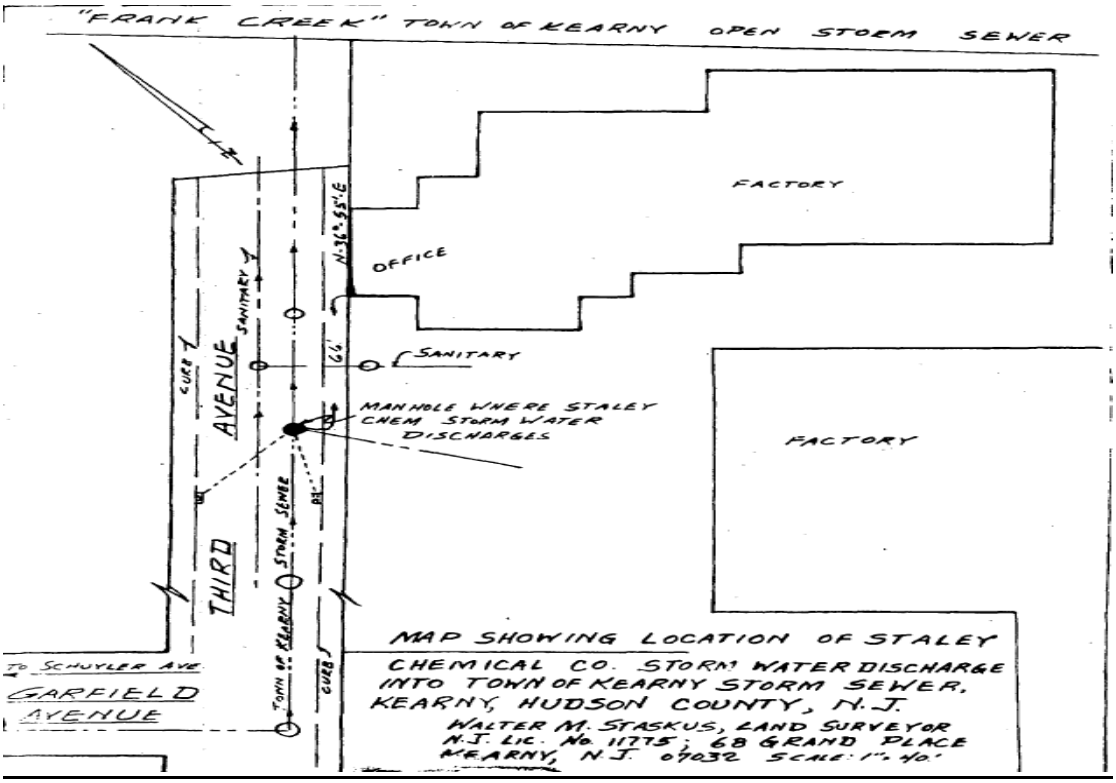
Storm Sewer

The 100 Third Avenue site had an NPDES Permit to discharge wastewaters to a municipal storm sewer on Third Avenue. The Third Avenue municipal storm sewer discharged into Frank Creek. The figure below shows the location of storm water discharges from the site. The site discharged 11,075,000 gallons of water in 1971 and 44,800,000 gallons of water in 1974 to the Third Avenue storm sewer (PAS-00108802, PAS-00108865).

LIST OF INDUSTRIES WITH NPDES PERMITS

(1) No.	ID#	NPDES PERMIT #	Company Name	Industry	Ave. Water Use (MGD)	Wastewater Discharge (4) Sanitary Ave.Max.	Process Ave. Max.	Cooling Ave. Max.	Total Ave. Max.	Receiving Waters	Remarks
264	M3	NJ0003026	A.E. Staley Co. Chemical Division	Chemicals	M-0.035	M-0.005	PS-0.001	R-0.024	0.003	Storm Sewer Frank Creek	

(PAP-00724141)



(PAS-00108808)

According to a January 28, 1974 Letter to the PVSC Chief Engineer Mr. Lubetkin, samples taken during the week of January 21-25, 1974 characterized A.E Staley's boiler blowdown to storm sewer as polluting samples while they cooling water was characterized as non-polluting (PAP-00724135).[9]

Direct Release

According to the April 1991 Warner Universal Corporation Sampling Plan, the site is located in an industrial section of Kearny. The eastern portions of the site is bordered by railroads siding and marshlands. Frank's Creek border the northern portion of the property and the western and southern sides of the facility are bordered by Third Avenue and other industrial establishments (PAP-00723181-83).[9]

The wetlands are eventually tributary to the Hackensack River which is located approximately 2.5 miles to the east (PAP-00723185).[9]

Spills

There is no information regarding spills in the available file material.

[9] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Tate & Lyle's previous certification.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

A.E Staley held PVSC Industrial Sewer Connection Permit No. 14015-15 (PAP-00724094).[10]

The site discharged wastewaters to a municipal storm sewer on Third Avenue, for ultimate discharge to Frank Creek, pursuant to a NJDES Permit No. 0003026 that expired on April 26, 1979 (PAP-00208504).

7. Response Actions

Characterization Activities

Two prior environmental investigations (in 1986 and 1990) were triggered, due to property transactions, and were evaluated under the then current NJDEP ECRA (Environmental Cleanup Responsibility Act) compliance program. The two ECRA investigations (ECRA# 86-939 and ECRA case number 90-A74) identified several areas of environmental concern at the property. [10]

Extensive soil and ground water investigations were conducted at the property until 1993 under NJDEP oversight. The identified areas of concern were remediated and resolved to the satisfaction of the NJDEP, and the UST areas / property were issued a Negative Declaration No Further Action (NFA) Letter (PAP-00723055-56). [10]

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

[10] This Report was revised to include documents received on May 22, 2020. The additional documents did not change Tate & Lyle's previous certification.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

TATE & LYLE INGREDIENTS AMERICAS LLC

Facility Name, Address and Size: A.E. Staley Manufacturing Company and its former division Staley Chemical Company. 320 Schuyler Avenue, Kearny, NJ (PAS-00108740). Employee and shift information was not available in the available file material.

1. **Business Type:** Administrative and sales office building (PAP-00208510).

2. **Time Period of Ownership/Operations**

   Operator: November 1968 to August 2, 1976
   Owner: November 1968 to August 2, 1976 (PAP-00193214)

   A.E. Staley Manufacturing Company is a part of Tate & Lyle North America (PAS-00108741).

   1968: A.E. Staley Manufacturing Company purchased the site on November 1968 (PAP-00193214).

   1976: 320 Schuyler Avenue was sold to V.E. Ralph & Son, Inc. on August 2, 1976 (PAP-00193214).



(PAS-00108742)

3. Operational History/COC Use and Presence at the Facility

The Declaration of Lynn Elder states that: The building on Schuyler Avenue in Kearny housed the administrative and sales offices; the manager of the entire operation, including the manager of manufacturing, the general manager, sales people, the accounting office, human resources employees and clerical staff worked in that building; it contained office furniture, files, shelving and general office equipment; and, no manufacturing was conducted in that building (PAP-00208510).

4. Identified COCs

There is no information regarding COCs in the available file material.

Historic Fill

The Allocation Team has determined that the facility is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

There is no information regarding soil sampling in the available file material.

No information is available regarding when fill materials were placed on the facility site.

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Sewer Systems

An undated Standard Form A – Municipal, Section IV-Industrial Waste Contribution to Municipal System, states that Staley Chemical was discharging 2,000 gallons of water per day 6 days per week to the municipal system (PAS-00108807). The address on the form was 320 Schuyler Ave., but there is a handwritten note on the form including the words “now 100 Third St. Kearny” (PAS-00108807). There is no suggestion in the available documents that the Schuyler Avenue property was discharging industrial waste and it is assumed that this address was used as the mailing address for the business.

Direct Release

There is no information regarding direct release in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

There is no information regarding response actions in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

TEVAL CORPORATION f/k/a CHARLES F. GUYON GENERAL PIPING COMPANY

Facility Name, Address and Size: Teval / Charles F. Guyon General Piping Company; 900-100 Frank E. Rodgers Boulevard South; Block 138, Lot 22A (0.56 acres); Block 138, Lot 1 (28 acres); and, Block 150, Lot 16A (7.091 acres) (PAP-00190146). Employee and shift information was not available in the available file material.

1. **Business Type:** Purchasing, warehousing, light machining activities, and selling pipes (PAP-00190187).

2. **Time Period of Ownership/Operations**

Operator: 1947 to 1992
Owner: 1947 to 2006

1900's: According to an April 1, 2015 letter from Husch Blackwell (on behalf of Coltec Industries, Inc. [Coltec]) to United States Environmental Protection Agency's (USEPA), Crucible Steel Corporation of America (Crucible) operated steel manufacturing facilities in Harrison, New Jersey, adjacent to River Mile 4.0 on the Passaic River. This included the 48-acre "Atha Works" facility, which it operated from 1900 to 1947, and then sold to Charles F. Guyon, Inc., while continuing to operate an adjacent 14-acre "Spaulding Works" facility from 1949 to 1974 (PAS-00048071).

1947-1992: Charles F. Guyon owned the facility from 1947 to 1988 with Charles F. Guyon General Piping, Inc. operating the site from December 27, 1947 to 1992. In 1984, Charles F. Guyon General Piping Company changed its name to Guyon General Piping, Inc. (PAP-00190151; PAP- 00190186).

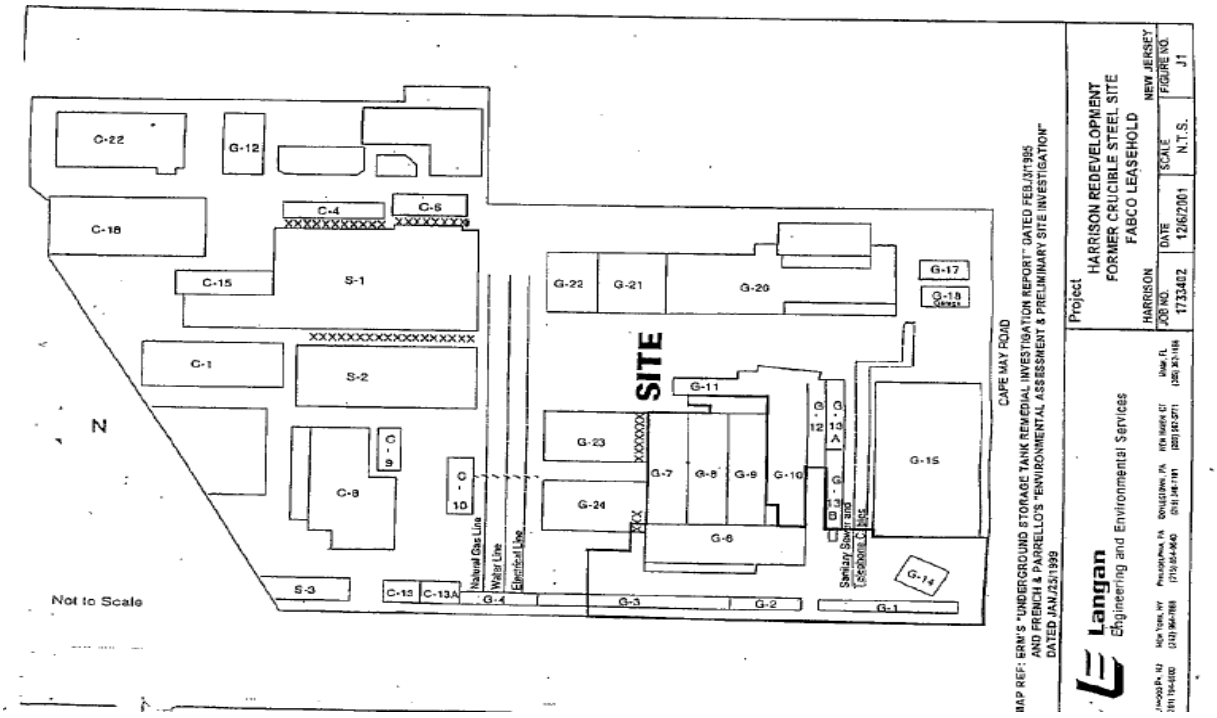
1980-1988: Fabco Piping, Inc. (Fabco) leased the southwest portion of the Guyon property for pipe fabricating operations from approximately July 1, 1980 until approximately June 30, 1988 (PAP- 00190151; PAP-00190185; PAS-00083189). Fabco's operations were contained to buildings G-1, G-2, a portion of G-3, G-6, G-7, G-8, and G-9, a portion of G-10 and G-14, and a portion of G-15 (PAP-00190160). Locations of buildings are provided on the map at the end of this section. Fabco terminated its lease in 1988 (PAP-00190196).

1991: According to a September 15, 2004 letter from Smith International, Inc., Van Leeuwen purchased certain assets of the distribution business from Chase. F. Guyon, Inc. in 1991. Between 1991 and 1994, Van Leeuwen leased one building on the site for use in its distribution business (PAS-00122929).

1992: Guyon changed its name to Teval Corporation (Teval) on July 7, 1992. From that time on the only business carried out by Teval was the ownership, leasing, and maintenance of the buildings on the property (PAP-00190186).

In the 1990's a number of buildings in the southern portion of the property were demolished (PAP-00190186) while the remaining buildings remained vacant, except for Building 12 which was rented out to Miele-Bros from 1992-2005 (PAP-00190196).

2006: The Guyon property was acquired by the Town of Harrison by eminent domain to build a mixed-use community which included the Red Bull Stadium (PAP-00190196; Factual Statement, p.1).



(PAP-00190165)

3. Operational History/COC Use and Presence at the Facility

Guyon General Piping, Inc. (Guyon)

According to the November 5, 2007 Declaration of Theodore Pichalski, a Facility Engineer at Teval (Pichalski Declaration), Guyon was in the business of selling pipes and valves, including some pipe fabrication. The pipe fabrication operations involved cutting, welding, and shaping of the pipe, including cutting of threads and in some cases, attaching valves (with coating, wrapping and lining furnished to all specifications [PAP-00190203]). The pipe products were sold to industrial customers, particularly those in the oil refining business (PAP-00190183). A facility layout drawing depicting the site which was previously owned by Guyon and subsequently Teval following a name change in 1992 is provided on Page 6 (PAP-00190184).

The Pichalski Declaration reported Guyon's operations were organized into four divisions: The Guyon Piping Division (also known as the Guyon Pipe, Valves and Fitting Division), the Fabrication Division, the Alloy Division, and Elizabeth Industries. The

Piping Division did all the warehousing of pipes prior to their sale and also did some working on the pipes, including the cutting of grooves to facilitate attaching pipes or valves, occasional bending of pipes and some cutting of threads. It did not do any welding (PAP-00190184). The Piping Division sold pipes and valves, plus some related fittings, often in large quantities. The material from which the pipes were made included steel, aluminum, brass, copper and several alloys. The Piping Division operated primarily in Buildings C-1, C-18, C-22, G-15, G-17, G-20, G-21 and G22. G-15 was a large building and was a warehouse in which pipes were stored prior to sale. In addition, pipes and valves were stored in Buildings G-10 and G-11 and in the garages G-1, G-2, G-3, and G-4 (PAP-00190184-85).

The Alloy Division provided products which were specifically designated for certain nuclear industry customers. It did not engage in any fabrication, but simply stored the pipes and sold them (PAP-00190185). Guyon's inventory consisted of over 60,000 tons of prime pipe (PAP-00190203). The Alloy Division operations were conducted in Buildings G-7, G-12, G-13A, G-13B, G23 and G-24 and they had their office in building C-10S. At some point Building G-7 was transferred to the Fabrication Division (PAP-00190185).

Elizabeth Industries bought and sold equipment for customers in bulk-such as a large number of shovels, chain saws, or similar equipment (PAP-00190185). They had their own building, Building C-4, and operated fairly independently of the other divisions. Their operations generated no process wastes, and no process wastewater (PAP-00190186).

Pipe fabrication operations were conducted by the Fabrication Division in Buildings G-6, G-7, G-8, G-9, G-14 and G-16 as shown in the figure below. The fabrication operations included the cutting, bending, and threading of pipes, as well as some welding (this was done only in Building G-6) (PAP-00190185). When pipes were being cut or threaded, cutting oil was used to keep the pipes and tools from overheating. Cutting oils were purchased and kept in 55-gallon drums that were stored indoors (PAP-00190187).

According to the Pichalski Declaration, there was no waste cutting oil because the heat generated by the cutting tools working on the pipes caused the cutting oil to vaporize (PAP-00190187). The only wastes generated by these processes were metal shavings and particles. These wastes were swept up, placed in drums, and sold to a recycler (PAP-00190187). According to Mr. Pichalski, there were no wastewater discharges from any of these operations to the Passaic River. All sanitary waste was discharged to a piping system which went to the publically owned treatment works operated by the Passaic Valley Sewerage Commission (PVSC) (PAP-00190187).

Guyon operated a fleet of trucks to deliver pipe to its customers. The trucks were housed in a garage building, Building G-18, where they were periodically serviced. Guyon installed a 250-gallon aboveground steel tank (AST) where used motor oil was kept. A company called Northeast Oil periodically came and pumped used oil out and hauled it away for recycling. Extra batteries were stored in Building G-18, and Guyon had several suppliers who periodically provided new batteries and removed old ones (PAP-00190195).

These operations were conducted by Guyon from the time Mr. Theodore Pichalski began work there in 1976 until Guyon leased the fabrication operations to Fabco in 1980. The portion of the property on which fabrication activates took place, and which was leased in 1980 to Fabco is specified in the figure on Page 8 below with diagonal lines and the legend “Former Fabco Piping leasehold” (PAP-00190185).

Guyon changed its name to Teval on July 7, 1992. From that time on the only business carried on by Teval was the ownership, leasing, and maintenance of the buildings on the property (PAP-00190186). Its inventory of pipes and valves and their related business equipment were transferred to Von Leeuwen Pipe and Tool Corporation, who removed them from the facilities. This took place over nearly three years. Thereafter, a number of buildings in the southern portion of the property were demolished in 1990s (PAP-00190186). From 1992 through 2005, the buildings which had not been demolished remained vacant, except Building 12 (near Building C-22) which was rented out to Miele-Bros., also known as North Jersey Appliance (PAP-00190196).

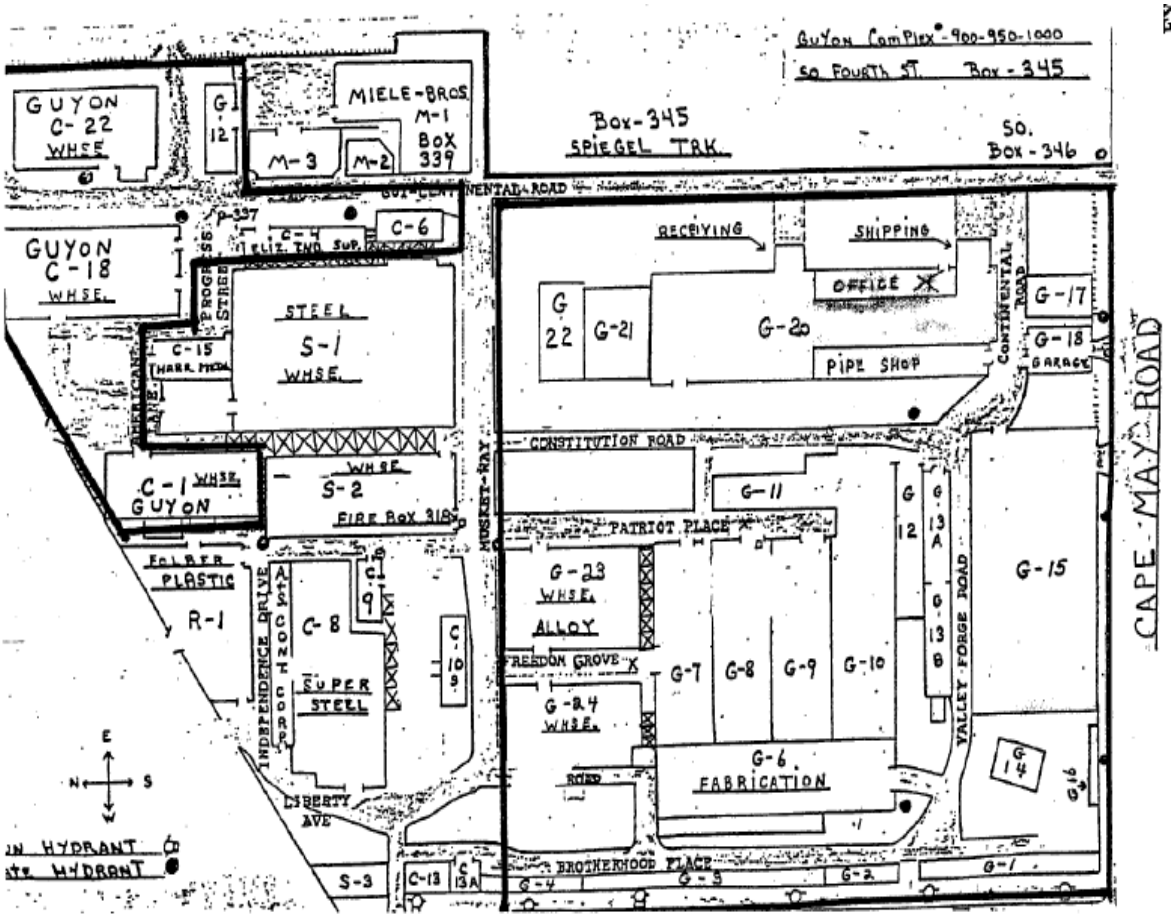
In 2006, the Town of Harrison took title to the Teval property by eminent domain. The site is now part of a 48-acre site, which was restored and developed by Advance Realty Group to include the Harrison Metro Center, housing, offices, real estate, and a soccer stadium for the New York Red Bulls soccer team (PAP-00190196).

According to the Preliminary Assessment Report, Harrison Redevelopment, Former Crucible Steel Site, 900-1000 Frank E. Rodgers Boulevard, Harrison, New jersey 07029, dated January 30, 2002 (2002 PA Report), the following Underground Storage Tanks (USTs) were at the facility (PAP-00190140).

B. Underground Storage Tank Registration Number Facility ID# 0048053, 0262604, 0226244

Size of Tank (Gallons)	Tank Contents
4,000	#0048053 - Leaded Gasoline
5,000	#0262604 - Heating Oil
8,000	#0226244 – Unleaded Gasoline (Tank 0001)
8,000	#0226244 - Medium Diesel Fuel (Tank 0002)
3,000	#0226244 - #2 Fuel Oil (Tank 0003)
1,000	#0226244 - Hydraulic Oil (Tank 6)
1,000	#0226244 - Hydraulic Oil (Tank 7)
3,000	#0226244 - Hydraulic Oil (Tank 9)
3,000	#0226244 - Hydraulic Oil (Tank 10)

(PAP-00190140)



(PAP-00190199)

Fabco Piping, Inc. Operations

According to the 2002 PA Report, Fabco was involved in the fabrication of pipe until April 1987 when it ceased production activities. The operations included pipe welding, cutting, bending, sandblasting, hardening, and painting. A small staff remained onsite until 1988 (PAP-00190160).

According to the Pichalski Declaration, Fabco conducted pipe fabrication operations from 1980 until 1988 when the company became insolvent, ceased its operations and terminated its lease with Guyon two years prior to its anticipated completion date. Fabco conducted sandblasting operations in Building G-16 and spray painting in Building G-14. According to Mr. Pichalski, there was no discharge to the Passaic River of any waste material generated by Fabco. Mr. Pichalski also stated that there were no discharge pipelines or other conduits from any of these buildings to the Passaic River and he does not recall any floor drains in any of the fabrication buildings (PAP-00190195). According to the Pichalski Declaration, metal threads and particles from pipe threading or cutting operations were collected, drummed, and sent offsite for recycling. Sandblasting waste was stored on the ground just north of Building G-16. Periodically, it would be scooped up and put in a dumpster and then trucked offsite to a disposal facility in Pennsylvania (PAP-00190195).

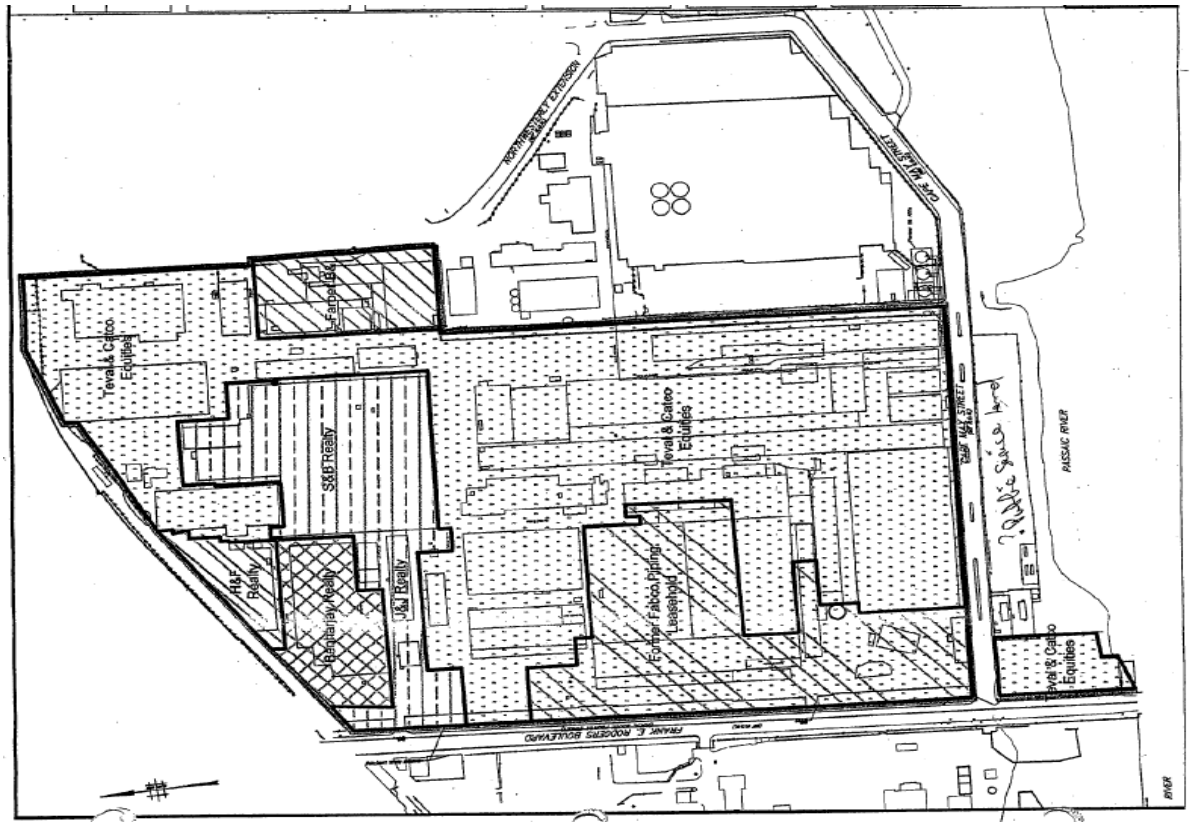
According to a February 20, 1990 letter to New Jersey Department of Environmental Protection (NJDEP) from Guyon, a darkroom was located adjacent to the cutting and sawing areas on the south side of the large building complex in the leasehold area. The sink in the darkroom was connected to the sanitary sewer system along with the adjoining restroom. According to the letter, all hazardous substances or wastes abandoned by Fabco in the area were disposed by Guyon (PAS-00083193).

A Paint Storage Area was located on the third floor of a large building complex of the leasehold area above the darkroom. Materials abandoned by Fabco and subsequently disposed by Guyon included lead paint, lead primer, and lead primer paint (PAS-00083193, 3200).

Sandblasting operations were located in the southwest corner of the leasehold area. Metal products were apparently sandblasted to clean them after the fabrication process was completed and prior to painting. Excess sandblast grit, approximately 475 tons, abandoned by Fabco was removed and disposed offsite by Guyon. (PAS-00083195).

The Paint Shop was located in the southwest corner of the leasehold property. The building was used for painting operations by Fabco. Materials abandoned by Fabco and subsequently disposed by Guyon included (8) 5-gallon coal tar epoxy, (2) 5-gallon of red lead primer, (3) 55-gallon hydraulic oil, and (3) 1-gallon red lead primer paint (PAS-00083195, 3206).

After Fabco terminated its lease in 1988, the property was inspected by the NJDEP under the Environmental Cleanup Responsibility Act (ECRA) and determined that there was some residual contamination resulting from their activities, notably in the area where sandblast residue had formerly been stored outside Building G-16. NJDEP insisted that Guyon, as the property owner, perform appropriate remedial action. This was done during 1990-1994, at the conclusion of which NJDEP advised Teval (the successor by name change to Guyon) that the remedial action had been satisfactorily completed and NJDEP issued a “No Further Action Letter” dated September 2, 1994 stating the property was “in full compliance with the Industrial Sites Recovery Act (ISRA) (PAP-00190196).



(PAP-00190198)

According to the 2002 PA Report, based on interviews with current property owners and operators, process waste streams were generated within the Benharjay Realty property (Super Steel's operations) and the Teval and Catco Equities property (North Jersey Appliance Warehouse – truck maintenance). Waste oils generated by North Jersey Appliance Warehouse's truck maintenance operations were disposed by Waste Management (PAP-00190154).

North Jersey Appliance Warehouse (North Jersey Appliance)

According to a Response to EPA Request for Information by North Jersey Appliance Warehouse, Inc., dated October 17, 1996, North Jersey Appliance operated at 1000 Frank E. Rodgers Boulevard South in Harrison, New Jersey since May-June 1981 (PAS-00076883).

North Jersey Appliance operated an appliance warehouse and distribution center at the facility on behalf of manufacturers, distributors and retail chains, for appliances such as refrigerators, air conditioners, stoves, television sets, and similar 'white goods" and "brown goods" in their original, factory-sealed cartons. North Jersey Appliance trucked these goods in and out of the facility and delivered them to customer locations and other sites. North Jersey Appliance's operations involved solely the storage and distribution of boxed appliances including, on occasion, returns. North Jersey Appliance engaged in no appliance manufacturing, repair, reconditioning, painting or similar operations at the Facility (PAP-00076884-85).

North Jersey Appliance maintained a fleet of about seven trucks to move merchandise and rented garage space for the fleet in a building immediately adjoining the facility from Teval. The maintenance garage performed routine periodic maintenance on vehicles, including oil changes and antifreeze changes. Waste oil and used antifreeze were stored indoors in 55-gallon drums on concrete floors until full, when they were periodically picked up for recycling by Bill's Waste Oil Service. The garage equipment included a self-contained, recirculating parts cleaner which utilized a naphtha solvent degreaser. The parts cleaner was serviced by Safety-Kleen, which at each service visit containerized and removed spent solvent from the unit for recycling, and recharged the unit with fresh solvent (PAS-00076886).

The facility also contained a 4,000 underground gasoline storage tank ("UGST"), which was used for gasoline for trucks. The UST was registered with the NJDEP, Reg. No. 0048053. Gasoline was dispensed from the UST via a standard pump dispenser. The facility also had a separate underground heating oil tank, believed to be 2,000 gallons or less in capacity, which holds heating oil for the furnace that heats the small office section of the primary warehouse building (PAS-00076886). North Jersey did not store drums, either full or empty, outdoors (PAS-00076887).

Van Leeuwen

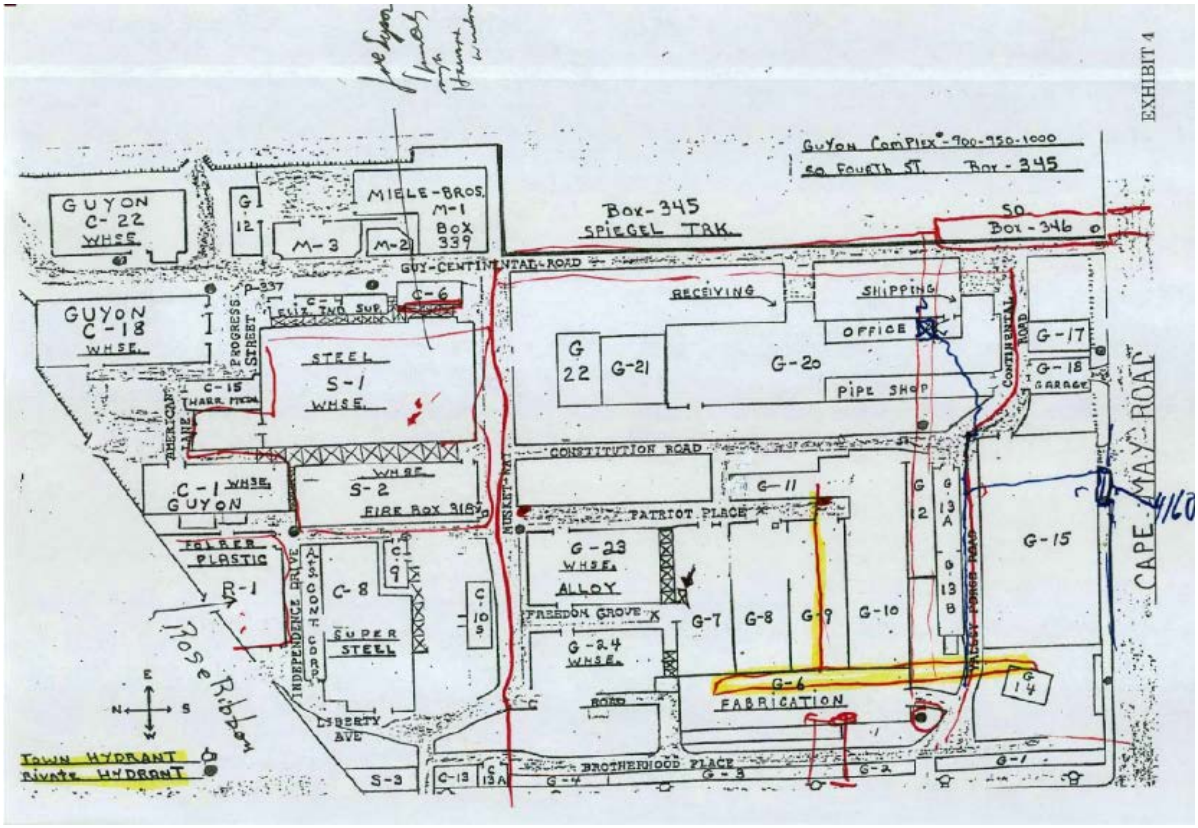
According to a September 15, 2004 letter from Smith International, Inc., Van Leeuwen purchased certain assets of the distribution business from Guyon in 1991. Between 1991 and 1994, Van Leeuwen leased one building on the site for use in its distribution business (PAS-00122929).

4. Identified COCs

- PCBs (release, detected)
- PAHs (detected)
- Copper (use, release, detected)
- Lead (release, detected)
- Mercury (release, detected)

PCBs

According to the Pichalski Declaration, there were seven electrical transformers at the site located in areas specified in blue on the drawing below (PAP-00190193).



(PAP-00190210)

The main transformer vault was located outside and on the south side of Building G-15, which faced south onto Cape May Road. The transformers themselves were inside the vault, so if there had been any leaking, it would have been contained within the vault (PAP-00190193). Two transformers were located at the north end of Building G-7 and were of comparable size to the four indoor transformers in the office Building G-20 (PAP-00190194). Mr. Pichalski reported he had never observed any leaking from any of the transformers on site at any time (PAP-00190194). All of these transformers were sampled in 1976 for polychlorinated biphenyl (PCB) content. No PCB-containing material as found. Nevertheless, the fluids were drained and replaced at the time with non-PCB oil (PAP-00190194).

According the Remediation/Decommissioning Results, Fabco Piping, Inc., 1000 South Fourth Street, Harrison, New Jersey 07029, dated May 1990 (May 1990 R/D Results), transformers located along the east side of the paint shop in the southwest portion of the site, contained less than 50 milligram per kilogram (mg/kg) of PCBs (PAS-00000961).

According the May 1990 R/D Results, a sample of sand blast grit associated with the steel pipe sand blasting operation of Fabco was collected on February 13, 1989 and analyzed for contaminants (PAS-00083226-27; PAS-00000962). PCB Aroclor-1254 was detected at 1.0 parts per million (ppm). Six other PCB Aroclors were non-detect (PAS-00083258). Aroclor 1254 was also detected at the railroad tracks at a concentration of 3.8 mg/kg (PAS-00000986).

According to the Soil Reuse Plan, Harrison Redevelopment, Former Crucible Steel Site, Harrison, New Jersey, dated August 2006 and Revised January 2007, (August 2006 Soil Reuse Plan), French & Parello (F&P) performed environmental sampling in 1998 and detected PCBs in SP-8 at 5.3 mg/kg, exceeding the non-residential direct contact cleanup criteria of 2 mg/kg. The remaining samples did not contain chemical constituents at concentrations exceeding the applicable cleanup standards (PAP-00190219).

According to the Remedial Investigation/Remedial Action Report, Miles A Galin Property, 1000 4th Street South, Harrison, NJ, dated November 2008 (November 2008 RI/RA Report), PCBs in fill at AOC-1A south of Cape May Street were more extensive than previously characterized. Several samples contained PCBs at concentrations exceeding the USEPA's 50 mg/kg Toxic Substance Control Act (TSCA) threshold and the extent of impacts spanned the entire parcel (PAP-00190180).

According to the November 2008 RI/RA Report, 28 samples were analyzed for PCBs. The samples were derived from the first available soil layer, with deeper samples collected from two borings. PCB concentrations in all but two samples were less than the cleanup criteria. PCBs were detected at 1.3 mg/kg and 0.66 mg/kg in the remaining two samples (PAP-00190177). Approximately 1,400 tons of PCB-impacted soil was removed from the site under the oversight of EPA and NJDEP (PAP-00190182).

According to a Review of Evidence Compiled on Potentially Responsible Parties of the Passaic River Study Area: Crucible Steel Corporation, Guyon Pipe Company, Inc., 1000 South Fourth Street, Harrison, NJ 07029, dated February 12, 2002 (February 2002 Report), concentrations detected during the timeframe of Teval's operation and ownership of the Guyon facility are presented in the table below with locations provided on the maps at the end of this section (PAS-00083179, PAS-00109612)

PCB Core Samples (mg/kg)			
Location	**Core Location**	**PCB Aroclor 1254**	**Dates**
Mud Flats	Core 289	1,320	1995-1961
		2,300	1961-1928
	Core 290	1,860	1995-1961
		1,900	1961-1928
Transect 15	Core 245	192	1995-1990
		2,760	1967-1958
	Core 244	2,070	1995-1983
		964	1983-1972
	Core 243	944	1995-1987
		5,330	1971-1964
		3,030	1964-1956

PAHs

According to the August 2006 Soil Reuse Plan, polycyclic aromatic hydrocarbons (PAHs) were detected in the soil at AOC 8 in 2004 at concentrations exceeding the NJDEP soil cleanup criteria (PAP-00190219). Note: Concentrations were not in the report.

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According to the August 2006 Soil Reuse Plan, PAHs [e.g., benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene] were detected in nearly all samples collected at AOC 8 in April 2006 at concentrations exceeding the soil cleanup criteria,(PAP-00190220).

According to the February 2002 Report, concentrations detected during the timeframe of Teval's operation and ownership of the Guyon facility are presented in the table below with locations provided on the map at the end of this section.

Contaminant		MUDFLATS						TRANSECT 15					
	Site Use	Core 289	Dates	Core 290	Dates	Core 291	Dates	Core 245	Dates	Core 244	Dates	Core 243	Dates
Chrysene	4800	1400	1995-1961	4300	1995-1961	4300	1995-1980	1800	1995-1990	8900	1995-1983	1200	1995-1987
ppb	soil	2400	1961-1928	4600	1961-1928	6200	1980-1966	2500	1990-1985	2600	1983-1972	1500	1987-1979
mean: 3915		12000	1928-1895	8600	1928-1895	4400	1966-1952	3100	1985-1976	5200	1972-1961	2500	1979-1971
high: 150000		ND	1895-1861	ND	1895-1861	4800	1952-1937	3700	1976-1963	1500	1961-1950	2900	1971-1964
top 20		ND	1861-1828	ND	1861-1828	4700	1937-1923	4500	1967-1958	6300	1950-1939	2300	1964-1956
above mean		ND	1828-1795	ND	1828-1795	1000	1923-1909	3500	1963-1954	4500	1939-1928	2100	1956-1948
								5200	1954-1945				
Dibenz(a,h)anthracene	300	ND	1995-1961	ND	1995-1961	1000	1995-1980	ND	1995-1990	ND	1995-1983	ND	1995-1987
ppb	soil	ND	1961-1928	ND	1961-1928	ND	1980-1966	800	1990-1985	ND	1983-1972	ND	1987-1979
mean: 1513		930	1928-1895	1000	1928-1895	ND	1966-1952	960	1985-1976	740	1972-1961	ND	1979-1971
high: 25000		ND	1895-1861	ND	1895-1861	ND	1952-1937	1000	1976-1963	ND	1961-1950	ND	1971-1964
top 20		ND	1861-1828	ND	1861-1828	ND	1937-1923	880	1967-1958	ND	1950-1939	ND	1964-1956
above mean		ND	1828-1795	ND	1828-1795	ND	1923-1909	ND	1963-1954	ND	1939-1928	ND	1956-1948
								1000	1954-1945				
Fluoranthene	7400	2500	1995-1961	6500	1995-1961	6600	1995-1980	2700	1995-1990	25000	1995-1983	2000	1995-1987
ppb	soil	4300	1961-1928	5500	1961-1928	7700	1980-1966	4000	1990-1985	5000	1983-1972	2300	1987-1979
mean: 6820		21000	1928-1895	9800	1928-1895	5200	1966-1952	4900	1985-1976	8800	1972-1961	4300	1979-1971
high: 320000		ND	1895-1861	ND	1895-1861	5400	1952-1937	6500	1976-1963	4200	1961-1950	4800	1971-1964
top 20		ND	1861-1828	ND	1861-1828	5900	1937-1923	5800	1967-1958	8400	1950-1939	3500	1964-1956
above mean		ND	1828-1795	ND	1828-1795	1800	1923-1909	5100	1963-1954	6100	1939-1928	3200	1956-1948
								7400	1954-1945				
Fluorene	500	ND	1995-1961	880	1995-1961	ND	1995-1980	ND	1995-1990	14000	1995-1983	ND	1995-1987
ppb	soil	ND	1961-1928	ND	1961-1928	1100	1980-1966	ND	1990-1985	ND	1983-1972	ND	1987-1979
mean: 3432		ND	1928-1895	770	1928-1895	1400	1966-1952	1200	1985-1976	860	1972-1961	ND	1979-1971
high: 140000		ND	1895-1861	ND	1895-1861	1000	1952-1937	870	1976-1963	1100	1961-1950	ND	1971-1964
top 20		ND	1861-1828	ND	1861-1828	2000	1937-1923	1000	1967-1958	1500	1950-1939	ND	1964-1956
above mean		ND	1828-1795	ND	1828-1795	ND	1923-1909	920	1963-1954	1900	1939-1928	ND	1956-1948
								1900	1954-1945				
Indeno(1,2,3-cd)pyrene	1100	ND	1995-1961	1100	1995-1961	2400	1995-1980	1000	1995-1990	2400	1995-1983	ND	1995-1987
ppb	soil	ND	1961-1928	1100	1961-1928	1600	1980-1966	1400	1990-1985	ND	1983-1972	ND	1987-1979
mean: 1886		ND	1928-1895	2900	1928-1895	1200	1966-1952	1800	1985-1976	1500	1972-1961	1200	1979-1971
high: 57000		ND	1895-1861	ND	1895-1861	1200	1952-1937	1900	1976-1963	ND	1961-1950	ND	1971-1964
top 20		ND	1861-1828	ND	1861-1828	1000	1937-1923	1700	1967-1958	1500	1950-1939	990	1964-1956
above mean		ND	1828-1795	ND	1828-1795	ND	1923-1909	1500	1963-1954	1200	1939-1928	990	1956-1948
Benzo(a)anthracene	4000	1100	1995-1961	3300	1995-1961	4300	1995-1980	1300	1995-1990	10000	1995-1983	ND	1995-1987
ppb	soil	1900	1961-1928	3200	1961-1928	5500	1980-1966	1800	1990-1985	2200	1983-1972	1100	1987-1979
mean: 3546		14000	1928-1895	8000	1928-1895	3400	1966-1952	2200	1985-1976	5400	1972-1961	1600	1979-1971
high: 150000		ND	1895-1861	ND	1895-1861	3600	1952-1937	3100	1976-1963	2300	1961-1950	1100	1971-1964
top 20		ND	1861-1828	ND	1861-1828	4000	1937-1923	2700	1967-1958	4400	1950-1939	1400	1964-1956
above mean		ND	1828-1795	ND	1828-1795	950	1923-1909	2900	1963-1954	3600	1939-1928	1900	1956-1948
								5000	1954-1945				
Benzo(a)pyrene	3900	1200	1995-1961	3500	1995-1961	3000	1995-1980	1500	1995-1990	7400	1995-1983	1400	1995-1987
ppb	soil	1900	1961-1928	3300	1961-1928	4300	1980-1966	1800	1990-1985	1900	1983-1972	1400	1987-1979
mean: 3231		9900	1928-1895	5500	1928-1895	2800	1966-1952	2300	1985-1976	5000	1972-1961	2400	1979-1971
high: 130000		ND	1895-1861	ND	1895-1861	3100	1952-1937	2400	1976-1963	1800	1961-1950	2300	1971-1964
top 20		ND	1861-1828	ND	1861-1828	3000	1937-1923	2500	1967-1958	4100	1950-1939	2200	1964-1956
above mean		ND	1828-1795	ND	1828-1795	830	1923-1909	2100	1963-1954	3200	1939-1928	2100	1956-1948
								4700	1954-1945				
Benzo(b)fluoranthene	6100	1100	1995-1961	2700	1995-1961	3800	1995-1980	1500	1995-1990	8700	1995-1983	1200	1995-1987
ppb	soil	2000	1961-1928	3800	1961-1928	5000	1980-1966	1600	1990-1985	1400	1983-1972	1400	1987-1979
mean: 2865		8000	1928-1895	4800	1928-1895	2700	1966-1952	1900	1985-1976	3600	1972-1961	2000	1979-1971
high: 100000		ND	1895-1861	ND	1895-1861	4100	1952-1937	2300	1976-1963	2400	1961-1950	ND	1971-1964
top 20		ND	1861-1828	ND	1861-1828	2400	1937-1923	1800	1967-1958	4000	1950-1939	2200	1964-1956
above mean		ND	1828-1795	ND	1828-1795	520	1923-1909	1900	1963-1954	2400	1939-1928	1900	1956-1948
								3900	1954-1945				
Benzo(g,h,i)perylene	1100	ND	1995-1961	1200	1995-1961	2200	1995-1980	800	1995-1990	ND	1995-1983	ND	1995-1987
ppb	soil	ND	1961-1928	1300	1961-1928	1300	1980-1966	840	1990-1985	ND	1983-1972	ND	1987-1979
mean: 2030		ND	1928-1895	3200	1928-1895	910	1966-1952	1000	1985-1976	1500	1972-1961	ND	1979-1971
high: 63000		ND	1895-1861	ND	1895-1861	960	1952-1937	1700	1976-1963	ND	1961-1950	ND	1971-1964
top 20		ND	1861-1828	ND	1861-1828	780	1937-1923	1600	1967-1958	ND	1950-1939	ND	1964-1956
above mean		ND	1828-1795	ND	1828-1795	ND	1923-1909	1300	1963-1954	1200	1939-1928	1200	1956-1948
								4000	1954-1945				
Benzo(k)fluoranthene	3300	1100	1995-1961	3700	1995-1961	2900	1995-1980	1000	1995-1990	5200	1995-1983	1600	1995-1987
ppb	soil	1500	1961-1928	2500	1961-1928	2200	1980-1966	1600	1990-1985	2300	1983-1972	1400	1987-1979
mean: 2556		4200	1928-1895	2600	1928-1895	1600	1966-1952	1800	1985-1976	3600	1972-1961	2600	1979-1971
high: 63000		ND	1895-1861	ND	1895-1861	2500	1952-1937	2300	1976-1963	1500	1961-1950	ND	1971-1964
top 20		ND	1861-1828	ND	1861-1828	2100	1937-1923	3000	1967-1958	3200	1950-1939	1600	1964-1956
above mean		ND	1828-1795	ND	1828-1795	640	1923-1909	2000	1963-1954	3300	1939-1928	1800	1956-1948
								3000	1954-1945				

(PAS-00083180-81, PAS-00109609-10)

Metals - Copper, Lead and Mercury

According the May 1990 R/D Results, the exterior portion of the paint shop, where empty containers and wood pallets were observed, was investigated on February 13, 1989. Soil samples contained copper and mercury at one or more sample locations at concentrations above the ECRA guidelines at the time (PAS-00000954-55). Copper was detected at S-1 (392 mg/kg), S-2 (239 mg/kg), and S-3 (324 mg/kg). Mercury was detected above ECRA guidelines only at S-3 at a concentration of 2.05 mg/kg. Lead was also detected at S-1 (808 mg/kg), S-2 (525 mg/kg), and S-3 (901 mg/kg) (PAS-00000955-56). Post-excavation samples collected on March 2, 1990 contained copper concentrations at 432 mg/kg and 401 mg/kg at S-202 and S-203, respectively. Similarly two of the analyses for lead were above ECRA guidelines at 3,710 mg/kg and 3,330 mg/kg, respectively. The levels of mercury were 0.595 mg/kg at S-201, 9.13 mg/kg at S-202, 10.2 mg/kg at S-203 and 7.7 mg/kg in the duplicate of S-201 (PAS-00000957, PAS-00083245).

According the May 1990 R/D Results, 12.8 mg/kg of EP Tox lead was detected in the stained soil and asphalt pavement near the railroad tracks running through the Fabco leasehold potion of the site. Post-excavation samples were not collected (PAS-00000960). The results also noted a No. 2 fuel oil aboveground storage tank (AST) was located on a concrete pad in a lean-to structure at the north end of the annealing and bending operations. Stained sediments were removed from the concrete pad on March 2, 1990 and disposed as hazardous waste due to the presence of 12.8 mg/kg of EP Toxicity (EP Tox) lead (PAS-00000961).

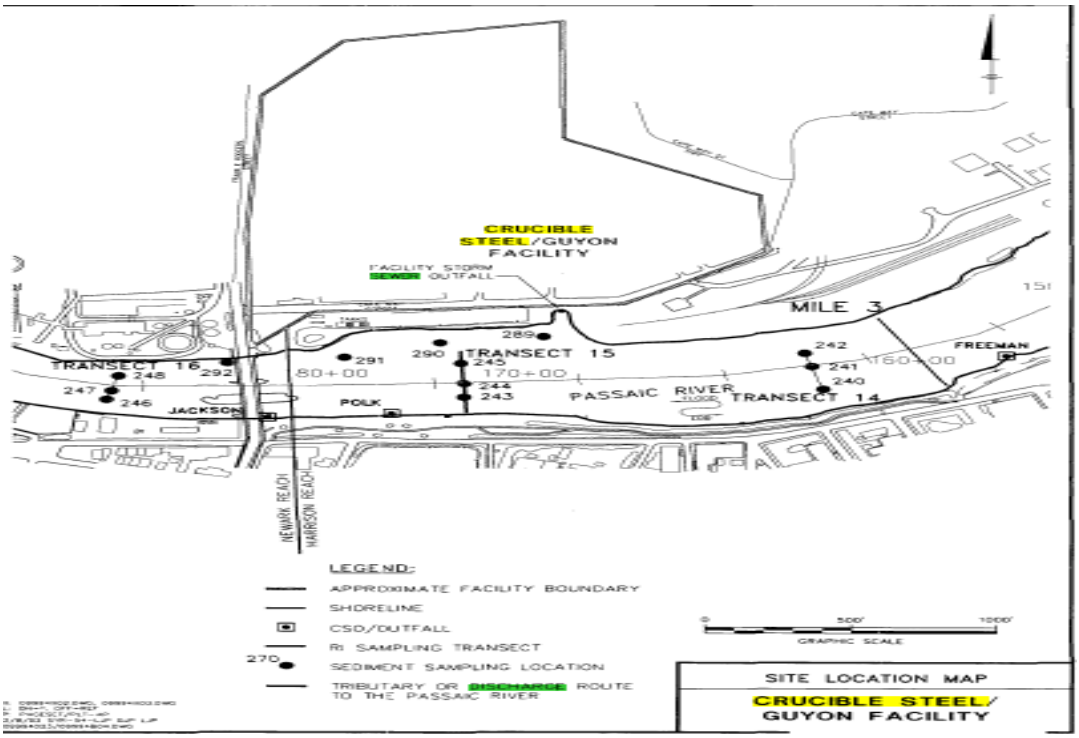
According to the February 2002 Report metals, concentrations detected during the timeframe of Teval's operation and ownership of the Guyon facility are presented in the table below with locations provided on the following map. (PAP-00027920; PAS-00083183; PAS-00109604).

Location	Core Location	Copper (mg/kg)	Dates
Mud Flats	291	393	1995-1980
		488	1980-1966
		384	1966-1952
		585	1952-1937
Transect 15	245	179	1995-1990
		266	1990-1985
		454	1985-1976
		563	1976-1963
		622	1967-1958
		636	1963-1954
		577	1954-1945
	244	185	1995-1983
		249	1983-1972
		139	1972-1961
		551	1961-1950
		304	1950-1939
	243	275	1995-1987
		295	1987-1979
		551	1979-1971

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		588	1971-1964
		675	1964-1956
		733	1956-1948
Location	**Core Location**	**Lead (mg/kg)**	**Dates**
Mud Flats	291	544	1995-1980
		541	1980-1966
		447	1966-1952
		723	1952-1937
Transect 15	245	269	1995-1990
		511	1990-1985
		607	1985-1976
		679	1976-1963
		751	1967-1958
		743	1963-1954
		605	1954-1945
	244	544	1995-1983
		420	1983-1972
		331	1972-1961
		611	1961-1950
		414	1950-1939
	243	655	1995-1987
		434	1987-1979
		682	1971-1964
		747	1964-1956
		865	1956-1948
		655	1995-1987
Location	**Core Location**	**Mercury (mg/kg)**	**Dates**
Mud Flats	291	6.5	1995-1980
		6.2	1980-1966
		3.4	1966-1952
		5	1952-1937
Transect 15	245	2.8	1995-1990
		4.9	1900-1985
		10	1985-1976
		12.6	1976-1963
		10.6	1967-1958
		14.5	1963-1954
		8	1954-1945
	244	2.8	1995-1990
		4.9	1900-1985
		10	1985-1976
		12.6	1976-1963
		10.6	1967-1958
	243	4.4	1995-1987
		6.1	1987-1979
		16.1	1971-1964
		13.3	1964-1956
		13.3	1956-1948
		4.4	1995-1987

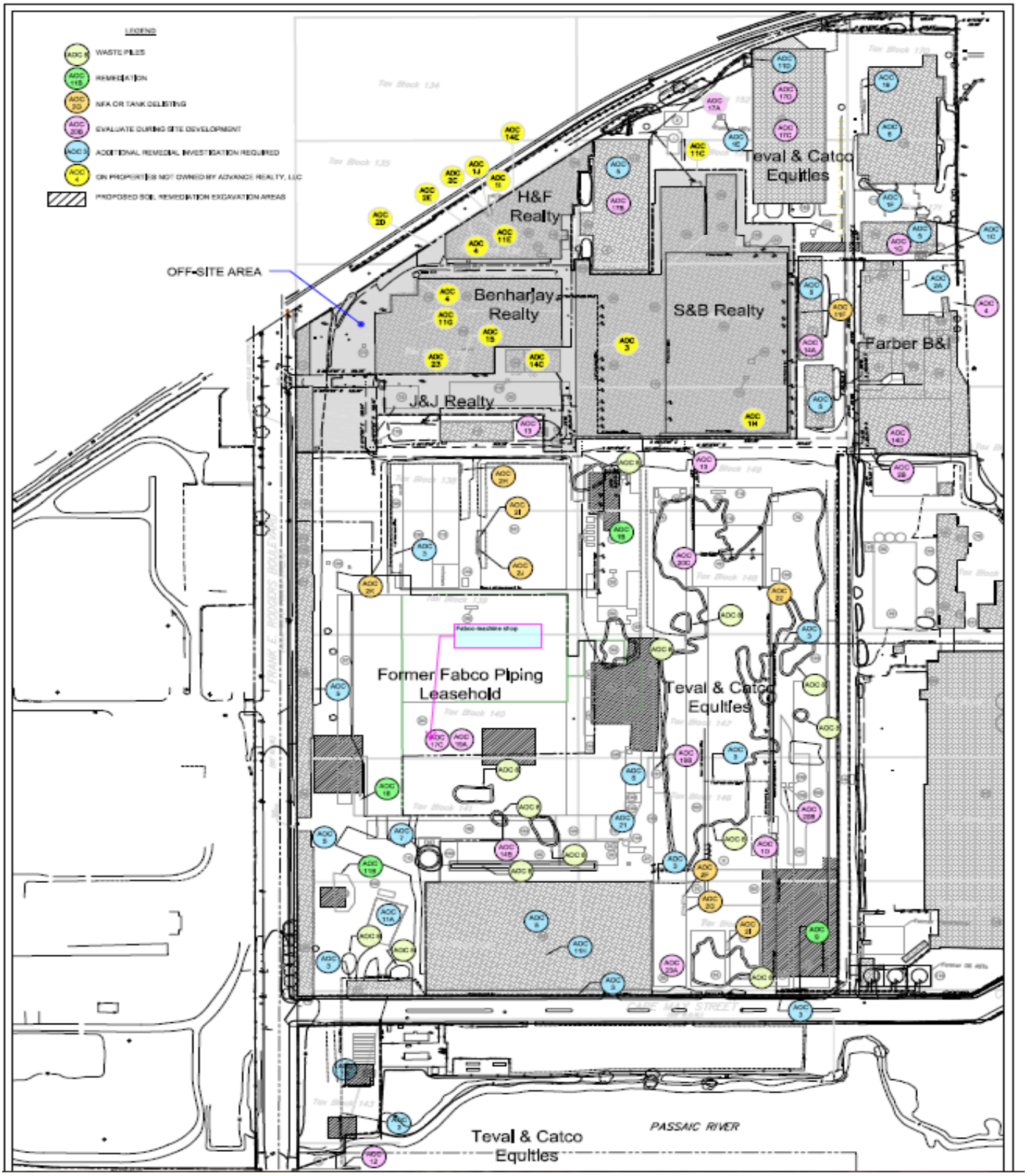


(PAS-00109597)

Areas of Environmental Concern

According to the 2002 PA Report, 23 Areas of Concern (AOC) were identified in 2001 (PAP-00190217). A map and table with the locations of AOC's, identified in 2001, is provided below (PAP-00210642).

AREAS OF CONCERN		
AOC #1: Aboveground Storage Tanks and Associated Piping	AOC #5: Floor Drains, Trenches, Piping and Sumps	17a) Former Machine Shop (Building #2)
1a) 12 Former Oils ASTs	AOC #6: Roof Leaders	17b) Machine Shop (Building #3 & #11)
1b) Four Former Oil Coolers and Oil Pump House	AOC #7: Stormwater Detention Pond and Fire Ponds	17c) Former Machine Shop (Building #24)
1c) Former Acid Tanks	AOC #8: Waste Piles	17D) Machine Shop (Building #58)
1d) Six Former Fuel Oil Tanks Under Building #8	AOC #9: Former Incinerator	AOC #18: Former Chem Lab
1e) Three Former ASTs	AOC #10: Historic Fill Materials	AOC #19: Former Hydraulic Plant
1f) One 275-Gallon Heating Oil AST	AOC #11: Electrical Transformers and Capacitors	19a) Former Hydraulic Plant (Building #24)
1g) Four Automotive Fluid ASTs	11a) Former Indoor Electrical Sub-Station (Building #26)	19b) Former Hydraulic Pump House (Building #191)
1h) One Empty 275-Gallon AST (Building #65)	11b) Former Outdoor Sub-Station (Building #100)	AOC #20: Former Scrap Yards
1i) Stain AST(s) (Building #52)	11c) Existing Outdoor Transformers (Building #121)	20a) Former Scrap Yard #30
1j) One 1,000-Gallon Heating oil AST (Building #52)	11d) Existing Outdoor Transformers (Building #58)	20b) Former Scrap Yard #106
AOC #2: Underground Storage Tanks and Associated Piping	11e) Existing Outdoor Transformers (Building #52)	20c) Former Scrap Yard #70
2a) Former 4,000-Gallon Leaded Gasoline UST	11f) Existing Indoor Transformer (Building #7)	AOC #21: Former Ash Tunnel
2b) 2,000-Gallon #2 Heating Oil UST	11g) Existing Indoor Transformer (Building #105)	AOC #22: Former Motor Generators
2c) 5,000-Gallon #2 Heating Oil Tank	11h) Existing Capacitors (Building #105)	AOC 23: Painting and Drying Room
2d) One UST (Building #52)	AOC #12: Former Non-Contact Cooling Water Discharges	
2e) Former UST (NJ Transit)	AOC #13: Two Inactive Production Wells	
2f) Former 8,000-Gallon Unleaded Gasoline UST	AOC #14: Boiler Rooms	
2g) Former 8,000-Gallon Medium Diesel Fuel UST	14a) Boiler House (Buildings #7, #20, & #40)	
2h) Former 6,000-Gallon #2 Fuel Oil UST	14b) Former Boiler House (Building #25)	
2i) Former 2,000-Gallon Hydraulic Oil UST	14c) Former Boiler House (Building #19)	
2j) Former 2,000-Gallon Hydraulic Oil UST	14d) Boiler Room (Building #99)	
2k) Former 500-Gallon Hydraulic Oil UST	14e) Boiler Room (Building #52)	
2l) Former 2,000-Gallon Gasoline UST	AOC #15: Settling Pits	
AOC #3: Underground Petroleum Piping	AOC #16: Reclaiming Pits	
AOC #4: Dumpsters	AOC #17: Machine Shops	



(PAP-00210642)

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00000957), (PAS-00083180-81, PAS-00109609-10).

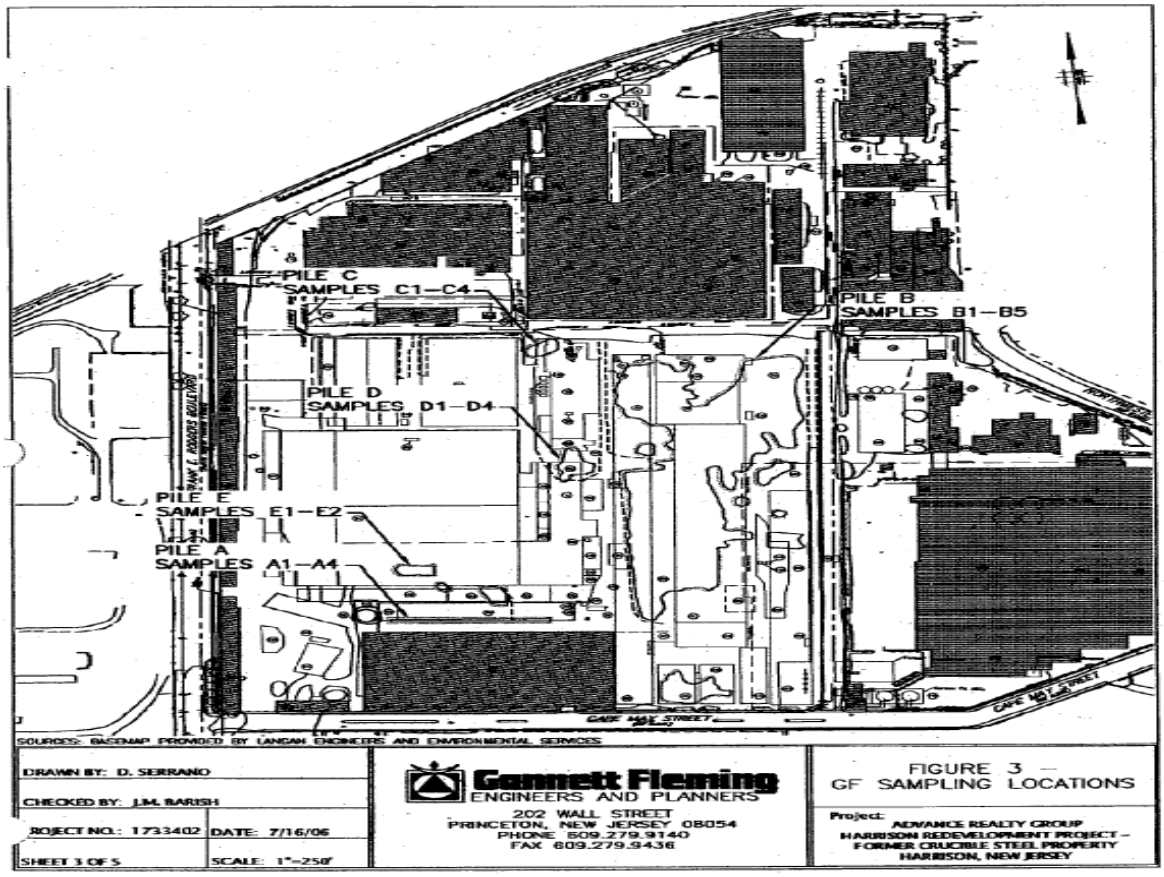
COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	3,710 mg/kg
Copper	432 mg/kg
Mercury	10.2 mg/kg
Benzo(a)anthracene	150 mg/kg
Benzo(a)pyrene	130 mg/kg
Benzo(b)fluoranthene	100 mg/kg
Benzo(k)fluoranthene	630 mg/kg
Dibenzo(a,h)anthracene	250 mg/kg
Indeno(1,2,3-cd)pyrene	570 mg/kg

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] NJDEP, *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,700), copper (11.2/92.9), and mercury (0.21/3.7).

According to the November 2008 RI/RA Report, unconsolidated subsurface materials consist of historic fill as defined by NJDEP, ranging between two and 20 feet thick across the property. The fill is a mixture of sand, gavel, coal, ash, cinders and other debris (i.e., concrete, brick) derived from various sources, including the Passaic River, to raise the property grade during the initial development in the 1800's to support the development of the property before construction of the Crucible Steel facility (PAP-00190176-77).

According to the November 2008 RI/RA Report, the fill was characterized by analyzing 63 samples for metals and 91 samples for Base Neutral (BN)/PAHs, respectively. PAHs and metals (copper, lead and mercury) were detected at concentrations exceeding the soil cleanup criteria in effect at the time the work was done. The November 2008 RI/RA Report concluded that these constituents were inherent to fill and that no further actions other than installing the engineering and institutional controls described in the RAWP were warranted (PAP-00190177).

According to the August 2006 Soil Reuse Plan, the fill was sampled at 14 locations in April 2006. Each sample was collected from approximately two feet below the fill surface. Sampling locations are shown on the figure below (PAP-00190220). Note: Appendix C, containing laboratory data, was missing from the August 2006 Soil Reuse Plan.



(PAP-00190226)

According to the August 2006 Soil Reuse Plan, the material from AOC 8 (containing PCBs and PAHs below the Residential Direct Contact Soil Remediation Standards [DCSRS]) was to be used as fill for excavations dug during the soil remediation program. Remaining material was to be used as fill during redevelopment activities (PAP-00190222).

5. COC Pathways

According to the November 2008 RI/RA Report, the Passaic River is immediately south of the property and flows west to east along the reach adjacent to the site. No other surface water bodies are present on or immediately adjacent to the property (PAP-00190176).

Sanitary Sewer

According to the 2002 PA Report, since the original construction to present (2002), sanitary and storm discharge went to the PVSC and non-contact cooling water discharge went to a cistern which discharges to the Passaic River (PAP-00190130).

According to a February 20, 1990 letter to NJDEP from Guyon, all sanitary wastes from the leasehold portion of the facility were discharged into common collectors from locations throughout both the leasehold and non-leasehold portion of the industrial complex. Thus, the sanitary waste collection system is considered “common property” of the entire industrial complex. The PVSC verified that sanitary wastes from the entire industrial complex entered the PVSC collection system and treatment plant in Newark, New Jersey (PAS-00083195).

According to the Pichalski Declaration, there were no wastewater discharges from any operations to the Passaic River. All sanitary waste was discharged to a piping system, which went to the publically owned treatment works operated by the PVSC (PAP-00190187).

Storm Sewer

According to a February 20, 1990 letter to NJDEP from Guyon, the stormwater from roof drains and surface water runoff from paved areas within the leasehold area collect in a cistern which discharges into the Passaic River (PAS-00083195).

According to a Response to EPA Request for Information by North Jersey Appliance Warehouse, Inc., dated October 17, 1996, the storm sewer system collected and discharged rainwater runoff from roofs and paved surfaces. The storm sewer system was believed to discharge ultimately into the Passaic River (PAS-00076887). However, no diagrams of the storm sewer lines were in the possession of North Jersey Appliance (PAS-00076888).

North Jersey Appliance additionally reported that the facility was prone to storm sewer back up during periods of heavy, persistent rainfall. At such times, it was stated that storm water tended to overload the flow capacity of the storm sewers and pond up at low points on the property, but did not enter the buildings. It was also stated that one of the

storm sewer lines (all of which were believed to date back many decades) running from the loading dock area apparently experienced an internal collapse at one or more locations along the run and had been clogged for several years. North Jersey Appliance stated that they utilized a sump pump at the loading dock area to redirect storm water that collected at the low point of the ramp and that the storm water was pumped through a hose to an outlying collection grate (PAS-00076890).

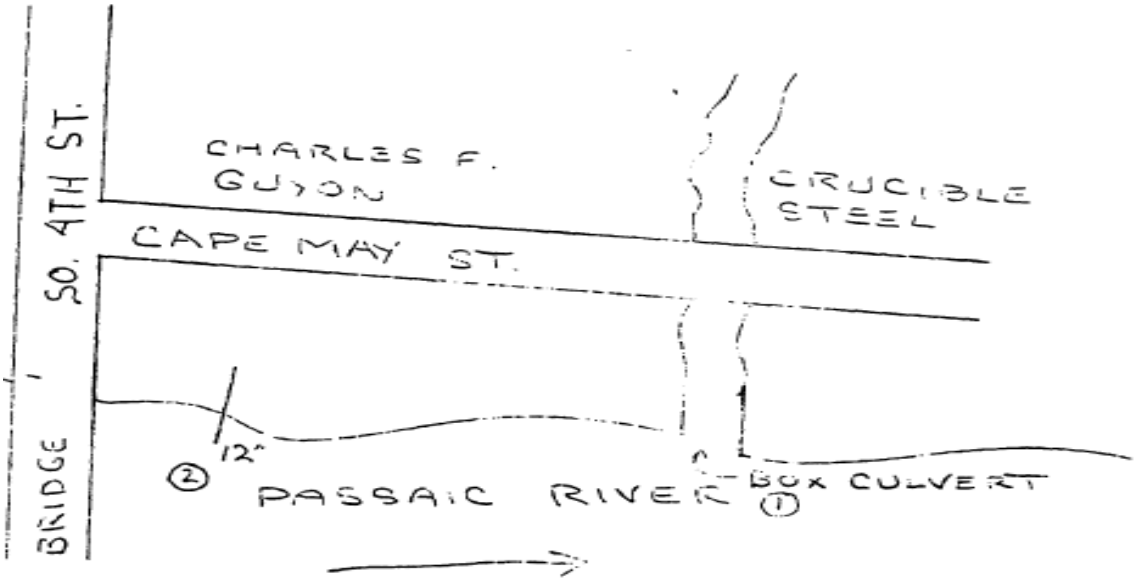
According to the Pichalski Declaration, in 1976, there were some historic storm water drains at several locations on the site. However, they were all plugged up with dirt and were unusable. Thus, there were at the time no functioning storm drains or conduits. However, Mr. Pichalski stated that he noticed that storm water tended to gather along the onsite roadway known as Valley Forge Road between buildings G-13A and G-13B on the north site and G-15 on the south side (PAP-00190188).

Direct Release

According to the 2002 PA Report, the river water cistern handled surface water runoff as well as non-contact cooling water for former site operations. The river water cistern was located adjacent to the northwest corner of Building 55 and is approximately 35 feet in diameter. *Note Figure G1 in Appendix G with location was missing from the report.* The feature was constructed of brick and contained several large diameter river water intake pipes, as well as, smaller diameter pipes from the site. Mr. Ted Pichalshi stated that process wastes were disposed offsite, however no documentation currently exists. Furthermore, he had no knowledge of disposal onsite (PAP-00190154).

According to a 2015 Husch Blackwell letter, PVSC filed suit against Crucible Steel in 1970 for discharging oil through a box culvert installed by Crucible into the Passaic River from 1969 through 1971 from the adjacent Spaulding Works site (PAS-00076889; PAS-00000875). Crucible took several steps to prevent oil discharges from its plant, but investigations revealed that the oil observed at the outfall was originating from an unknown offsite source discharging to part of the drainage system known as Guyon Lateral No. 1. This is also documented in a 1971 PVSC Annual Report. The oil discharge ceased when the lateral was plugged (PAS-00048071-72; PAS-00070955-56; PAS-00000874-81). It is noted that the documents state that Crucible suspected that Teval could have been a potential source of the oily discharge, but Teval was determined not to be a source of the oily discharge. According to the Pichalski Declaration, Mr. Pichalski did not observe any connections from the Teval property to the outfall associated with the aforementioned discharge (PAS-00070955-56; PAP-00190190).

According to the Pichalski Declaration, during his time at the facility, he only observed two outfalls from the Teval property that discharged to the Passaic River. These included (1) a pipe from a cistern and (2) a plugged eight-foot diameter pipe on the southeast side of the property along the boundary with Spiegel Trucking Company (PAP-00190193). He reported that Teval routed stormwater runoff to the cistern, which previously had been installed at the site by Crucible. The cistern was 40 feet deep and connected to the Passaic River by a large concrete pipe, approximately 48 inches in diameter (PAP-00190188). A site map shows the location of one storm sewer outfall (see below).



(PAS-00083136)

Spills

According to the Pichalski Declaration, spills or dumping of waste material outdoors from any of the Guyon buildings was not observed (PAP-00190187). There were no floor drains in any of the buildings and indoor spills were quickly cleaned up (PAP-00190188). The Pichalski Declaration also reported any spills in the battery storage building G-18 were promptly cleaned up with rags, and the rags were drummed and disposed offsite (PAP-00190195).

The Pichalski Declaration reported that Mr. Pichalski was shown two affidavits which were filed in a case in the Superior Court of New Jersey entitled Passaic Valley Sewerage Commissioners v. Crucible Steel Corporation of America including one dated June 5, 1970 and the other dated January 25, 1971. The subject of that litigation and affidavits was an alleged release of oil to the Passaic River in 1970 from the outfall of a large underground drainage system from the property which at that time, according to the affidavits, extended under the adjacent Crucible Steel property and also under property which was then owned by Guyon and a number of others. The description of the oil found leaking in 1970 from the large pipe was described as having the appearance of a fine number 2 type fuel oil, or mineral oil, which had suspended in it a fine powdery or pulverized substance. Although Mr. Pichalski was not on site in 1970, he was not aware of any oily material that was used or generated by Guyon at any time that would have matched this description of what was apparently released from the large pipe in 1970. He stated that Guyon did not use No. 2 fuel oil and that their fuel was diesel and gasoline, which was stored in USTs in front of Building G-18 (PAP-00190190, PAS-00000862). It should be noted that a No. 2 oil AST was reportedly located on a concrete pad at the north end of the annealing and bending operations area. However, the period of operation for this AST was not noted in the reference material (PAS-00000961).

6. Regulatory History/Enforcement Actions

Inspections and Violation

According to a Report of Inspection, dated March 22, 1990 of Fabco Piping, Inc. involving Guyon Piping, the inspector noted several transformers inside a fenced area beside the garage. There was no staining of the soil beneath the transformers. The owners and PCB content were unknown on the day of inspection. The inspection also notes small quantities of hazardous materials in the form of cleaning substances (mostly phenols) being temporarily stored near the entrance to the main building (PAS-00083208).

According to the 2002 PA Report, no enforcement actions (Notice of Violations, Court Orders, official notices or directives) for violations of environmental laws or regulations were involved at the site (PAP-00190141).

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the site:

- Remediation/Decommissioning Results, Fabco Piping, Inc., 1000 South Fourth Street, Harrison, New Jersey 07029 (May 1990) (PAS-00000945-1001)
- Sampling Plan Results and Cleanup Plan Addendum, Fabco Piping, Inc. (Dec 1990) (PAP-00190162)
- Final Remedial Action Report (DRAFT), Fabco Piping, Inc. (1993) (PAP-00190163)
- Underground Storage Tank Remedial Investigation Report (Feb 1995) (PAP-00190164)
- Preliminary Assessment Report, Harrison Redevelopment, Former Crucible Steel Site (January 2002) (PAP-00190126-168)
- Remedial Investigation/Remedial Action Report, Miles A Galin Property, 1000 4th Street South, Harrison, NJ (November 2008) (PAP-00190169-182)

Soil

According to the November 2008 RI/RA Report, an RAWP included with the SI report described the scope of activities to be performed during site redevelopment to address environmental conditions identified by the SI and prior studies. The proposed work included limited “hot spot” soil removal with post excavation sampling; removing USTs; recovering free phase product; reusing stockpiled historic fill as backfill; abandoning the groundwater monitoring well network and the reinstallation of wells (PAP-00190179).

Remedial Activities

According to the 2002 PA Report, two remediation events occurred at the site. The first was completed as part of the closure of the Fabco Piping, Inc. leasehold under the oversight of ECRA/ISRA (No. 88800). The second was UST closure activities (UST Facility No. 0226244, NJ Spill No. 93-05-04-1437) conducted by Guyon (PAP-00190160). These two activities are summaries below.

Fabco Piping, Inc. (ISRA No. 88800)

In 1980, Fabco leased the southwest portion of the Guyon property for pipe fabricating operations. Fabco's operations were contained to buildings G-1, G-2, a portion of G-3, G-6, G-7, G-8, and G-9, a portion of G-10 and G-14 and a portion of G-15 (PAP-00190160). The following descriptions relate to investigations and remediation activities completed in the Fabco leasehold portion of the Guyon property (PAP-00190160):

On May 25, 1990, First Environment reported excavation and disposal of contaminated soils (approximately 69.8 8 tons) from the Exterior of the Paint shop. Collection and analysis of post excavation samples from 16-22 inches below ground surface (bgs) was conducted. Based on the analytical results, soils were excavated and stockpiled for proper offsite disposal in March 1990. The material was disposed in May 1990 as a non-hazardous waste (PAP-00190161, 63; PAS-00000955). Additional soils were removed on September 20, 1993 to the underling clay layer (4.0 to 5.5 feet bgs). Post-excavation samples revealed lead concentrations below the property cleanup level. On September 2, 1994, NJDEP issued a letter stating that the Fabco portion of the site complied with ISRA and that No Further Action was warranted (PAP-00190163).

Railroad tracks were excavated and stained soils were disposed (approximately 2 cubic yards) on March 2, 1990. Excavated soils were disposed of offsite as hazardous waste due to the presence of 12.8 ppm of EP Tox lead. Post-excavation samples were not collected (PAS-00000960; PAP-00190161).

Stained sediments from the floor of a Concrete Floor Lean-To in the annealing and bending area were removed (approximately 0.25 cubic yards). This area contained a No. 2 fuel oil AST according to the May 1990 R/D Results. Excavated soils were disposed of offsite as hazardous waste due to the presence of 12.8 ppm EP Tox lead (PAS-00000961; PAP-00190161).

Sandblasting operations were located in the southwest corner of the leasehold area. Metal products were apparently sandblasted to clean them after the fabrication process was completed and prior to painting. Excess sandblast grit, approximately 475 tons, abandoned by Fabco was removed and disposed offsite by Guyon. (PAS-00083195).

Former Guyon General Piping, Inc. UST Closures (UST Facility No. 0226244; NJ Spill No. 93-05-04-1437)

In 1994, Guyon completed the closure of seven regulated USTs. The following description relates to remediation activities completed by Guyon (PAP-00190164):

A February 3, 1995, Underground Storage Tank Remedial Investigation Report detailed that seven regulated USTs were closed in 1994. The report states that soil contamination did not impact groundwater and that the horizontal and vertical extent of soil contamination was delineated, and over 200 tons of contaminated soil was remediated. On December 22, 1995, NJDEP approved No Further Action for the UST area (PAP- 00190164).

According to the Pichalski Declaration, after Fabco terminated its lease in 1988, the property was inspected by the NJDEP under ECRA, and determined that there was residual contamination resulting from site activities, notably in the areas where sandblast residue had formerly been stored in the area outside Building G-16 and where paint waste had been stored near Building G-14. Mr. Pichalski also stated that Teval remediated the property between 1990 and 1994 (PAP-00190196). NJDEP issued a No Further Action letter dated September 2, 1994 based on the implementation and completion of the Remedial Action Workplan, Final Report, and NJDEP investigation of the site (PAP-00190156; PAP-00190213).

According to a December 22, 1995 letter from NJDEP, Teval complied with the requirements regarding the remedial investigation and remedial action related to one 2,000 gallon leaded gasoline UST, one 8,000 gallon diesel UST, one 8,000 gallon leaded gasoline UST, one 500 gallon hydraulic oil UST, two 2,000 gallon hydraulic oil USTs, and one 6,000 gallon No. 2 Fuel Oil UST. The December 22, 1995 letter from NJDEP, NJDEP issued a No Further Action letter associated with the USTs (PAP-00190157).

According to the November 2008 RI/RA Report, NJDEP recommended that the RA and site closure be coordinated with USEPA due to the presence of TSCA level of PCBs. On April 16, 2007, NJDEP and USEPA agreed that the Self Implementing Cleanup rules under 40 CFR 761 would be an appropriate remedial strategy. The plan was approved by USEPA on November 9, 2007 and by NJDEP on April 1, 2008 (PAP-00190182).

According to the November 2008 RI/RA Report, the RA consisted of excavating fill with PCBs exceeding 10 mg/kg and disposing of the material offsite as TSCA or non-TSCA regulated waste. Analytical results of in-place samples were used to define and segregate the fill for disposal as required by USEPA. The RA was performed in June and July 2008, which resulted in the removal of approximately 1,400 tons of PCB-impacted fill. Imported clean fill was used to backfill the excavations at the request of NJDEP (PAP-00190182).

According to the November 2008 RI/RA Report, after the receipt of NJDEP's "Comfort Letter," the property was to be transferred to the Town of Harrison under an existing agreement. The November 2008 RI/RA Report states that the Town of Harrison was to be responsible for installing and maintaining the final engineering control (PAP-00190182).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

TEXTRON, INC.

Facility Name, Address and Size: Textron, Inc., 681 Main Street, Belleville, New Jersey; Block 56, Lots 5, 6, 7, 9, and 31; Buildings 4A, 6B, 9-12, 12A, 14, 17, 18, 22, and 23 (PAS-00102978); 15 acres in what is currently the Belleville Industrial Center (PAS-00103078). Note: Conveyance documents were not available for review to verify the site description. Employee and shift information was not available in the available file material.

1. **Business Type:** Production of artificial leather and vinyl plastics (PAP-00145594; PAS-00103079).

2. **Time Period of Ownership/Operations**

Operator: August 13, 1956 to April 1962
Owner: August 1956 to April 1962

1956: On August 13, 1956, Textron, Inc. (Textron) purchased the assets of Federal Leather Company excluding any obligations or liabilities (PAP-00145546; PAP-00208634).

1958: Textron Inc. transferred the business and assets of its Federal Industries Division to Federal Industries, Inc., a subsidiary of Textron, Inc. (PAP-00208626).

1962: On April 25, 1962, Textron Industries, Inc. sold the assets of the Federal Industries Division to Air Reduction Company (also known as Airco) (PAP-00145518).

1962-1966: Cumberland Chemical Company owned the Facility from April 30, 1962 until December 30, 1966 (PAS-00103078).

1970: Belleville Industrial Center owned and operated the site starting in 1968 and from 1975 to 2001 Helion Industries was a tenant of Belleville Industrial Center (PAS-00102979).

3. **Operational History/COC Use and Presence at the Facility**

Note that available references contain minimal information regarding operations, chemicals used and releases for Textron during its period of operation and ownership at this site location.

According to a Preliminary Assessment Report, Ideal Plating and Polishing Company, Inc., Belleville, Essex County, dated July 28, 1993 (1993 PAR), a 1938 Sanborn Company Insurance Map of Belleville shows that Federal Leather covered all of Block 56, Lots 5, 6, 7, 9 and 31. The Sanborn Map shows that Federal Leather contained a foundry, a wire rope factory, numerous solvent/fuel/naphtha tanks, a dye grinding shop, a lacquer storage facility, a varnishing and drying shop, a dope mixing shop, a chemical storage area, a dye house, and a solvent recovery shop (PAS-00103079). It is not known if these features were present during Textron's ownership or operation of the Facility from 1956-1962 or any subsequent operations. Textron operations at the

property included producing vinyl coated fabrics, dyeing finishing textiles, and producing automobile seat covers and injection molded vinyl parts (PAP-00145594; PAS-00103079).

In order to impart the properties of flame-retardancy and mildew resistance into textile materials, Textron's subsidiaries impregnated such materials with an antimony triflouride solution. In addition, the company had a method for making a highly stretchable laminated knitted fabric. That process involved applying plasticized vinyl resin to materials using coating machines. The machines applying the plasticized vinyl resin used methyl ethyl ketone as a solvent (PAP-00145594-95).

According to a Preliminary Assessment Report, dated February 10, 2003 (2003 PAR), trenches and sumps were used by Helion to direct process wastewaters to the property's sewer system and ultimately to the Passaic Valley Sewerage Commission (PVSC) (PAS-00103072). A narrative of the Belleville Industrial tenant Helion's disposal processes for all historic and current process waste streams and disposal points describes wastewater management for Buildings 11C and 9C at the site during Helion's occupancy "The wastewaters were pumped through trenches in the floors of the buildings to the production/mixing outlet No. 1 located along the northern end of building 11C. From there, the wastewaters were discharged to a trench that transected building 11B and ultimately discharged through the northwestern end of building 14A to the sewer system" (PAS-00103069).

According to the April 25, 1962 Purchase Agreement between Textron and Air Reduction Company, the following purchase agreements were in effect.

19. Various purchase contracts:

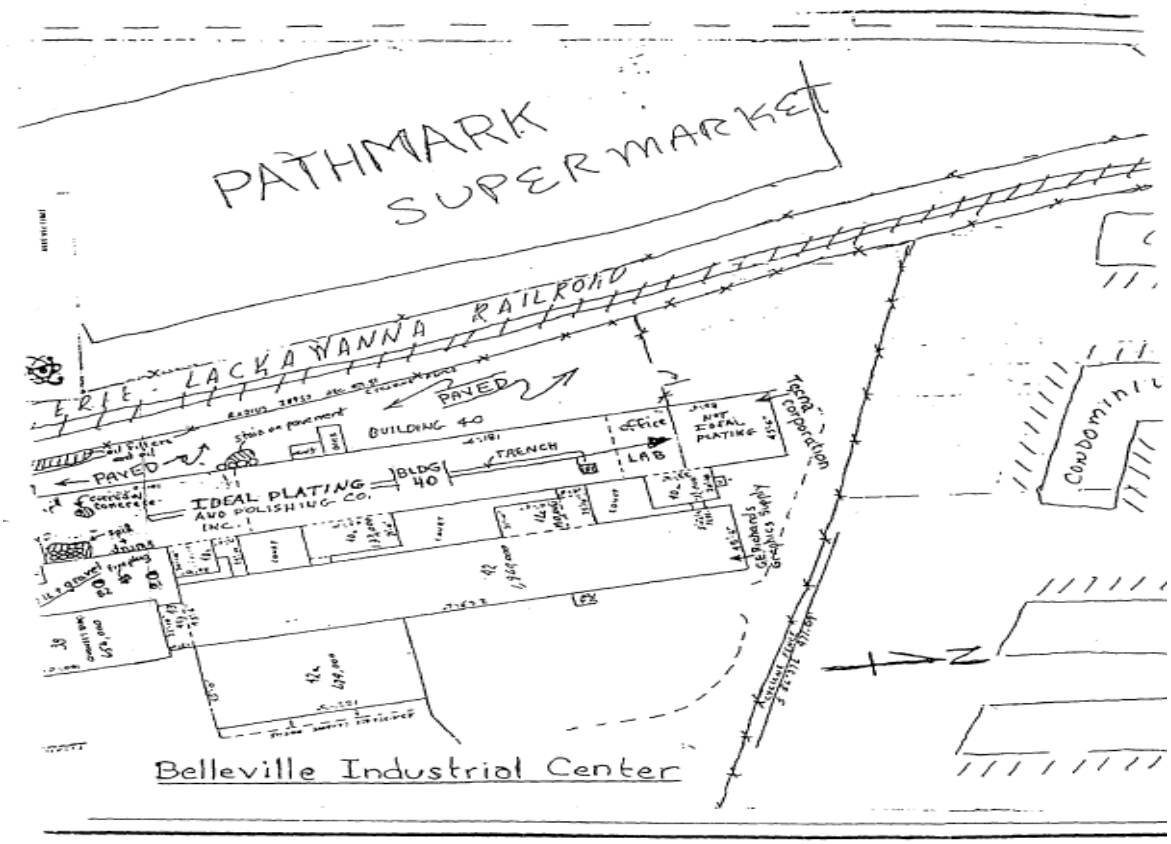
Date	Seller	Item
11/22/61	Amoco Chemical Corporation	Chemicals
9/8/61	Barker Industrial Trucks	Maintenance service for material handling equipment
12/11/61	Celanese Chemical Company	Chemicals
1/1/62-12/31/62	E. I. duPont de Nemours & Co., Inc.	Chemicals
12/13/61	Enjay Chemical Company	Chemicals
1/9/62	Monsanto Chemical Company	Chemicals
1/9/62	Monsanto Chemical Company	Chemicals
1/9/62	Monsanto Chemical Company	Chemicals
1/12/62	Monsanto Chemical Company	Chemicals
1/12/62	Monsanto Chemical Company	Chemicals
1/12/62	Monsanto Chemical Company	Chemicals
6/1/61	Northern New Jersey Oil Co.	Bunker fuel oil
11/22/61	Shell Chemical Co.	Chemicals

(PAP-00145540-41; PAP-00208772-73)

The type and quantity of chemicals was not available in the Purchase Agreement (PAP-00145540).

A review of available documents did not provide any additional information regarding processes or chemicals used in manufacturing processes conducted by Textron or its subsidiaries at the facility site.

PAS-00103096



(PAS-00103096)

4. Identified COCs

- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PAHs

The Site Investigation Report, Former Helion Industries, Inc., Buildings 4A, 6B, 9-12, 12A, 14, 17, 18, 22, and 23, Belleville Industrial Center, 681 Main Street, Belleville, New Jersey 07019, dated December 18, 2003 (2003 SI Report) states the following regarding polycyclic aromatic hydrocarbons (PAHs) “The source of the constituents likely stems from the nearby sump and the former effluent that was received by the sump, and is not believed to be fill related. The exceedances in [Building] 18 were noted directly below a compromised floor drain. As noted in the February 2003 Preliminary Assessment Report, Helion utilized a variety of hazardous materials, including solvents in their operations” (PAS-00102989).

As noted in the 2003 SI Report, sampling concentrations of PAHs including benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and bis(2-ethylhexyl) phthalate were detected in soils adjacent to sumps and floor drains in Buildings 11C and 18 (PAS-00102982; PAS-00102988). Below is a table summarizing the exceedances.

Summary of Parameters that Exceed Unrestricted Use NJDEP Soil Cleanup Criteria

VOCs	NJDEP Soil Cleanup Criteria (mg/kg)			11C-a (mg/kg)	11C-b (mg/kg)	18 (mg/kg)
Benzene	3	13	1	Non Detect	***6.6***	Non Detect
Cis-1,2-Dichloroethene	79	1000	1	***1.8***	0.94	0.13
Tetrachloroethene	4	6	1	***6.3***	***9***	***6.7***
Trichloroethene	23	54	1	***5.8***	***18***	***5.9***
SVOC						
Benzo[a]anthracene	0.9	4	500	***1.1***	0.37	Non Detect
Benzo[a]pyrene	0.66	0.66	100	***0.91***	0.41	Non Detect
Benzo[b]fluoranthene	0.9	4	50	**1.2**	0.48	Non Detect
Bis(2-Ethylhexyl)phthalate	49	210	100	0.079	0.14	***59***
METALS						
Antimony	14	340	NS	Non Detect	Non Detect	***54***
Copper	600	600	NS	17	98	***990***

Bold and italicized font indicates an exceedance of unrestricted use criteria.
NS: Not Specified

(PAS-00102988)

Metals - Copper, Lead and Mercury

In the 2003 SI Report, sampling results showed that copper was identified in soils adjacent to sumps and floor drains in Building 18. The sample was taken at 0.5 foot to 1 foot below ground surfaces (bgs) and contained 990 mg/kg of copper (PAS-00102988).

Further testing from the 2005 RI Report explained that analytical results for soil samples surrounding and adjacent to the 2003 site investigation sampling did not exceed the unrestricted use NJDEP Soil Cleanup Criteria for copper in sample 11C (PAS-00103179).

According to the 2003 SI Report, the following metal concentrations were detected in soil samples taken from Buildings 14B, 17, and 18 from 0.5-1 ft bgs on October 9, 2003 (PAS-00103002):

Metal Concentrations (mg/kg)							
Metal	**14B-a**	**14B-b**	**14B-c**	**14B-d**	**17-A**	**17-B**	**18**
Copper	14	20	21	25	17	13	990
Lead	19	13	17	15	30	15	280
Mercury	0.1	ND	ND	ND	0.12	ND	0.46

According to the 2005 RI Report, Helion operated in Buildings 9C, 11C, 14B and 18 (PAS-00103181; PAP-00445807). The Hazardous Substance/Waste Inventory for Helion reported 1 gallons/lbs. of waste mercury stored in a fiberglass drum (PAS-00103067).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the Operable Unit 2 (OU2) contaminants of concern (COCs): PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00103002), (PAS-00102988), (PAS-00102988).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	280 mg/kg
Copper	990 mg/kg
Mercury	0.46 mg/kg
Benzo(a)anthracene	1.1 mg/kg
Benzo(a)pyrene	0.91 mg/kg

According to an undated PRP Data Extraction Form for Textron, Inc. (Data Extraction Form), the former Federal Leather Company developed the site in 1916 (PAP-00145593).

There is insufficient information to determine whether referenced soil samples were taken in an area of the site that contained Historic Fill.

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] NJDEP, *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Sanitary Sewer

A review of available documents did not provide information on processes used at the facility for the discharge of wastewater or stormwater during the period of Textron operations nor regarding PVSC discharge permits issued to the facility.

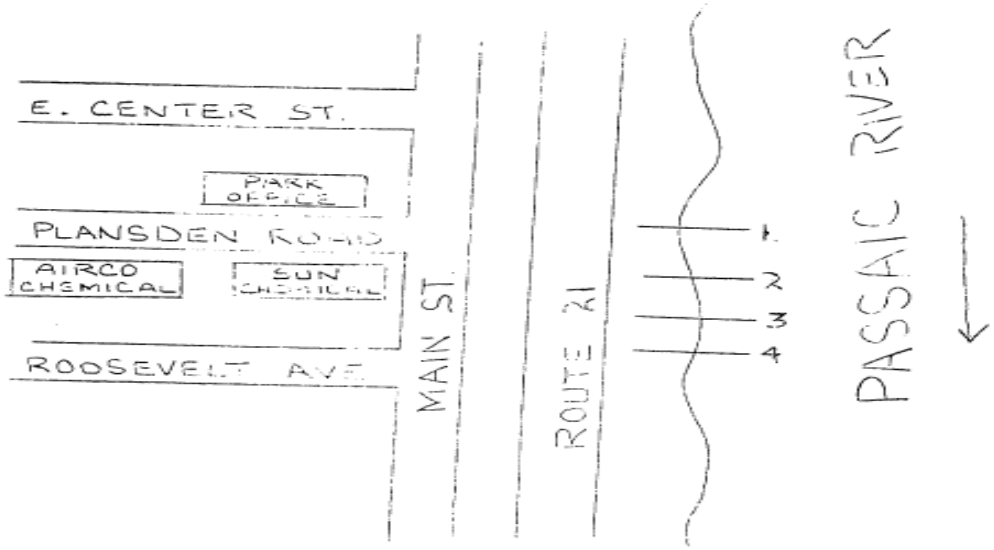
According to the Data Extraction Form, "Prior to at least 1926, sewage and wastes were directly discharging to the Passaic River from the Federal Leather facility. … Sometime after 1926, sanitary sewers were installed to route discharge to the PVSC, with the exception of historic Buildings 9-11 and related process areas drainage until at least June 10, 1977" (PAP-00145598).

No information on discharges to the sewer or PVSC during Textron's ownership period was documented in the available file material.

Storm Sewer

At an unknown date, the Federal Industrial park area contained Sun Chemical Corp and Airco Chemical Plastic Company with four sewer outlets as follows and shown in the map below:

1. 24" storm sewer outlet.
2. 24" storm sewer outlet.
3. 24" storm sewer outlet.
4. 30" pipe used for cooling water only.



(PAS-00103192)

The Data Extraction Form notes that in 1969, the United States Federal Water Pollution Control Administration reported the existence of a storm sewer "from Belleville Industrial Center," which was flowing at the time of observation. The Data Extraction Form also states that:

> "It is believed that this storm sewer is part of the same historic infrastructure identified above" (PAP-00145597).
>
> "In April 1977, PVSC reported the discovery of an illegal cross connection between the floor drains in BIC's [Belleville Industrial Center's] Building 11 with the storm sewer line leading to the Passaic River. … The floor drains in Building 11 are shown on Figure 2 of the BIC's 2003 Site Investigation Report to be part of the floor drain, trench, and sump system that was characterized in this report, and shown to discharge to a "sewer in road for industrial complex" (PAP-00145597).
>
> "The 1977 discovery by PVSC and subsequent correspondence indicates that the wastewater sewer in these buildings was part of the historic facility infrastructure operated previously by Federal Leather. As indicated above, discharges made via this storm sewer line would have likely gone undetected by PVSC, as they did with later tenants of the Site" (PAP-00145597).

The additional areas were connected to the sanitary sewers after at least June 10, 1977 (over 15 years after Textron's subsidiaries' ownership) (PAP-00145598).

Direct Release

According to the 1993 PAR, the site is adjacent to the Passaic River. The 1993 PAR also reported a migration pathway of run-off from the facility to the Passaic River via storm drains (PAS-00103088). The 1993 PAR also states that surface water contamination may occur during fires due to runoff, or due to spills to the storm drain system (PAS-00103090).

According to the 1993 PAR, during a July 19, 1993 site investigation by BFO-SA, Captain Vicari of the Belleville Fire Department stated that he was aware of a number of fires at the facility during the 1960s. He recalled one relatively serious fire, which occurred in a drying room and was accelerated by volatile compounds used in the process. Captain Vicari also stated that methyl ethyl ketone was dumped by employees who used the substance to wash parts (PAS-00103080). Note: Documentation supporting the information provided by Captain Vicari was not identified in the available file materials.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the site:

- Site Investigation Report, Former Helion Industries, Inc., Buildings 4A, 6B, 9-12, 12A, 14, 17, 18, 22, and 23, Belleville Industrial Center, 681 Main Street, Belleville, New Jersey 07019 (December 2003) (PAS-00102974-3005)
- Remedial Investigation, Former Helion Industries, Inc., - Buildings 11 and 18, Bellville Industrial Center, 681 Main Street, Bellville, New Jersey 07109 (January 2005) (PAS-00103165-190)

Sampling

As noted above, the facility site was the subject of a 2003 site investigation and December 2005 remedial investigation; however, a review of available documents did not provide additional information on response actions undertaken at the site.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

TIFFANY AND COMPANY

Facility Name, Address and Size: The Tiffany Plant; 820 Highland Avenue, Newark, New Jersey. According to a Contract Agreement between Tiffany and Company and Campy Construction, dated November 26, 1985, 820 Highland Ave consisted of two tracts; Tract 1 – Block 848B, Lots 1 to 22, and Tract 2 – 3 Parcels A-C and Block 852, Lots 9 and 11. No Lot number was provided for Parcel A-C, just metes and bounds. Parcel A contained 0.077 acres, Parcel B contained 2.09 acres and Parcel C contained 3.07 acres (PAP-00435299, 332-333). No acreage was provided for Tract 1 and Block 852. In a 1972 Passaic Valley Sewerage Commissioners (PVSC) Waste Effluent Survey, Tiffany reported that 157 employees were working five days a week on one shift (PAS-00109140).

1. **Business Type:** Manufacture of sterling silver products and the printing of high quality personal paper products (PAP-00206463).

2. **Time Period of Ownership/Operations**

Operator: 1897 to 1986 (PAS-00109172; PAS-00048871)

Owner: 1890s to 1991 (PAP-00435339; PAP-00435378; PAS-00048870)

1890s: In the 1890s, Louis Tiffany built a facility on the border of Newark and Belleville, New Jersey, located next to Branch Brook Park. The facility was used as a silver plate jewelry factory and warehouse and was located at 820 Highland Avenue in Newark, New Jersey (PAS-00048870).

1970s: In the late 1970s, Tiffany was acquired by Avon Products Inc. (PAS-00048871).

1984: Tiffany employees purchased the company through an employee buy-out (PAS-00048871). The present owner was listed as Avon Products with the sale involving Blocks 848-B and 852, Lots 1, 7, 9, 15, and 19 (PAP-00019996). In addition, Tiffco, Inc., (Tiffco), a Delaware Corporation, entered into an agreement to purchase the stock of Tiffany, which was owned by Avon Products, Inc. on September 12, 1984 (PAS-00048940).

Tiffany entered into an Administrative Consent Order (ACO) with New Jersey Department of Environmental Protection (NJDEP) effective October 12, 1984, to allow the purchase of Tiffany stock by Tiffco, Inc. effective on or about October 15, 1984. Tiffany also notified NJDEP that Tiffany was going to cease operations at the Newark facility on or about June 28, 1985. NJDEP and Tiffany expressly agreed that the stock transfer and cessation were subject to the NJDEP Environmental Cleanup Responsibility Act (ECRA) (PAP-00435037).

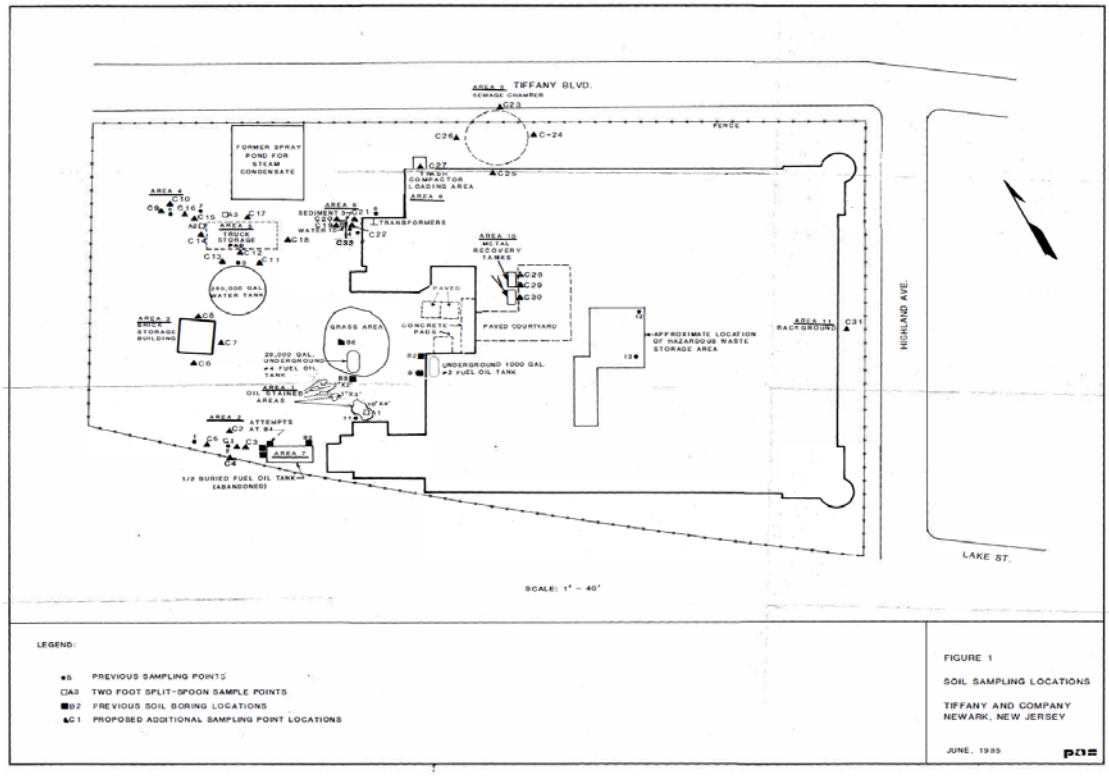
1985: Tiffany informed NJDEP that Tiffany had entered into an Agreement of Sale with Campy Construction on November 25, 1985 (PAP-00435037).

1986: After the Tiffany employee buy-out, the new owners decided to shut the facility down in 1985. The facility was formally closed in 1986 (PAS-00048871). In addition, on September 16, 1986, Tiffany filed an application for a NJDEP ACO for the contract purchase of Block 848B, Lots 1-22 and Block 852, Lots 9 and 11 by Campy Construction (PAP-00442780-86).

1991: Tiffany and Company conveyed to Tiffany Manor Associates, Limited Partnership, (Tiffany Manor), Block 852, Lot 11 in November 1991 (PAP-00435378-79). According to the Title Closing Statement, the Tiffany Factory Building at 820 Highland Avenue was sold to Tiffany Manor Associates, on November 18, 1991 (PAP-00435339). It was agreed that upon closing of the sale, Tiffany Manor would begin the conversion of the building and grounds into 129 residential dwelling units and related parking areas (PAP-00435340).

3. Operational History/COC Use and Presence at the Facility

Operations included the manufacture of sterling silver products and the printing of personal paper products (PAP-00206463; PAS-00048935). In two Tiffany Inter-Departmental Memorandums dated June 7, 1984 and June 18, 1984, the materials used at the facility were stated to include various acids, sodium cyanide, hydrogen peroxide, carbon tetrachloride and potassium cyanide. No OU2 COCs were identified as being used at the facility (PAP-00020031-34). A facility map is included below. The facility map shows that there were transformers on-site; however, there is no documentation that these transformers contained PCBs or that PCBs were detected on site (PAP-00019573).



In the *Environmental Cleanup Responsibility Act (ECRA) Site Evaluation Submission (SES)* dated September 24, 1984 (1984 SES), Tiffany reported that the silver manufacturing process started with silver plates rolled to various thicknesses. These rolled plates were then processed into flatware and hollow ware items. In the process, annealing was required using molten cyanide salts. The parts were then dipped into a 4% solution of sulfuric acid. The residues from these salts and acid were flushed into a below ground concrete holding, diluting, and settling tank. In addition, it was sometimes necessary to clean the parts in a solution of nitric acid and wash them in a solution of ammonia. The residues of the acid and ammonia were also funneled to the settling tank. The effluent, which was reported to be approximately 10,000 gallons per day, was discharged to the PVSC system. Tiffany reported that the effluent was analyzed on a monthly basis. The settling tank was then pumped out approximately once a year and the sludge was refined to reclaim any sterling silver (PAS-00048935).

The stationery manufacturing process included engraving that was completed using copper and steel dies. After pantographing, the dies or plates were placed in an etching tank that contained iron perchloride. This tank was emptied about every four to six weeks. The remains of this tank were then flushed into a below ground concrete holding tank and was discharged to the Passaic Valley Sewerage Commission (PVSC) system under Permit No. 20400950 (PAS-00048935).

4. Identified COCs

- PAHS (used, detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

PAHs

Polycyclic aromatic hydrocarbon (PAH) containing materials such as No. 2 fuel oil and No. 6 fuel oil, were handled at the site as a part of plant operations as shown in the above facility map. The following fuel tanks were located on site:

- 28,000-gallon underground No. 4 fuel oil
- a half-buried abandoned fuel oil
- 1,000-gallon underground No. 2 fuel oil

According to a 1988 Soil Boring Results and Proposed Cleanup report, base neutral extractable organic contamination was noted in two samples collected from the former location of a partially buried fuel oil tank (PAP-00019943). No PAH data were identified in the referenced report.

Copper

The stationery manufacturing process included engraving that was completed using copper and steel dies. After pantographing, the dies or plates were placed in an etching tank that contained iron perchloride. This tank was emptied about every four to six weeks. The remains of this were flushed into a below ground concrete holding tank and discharged to the PVSC system under Permit No. 20400950 (PAS-00048935). The

copper dies used for engraving were purchased from an off-site manufacturer and were stored inside the facility.

In March 1986, copper was detected in surface soil at a maximum concentration of 2,600 parts per million (PAS-00109231-36).

In April 1988, copper was detected in surface soil at a maximum concentration of 320 parts per million (PAP-00019994-95).

Lead

In August 1984, lead was detected in surface soil at a maximum concentration of 1,300 parts per million at 0-6 inches below ground surface (bgs) (PAP-00434712-13). In March 1986, lead was detected in surface soil at maximum concentration of 2,500 ppm at 0-12 inches bgs (PAS-00109231-36).

In April 1988, lead was detected in surface soil at a maximum concentration of 2,100 parts per million at 0- 2 feet bgs (PAP-00019994-95).

There was no indication of lead being used in the available file material reviewed for this report.

Mercury

In April 1988, mercury was detected in surface soil at a maximum concentration of 2.4 parts per million (PAP-00019994-95).

There was no indication of mercury being used in the available file material reviewed for this report.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead,

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current

copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00019994-95; PAS-00109231-36).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,500 mg/kg
Copper	2,600 mg/kg
Mercury	2.4 mg/kg

It is noted that in 1988 a total of 34 borings were drilled throughout the open area of the site per the conditionally approved 1988 Sampling Plan. Using the data from the 34 borings, five subsurface cross-sections were developed to define a contamination pattern on site. According to the 1988 Soil Boring Results and Proposed Cleanup report, base neutral extractable organic contamination was noted in two samples collected from the former location of a partially buried fuel oil tank. Elevated levels of lead and copper were also detected in certain samples throughout the boring grid. Mercury, and other metals were detected in a few isolated samples with no consistent contamination pattern evident (PAP-00019943). The description of the materials encountered in the boring samples included fill; however, the composition of the fill was not presented (PAP-00019959-92).

5. COC Pathways

The Tiffany facility is situated approximately 250 feet from the Second River. Surface drainage is generally east-northeast from the site (PAP-00019416). It is approximately 1.5 miles from the Passaic River (PAS-00048870). No documentation of possible historical direct discharges of wastewater to the river was identified in the available file material.

Sanitary Sewer

An April 1972 Waste Effluent Survey states that, in 1971, Tiffany discharged 8,042,496 gallons of process wastewater to the sanitary sewer. Zero gallons of process wastewater were released to the “storm sewer, river or ditch” (PAS-00009982-83).

According to Individual Monitoring Discharge reports, the following wastewater volumes were discharged from Outlet 200400950-41100-0201.

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version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

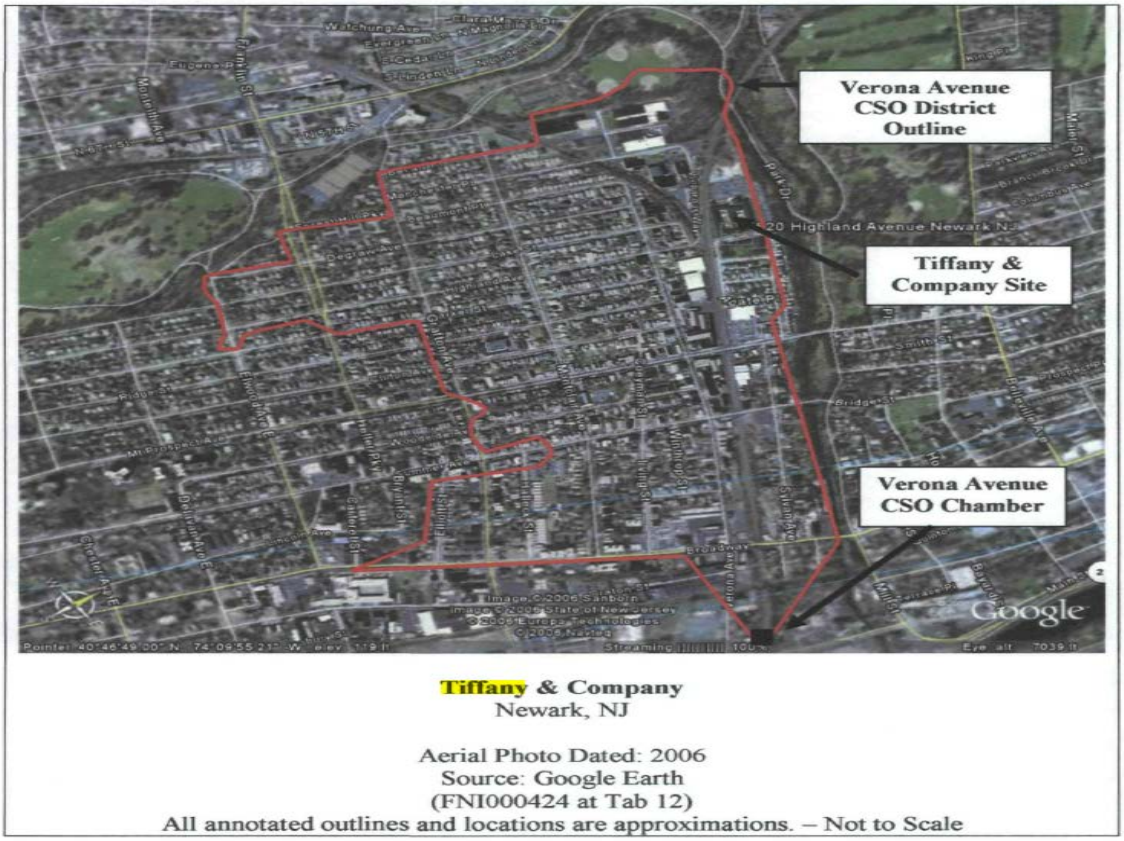
Wastewater Discharge Volume	
Monitoring Period	**Volume Discharged (gallons)**
4-1-1983 to 6-31-1983	2,566,203
7-1-1983 to 9-30-1983	1,255,895

(PAS-00048901-04)

According to an October 25, 1984 letter prepared by Tiffany, all floor drains at the facility lead through a single pipe to a settling tank. The settling tank had an overflow pipe, which allowed all solids to settle to the bottom and permitted only liquids to enter into the monitored discharge of the PVSC system (PAP-00206465-68).

According to the 1984 SES, operational wash water from facility operations was discharged to the sanitary sewer pursuant to a PVSC permit at approximately 10,000 gallons per day (PAS-00048935-36).

Based on a PVSC Plan of Collection System, the following annotated aerial photograph was created for the Lower Passaic River Study Area. It identified Tiffany as being in the Verona Avenue CSO District (PAS-00109014, 281). It was reported that during wet weather events, a portion of the sewer flow in the Verona Avenue CSO District was discharged directly to the Passaic River via the Verona Avenue overflow chamber (PAS-00109276).



Tiffany & Company
Newark, NJ

Aerial Photo Dated: 2006
Source: Google Earth
(FNI000424 at Tab 12)
All annotated outlines and locations are approximations. – Not to Scale

(PAS-00109014)

Stormwater

In an October 25, 1984 letter, Tiffany stated that two outside stormwater drains were present and were reported to empty into the Newark City storm sewer system which ultimately emptied into the PVSC system (PAP-00206465). According to a February 10, 1993 letter to NJDEP, Tiffany had a cistern to store stormwater which was released during low flow periods to the PVSC (PAP-00019759). No further information was identified from the review of the available documents.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

In an April 21, 2016, response to EPA request for information, Tiffany's attorney stated that the 1984 buy-out by Tiffany employees triggered the NJDEP ECRA. Tiffany completed the NJDEP Site Evaluation Submission and the cleanup plan as required which was approved by NJDEP in 1984. The cleanup plan stipulated that Tiffany would be responsible for any contamination found in the investigated areas (PAS-00048871).

Inspections

There is no information regarding inspections in the available file material.

Violations

According to an April 21, 2016, response to EPA request for information, Tiffany did not receive any permit violations from PVSC in the 90 years that if operated (PAS-00048870). No information to confirm or refute the claim was identified in available documents.

Permits

According to the 1984 SES, operational wash water was discharged to the sanitary sewer under PVSC Permit No. 20400950 (PAS-00048935). A PVSC permit was identified in the file material for the effective dates 1981 through 1986; no monitoring for COCs was required by the permit (PAS-00048880-84).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- Letter summary report for the sampling and analysis dated August 30, 1984 (PAP-00434711)

- Sampling and Analysis Plan for Environmental Cleanup Responsibility Act (ECRA) dated September 1984 (PAS-00109155)
- Phase II Sampling and Analysis Plan for Environmental Cleanup Responsibility Act (ECRA) dated August 1985 (PAP-00019736)
- Revised Sampling and Analysis Plan for Environmental Cleanup Responsibility Act (ECRA) dated December 1985 (PAP-00019552)
- Report on Revised Sampling and Analysis Program and Proposed Site Cleanup Plan for Tiffany and Company dated June 1986 (PAS-00109228)
- Report of Sampling and Analysis Program performed at Tiffany and Company Facilities dated February 1987 (PAS-00109240)
- Soil Boring Results and Proposed Cleanup dated 1988 (PAP-00019937)
- Presentation of Findings for Tiffany and Company, ECRA Case No. 84257 dated April 1991 (PAS-00048959)
- Proposed Soil Boring Plan for Tiffany and Company, ECRA Case No. 84257 no date provided (PAP-00434173)

Remedial Activities

In August 1984, 13 areas within the facility were identified as areas of potential environmental concern. Of those, the areas of environmental concern potentially related to releases of COCs, along with location description, and sampling depths are listed below.

Areas of Concern Potentially Related to Releases of COCs			
Site No.	**Description**	**Potential COCs**	**Sampling Depth**
2	Area behind building by Site No. 1 which was the former coal pile area.	Lead	0-6 inches
3	Catch basin with 18 inches of sediment located outside of the boiler room. The catch basin may have received boiler cleaning water.	Lead	6 inches of sediment
4	Soils immediately adjacent to the catch basin (Site No. 3). This sample was obtained to evaluate if stormwater runoff from the catch basin was influencing this area	Lead	0-11 inches
10	Discharge water from catch basin outside of the boiler room. This sample was obtained to identify potential contamination from stormwater runoff and boiler blowdown	Lead	grab water sample

(PAP-00434711-16; PAS-00109181-83)

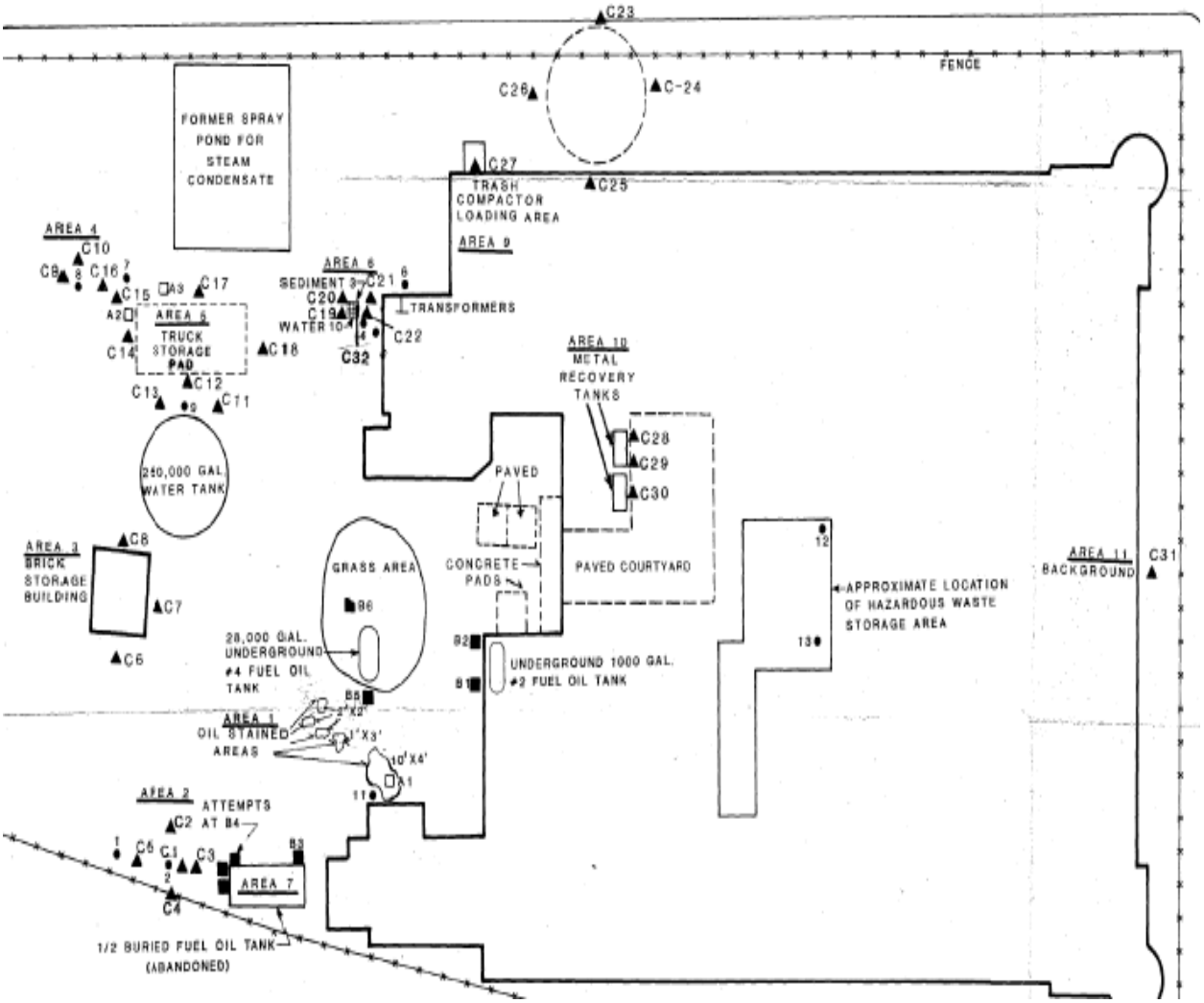
According to an August 30, 1984, letter report, analytical results showed that there were elevated lead concentrations at Area Nos. 2, 3, 4, and 10 (discharge water). Lead was detected at the following concentrations:

- Site No. 2 – 1,300 parts per million (ppm) at 0-6 inches bgs;
- Site No. 3 – 200 ppm at 6 inches of sediment;
- Site No. 4 – 210 ppm at 0-6 inches bgs; and
- Site No. 10 – 1.4 ppm discharge water sample (PAP-00434712-13)

According to the Sampling and Analysis Plan for ECRA prepared by PAS dated September 1984; the Phase II Sampling and Analysis Plan for Environmental Cleanup Responsibility Act (ECRA) dated August 1985; and, the Revised Sampling and Analysis Plan for ECRA dated December 1985, based on the preliminary investigation of August 3, 1984, described above, 11 Areas were identified for further sampling (only those proposed for COC sampling are described below):

- Area 1: Adjacent to the fill neck for a 28,000-gallon underground No. 4 fuel oil tank. At this location there was a stained area of macadam, believed to be overflow from the hose during tank filling of the underground tank. Samples C1-2 were to be analyzed for petroleum hydrocarbons and lead.
- Area 2: Located in the area surrounding former sampling location No. 2 (coal pile). Samples C3-8 were to be analyzed for lead.
- Area 5: Located at the truck storage pad and the surrounding soil. Samples C11-18 were proposed to be analyzed for petroleum hydrocarbons and lead.
- Area 6: Located from around the catch basin (located across from the truck storage pad). Samples C212-23 were proposed to be analyzed for cyanide and lead.
- Area 7 addressed a half-buried abandoned fuel oil tank located where Tiffany proposed to remove the brick structure that encapsulated the tank.
- Area 10 was located at the metal recovery tanks. To demonstrate the integrity of the tanks, three soil borings were proposed. Samples C28-30 were to be analyzed for metals, among other constituents (PAS-00109159; PAP-00019741-44, PAP-00019561-63).

The following figure provides the locations of the sampling that occurred (PAP-00019573):



The *Report on Revised Sampling and Analysis Program and Proposed Site Cleanup Plan for Tiffany and Company* prepared by International Technology Corporation dated June 1986 reported the results from the sampling that occurred on March 11-14, 1986 and proposed a Cleanup Plan for the areas designated in the SAP (PAS-00109230). The following tables summarize the levels of copper and lead concentrations found:

Lead Concentrations Detected		
Sample No.	**Depth**	**Results (ppm)**
C1	0-6 inches	530
C3	0-6 inches	650
C4	0-6 inches	510
C19	0-12 inches	2,500
C20	0-12 inches	150
C21	0-12 inches	210
C22	0-12 inches	1,500
C32	0-12 inches	580

(PAS-00109231-36).

Copper Concentrations Detected		
Sample No.	**Depth**	**Results (ppm)**
C3	0-6 inches	300
C4	0-6 inches	470
C19	0-12 inches	2,600
C20	0-12 inches	230
C21	0-12 inches	260
C22	0-12 inches	1,500
C29	0-10 feet	920
C32	0-12 inches	650

(PAS-00109231-36).

According to the 1988 Soil Boring Results and Proposed Cleanup report, on February 9-10 and April 8, 1988, sampling was conducted with a total of 34 borings drilled and 43 samples retrieved for analysis (PAP-00019940). According to the report, the following results were obtained:

- Base neutral extractable organic contamination was noted in two samples collected from the former location of a partially buried fuel oil tank. No data for these samples was included in the available references.
- Elevated levels of lead and copper were also detected in certain samples throughout the boring grid.
- Mercury, and other metals were detected in a few isolated samples with no consistent contamination pattern evident (PAP-00442222).

The following data tables present the sampling data identified in the 1988 Soil Boring Results and Proposed Cleanup report ((PAP-00019994-95):

Lead		
Sample No.	**Depth**	**Results (ppm)**
B-03A	2-4 feet	240
B-05A	1-2 feet	280
B-07A	1-2 feet	250
B-09A	1-2 feet	710
B-11A	1-2 feet	130
B-12A	1-2 feet	330
B-14A	0-2 feet	2,100
B-15A	0-2 feet	120
B-16A	0-2 feet	250
B-17A	0-2 feet	130
B-19A	0-2 feet	120
B-20A	0-1.6 feet	720
B-21A	0-1.6 feet	100
B-23A	0-8 inches	330
B-25A	0-6 inches	210
B-26A	0-1.6 feet	270

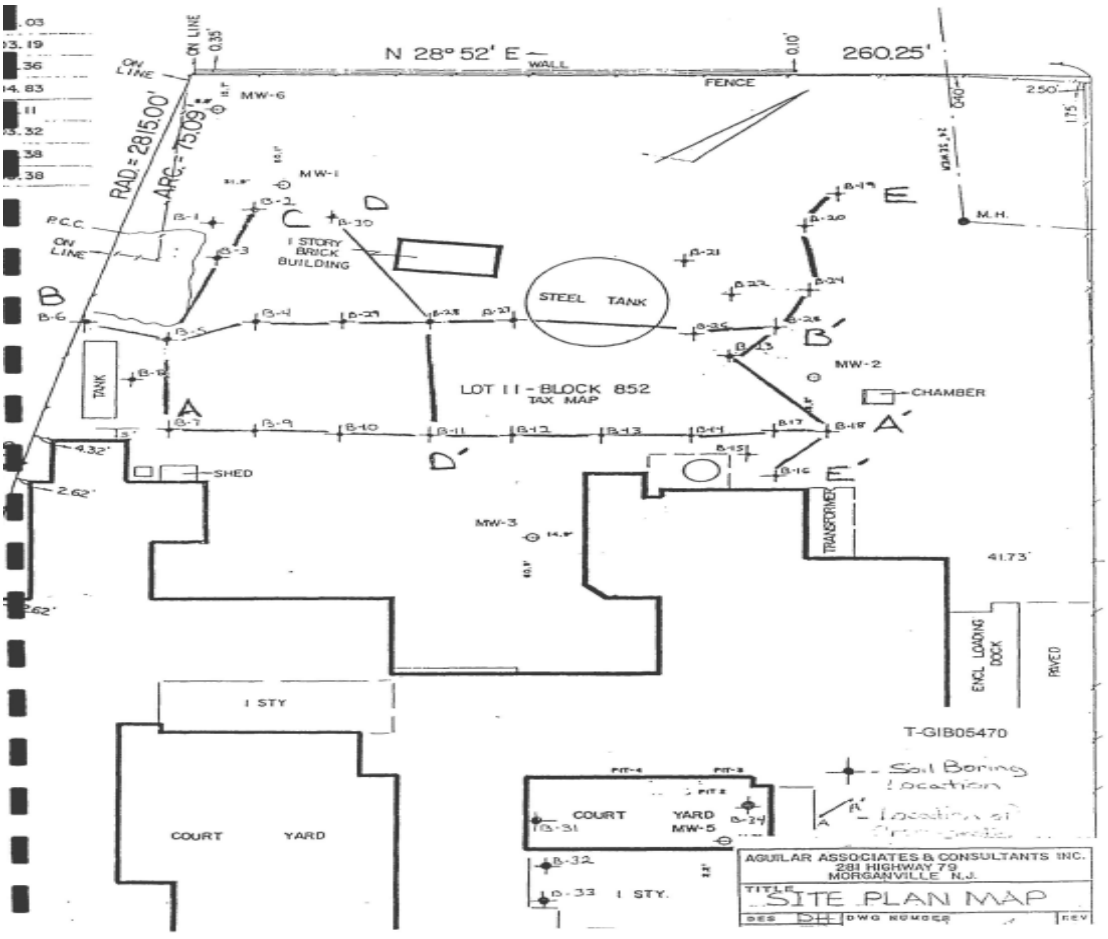
Tiffany & Company

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

Copper		
Sample No.	**Depth**	**Results (ppm)**
B-07A	1-2 feet	190
B-09	1-2 feet	350
B-11A	1-2 feet	200
B-12A	0-2 feet	180
B-14A	0-2 feet	210
B-17A	0-2 feet	270
B-19A	0-2 feet	320
B-20A	0-1.6 feet	190
B-23A	0-8 inches	170

Mercury		
Sample No.	**Depth**	**Results (ppm)**
B-09A	1-2 feet	1.2
B-12A	0-2 feet	2.4
B-13C	4-6 feet	1.0

The following site map identifies the locations of the above-referenced soil boring locations (PAP-00019948).

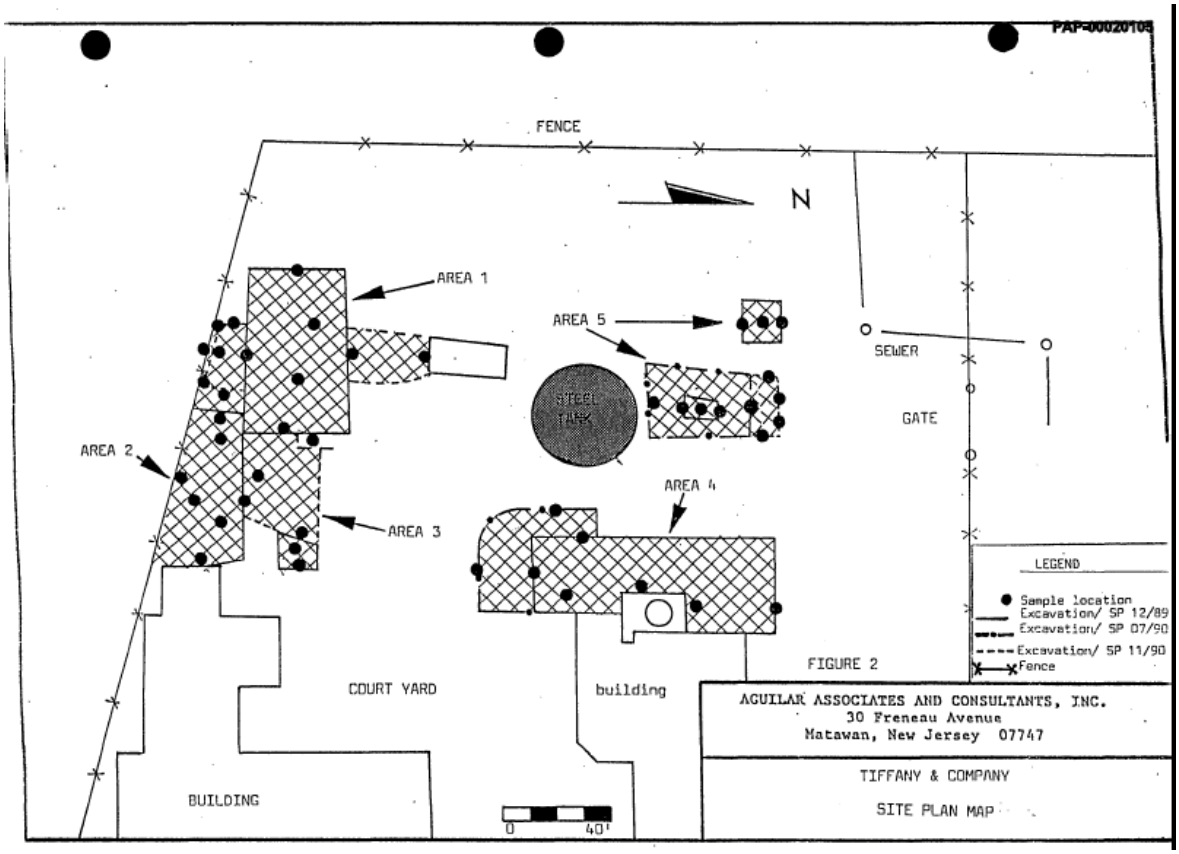


Remedial Activities

According to the *Presentation of Findings for Tiffany and Company*, *ECRA Case No. 84257* prepared by Aguilar Associates & Consultants, Inc. dated April 1991, soil excavation and confirmation sampling activities at the Tiffany facility commenced on December 4, 1989 and were completed on November 29, 1990 for five areas. Of those, COCs were identified at four areas. All excavations were advanced to competent bedrock. Following soil excavation, post-excavation sampling was performed. Soil samples were taken from the sidewalls and from the base of each excavation (PAP-00020104).

Post Excavation Sampling			
Location	**~Total volume of soil excavated**	**~ Depth to competent bedrock**	**COCs**
Area 2	250 – 340 cy	10.5 to 2.0 feet	Base neutral semi-volatile organics, lead, and copper (PAP-00020107)
Area 3	15 cy	2.5 feet	Base neutral semi-volatile organics, copper, lead (PAP-00020111)
Area 4	37 cy	2.5 feet	Base neutrals. Copper, lead (PAP-00020112, 14)
Area 5A	15 cy	2.0 feet	Lead (PAP-00020115)
Area 5B	15 cy; additional 20 feet of soil removed during further excavation on May 8, 1990 and July 17, 1990	Not provided	Lead (PAP-00020117)

The following figure shows the locations of the Areas discussed in the table above (PAP-00020105):



According to the *Presentation of Findings for Tiffany and Company*, *ECRA Case No. 84257* prepared by Aguilar Associates & Consultants, Inc. dated April 1991, Area 10 was identified as an area of concern during an ECRA inspections conducted on August 15, 1990. A drum in the interior courtyard was observed to be leaking an oily substance to the ground. The drum was repacked, and the stained soils were excavated and sampled for base neutral semivolatile organics and total petroleum hydrocarbons. The analytical results showed no base neutral or total petroleum hydrocarbons exceeded ECRA soil action levels (PAP-00020118). No PAH data related to this area was identified in the file material.

According to a letter prepared by legal counsel for Tiffany, data showed that metals contamination identified in soil, including lead and copper, were removed to concentrations below NJDEP "Soil Cleanup Criteria" except for Area 5B where lead marginally exceeded the proposed standard. The letter stated that the areas had been covered with soil and will be covered by a parking lot (PAP-00019733-35). On July 30, 1993, NJDEP deemed the work complete and stated that Tiffany was in "full compliance with ISRA" (PAP-00019721; PAS-00048957)

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

ATTACHMENT K

ALLOCATION OPERATIONS SPREADSHEET

Attachment K

Protocol Calculation			
Allocation Party	AP Base Score	AP Adjusted Base Score	Allocation Share
Occidental Chemical Corp.	83.9193436	167.8386872	0.999396103
Nokia-Lucent Technologies	0.055528253	0.047199015	0.000281047
Pharmacia LLC	0.030947019	0.026304966	0.000156633
PMC, Inc.	0.004923318	0.006400314	3.81107E-05
EnPro Holdings, Inc.	0.005172242	0.004137793	2.46385E-05
Hexcel Corp.	0.004522065	0.004069859	2.4234E-05
Pitt Consol Chemical Company	0.002374923	0.002137431	1.27273E-05
ISP Chemicals LLC	0.002646154	0.002116923	1.26052E-05
Givaudan Fragrances Corp.	0.002302265	0.002072038	1.2338E-05
Congoleum Corp.	0.001945765	0.0016539	9.84815E-06
BASF Corporation	0.001429937	0.001286943	7.66311E-06
Cooper Industries LLC	0.000837515	0.000753673	4.48775E-06
PSE&G Corp.	0.000811297	0.000728658	4.3388E-06
Seton Company, Inc. (Seton Tanning)	0.000355065	0.000461585	2.74851E-06
Hoffman-La Roche Inc.	0.000324829	0.000276105	1.64407E-06
Legacy Vulcan Corporation	0.00028396	0.000241366	1.43721E-06
21st Century Fox America, Inc. (21CFA)	0.000257974	0.000219278	1.30569E-06
Celanese Ltd./CAN Holdings LLC	0.000169159	0.000149105	8.87848E-07
Curtiss-Wright Corporation	0.000111646	0.000117228	6.98037E-07
Teval/Guyon	0.000101253	0.000101253	6.02914E-07
Okonite Company	9.45889E-05	8.98594E-05	5.35068E-07
Alliance Chemical Inc.	7.30389E-05	8.03428E-05	4.78401E-07
Kearny Smelting & Refining	7.29849E-05	8.02834E-05	4.78048E-07
Sherwin Williams Co.	8.95844E-05	7.61468E-05	4.53416E-07
CBS Corporation	9.51582E-05	7.61265E-05	4.53296E-07
Benjamin Moore & Co.	6.46692E-05	5.82023E-05	3.46566E-07
EPEC Polymers, Inc.	7.04684E-05	5.63747E-05	3.35684E-07
Conopco, Inc.	5.76406E-05	5.18765E-05	3.08899E-07
Royce Associates	3.63688E-05	4.72795E-05	2.81526E-07
SpectraServ, Inc.	3.93755E-05	4.13442E-05	2.46184E-07
General Electric Company	4.6004E-05	3.90905E-05	2.32765E-07
Safety Kleen Envirosystems Co./McKesson Corp.	3.73365E-05	3.36028E-05	2.00088E-07
Chevron Environmental Management Co.	4.04923E-05	3.23939E-05	1.92889E-07
Stanley Black & Decker, Inc.	3.69549E-05	2.95639E-05	1.76039E-07
Schiffenhaus Packaging Corp. (Rock-Tenn Company)	2.19603E-05	2.77706E-05	1.6536E-07
Leemilt's Petroleum, Inc.	3.39523E-05	2.71618E-05	1.61735E-07
Tiffany and Company	3.11994E-05	2.49595E-05	1.48622E-07
Atlantic Richfield (ARCO)	2.6247E-05	2.09976E-05	1.2503E-07
Atlas Refining Inc.	1.36096E-05	1.49705E-05	8.91421E-08
DII Industries, LLC	1.83223E-05	1.46578E-05	8.72801E-08
Campbell Foundry Company	1.01799E-05	1.06889E-05	6.3647E-08
Goody Products Inc.	1.09812E-05	9.8831E-06	5.88489E-08
Garfield Molding Company, Inc.	8.0108E-06	6.80918E-06	4.05453E-08
Otis Elevator Co.	6.46365E-06	5.81729E-06	3.46391E-08
Berol Corporation	5.11316E-06	4.09053E-06	2.43571E-08
Franklin Burlington Plastics Inc.	4.30227E-06	3.87204E-06	2.30561E-08
BASF Catalysts LLC	4.17362E-06	3.75626E-06	2.23666E-08
Arkema Inc.	3.48143E-06	3.13329E-06	1.86572E-08
Goodrich Corporation	2.83668E-06	2.41118E-06	1.43574E-08
Textron Inc.	2.19077E-06	1.97169E-06	1.17405E-08
Newark Morning Ledger Co.	1.84198E-06	1.84198E-06	1.09681E-08
PPG Industries Inc.	2.11122E-06	1.79454E-06	1.06856E-08

Alternative Calculation			
Allocation Party	AP Base Score	AP Adjusted Base Score	Allocation Share
Occidental Chemical Corp.	85.0647157	170.1294314	0.929393785
Nokia-Lucent Technologies	7.06297087	6.003525224	0.032796436
Pharmacia LLC	3.944440729	3.352774611	0.018315749
Cooper Industries LLC	0.750058853	0.674967181	0.003687253
Hexcel Corp.	0.579604384	0.521643945	0.002849669
Pitt Consol Chemical Company	0.36195672	0.325761047	0.001779588
21st Century Fox America, Inc. (21CFA)	0.378949964	0.322107469	0.001759629
PMC, Inc.	0.213814105	0.277958337	0.001518448
ISP Chemicals LLC	0.337664005	0.270131203	0.00147569
Congoleum Corp.	0.252014888	0.214212654	0.001170214
BASF Corporation	0.188394086	0.169554677	0.000926254
EnPro Holdings, Inc.	0.163325275	0.130660219	0.000713779
Seton Company, Inc. (Seton Tanning)	0.05681916	0.073864909	0.000403514
Sherwin Williams Co.	0.079368208	0.067462977	0.000368541
Conopco, Inc.	0.055969097	0.050372187	0.000275176
PSE&G Corp.	0.047757026	0.042189636	0.000230476
Kearny Smelting & Refining	0.037152398	0.040867638	0.000223254
CBS Corporation	0.047900008	0.038320006	0.000209337
Hoffman-La Roche Inc.	0.044617908	0.037925222	0.00020718
EPEC Polymers, Inc.	0.044566397	0.035653117	0.000194768
Givaudan Fragrances Corp.	0.038369767	0.03453279	0.000188648
Legacy Vulcan Corporation	0.036105744	0.030689882	0.000167655
Curtiss-Wright Corporation	0.027050597	0.028403127	0.000155162
SpectraServ, Inc.	0.02565963	0.026942612	0.000147184
Schiffenhaus Packaging Corp. (Rock-Tenn Company)	0.016427556	0.020774029	0.000113486
Okonite Company	0.02179977	0.020709781	0.000113135
Alliance Chemical Inc.	0.015929441	0.017522385	9.57224E-05
Celanese Ltd./CAN Holdings LLC	0.015858339	0.014230943	7.77417E-05
Teval/Guyon	0.014042045	0.014042045	7.67098E-05
Benjamin Moore & Co.	0.008197316	0.007377585	4.03027E-05
DII Industries, LLC	0.008917607	0.007134086	3.89725E-05
Safety Kleen Envirosystems Co./McKesson Corp.	0.005793615	0.005214254	2.84848E-05
Royce Associates	0.003573585	0.004645661	2.53786E-05
Chevron Environmental Management Co.	0.005144011	0.004115209	2.24808E-05
Stanley Black & Decker, Inc.	0.004368826	0.003495061	1.9093E-05
BASF Catalysts LLC	0.003868865	0.003481979	1.90216E-05
Tiffany and Company	0.004345019	0.003476015	1.8989E-05
Leemilt's Petroleum, Inc.	0.00429804	0.003438432	1.87837E-05
Otis Elevator Co.	0.003392932	0.003053639	1.66816E-05
Atlantic Richfield (ARCO)	0.003230858	0.002584686	1.41198E-05
Textron Inc.	0.002078673	0.001870806	1.022E-05
Arkema Inc.	0.001913396	0.001722056	9.40736E-06
Atlas Refining Inc.	0.001501546	0.0016517	9.02301E-06
Newark Morning Ledger Co.	0.001553727	0.001553727	8.4878E-06
Campbell Foundry Company	0.001415942	0.001486739	8.12185E-06
Newark Group, Inc.	0.001695479	0.001356383	7.40974E-06
Garfield Molding Company, Inc.	0.001474748	0.001253535	6.84789E-06
Revere Smelting & Refining Corp.	0.001389322	0.001111458	6.07174E-06
Franklin Burlington Plastics Inc.	0.001146599	0.001031939	5.63734E-06
Goodrich Corporation	0.001184215	0.001006582	5.49882E-06
Coats & Clark, Inc.	0.001069637	0.00085571	4.67462E-06
Harris Corporation	0.001020412	0.000816329	4.4595E-06

Attachment K

Protocol Calculation			
Allocation Party	AP Base Score	AP Adjusted Base Score	Allocation Share
Revere Smelting & Refining Corp.	2.14786E-06	1.71829E-06	1.02316E-08
Newark Group, Inc.	2.1058E-06	1.68464E-06	1.00312E-08
Quality Carriers, Inc./Quala Systems	1.979E-06	1.68215E-06	1.00164E-08
Sun Chemical Corporation (Foundry Street Complex)	1.51565E-06	1.2883E-06	7.6712E-09
Coats & Clark, Inc.	1.55326E-06	1.2426E-06	7.39909E-09
Harris Corporation	1.36502E-06	1.09202E-06	6.50242E-09
Foundry Street Corporation (Foundry Street Complex)	5.05217E-07	6.0626E-07	3.60998E-09
Purdue Pharma Technologies Inc.	5.94778E-07	5.05561E-07	3.01037E-09
Ashland Inc.	4.93883E-07	4.44495E-07	2.64675E-09
Neu Holdings (Eden Wood Corporation)	3.79485E-07	4.17433E-07	2.48561E-09
Roman Asphalt Corporation	2.40075E-07	3.12098E-07	1.85839E-09
Alden Leeds Inc.	2.18263E-07	2.6872E-07	1.6001E-09
Passaic Pioneer Properties Co.	2.3268E-07	2.44314E-07	1.45477E-09
Tate & Lyle Ingredients Americas LLC	3.02589E-07	2.42071E-07	1.44141E-09
STWB Inc.	1.28678E-07	1.02943E-07	6.12973E-10
Honeywell International, Inc.	1.01755E-07	8.14041E-08	4.84721E-10
Essex Chemical Corporation	8.41196E-08	7.57077E-08	4.50802E-10
Canning Gumm LLC	7.80917E-08	7.02826E-08	4.18498E-10
Elan Chemical Co., Inc.	1.11154E-08	1.16712E-08	6.94961E-11
Hartz Consumer Group, Inc.	4.66091E-09	3.72873E-09	2.22027E-11
National Standard LLC	7.53824E-10	6.4075E-10	3.81535E-12
Covanta Essex Company	3.81492E-10	3.24268E-10	1.93085E-12

Alternative Calculation			
Allocation Party	AP Base Score	AP Adjusted Base Score	Allocation Share
Goody Products Inc.	0.000573926	0.000516533	2.82175E-06
General Electric Company	0.000604695	0.00051392	2.80747E-06
Purdue Pharma Technologies Inc.	0.000419018	0.000356165	1.94568E-06
PPG Industries Inc.	0.000403158	0.000342684	1.87204E-06
Neu Holdings (Eden Wood Corporation)	0.000283876	0.000312264	1.70586E-06
Passaic Pioneer Properties Co.	0.000207438	0.00021781	1.18987E-06
Quality Carriers, Inc./Quala Systems	0.000250199	0.000212669	1.16178E-06
Tate & Lyle Ingredients Americas LLC	0.000265581	0.000212464	1.16066E-06
Sun Chemical Corporation (Foundry Street Complex)	0.000194701	0.000165496	9.04083E-07
Foundry Street Corporation (Foundry Street Complex)	6.49005E-05	7.78805E-05	4.25451E-07
Honeywell International, Inc.	9.45193E-05	7.56154E-05	4.13077E-07
STWB Inc.	8.635E-05	6.908E-05	3.77375E-07
Essex Chemical Corporation	7.47847E-05	6.73062E-05	3.67685E-07
Canning Gumm LLC	6.7596E-05	6.08364E-05	3.32341E-07
Berol Corporation	2.78085E-05	2.22468E-05	1.21531E-07
Ashland Inc.	2.71968E-06	2.44771E-06	1.33715E-08
Roman Asphalt Corporation	1.30568E-06	1.69738E-06	9.27254E-09
Alden Leeds Inc.	1.18705E-06	1.46146E-06	7.98378E-09
National Standard LLC	8.20024E-07	6.9702E-07	3.80773E-09
Hartz Consumer Group, Inc.	8.30786E-07	6.64629E-07	3.63078E-09
Covanta Essex Company	4.15218E-07	3.52935E-07	1.92804E-09
Elan Chemical Co., Inc.	6.03177E-08	6.33336E-08	3.45983E-10

ATTACHMENT L

FACILITY DATA COMPUTATION SHEETS

Allocation Facility Cmass Calculation

21st Century Fox America, Inc. (21CFA)	100 Lister Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	5,492.36	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	970.45	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	2,517.07	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	0.77	100.00%	-	0.00%	-	100.00%	-	0.77	1.018817E-2	0.01
LPAHs	100.00%	567.02	100.00%	-	0.00%	-	100.00%	-	567.02	1.018817E-2	5.78
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	486.72	100.00%	-	0.00%	-	100.00%	-	486.72	1.018817E-2	4.96
Dieldrin	100.00%	1.11	100.00%	-	0.00%	-	100.00%	-	1.11	1.018817E-2	0.01
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

21st Century Fox America, Inc. (21CFA)	100 Lister Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.01	3.269E-8	1.634E-9
LPAHs	0.01	170,000.00	5.78	3.398E-5	3.398E-7
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	4.96	1.837E-4	2.516E-4
Dieldrin	0.13	390.00	0.01	2.900E-5	3.770E-6
Dioxins_Furans	83.92	38.00	0	2.681E-8	2.250E-6

Allocation Facility COC Base Scores - Alternative Calulcation

21st Century Fox America, Inc. (21CFA)	100 Lister Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.772E-7	0.01	0.03	1.772E-7	8.858E-9
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.882E-4	5.78	26.22	1.882E-4	1.882E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	1.934E-1	4.96	5,216.26	1.934E-1	2.649E-1
Dieldrin	0.13	390.00	1.27	389.99	8.771E-1	0.01	342.04	8.771E-1	1.140E-1
Dioxins_Furans	83.92	38.00	3,729.82	0.00	2.681E-8	0	0	2.681E-8	2.250E-6

Facility Bypass Information

21st Century Fox America, Inc. (21CFA)	**100 Lister Ave**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	2.8 Acres
24	# hours/per day discharged	Organic Chemical Production
5	#days/week discharged	All sanitary water, wastewater and process water discharged to the sewer. No routes of direct entry to the Passaic River. FDR
	#weeks/yr discharged	Directly to PVSC no CSO or Bypass
20,287,112	calc gal/yr discharge	No information on sewer discharge sampling or flowrates - USING SUN CHEMICAL TO ESTIMATE
1939	Yr Ops started	
1972	Yr Ops ceased	According to March 2018 Documentation of Environmental Indicator Determination, there are no current
33	calc #yrs facility operated	or known historic site related surface or waste water conveyances to the Passaic River
Copper (Cu)		
33	#yrs facility discharged	Estimated based on Sun Chemical
2.17	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
5,492.36	calc kg COC discharged	
Lead (Pb)		
33	#yrs facility discharged	Estimated based on Sun Chemical
0.383	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
970.45	calc kg COC discharged	
Mercury (Hg)		
33	#yrs facility discharged	Estimated based on Sun Chemical
0.9933	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,517.07	calc kg COC discharged	
HPAHs		
33	#yrs facility discharged	
	calc mg/L O&G	No Historic Use of PAHs on site
10%	% O&G that is considered PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
33	#yrs facility discharged	
	calc mg/L O&G	No Historic Use of PAHs on site
10%	% O&G that is considered PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
34	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
23	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
27	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
28	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
23	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
5,492.36	kg Copper	
970.45	kg Lead	
2,517.07	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
2.8	ACRES - TOTAL SITE AREA (acres)	FDR page 1	
1.0	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill based on aerial photographs and Google Earth.	
4,046.86	METERS^2/ACRE		
4,047	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1939	Year site operations began	FDR page 1	
1974	Year site processing and storage operations ceased	FDR page 1	
35	NUMBER YEARS DISCHARGE		
14	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Silt/Sand/Gravel, Dark Brown Blend. Bulk density range 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
27,797	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The site is located on regional Historic Fill (FDR page 17)	
Copper (Cu)			
35	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Maximum detected concentration of copper in soils 281 ppm (FDR; PAP-00026600, PAS-00107134, PAP-00026528, PAS-00106903). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
35	YEARS DISCHARGED		
0	MG/KG (AVERAGE CONCENTRATION)	Maximum detected concentration of lead in soils 671 ppm (FDR; PAS-00107134, PAP-00026528, PAS-00106903). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Mercury (Hg)		
35	YEARS DISCHARGED	
0.0	MG/KG (MAX CONCENTRATION)	Maximum detected concentration of mercury in soils 3.6 ppm (PAS-00107134). Set to 0 since less than HF.
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
35	YEARS DISCHARGED	
27.6	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
1	KILOGRAMS DISCHARGED	
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table. LMW PAH concentrations reflect a single sample and HMW PAHs are remvoed from the summation of LMW PAHs. Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.
35	YEARS DISCHARGED	
89	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Other PAH compound maximum concentrations listed in documents.
0.000001	kg per mg (Merck Index)	
2	KILOGRAMS DISCHARGED	
PCBs		NJDEP concluded that PCBs are not a site COC in 2016 (PAP-00026459).
35	YEARS DISCHARGED	FDR does not indicated PCBs in site soils.
0	MG/KG (MAX OF REPORTED CONCENTRATIONS)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		
35	YEARS DISCHARGED within DDx Timeline	DDx timeframe 1940-1974 (35 years).
17510	MG/KG (MAX CONCENTRATION)	DDx concentrations reflect a single sample, ABUST-S1-0.5-2.5 (PAP-00026610). Sum of 510 mg/kg 4,4-DDE, and 17000 mg/kg 4,4-DDT.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
487	KILOGRAMS DISCHARGED	
Dieldrin		
24	YEARS DISCHARGED within Dieldrin Timeline	Dieldrin timeframe 1950-1974 (24 years). The end date for years discharge reflects the year the site was sold.
40	MG/KG (MAX CONCENTRATION)	Sample ABUST S1 (PAP-00026610,6495)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1	KILOGRAMS DISCHARGED	
Dioxins/Furans		2,4-D produced onsite
35	YEARS DISCHARGED	
0.0042	MG/KG (MAX CONCENTRATION)	Detected in range of 0.36-4.2 ug/kg in soils (FDR, PAS-00107212)
0.000001	kg per mg (Merck Index)	
0.00012	calc kg COC discharged	

Sample LA-4-4 (2.5-3.0 ft bgs) (PAP-00026526) Carcinogenic PAH concentrations have been updated to reflect a single sample. Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	21.000	1.0	21.0000
Benzo(a)anthracene	25.000	0.1	2.5000
Benzo(b)fluoranthene	24.000	0.1	2.4000
Benzo(k)fluoranthene	12.000	0.01	0.1200
Chrysene	22.000	0.001	0.0220
Dibenz(a,h)anthracene	0.840	1.0	0.8400
Indeno(1,2,3-cd)pyrene	7.300	0.1	0.7300

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 27.6

Sample LA-4-4 (2.5-3.0 ft bgs) (PAP-00026526)	
Anthracene	13
Acenaphthene	3.4
Acenaphthylene	4.5
Fluorene	8.6
Naphthalene	4.1
Phenanthrene	53
2-Methylnaphthalene	2.4
SUM	89

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
0.77	kg PAHs (Benzo(a)pyrene Equivalent)
2.47	kg PAHs (Other)
0.00	kg PCBs
486.72	kg DDx
1.11	kg Dieldrin
0.0001	kg Dioxins/Furans

491.08	MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	NOTES, COMMENTS, REFERENCES	
1939	Year site operations began	FDR page 1	Randell Inteview dated 1/25/1994 stated he and other works routinely dumped five gallon pails of waste cresol into the Passaic River (PAS-00003917)
1974	Year site processing and storage operations ceased	FDR page 1	Rothberg's Affidavit dated 2/21/06 states "…..it made no sense for employees to hand carry buckets of process waste to the river. He never observed nor had any other knowledge of any employess carrying buckets of waste from the facility across neighboring properties to the river. "I cannot conceive of any reason that anyone would have done such a thing, when the troughs and other disposal areas at the facility provided a ready means for waste disposal and were within approximately fifteen feet of any location within the facility. Nor was waste cresol, which Mr. Randell said was in the buckets, generated at the Newark Plant." (PAP-00027867-68, PAP-00027868)
			According to Google Maps there is a road that goes to the river just west of the property.
35	NUMBER YEARS DISCHARGE		Assume buckets of waste cresol dumped 1 time per year for years of operation

Cresol could be made from coal tar, which contains a number of PAHs.

PAHs

Assume 5 gallons buckets of Cresol Dumped. 8 buckets per year = 40 gallons per year

Assume Cresol contains 10% PAHs

35 YEARS DISCHARGED

Cresol: 8.89#/gallon

MG/KG (TOTAL PAH MAX CONCENTRATION)

40 gallons x 8.89#/gallon x .453592 kg/# = 161.30 kg/yr x 10% = 16.13 kg/yr

0.000001 kg per mg (Merck Index)

16.13 kg/yr x 35 years = 564.55 kg

564.55 KILOGRAMS DISCHARGED

Chrysene		0.001	0.0000
Dibenz(a,h)anthracene		1.0	0.0000
Indeno(1,2,3-cd)pyrene		0.1	0.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.0**

SUMMARY CMASS ESTIMATES:

564.55 kg PAHs MAX

564.55 MASS (KG) DISCHARGED BY OVERLAND FLOW

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

21st Century Fox America, Inc. (21CFA)

100 Lister Ave	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.580E-4	5.0%	Occasional Noncompliance	An RI Report noted spills may have occurred during 1914 (possibly earlier) through the mid-1980s due to several rail lines that crossed the facility, based on buried rail ties discovered at the site (PAS-00107038). Former Montrose Chemical employee Oscar Randall noted that much of the unpaved area at the property was heavily contaminated with spilled substances. The soil was jet black and smelled strongly of cresol, and the groundwater was discolored and smelled (PAS-00106689). According to the interview of Randell dated January 25, 1994, he and other workers would routinely dump five-gallon pails of waste cresol into the Passaic River (PAS-00003917) - not possible to quantify amount. No indication that NOVs issued to facility	-20.0%	0% Cooperation with conduct of allocation and requests for related information -20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.193E-4

AP_ABS	2.193E-4

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

21st Century Fox America, Inc. (21CFA)

100 Lister Ave	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.789E-1	5.0%	Occasional Noncompliance	An RI Report noted spills may have occurred during 1914 (possibly earlier) through the mid-1980s due to several rail lines that crossed the facility, based on buried rail ties discovered at the site (PAS-00107038). Former Montrose Chemical employee Oscar Randall noted that much of the unpaved area at the property was heavily contaminated with spilled substances. The soil was jet black and smelled strongly of cresol, and the groundwater was discolored and smelled (PAS-00106689). According to the interview of Randell dated January 25, 1994, he and other workers would routinely dump five-gallon pails of waste cresol into the Passaic River (PAS-00003917) - not possible to quantify amount. No indication that NOVs issued to facility	-20.0%	0% Cooperation with conduct of allocation and requests for related information -20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.221E-1

AP_ABS	3.221E-1

Allocation Facility Cmass Calculation

Alden Leeds Inc. | **55 Jacobus Avenue** | **Kearny** | **NJ**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	20.17	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	13.45	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Alden Leeds Inc.	**55 Jacobus Avenue**	**Kearny**	**NJ**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Alden Leeds Inc.	**55 Jacobus Avenue**	**Kearny**	**NJ**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Alden Leeds Inc.	**55 Jacobus Avenue**	**Kearny**	**NJ**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Facility used for Office Space and Storage of Raw Materials and Finished Product. No Hazardous Waste
	# hours/per day discharged	No information on sewer discharge
	#days/week discharged	1987 violation order form Hudson Regional Health Commission for connection of septic holding tank to storm drain system
	#weeks/yr discharged	
411,250	calc gal/yr discharge	
1993	Yr Ops started	
2005	Yr Ops ceased	
12	calc #yrs facility operated	
Copper (Cu)		
12	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
12	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
12	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
12	#yrs facility discharged	
18.00	calc mg/L O&G	Based on Alden Leads Hackensack Ave
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1.1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
20.17	calc kg COC discharged	
LPAHs		
12	#yrs facility discharged	
18.00	calc mg/L O&G	Based on Alden Leads Hackensack Ave
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.7	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
13.45	calc kg COC discharged	
PCBs		
-15	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-20	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-5	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	

Dioxins/Furans		
12	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
13	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-7	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-17	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
20.17	kg HPAHs	
13.45	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Alden Leeds Inc.	**100 Hakensack Avenue**	**Newark**	**NJ**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	21.85	100.00%	54.0	53.96	1.018817E-2	0.55
LPAHs	100.00%	-	100.00%	-	0.00%	14.57	100.00%	36.0	35.97	1.018817E-2	0.37
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Alden Leeds Inc.	**100 Hakensack Avenue**	**Newark**	**NJ**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.55	2.291E-6	1.145E-7
LPAHs	0.01	170,000.00	0.37	2.156E-6	2.156E-8
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Alden Leeds Inc.	**100 Hakensack Avenue**	**Newark**	**NJ**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.241E-5	0.55	2.43	1.241E-5	6.207E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.194E-5	0.37	1.66	1.194E-5	1.194E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Alden Leeds Inc.	**100 Hakensack Avenue**	**Newark**	**NJ**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Very limited information. Facility repackaged pool chemicals
24	# hours/per day discharged	1994 PVSC Permit
	#days/week discharged	111,250 gallons sanitary water and 300,000 gallons of process wastewater
250	#days/year discharged	
411,250	calc gal/yr discharge PAS0000007	Discharged wastewater to sanitary sewer and cooling water to storm sewer/river/ditch
1993	Yr Ops started	
2005	Yr Ops ceased	
13	calc #yrs facility operated	
Copper (Cu)		
13	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
13	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
13	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
13	#yrs facility discharged	Only sampling data from 1994
18.00	calc mg/L O&G PAS0000007	18 mg/l Oil & Grease
10%	% O&G that is considered PAHs	13.3 mg/l TPH
60%	% PAHs considered as HPAHs	20.1 mg/l TOC
1.08	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
21.85	calc kg COC discharged	
LPAHs		
13	#yrs facility discharged	Only sampling data from 1994
18.00	calc mg/L O&G PAS0000007	18 mg/l Oil & Grease
10%	% O&G that is considered PAHs	13.3 mg/l TPH
40%	% PAHs considered as LPAHs	20.1 mg/l TOC
0.72	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
14.57	calc kg COC discharged	
PCBs		
-15	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-20	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-5	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
13	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
13	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-7	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-17	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
21.85	kg HPAHs	
14.57	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Very limited information. Facility repackaged pool chemicals
	# days/week discharged	1994 PVSC Permit
	# weeks/yr discharged	1,100,000 gallons of cooling water discharged to Storm sewer/ditch/river
1,100,000	# gals/yr directly discharged PAS0000007	
		Discharged wastewater to sanitary sewer and cooling water to storm sewer/river/ditch
1993	Yr Ops started	
2005	Yr Ops ceased	
12	calc #yrs facility operated	
Copper (Cu)		
12	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
12	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
12	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
12	#yrs facility discharged	Only sampling data from 1994
18.00	calc mg/L O&G PAS0000007	18 mg/l Oil & Grease
10%	% O&G that is considered PAHs	13.3 mg/l TPH
60%	% PAHs considered as HPAHs	20.1 mg/l TOC
1.08	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
53.96	calc kg COC discharged	
LPAHs		
12	#yrs facility discharged	Only sampling data from 1994
18.00	calc mg/L O&G PAS0000007	18 mg/l Oil & Grease
10%	% O&G that is considered PAHs	13.3 mg/l TPH
40%	% PAHs considered as LPAHs	20.1 mg/l TOC
0.72	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
35.97	calc kg COC discharged	
PCBs		
-15	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-20	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-5	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
12	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
13	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-7	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-17	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
53.96	kg HPAHs	
35.97	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Alden Leeds Inc.	2145 McCarter Highway	Newark	NJ	07104

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	8.23%	13.45	100.00%	31.5	32.58	1.018817E-2	0.33
LPAHs	100.00%	-	100.00%	-	8.23%	8.97	100.00%	21.0	21.72	1.018817E-2	0.22
PCBs	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Alden Leeds Inc.	**2145 McCarter Highway**	**Newark**	**NJ**	**07104**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.33	1.383E-6	6.916E-8
LPAHs	0.01	170,000.00	0.22	1.302E-6	1.302E-8
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Alden Leeds Inc.	**2145 McCarter Highway**	**Newark**	**NJ**	**07104**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	7.496E-6	0.33	1.47	7.496E-6	3.748E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	7.210E-6	0.22	1.	7.210E-6	7.210E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Alden Leeds Inc.	**2145 McCarter Highway**	**Newark**	**NJ**	**07104**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Verona Ave	CSO	1.27%	21.70%	
2	Verona Ave	Bypass	7.95%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No information or data regarding CSO discharges.
	# hours/per day discharged	PAS00000045 NJDEP Memorandum from 1993 states "Floor sweepings of chlorinating agents were added to the facility wastewater treatment system and discharged to the combined sewer one time per week." Assumed no COCs involved.
	#days/week discharged	Utilizing Alden Leads Hackensack Ave to estimate
	#weeks/yr discharged	
411,250	calc gal/yr discharge	
1964	Yr Ops started	
1971	Yr Ops ceased	
8	calc #yrs facility operated	
Copper (Cu)		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
8	#yrs facility discharged	Based on Alden Leads Hackensack Avenue
18.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1.1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
13.45	calc kg COC discharged	
LPAHs		
8	#yrs facility discharged	Based on Alden Leads Hackensack Avenue
18.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.7	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
8.97	calc kg COC discharged	
PCBs		
8	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
8	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
8	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
8	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
8	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
8	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
13.45	kg HPAHs	
8.97	kg LPAHs	
-	kg PCBs	
-	kg DDx	

-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Utilizing Alden Leads Hackensack Ave to Estimate
	# days/week discharged	
	# weeks/yr discharged	
1,100,000	# gals/yr directly discharged	
1964	Yr Ops started	
1971	Yr Ops ceased	
7	calc #yrs facility operated	
Copper (Cu)		
7	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
7	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
7	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
7	#yrs facility discharged	
18.00	calc mg/L O&G	Based on Alden Leads Hackensack Ave
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1.08	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
31.48	calc kg COC discharged	
LPAHs		
7	#yrs facility discharged	
18.00	calc mg/L O&G	Based on Alden Leads Hackensack Ave
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.72	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
20.98	calc kg COC discharged	
PCBs		
8	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
8	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
8	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
7	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
8	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
8	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
8	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
31.48	kg HPAHs	
20.98	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Alden Leeds Inc.

2145 McCarter Highway | Newark | NJ | 07104

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.217E-8	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	9.861E-8

100 Hakensack Avenue | Newark | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.361E-7	5.0%	Occasional Noncompliance	Facility had a fire on July 26, 1971 that destroyed the building and resulted in the release of “a large quantity” of chlorinated cyanuric acid into the Second River (PAS-00000022). PVSC presented an Award of Excellence to Alden Leeds-Hackensack Ave. for operations from January 1, 2002 through December 31, 2005 without incurring a reporting or effluent violation (PAP-00097620; PAS-00020963).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	1.701E-7

55 Jacobus Avenue | Kearny | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	5.0%	Occasional Noncompliance	According to a “Field Investigation” form prepared by the Hudson Regional Health Commission, dated April 21, 1987, a “violation order” would be issued to Alden Leeds regarding the connection of a septic holding tank to the storm drain system at the 55 Jacobus Avenue facility (PAS-00000047).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	0

AP_ABS	2.687E-7

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Alden Leeds Inc.

2145 McCarter Highway | Newark | NJ | 07104

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.469E-7	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	5.363E-7

100 Hakensack Avenue | Newark | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.401E-7	5.0%	Occasional Noncompliance	Facility had a fire on July 26, 1971 that destroyed the building and resulted in the release of “a large quantity” of chlorinated cyanuric acid into the Second River (PAS-00000022). PVSC presented an Award of Excellence to Alden Leeds-Hackensack Ave. for operations from January 1, 2002 through December 31, 2005 without incurring a reporting or effluent violation (PAP-00097620; PAS-00020963).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	9.252E-7

55 Jacobus Avenue | Kearny | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	5.0%	Occasional Noncompliance	According to a “Field Investigation” form prepared by the Hudson Regional Health Commission, dated April 21, 1987, a “violation order” would be issued to Alden Leeds regarding the connection of a septic holding tank to the storm drain system at the 55 Jacobus Avenue facility (PAS-00000047).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	0

AP_ABS	1.461E-6

Allocation Facility Cmass Calculation

Alliance Chemical Inc.	33 Avenue P	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	221.17	100.00%	-	0.00%	17,767.89	100.00%	2,865.8	3,086.96	1.018817E-2	31.45
Lead	100.00%	354.83	100.00%	-	0.00%	3,333.18	100.00%	537.6	892.44	1.018817E-2	9.09
Mercury	100.00%	18.87	100.00%	-	0.00%	9.71	100.00%	1.6	20.44	1.018817E-2	0.21
HPAHs	100.00%	22.61	100.00%	-	0.00%	73,646.46	100.00%	11,878.5	11,901.07	1.018817E-2	121.25
LPAHs	100.00%	36.67	100.00%	-	0.00%	49,097.64	100.00%	7,919.0	7,955.64	1.018817E-2	81.05
PCBs	100.00%	5.54	100.00%	-	0.00%	-	100.00%	-	5.54	1.018817E-2	0.06
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Alliance Chemical Inc.	**33 Avenue P**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	31.45	1.498E-5	1.033E-5
Lead	0.01	3,200,000.00	9.09	2.841E-6	2.841E-8
Mercury	0.95	42,000.00	0.21	4.957E-6	4.709E-6
HPAHs	0.05	240,000.00	121.25	5.052E-4	2.526E-5
LPAHs	0.01	170,000.00	81.05	4.768E-4	4.768E-6
PCBs	12.87	26,000.00	0.06	2.171E-6	2.794E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Alliance Chemical Inc.	**33 Avenue P**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.115E-2	31.45	23,374.85	1.115E-2	7.691E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	3.093E-3	9.09	9,887.05	3.093E-3	3.093E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	4.728E-3	0.21	198.36	4.728E-3	4.491E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.738E-3	121.25	535.91	2.738E-3	1.369E-4
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.641E-3	81.05	367.85	2.641E-3	2.641E-5
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.761E-4	0.06	7.12	2.761E-4	3.553E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Alliance Chemical Inc.	**33 Avenue P**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
24,824,386	# gals/yr directly discharged (FDR) (PAS00049812, 49890; PAS-00049812, 49893; PAS-00072817, 72895; PAP-00066317, 66320, 66369)	
1970	Yr Ops started PVSC discharge	
2001	Yr Ops ceased	
31	calc #yrs facility operated	
Copper (Cu)		
31	#yrs facility discharged	
6.10	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
17,767.9	calc kg COC discharged	
Lead (Pb)		
31	#yrs facility discharged	
1.14	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3,333.2	calc kg COC discharged	
Mercury (Hg)		
31	#yrs facility discharged	
0.003	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
9.7	calc kg COC discharged	
HPAHs		
31	#yrs facility discharged	
421	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
25.3	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
73,646.5	calc kg COC discharged	
LPAHs		
31	#yrs facility discharged	
421	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
16.9	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
49,097.6	calc kg COC discharged	
PCBs		
8	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
3	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
18	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
31	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
32	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
16	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
6	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
17,768	kg Copper	
3,333	kg Lead	
10	kg Mercury	
73,646	kg HPAHs	
49,098	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	
24,824,386	# gals/yr directly discharged (FDR) (PAS00049812, 49890; PAS-00049812, 49893; PAS-00072817, 72895; PAP-00066317, 66320, 66369)	assume effluent chars prior to PVSC hookup would have been similar to post PVSC hookup
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1965	Yr Ops started (FDR)	
1970	Yr Ops connected to PVSC (FDR)	
5	calc #yrs facility discharged to Plum Creek	
Copper (Cu)		
5	#yrs facility discharged	
6.10	calc mg/L COC discharged (FDR) (PAS-00072817, 72895; PAP-00066317, 66320, 66369)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,866	calc kg COC discharged	
Lead (Pb)		
5	#yrs facility discharged	
1.14	calc mg/L COC discharged (FDR) (PAS-00072817, 72895; PAP-00066317, 66320, 66369)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
538	calc kg COC discharged	
Mercury (Hg)		
5	#yrs facility discharged	
0.003	calc mg/L COC discharged (FDR) (PAS-00072817, 72895; PAP-00066317, 66320, 66369)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2	calc kg COC discharged	
HPAHs		
5	#yrs facility discharged	
421	calc mg/L O&G discharged; (FDR) (PAS-00072817, 72895; PAP-00066317, 66320, 66369, PAS-00049812, 49893; PAP-00066317, 66416)	
10%	% O&G considered as PAHs	
60%	% COC in PAHs	
25.28	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
11,878.46	calc kg COC discharged	
LPAHs		
5	#yrs facility discharged	
421	calc mg/L O&G discharged; (FDR) (PAS-00072817, 72895; PAP-00066317, 66320, 66369, PAS-00049812, 49893; PAP-00066317, 66416)	
10%	% O&G considered as PAHs	
40%	% COC in PAHs	
16.86	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
7,918.97	calc kg COC discharged	
PCBs		
6	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
6	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
6	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
5	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
6	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
6	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
6	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
2,866	kg Copper	
538	kg Lead	
1.6	kg Mercury	
11,878	kg HPAHs	
7,919	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Alliance Chemical Inc.

33 Avenue P	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.304E-5	10.0%	Periodic Noncompliacne	NOVs issued for hazardous discharges (e.g., acid, corrosive waste, greasy material, pH) from 1973 to 1992 (PAS-00049898, PAP-00065863, PAP-0006643, etc.), including exceedances of lead in samples collected in November 1990 (PAP-00066412). PVSC filed a Complaint dated December 17, 1993, due to continued violation of Permit No.20401080 (for zinc and cyanide). Since it was likely to continue to exceed its discharge limitations and adversely affect public health or safety or the operations of the PVSC system, PVSC demanded revoking the sewerage connection permit (PAP-00216733-36). ...some... fill came from the building, which was destroyed in a January 1980 explosion and fire (PAS-00049994). Unable to quantify releases from explosion and firefighting. Alliance also used the Avenue P landfill site to the south to store their drums; FDR says, "The 1990 Avenue P Landfill Investigative Summary noted that a 1974 aerial photograph identified a road entering the northwestern portion of the Avenue P Landfill from Alliance, and the number of drums on the Alliance premises was significantly reduced. Most of the drums were discovered in the northwest portion of the landfill (PAS-00129646-47)."	0.0%	0% Cooperation with conduct of allocation and requests for related information	8.034E-5

AP_ABS	8.034E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Alliance Chemical Inc.

33 Avenue P	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.593E-2	10.0%	Periodic Noncompliacne	NOVs issued for hazardous discharges (e.g., acid, corrosive waste, greasy material, pH) from 1973 to 1992 (PAS-00049898, PAP-00065863, PAP-0006643, etc.), including exceedances of lead in samples collected in November 1990 (PAP-00066412). PVSC filed a Complaint dated December 17, 1993, due to continued violation of Permit No.20401080 (for zinc and cyanide). Since it was likely to continue to exceed its discharge limitations and adversely affect public health or safety or the operations of the PVSC system, PVSC demanded revoking the sewerage connection permit (PAP-00216733-36). ...some... fill came from the building, which was destroyed in a January 1980 explosion and fire (PAS-00049994). Unable to quantify releases from explosion and firefighting. Alliance also used the Avenue P landfill site to the south to store their drums; FDR says, "The 1990 Avenue P Landfill Investigative Summary noted that a 1974 aerial photograph identified a road entering the northwestern portion of the Avenue P Landfill from Alliance, and the number of drums on the Alliance premises was significantly reduced. Most of the drums were discovered in the northwest portion of the landfill (PAS-00129646-47)."	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.752E-2

AP_ABS	1.752E-2

Allocation Facility Cmass Calculation

Arkema Inc.	25 & 67 Main Street	Belleville	NJ	07109

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	32.97	100.00%	456.98	0.00%	6,854.77	100.00%	-	489.95	1.018817E-2	4.99
Lead	100.00%	34.71	100.00%	140.01	0.00%	2,100.11	100.00%	-	174.72	1.018817E-2	1.78
Mercury	100.00%	0.68	100.00%	1.83	0.00%	27.40	100.00%	-	2.51	1.018817E-2	0.03
HPAHs	100.00%	1.54	100.00%	77.60	0.00%	1,164.06	100.00%	-	79.14	1.018817E-2	0.81
LPAHs	100.00%	-	100.00%	51.74	0.00%	776.04	100.00%	-	51.74	1.018817E-2	0.53
PCBs	100.00%	0.21	100.00%	-	0.00%	-	100.00%	-	0.21	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Arkema Inc.	**25 & 67 Main Street**	**Belleville**	**NJ**	**07109**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	4.99	2.377E-6	1.640E-6
Lead	0.01	3,200,000.00	1.78	5.563E-7	5.563E-9
Mercury	0.95	42,000.00	0.03	6.081E-7	5.777E-7
HPAHs	0.05	240,000.00	0.81	3.360E-6	1.680E-7
LPAHs	0.01	170,000.00	0.53	3.101E-6	3.101E-8
PCBs	12.87	26,000.00	0	8.229E-8	1.059E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Arkema Inc.	25 & 67 Main Street	Belleville	NJ	07109

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.769E-3	4.99	3,710.	1.769E-3	1.221E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	6.054E-4	1.78	1,935.64	6.054E-4	6.054E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	5.799E-4	0.03	24.33	5.799E-4	5.509E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.821E-5	0.81	3.56	1.821E-5	9.105E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.717E-5	0.53	2.39	1.717E-5	1.717E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.047E-5	0	0.27	1.047E-5	1.347E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Arkema Inc.	**25 & 67 Main Street**	**Belleville**	**NJ**	**07109**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal/day discharged	
	# hours/per day discharged	
5	#days/week discharged (FDR) (PAP-000351693)	
250	#day/year (FDR) (PAP-00351581)	
49,734,575	calc gal/yr discharged; (FDR) (PAP-00351618, PAP-00351695-701, PAP-00351683-92, PAP-351582-595)	115,000 gal/day: PAP-000352197-219
1921	Yr Ops started (FDR)	
1989	Yr Ops ceased (APQ)	
68	calc #yrs facility operated	1989 consistent with having 1988 process information
Copper (Cu)		
68	#yrs facility operated	
0.57	calc mg/L COC discharged; (FDR) (PAP-00351618, PAP-00351695-701, PAP-00351683-92, PAP00352197-219)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
7,312	calc kg COC discharged	
Lead (Pb)		
68	#yrs facility operated	
0.18	calc mg/L COC discharged; (FDR) (PAP-00351618, PAP-00351695-701, PAP-00351683-92, PAP00352197-219)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,240	calc kg COC discharged	
Mercury (Hg)		
68	#yrs facility operated	
0.0023	calc mg/L COC discharged; (FDR) (PAP-00351618, PAP-00351695-701, PAP-00351683-92, PAP00352197-219)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
29	calc kg COC discharged	
HPAHs		
68	#yrs facility operated	
1.6	calc mg/L COC discharged; (FDR) (PAP-00351618, PAP-00351695-701, PAP-00351683-92, PAP00352197-219)	
10%	% O&G that is considered PAHs	
60%	% PAHs in O&G considered as HPAHs	
0.10	calc mg/L COC	deed notice for PAHs approved by NJDEP (APQ); O&G detected cut 50% to account for other potential non-PAH organic carbons in effluent.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,242	calc kg COC discharged	
LPAHs		
68	#yrs facility operated	
1.6	calc mg/L HPAHs in reported O&G discharge analysis provided with 1977 PVSC application (PAP00351695, 700-701)	
10%	% O&G that is considered PAHs	
40%	% PAHs in O&G considered as LPAHs	
0.06	calc mg/L COC	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
828	calc kg COC discharged	
PCBs		
49	#yrs facility operated within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility operated within DDx Timeline	
	calc mg/L COC discharged	(no data in 1975 analysis provided with 1977 PVSC application (PAP 00351695, 700-701); no indication of use/presence (APQ))
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility operated within Dieldrin Timeline	
	calc mg/L COC discharged	(no data in 1975 analysis provided with 1977 PVSC application (PAP 00351695, 700-701); no indication of use/presence (APQ))
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
68	#yrs facility operated	
	calc mg/L COC discharged	(no data in 1975 analysis provided with 1977 PVSC application (PAP 00351695, 700-701); no indication of use/presence (APQ))
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
44	#yrs facility operated within 2,4-D Timeline	
	calc mg/L COC discharged	(no data in 1975 analysis provided with 1977 PVSC application (PAP 00351695, 700-701); no indication of use/presence (APQ))
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility operated within 2,4,5-T Timeline	
	calc mg/L COC discharged	(no data in 1975 analysis provided with 1977 PVSC application (PAP 00351695, 700-701); no indication of use/presence (APQ))
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility operated within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	(no data in 1975 analysis provided with 1977 PVSC application (PAP 00351695, 700-701); no indication of use/presence (APQ))
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
7,312	kg Copper	
2,240	kg Lead	
29	kg Mercury	
1,242	kg HPAHs	
828	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
7.67	ACRES - TOTAL SITE AREA (acres)	FDR page 1	Only the 25 Main Street site is reported to have had manufacturing (FDR, pages 3-6).
2.25	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of historical aerial photographs 1995-2020 and Figure on PAP-00466498.	
4,046.86	METERS^2/ACRE		
9,105	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1921	Year site operations began	Wallace & Tiernan (division of Arkema) developed the site and began operations (FDR, page 2)	
1989	Year site processing and storage operations ceased	Arkema sold all three parcels in 1989 (FDR, page 2)	
68	NUMBER YEARS DISCHARGE	Arkema liability 68 years, 1921 to 1989 (FDR, page 1)	
62	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,763	KG/M^3 SOIL DENSITY	Fill reported as fine to medium sand with trace silt and gravel (FDR, page 11). Bulk density range 1346 KG/M^3 to 2179 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
109,160	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
68	YEARS DISCHARGED		
302	MG/KG (MAX CONCENTRATION)	Copper was found in on-site soil sample S-7 (0.-0.5 ft bgs) (FDR, page 10; PAP-00352577).	
0.000001	kg per mg (Merck Index)		
32.97	KILOGRAMS DISCHARGED		
Lead (Pb)			
68	YEARS DISCHARGED		
318	MG/KG (MAX CONCENTRATION)	Lead concentration based on S-7 result (PAP-00726534)	
0.000001	kg per mg (Merck Index)		
34.71	KILOGRAMS DISCHARGED		
Mercury (Hg)			
68	YEARS DISCHARGED		
6.2	MG/KG (MAX CONCENTRATION)	Mercury was found in on-site soil sample S-7 (0.0-0.5 ft bgs) (FDR, page 10, PAP-00352577).	
0.000001	kg per mg (Merck Index)		
0.68	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
68	YEARS DISCHARGED	
14.1	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations
0.000001	kg per mg (Merck Index)	
1.54	KILOGRAMS DISCHARGED	
PAHs (others detected)		
68	YEARS DISCHARGED	
0	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
PCBs		
59	YEARS DISCHARGED	Number of years reflect a 1930 start date for PCBs.
1.89	MG/KG (MAX CONCENTRATION)	Maximum post-excavation concentration (Background, FDR Table, page 8).
0.000001	kg per mg (Merck Index)	
0.21	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.00	calc kg COC discharged	

PAHs used in this were actual concentrations from soil sample S-7 (North Yard Area soil sample - see PAP-00726495-530).

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	11.000	1.0	11.0000
Benzo(a)anthracene	9.800	0.1	0.9800
Benzo(b)fluoranthene	14.000	0.1	1.4000
Benzo(k)fluoranthene	4.000	0.01	0.0400
Chrysene	12.000	0.001	0.0120
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	6.600	0.1	0.6600

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **14.1**

SUMMARY CMASS ESTIMATES:

32.97	kg Copper
34.71	kg Lead
0.68	kg Mercury
1.54	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
0.21	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

70.10 MASS (KG) DISCHARGED FROM SURFACE SOIL

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Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Arkema Inc.

25 & 67 Main Street	**Belleville**	**NJ**	**07109**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.481E-6	10.0%	Periodic Noncompliacne	NOVs issued in 1988 for copper and lead in wastewater discharge samples (PAP-00351641; PAP-00351653). The December 1989 Report of Inspection noted outdoor soil staining due to oil from leaking indoor machinery. There was a heavily stained drum storage area in the North Yard. Exhaust ventilators for the plating room for Building 3 had condensate drains that were discharging to the stained soil below (PAS-00102607). There was a former spill in the location of the warehouse loading bay, one sample collected - had high PAHs. A compressor on the inside of the building discharged blowdown to the outside. When the boiler for this building was in operation, it also appeared to have discharged blowdown to the exterior (PAS-00102606-07). According to the ECRA Sampling Report and Phase II Sampling Plan, the associated stained soil was later removed (PAS-00102639-40). A compressor on the inside of the building discharged blowdown to the outside. When the boiler for this building was in operation, it also appeared to have discharged blowdown to the exterior (PAS-00102606-07). According to the ECRA Sampling Report and Phase II Sampling Plan, the associated stained soil was later removed (PAS-00102639-40).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.133E-6

AP_ABS	3.133E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Arkema Inc.

25 & 67 Main Street	**Belleville**	**NJ**	**07109**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.913E-3	10.0%	Periodic Noncompliacne	NOVs issued in 1988 for copper and lead in wastewater discharge samples (PAP-00351641; PAP-00351653). The December 1989 Report of Inspection noted outdoor soil staining due to oil from leaking indoor machinery. There was a heavily stained drum storage area in the North Yard. Exhaust ventilators for the plating room for Building 3 had condensate drains that were discharging to the stained soil below (PAS-00102607). There was a former spill in the location of the warehouse loading bay, one sample collected - had high PAHs. A compressor on the inside of the building discharged blowdown to the outside. When the boiler for this building was in operation, it also appeared to have discharged blowdown to the exterior (PAS-00102606-07). According to the ECRA Sampling Report and Phase II Sampling Plan, the associated stained soil was later removed (PAS-00102639-40). A compressor on the inside of the building discharged blowdown to the outside. When the boiler for this building was in operation, it also appeared to have discharged blowdown to the exterior (PAS-00102606-07). According to the ECRA Sampling Report and Phase II Sampling Plan, the associated stained soil was later removed (PAS-00102639-40).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.722E-3

AP_ABS	1.722E-3

Allocation Facility Cmass Calculation

Ashland Inc.	221 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	10.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	10.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	10.00%	-	0	1.018817E-2	0
HPAHs	100.00%	60.94	100.00%	-	0.00%	12.34	10.00%	11.0	62.04	1.018817E-2	0.63
LPAHs	100.00%	603.62	100.00%	-	0.00%	8.23	10.00%	7.4	604.36	1.018817E-2	6.16
PCBs	100.00%	-	100.00%	-	0.00%	-	10.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	10.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	10.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	10.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Ashland Inc.	221 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.63	2.634E-6	1.317E-7
LPAHs	0.01	170,000.00	6.16	3.622E-5	3.622E-7
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Ashland Inc.	221 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.427E-5	0.63	2.79	1.427E-5	7.137E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.006E-4	6.16	27.94	2.006E-4	2.006E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Ashland Inc.	**221 Foundry Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
2,150	gal discharged per day PAP00089937	
	# hours/per day discharged	1984 PVSC Permit Application
5	#days/week discharged	1995 Ashland Letter regarding PVSC Permit #20402793
52	#weeks/yr discharged	
559,000	calc gal/yr discharge	Discharged all wastewater to industrial sewer since ownership (1968), overflow from Roanoke St
		CSO storm sewer discharges to Passaic River during high precipitation. Events.
1968	Yr Ops started	
1992	Yr Ops ceased	
24	calc #yrs facility operated	
Copper (Cu)		
24	#yrs facility discharged	
-	calc mg/L COC discharged	1986 sampling ND
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
24	#yrs facility discharged	
-	calc mg/L COC discharged	1986 sampling ND
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
24	#yrs facility discharged	
-	calc mg/L COC discharged	1986 sampling ND
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
24	#yrs facility discharged	Permit Application Files (PAP-00089937)
162	calc mg/L TOC	320 mg/l TOC outlet 20403791
2.5%	% TOC that is considered O&G	4 mg/l TOC outlet 20403792
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.2	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
12.34	calc kg COC discharged	
LPAHs		
24	#yrs facility discharged	Permit Application Files (PAP-00089937)
162	calc mg/L TOC	320 mg/l TOC outlet 20403791
2.5%	% TOC that is considered O&G	4 mg/l TOC outlet 20403792
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.16	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
8.23	calc kg COC discharged	
PCBs		
10	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
5	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
20	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
24	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
25	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
18	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
8	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
12.3	kg HPAHs	
8.2	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1990 NJDEP Letter states NJPDES Permit #NJ0076641 for surface water discharge
	# days/week discharged	No other information…estimated based on discharge to PVSC
	# weeks/yr discharged	
500,000	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1968	Yr Ops started	
1992	Yr Ops ceased	
24	calc #yrs facility operated	
Copper (Cu)		
24	#yrs facility discharged	1986 Sampling ND
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
24	#yrs facility discharged	1986 Sampling ND
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
24	#yrs facility discharged	1986 Sampling ND
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
24	#yrs facility discharged	Permit Application Files (PAP-00089937)
162	calc mg/L TOC	320 mg/l TOC outlet 20403791
2.5%	% TOC that is considered O&G	4 mg/l TOC outlet 20403792
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.24	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
11.04	calc kg COC discharged	
LPAHs		
24	#yrs facility discharged	Permit Application Files (PAP-00089937)
162	calc mg/L TOC	320 mg/l TOC outlet 20403791
2.5%	% TOC that is considered O&G	4 mg/l TOC outlet 20403792
10%	% O&G that is considered PAHs	
40%	% PAHs considered as PAHs	
0.16	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
7.36	calc kg COC discharged	
PCBs		
10	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
5	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
20	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
24	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
25	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
18	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
8	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
11.04	kg HPAHs	
7.36	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information # hours/day discharged # days/week discharged # weeks/yr discharged	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
11	ACRES - TOTAL SITE AREA (acres)	FDR, p 1	
7	ACRES - AFFECTED AREA	Rough estimate of site area with exposed soil determined from review of historical aerial photographs 1995-2020 (Google Earth Pro) and Figure 1 Allocation Facilities map.	
4,046.86	METERS^2/ACRE		
26,305	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
3	METERS^3/YEAR (ERODED SOIL VOLUME)		
1968	Year site operations began	1968 - Ashland Oil, Inc. acquired the property from Lasp Realty, Inc., in June 1968 (PAP-00089138; PAS-00050517; FDR, p 1)	
2003	Year site was purchased from Ashland	1992 - All facility buildings, process lines, and storage tanks, as well as on-site railroad sidings, were dismantled and removed from the site in 1992 (PAP-00090523; FDR, p 1)	2003 - Foundry Street Development LLC acquired the property in 2003 (PAS-00000057; FDR, p 1)
35	NUMBER YEARS DISCHARGE	1999 - approx 750 tons of soil containing tar/asphalt were excavated from AOC-1 to 4 ft bgs (PAP-00089701). Area approx 4600 sq ft (0.106 acres) (PAP-00089764). This remediation is not accounted for in the years liable because it's such a small	
92	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Surface soils during drilling were loose/non-cohesive silt, fine to coarse sand, clay, gravel, wood, cobbles, cement and brick fragments, and cinders (PAP-00089967) Bulk density of silty sand and gravel and clay range 1442 KG/M3 to 2483 KG/M3, so use average. (http://structx.com/Soil_Properties_002.html)	
180,680	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Site is not located on historic fill (FDR pg 5) Copper Cyanide handled at facility (FDR pg 2).	
35	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Concentration 0 mg/kg because the only available soil sample (MW-4P) was taken of the viscous asphalt-like product present in the upper fill material surrounding well MW-4 (PAP-00089980).	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Lead (Pb)

35 YEARS DISCHARGED
0 MG/KG (AVERAGE CONCENTRATION)

Concentration 0 mg/kg because the only available soil sample (MW-4P) was taken of the viscous asphalt-like product present in the upper fill material surrounding well MW-4 (PAP-00089980).

0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

Mercury (Hg)

35 YEARS DISCHARGED
0.0 MG/KG (MAX CONCENTRATION)

Concentration 0 mg/kg because the only available soil sample (MW-4P) was taken of the viscous asphalt-like product present in the upper fill material surrounding well MW-4 (PAP-00089980).

0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

35 YEARS DISCHARGED
308.3 MG/KG (TOTAL PAH MAX CONCENTRATION)

Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations.

Sample 40-1 (PAP-00123631, Figure 9)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	200.000	1.0	200.0000
Benzo(a)anthracene	240.000	0.1	24.0000
Benzo(b)fluoranthene	360.000	0.1	36.0000
Benzo(k)fluoranthene	0.000	0.01	0.0000
Chrysene	250.000	0.001	0.2500
Dibenz(a,h)anthracene	35.000	1.0	35.0000
Indeno(1,2,3-cd)pyrene	130.000	0.1	13.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **308.3**

0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

PAHs (others detected)

35 YEARS DISCHARGED
113 MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001 kg per mg (Merck Index)

PAH values from sample SB-124 (0-0.5 ft bgs) (PAP-00089739, Table 13)

Acenaphthene	14
Anthracene	22
Fluorene	18
Naphthalene	ND
Fluoranthene	59
SUM	113

20 KILOGRAMS DISCHARGED

PCBs

0 YEARS DISCHARGED
MG/KG (MAX OF REPORTED CONCENTRATIONS)
0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

DDx

0 YEARS DISCHARGED within DDx Timeline
MG/KG (MAX CONCENTRATION)
3.785 L per gallon (Merck Index)
0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

Dieldrin

0 YEARS DISCHARGED within Dieldrin Timeline
MG/KG (MAX CONCENTRATION)
3.785 L per gallon (Merck Index)
0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

Dioxins/Furans NONE FOUND IN AVAILABLE DOCUMENTATION

0 YEARS DISCHARGED
0 MG/KG (MAX CONCENTRATION)
0.000001 kg per mg (Merck Index)
0 calc kg COC discharged

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
55.69	kg PAHs (Benzo(a)pyrene Equivalent)
20.42	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

76.11	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Discharge Calcs	Direct Discharge Information	NOTES, COMMENTS, REFERENCES		
	4.08 FEET/YEAR AVERAGE PRECIPITATION per Rutgers Univ.			
	7.5 ACRES - TOTAL SITE AREA (acres)			
	0.46 ACRES - AFFECTED AREA	Dike area was roughly 100 ft x 200 ft (PAP-00089932 p 2). 20000 sf = 0.4591 acre		
	4,046.86 METERS^2/ACRE			
	1,858 METERS^2 (AFFECTED AREA)			
	0.0001 METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.		
	0 METERS^3/YEAR (ERODED SOIL VOLUME)			
	1979 YEAR OF DOCUMENTED FUEL OIL SPILL	#4 fuel oil spilled from AST on March 6, 1979 (PAP-00089932)		
	2003 Year site was purchased from Ashland	1992 - All facility buildings, process lines, and storage tanks, as well as on-site railroad sidings, were dismantled and removed from the site in 1992 (PAP-00090523; FDR, p 1)	Tank 215 adjacent to tank farm in west parcel. Entire tank farm was within dike 1994 - remediation of LNALP impaced soils and soils exceeding 10,000 mg/kg total organic contaminants (PAP-00089622). Description of remediation not available, will assume it was not a type to address COCs in this spreadsheet	2003 - Foundry Street Development LLC acquired the property in 2003 (PAS-00000057; FDR, p 1)
	24 NUMBER YEARS DISCHARGE			
	4 METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)			
	1,963 KG/M^3 SOIL DENSITY	Surface soils during drilling were loose/non-cohesive silt, fine to coarse sand, clay, gravel, wood, cobbles, cement and brick fragments, and cinders (PAP-0009964, 7) Bulk density of silty sand and gravel and clay range 1442 KG/M3 to 2483 KG/M3, so use average. (http://structx.com/Soil_Properties_002.html)		
	8,751 KILOGRAMS (TOTAL WT OF SOIL AFFECTED OVER TIME)			
Copper (Cu)				
	24 YEARS DISCHARGED			
	0 MG/KG (MAX CONCENTRATION)			
	0.000001 kg per mg (Merck Index)			
	0 KILOGRAMS DISCHARGED			
Lead (Pb)				
	24 YEARS DISCHARGED			
	0 MG/KG (MAX CONCENTRATION)			
	0.000001 kg per mg (Merck Index)			
	0 KILOGRAMS DISCHARGED			

Mercury (Hg)

24	YEARS DISCHARGED
0.0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

PAHs number 5 fuel oil, values from "Characteristics of Spilled Oils, Fuels, and Petroleum Products" Wang 2003, PAHs listed on p 132 (0.0% weathered values used)

24	YEARS DISCHARGED
600.38	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)
0.000001	kg per mg (Merck Index)
5.25	KILOGRAMS DISCHARGED

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	449.350	1.0	449.3500
Benzo(a)anthracene	551.510	0.1	55.1510
Benzo(b)fluoranthene	125.740	0.1	12.5740
Benzo(k)fluoranthene	34.080	0.01	0.3408
Chrysene	11887.000	0.001	11.8870
Dibenz(a,h)anthracene	68.560	1.0	68.5600
Indeno(1,2,3-cd)pyrene	25.150	0.1	2.5150

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **600.4**

PAHs (others detected)

24	YEARS DISCHARGED
66640	MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
583.20	KILOGRAMS DISCHARGED

From Wang 2003 p 132 (data presented in ug/g)	
Acenaphthylene	33.69
Acenaphthene	167.5
Phenanthrene	24130
Anthracene	22779
Benzo(g,h,i)perylene	83.87
Fluorene	4986
Naphthalene	14460
SUM	66640.06

PCBs

24	YEARS DISCHARGED within PCBs Timeline
0	MG/KG (MAX OF REPORTED CONCENTRATIONS)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED

DDx

24	YEARS DISCHARGED within DDx Timeline
	MG/KG (CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED

NO CONCENTRATION INFO

Dieldrin

24	YEARS DISCHARGED within Dieldrin Timeline
	MG/KG (CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED

NO CONCENTRATION INFO

Dioxins/Furans

24	YEARS DISCHARGED
	MG/KG (CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	calc kg COC discharged

NO CONCENTRATION INFO

SUMMARY CMASS ESTIMATES:

0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
5.25	kg Benzo(a)pyrene Equivalent
583.20	kg PAHs MAX
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

588.45 MASS (KG) DISCHARGED BY OVERLAND FLOW

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Ashland Inc.

221 Foundry Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.939E-7	10.0%	Periodic Noncompliacne	The facility received a notice of violation from PVSC on August 10, 1990, for failure to maintain continuous monitoring of facility outfalls (PAS-00050635). Ashland was notified on May 26, 1971, to cease pollution at once, and warned against discharge to the sanitary sewer without proper pretreatment, after a sample of washings entering into the Roanoke Avenue Storm Sewer at Avenue P. was “not only highly polluting,” but contained flammable and explosive materials (PAP-00089153). Inspections conducted by NJDEP personnel on March 13 and 28, 1979, noted spillage and/or leakage throughout Ashland’s facility. Areas noted included the following: all tank farms, loading/unloading manifolds, pipe connections, sumps, and the storm sewer system. According to NJDEP, corrective measures were discussed with Ashland’s officials who stated that it would not be economically feasible for the company to implement all of the remedies required by NJDEP.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	4.445E-7

AP_ABS	4.445E-7

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Ashland Inc.

221 Foundry Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.720E-6	10.0%	Periodic Noncompliacne	The facility received a notice of violation from PVSC on August 10, 1990, for failure to maintain continuous monitoring of facility outfalls (PAS-00050635). Ashland was notified on May 26, 1971, to cease pollution at once, and warned against discharge to the sanitary sewer without proper pretreatment, after a sample of washings entering into the Roanoke Avenue Storm Sewer at Avenue P. was “not only highly polluting,” but contained flammable and explosive materials (PAP-00089153). Inspections conducted by NJDEP personnel on March 13 and 28, 1979, noted spillage and/or leakage throughout Ashland’s facility. Areas noted included the following: all tank farms, loading/unloading manifolds, pipe connections, sumps, and the storm sewer system. According to NJDEP, corrective measures were discussed with Ashland’s officials who stated that it would not be economically feasible for the company to implement all of the remedies required by NJDEP.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.448E-6

AP_ABS	2.448E-6

Allocation Facility Cmass Calculation

Atlantic Richfield (ARCO)	86 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	2.	100.00%	-	0.00%	343.38	100.00%	345.1	347.06	1.018817E-2	3.54
LPAHs	100.00%	9.16	100.00%	-	0.00%	228.92	100.00%	230.0	239.2	1.018817E-2	2.44
PCBs	100.00%	5.03	100.00%	-	0.00%	-	100.00%	-	5.03	1.018817E-2	0.05
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Atlantic Richfield (ARCO)	**86 Doremus Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	3.54	1.473E-5	7.367E-7
LPAHs	0.01	170,000.00	2.44	1.434E-5	1.434E-7
PCBs	12.87	26,000.00	0.05	1.971E-6	2.537E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Atlantic Richfield (ARCO)	86 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	7.985E-5	3.54	15.63	7.985E-5	3.993E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	7.939E-5	2.44	11.06	7.939E-5	7.939E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.507E-4	0.05	6.47	2.507E-4	3.226E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Atlantic Richfield (ARCO)	**86 Doremus Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	West Yard Sanitary and Storm water discharge was to the PVSC. No evidence of any permit
	# hours/per day discharged	for these discharges. Assume connect to PVSC as same site as Chevron.
	#days/week discharged	
	#weeks/yr discharged	Assume similar flow as for direct discharge to the Passaic River
9,600,000	calc gal/yr discharge	
1930	Yr Ops started	
1951	Yr Ops ceased	
21	calc #yrs facility operated	
Copper (Cu)		
21	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
21	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
21	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
21	#yrs facility discharged	Based on Chevron
7.5	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.5	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
343	calc kg COC discharged	
LPAHs		
21	#yrs facility discharged	Based on Chevron
7.5	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.3	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
229	calc kg COC discharged	
PCBs		
22	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
12	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
2	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
21	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
6	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
7	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
2	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
343	kg HPAHs	
229	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	PA/SI Report (2014) PAP00084000 indicates no wastewater treatment, septic systems or discharge
	# days/week discharged	to sewer.
	# weeks/yr discharged	No evidence of sewer sampling - no sewer data
9,647,180	# gals/yr directly discharged	PETROLEUM Terminal - estimating based on Chevron since same location at 86 Doremius Ave
		no storm drains found in the West Yard at this time.
4.08	ft; 30yr average annual precipitation per Rutgers information	
14.50	acres	
43,560	ft2 per acre	
1930	Yr Ops started	
1951	Yr Ops ceased	
21	calc #yrs facility operated	
Copper (Cu)		
21	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
21	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
21	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
21	#yrs facility discharged	
7.50	calc mg/L O&G	Based on Chevron
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.45	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
345.06	calc kg COC discharged	
LPAHs		
21	#yrs facility discharged	
7.50	calc mg/L O&G	Based on Chevron
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
0.30	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
230.04	calc kg COC discharged	
PCBs		
22	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
12	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
2	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
21	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
6	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
7	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
2	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
345.0627	kg HPAHs	
230.0418	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES		
4.083333333	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.			
14	ACRES - TOTAL SITE AREA (acres)				
4.5	ACRES - AFFECTED AREA	FDR page 2: Area A consists of 2.5 undeveloped acres located south of the West Yard. Additionally, based on google earth imagery, and creating polygons using measuring tool, an additional 2 acres of bare soil surrounding the tanks in the West and East Yard combined (grassy areas, see 06/2010 image) were estimated. Total of 4.5 acres of exposed soil. (Google Earth pro image)	Facility is adjacent to Passaic River (East Yard of property boundary abuts river). Chevron FDR page 1.		
4,046.86	METERS^2/ACRE				
18,211	METERS^2 (AFFECTED AREA)				
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.			
2	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER			
1930	Year site operations began	FDR Page 1: ARCO owned and operated the facility sometime in the 1930s. This calculation assumes 1930.	The Newark Terminal was operated as a petroleum storage and distribution facility (Chevron FDR Page 1)		
1951	Year site processing and storage operations ceased	FDR Page 1: ARCO conveyed the site to Tide Water Associated Oil Company on July 23, 1951	FDR Page 2: Facility operations were limited to bulk storage	The terminal was used to store and distribute refined petroleum products. It is believed that products were received via a pipeline system and by barge, and that products were distributed via tanker trucks. (Chevron FDR page 1)	Aerial photographs identified 11 tanks at the site and 2 docks that appeared to be leading to the Passaic River in 1943. The West Yard included three additional large storage tanks surrounded by concrete walls, a gasoline pump storage building, and an unlabeled building (Chevron FDR page 2)
21	NUMBER YEARS DISCHARGE	ARCO liability 21 years, 1930 to 1951 (FDR, page 1-2)			
38.242827	METERS3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)				
1962.5	KG/M3 SOIL DENSITY	Shallow borings from Area A were composed of a mixture of sand, silt, and gravel with varying amounts of brick fragments, rocks, wood and other debris (PAP-00066671, PDF page 8). Used "silty sand and gravel" soil type from http://structx.com/Soil_Properties_002.html. Bulk density range 1442 KG/M3 to 2483 KG/M3, so use average.			
75,052	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)				
Copper (Cu)					
21	YEARS DISCHARGED	Copper in included in this calculation even though it is not identified as a COC in the FDR (page 4) because it has been detected on site.			
0	MG/KG (MAX CONCENTRATION)	NOTE: No onsite sampling data were available for the time period during which ARCO owned/operated the Terminal; therefore, the data from the Chevron F&T calculation (same location) has been used for these calculations. Set to 0 since less than HF.			
0.000001	kg per mg (Merck Index)				
0	KILOGRAMS DISCHARGED				

Lead (Pb)

21 YEARS DISCHARGED

Maximum concentration in onsite soils (Chevron FDR Page 10, Table)
Concentration changed to 0 mg/kg because the Chevron FDR incorrectly has a concentration of 84,200 mg/kg. The referenced source shows a maximum lead concentration of 8,200 mg/kg (PAP-00339532). This is set to 0 because it is less than HF.

0 MG/KG (MAX CONCENTRATION)
0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

21 YEARS DISCHARGED
26.586 MG/KG (TOTAL PAH MAX CONCENTRATION)

Sum of Benzo(a)pyrene Equivalent conversion concentrations. Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

Maximum concentrations found in surface sample A-2A (0.0-0.5 ft) (PAP-00066671, PDF pg 38).

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	19.000	1.0	19.0000
Benzo(a)anthracene	12.000	0.1	1.2000
Benzo(b)fluoranthene	23.000	0.1	2.3000
Benzo(k)fluoranthene	26.000	0.01	0.2600
Chrysene	26.000	0.001	0.0260
Dibenz(a,h)anthracene	2.800	1.0	2.8000
Indeno(1,2,3-cd)pyrene	10.000	0.1	1.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **26.6**

0.000001 kg per mg (Merck Index)
2 KILOGRAMS DISCHARGED

PAHs (others detected)

Other PAHs detected = Benzo(g,h,i)perylene, Fluoranthene, Phenanthrene, Pyrene (Figure PAP-00066671, pdf pg 38)

21 YEARS DISCHARGED
MG/KG (TOTAL PAH MAX CONCENTRATION)

Sum of other detected PAHs from Figure PAP-00066671, pdf pg 38 from Sample ID A-2A (0.0-0.5 ft). Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

122
0.000001 kg per mg (Merck Index)
9 KILOGRAMS DISCHARGED

PCBs

21 YEARS DISCHARGED

Historic aerial photographs revealed that Area A has undergone filling activities, which are the likely source of PCBs (PAP-00066682).

67 MG/KG (MAX OF REPORTED CONCENTRATIONS)

PCB (Aroclor 1254) highest concentrations ranging from 10mg/kg to 67 mg/kg (Area 2; SW-75C at 0-0.5 ft) detected along the southern perimeter. (Chevron FDR page 4)
Historic fill was not a consideration for PCBs concentrations for the purpose of this calculation.

0.000001 kg per mg (Merck Index)
5 KILOGRAMS DISCHARGED

SUMMARY CMASS ESTIMATES:
0.00 kg Copper
0.00 kg Lead
2.00 kg PAHs (Benzo(a)pyrene Equivalent)
9.16 kg PAHs (Other)
5.03 kg PCBs

16.18 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Atlantic Richfield (ARCO)

86 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.625E-5	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.100E-5

AP_ABS	2.100E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Atlantic Richfield (ARCO)

86 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.231E-3	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.585E-3

AP_ABS	2.585E-3

Allocation Facility Cmass Calculation

Atlas Refining Inc.	142 Lockwood Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	190.19	0.00%	1,271.90	100.00%	336.3	526.45	1.018817E-2	5.36
Lead	100.00%	-	100.00%	649.10	0.00%	4,340.85	100.00%	1,147.6	1,796.69	1.018817E-2	18.31
Mercury	100.00%	-	100.00%	0.11	0.00%	0.73	100.00%	0.2	0.3	1.018817E-2	0
HPAHs	100.00%	-	100.00%	1,588.59	0.00%	10,623.71	100.00%	2,808.6	4,397.19	1.018817E-2	44.8
LPAHs	100.00%	-	100.00%	1,059.06	0.00%	7,082.47	100.00%	1,872.4	2,931.46	1.018817E-2	29.87
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Atlas Refining Inc.	**142 Lockwood Street**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	5.36	2.554E-6	1.762E-6
Lead	0.01	3,200,000.00	18.31	5.720E-6	5.720E-8
Mercury	0.95	42,000.00	0	7.372E-8	7.003E-8
HPAHs	0.05	240,000.00	44.8	1.867E-4	9.333E-6
LPAHs	0.01	170,000.00	29.87	1.757E-4	1.757E-6
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	7.507E-9	6.300E-7

Allocation Facility COC Base Scores - Alternative Calulcation

Atlas Refining Inc.	142 Lockwood Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.901E-3	5.36	3,986.31	1.901E-3	1.312E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	6.226E-3	18.31	19,905.	6.226E-3	6.226E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	7.030E-5	0	2.95	7.030E-5	6.679E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.012E-3	44.8	198.01	1.012E-3	5.058E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	9.730E-4	29.87	135.54	9.730E-4	9.730E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	7.507E-9	0	0	7.507E-9	6.300E-7

Facility Bypass Information

Atlas Refining Inc.	**142 Lockwood Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Dicharge Calcs	POTW Discharge Information	COMMENTS/NOTES
8,576	gal discharged per day (PAS00072817, PAS00072990, PAS00103218)	PVSC Waste Effluent Survey(s), PVSC Permit(s)
-	# hours/per day discharged	
5	#days/week discharged	Discharged all wastewater to sanitary sewer since development of PVSC System prior to that assume to Passaic River
52	#weeks/yr discharged	
2,229,863	calc gal/yr discharge	
1920	Yr Ops started	
2020	Yr Ops ceased	
100	calc #yrs facility operated	
Copper (Cu)		
100	#yrs facility discharged	
1.73	calc mg/L COC discharged (PAS00072970, PAS00103451, PAP00051987, PAS00114149, PAS00072817, PAS00103218)	PVSC Waste Effluent Surveys, PVSC Heavy Metal Source Determination, PVSC Application for Sewer Connection(s), PVSC User Self Monitoring Report(s)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,462.09	calc kg COC discharged	
Lead (Pb)		
100	#yrs facility discharged	
5.91	calc mg/L COC discharged (PAS00072981, PAS00114149, PAS0072970, PAS00103451, PAP00051987)	PVSC Waste Effluent Surveys, PVSC Heavy Metal Source Determination, PVSC Application for Sewer Connection(s), PVSC User Self Monitoring Report(s)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,989.95	calc kg COC discharged	
Mercury (Hg)		
100	#yrs facility discharged	
0.0010	calc mg/L COC discharged (PAS00114153, PAP00051987)	PVSC Heavy Metal Source Determination & PVSC User Self Monitoring Report(s)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.84	calc kg COC discharged	
HPAHs		
100	#yrs facility discharged	
241.16	calc mg/L O&G (PAS00051978, PAS00072817, PAS00103218)	calcs used to convert mg/kg O&G to HPAHs; remove if not needed
10%	% O&G that is considered PAHs	PVSC User Self Monitoring Reports, PVSC Permits, PVSC Waste Effluent Surveys
60%	% PAHs considered as HPAHs	
14	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
12,212.30	calc kg COC discharged	
LPAHs		
100	#yrs facility discharged	
241.16	calc mg/L O&G (PAS00051978, PAS00072817, PAS00103218)	calcs used to convert mg/kg O&G to LPAHs; remove if not needed
10%	% O&G that is considered PAHs	PVSC User Self Monitoring Reports, PVSC Permits, PVSC Waste Effluent Surveys
40%	% PAHs considered as LPAHs	
10	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
8,141.53	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
100	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
75	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
1,462.09	kg Copper	
4,989.95	kg Lead	
0.84	kg Mercury	
12,212.30	kg HPAHs	
8,141.53	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	Assume direct discharge to Passaic prior to PVSC installation (assume 1920)
2,229,683	# gals/yr directly discharged	Assume same discharge concentrations as to the PVSC
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1897	Yr Ops started	
1920	Yr Ops ceased	
23	calc #yrs facility operated	
Copper (Cu)		
23	#yrs facility discharged	
1.73	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
336.25	calc kg COC discharged	
Lead (Pb)		
23	#yrs facility discharged	
5.91	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,148	calc kg COC discharged	
Mercury (Hg)		
23	#yrs facility discharged	
0.0010	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.194	calc kg COC discharged	
HPAHs		
23	#yrs facility discharged	
241.16	calc mg/L O&G (PAS00051978, PAS00072817, PAS00103218)	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
14	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,808.6031	calc kg COC discharged	
LPAHs		
23	#yrs facility discharged	
241.16	calc mg/L O&G (PAS00051978, PAS00072817, PAS00103218)	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
10	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,872.4020	calc kg COC discharged	
PCBs		
-8	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-19	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-29	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
23	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-25	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-24	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-29	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
336.2547	kg Copper	
1,147.5954	kg Lead	
0.1941	kg Mercury	
2,808.6031	kg HPAHs	
1,872.4020	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
2.0356	ACRES - TOTAL SITE AREA (acres)		
0.50	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of historical aerial photographs 1995-2020 and Figure (FDR, Page 7). Assume no asphalt until 1960 (50 percent coverage) and 100 percent after for an estimated 0.5 acres.	
4,046.86	$METERS^2$/ACRE		
2,023	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1897	Year site operations began	FDR, Page 1	
2020	Year site processing and storage operations ceased	Present (FDR, Page 1)	
123	NUMBER YEARS DISCHARGE	Atlas Refinery liability 123 years, 1897 to present (FDR, page 1)	
25	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Silty sand and gravel (PAS-00052052). Bulk density range for silty sand and gravel 1442 KG/M3 to 2483 KG/M3, so use average. (http://structx.com/Soil_Properties_002.html)	
48,856	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Partially located on historic fill. Metals concentrations on FDR Page 6 are below Historic Fill (FDR page 5-6)	No soil results found for PCBs, PAHs, and pesticides.
Copper (Cu)	NONE FOUND IN AVAILABLE DOCUMENTATION		
123	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Lead (Pb)	NONE FOUND IN AVAILABLE DOCUMENTATION		
123	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Mercury (Hg)	NONE FOUND IN AVAILABLE DOCUMENTATION		
123	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
123	YEARS DISCHARGED	NONE FOUND IN AVAILABLE DOCUMENTATION	
0.0	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
PAHs (others detected)		NONE FOUND IN AVAILABLE DOCUMENTATION	
123	YEARS DISCHARGED		
0	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.000	1.0	0.0000
Benzo(a)anthracene	0.000	0.1	0.0000
Benzo(b)fluoranthene	0.000	0.1	0.0000
Benzo(k)fluoranthene	0.000	0.01	0.0000
Chrysene	0.000	0.001	0.0000
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.000	0.1	0.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.0**

PCBs	NONE FOUND IN AVAILABLE DOCUMENTATION	
90	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
DDx		
0	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		
123		
0.00057	MG/KG (MAX CONCENTRATION)	PAS-00125488
0.000001	kg per mg (Merck Index)	
0.000028	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
0.00	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.000028	kg Dioxins/Furans

0.000028	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Atlas Refining Inc.

142 Lockwood Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.361E-5	10.0%	Periodic Noncompliacne	Violations noted in 1972 (PAS-00051992-93; PAS-00052130-31) and 1981 (PAS-00072987) that were related to spills and poor housekeeping practices at the facility. In a March 8, 1989 Civil Action Complaint filed in the Superior Court of New Jersey, PVSC requested the permit be revoked stating that the petroleum hydrocarbon content control system and other pretreatment systems were functioning improperly. The complaint noted that violations were issued to Atlas from 1986 to 1989 (PAS-00052011-12). Atlas installed a Pretreatment System in 1986 (PAS-00052028). In addition, in at least the early 1970s, oil was released as a result of Atlas activities in the railyard near the Central Railroad tracks, and during periods of rainfall this material drained towards Blanchard Street and entered the catch basin and thus the Passaic River.	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.497E-5

AP_ABS	1.497E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Atlas Refining Inc.

142 Lockwood Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.502E-3	10.0%	Periodic Noncompliacne	Violations noted in 1972 (PAS-00051992-93; PAS-00052130-31) and 1981 (PAS-00072987) that were related to spills and poor housekeeping practices at the facility. In a March 8, 1989 Civil Action Complaint filed in the Superior Court of New Jersey, PVSC requested the permit be revoked stating that the petroleum hydrocarbon content control system and other pretreatment systems were functioning improperly. The complaint noted that violations were issued to Atlas from 1986 to 1989 (PAS-00052011-12). Atlas installed a Pretreatment System in 1986 (PAS-00052028). In addition, in at least the early 1970s, oil was released as a result of Atlas activities in the railyard near the Central Railroad tracks, and during periods of rainfall this material drained towards Blanchard Street and entered the catch basin and thus the Passaic River.	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.652E-3

AP_ABS	1.652E-3

Allocation Facility Cmass Calculation

Automatic Electro Plating Corp. (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	78.44	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	28.07	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	0.35	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	86.36	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	57.57	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Automatic Electro Plating Corp. (Foundry Street Complex)	**185 Foundry Street**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Automatic Electro Plating Corp. (Foundry Street Complex)	**185 Foundry Street**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Automatic Electro Plating Corp. (Foundry Street Complex)	**185 Foundry Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
2,173,003	# gal/yr discharge (FDR) (PAS-00114059, 114450)	
1970	Yr Ops started (FDR)	
2005	Yr Ops ceased (FDR)	
35	calc #yrs facility operated	
Copper (Cu)		
35	#yrs facility discharged	
0.27	calc mg/L COC discharged (FDR) (PAS-00114059, 114450; PAS-00114059, 114149)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
78	calc kg COC discharged	
Lead (Pb)		
35	#yrs facility discharged	
0.098	calc mg/L COC discharged; (FDR) (PAS-00114059, 114450; PAS-00114059, 114149)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
28	calc kg COC discharged	
Mercury (Hg)		
35	#yrs facility discharged	
0.0012	calc mg/L COC discharged; (FDR) (PAS-00114059, 114450; PAS-00114059, 114149)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.35	calc kg COC discharged	
HPAHs		
35	#yrs facility discharged	
5	calc mg/L O&G (FDR); (PAS-00114059, 114450)	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.30	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
86	calc kg COC discharged	
LPAHs		
35	#yrs facility discharged	
5	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.20	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
58	calc kg COC discharged	
PCBs		
8	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
3	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
18	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
35	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
36	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
16	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
6	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
78	kg Copper	
28	kg Lead	
0	kg Mercury	
86	kg HPAHs	
58	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Automatic Electro Plating Corp. (Foundry Street Complex)

185 Foundry Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	10.0%	Periodic Noncompliacne	In January 1986, AEP was found to be “in violation of Sections 307 and 308 of the Clean Water Act, 33 U.S.C. Subsection 1317, and Subsection 1318” (PAS-00000193). (Note: Subsection 1317 pertains to toxic and pre-treatment effluent standards and Subsection 1318 pertains to access to records.) “AEP consistently failed to meet electro-plating discharge standards which initiated enforcement actions by the USEPA in 1986” (PAS-00000228). A Civil-Action Suit (86-0920) was filed by USEPA, Region 2, and AEP signed a Consent Decree on April 15, 1987 for settlement of the pending actions (PAS-00000193; PAS-00014392). It is also noted that according to a “Foundry Street Complex Site Inspection” report prepared by NJDEP, dated November 15, 1990, a material storage area located on the south side of Building 19 appeared to be stained and that “a small area, approximately 2' x 2', appeared to be saturated with oil” near the northwest corner of Building 19 (PAS-00105569).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	0

AP_ABS	0

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Automatic Electro Plating Corp. (Foundry Street Complex)

185 Foundry Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	10.0%	Periodic Noncompliacne	In January 1986, AEP was found to be “in violation of Sections 307 and 308 of the Clean Water Act, 33 U.S.C. Subsection 1317, and Subsection 1318” (PAS-00000193). (Note: Subsection 1317 pertains to toxic and pre-treatment effluent standards and Subsection 1318 pertains to access to records.) “AEP consistently failed to meet electro-plating discharge standards which initiated enforcement actions by the USEPA in 1986” (PAS-00000228). A Civil-Action Suit (86-0920) was filed by USEPA, Region 2, and AEP signed a Consent Decree on April 15, 1987 for settlement of the pending actions (PAS-00000193; PAS-00014392). It is also noted that according to a “Foundry Street Complex Site Inspection” report prepared by NJDEP, dated November 15, 1990, a material storage area located on the south side of Building 19 appeared to be stained and that “a small area, approximately 2' x 2', appeared to be saturated with oil” near the northwest corner of Building 19 (PAS-00105569).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	0

AP_ABS	0

Allocation Facility Cmass Calculation

BASF Catalysts LLC	1 West Central Avenue	East Newark	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	26.28	100.00%	-	0.23%	1,152.72	100.00%	-	28.92	1.018817E-2	0.29
Lead	100.00%	62.56	100.00%	-	0.23%	268.41	100.00%	-	63.18	1.018817E-2	0.64
Mercury	100.00%	17.12	100.00%	-	0.23%	38.00	100.00%	-	17.21	1.018817E-2	0.18
HPAHs	100.00%	0.48	100.00%	-	0.23%	963.81	100.00%	-	2.69	1.018817E-2	0.03
LPAHs	100.00%	3.37	100.00%	-	0.23%	642.54	100.00%	-	4.84	1.018817E-2	0.05
PCBs	100.00%	0.02	100.00%	-	0.23%	-	100.00%	-	0.02	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.23%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.23%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.23%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

BASF Catalysts LLC	1 West Central Avenue	East Newark	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.29	1.403E-7	9.682E-8
Lead	0.01	3,200,000.00	0.64	2.011E-7	2.011E-9
Mercury	0.95	42,000.00	0.18	4.174E-6	3.965E-6
HPAHs	0.05	240,000.00	0.03	1.141E-7	5.707E-9
LPAHs	0.01	170,000.00	0.05	2.902E-7	2.902E-9
PCBs	12.87	26,000.00	0	7.837E-9	1.009E-7
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

BASF Catalysts LLC	1 West Central Avenue	East Newark	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.044E-4	0.29	219.	1.044E-4	7.205E-5
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.189E-4	0.64	699.9	2.189E-4	2.189E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	3.981E-3	0.18	167.02	3.981E-3	3.782E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	6.186E-7	0.03	0.12	6.186E-7	3.093E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.607E-6	0.05	0.22	1.607E-6	1.607E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	9.967E-7	0	0.03	9.967E-7	1.283E-5
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

BASF Catalysts LLC	**1 West Central Avenue**	**East Newark**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Central Ave	CSO	0.37%	61.94%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal/day discharged	note -owned since 1935....; The 1950 Sanborn map describes the buildings on site as Auto Repair, Auto Paint/Spraying, and Auto Showroom; The Clark Thread Company operated at the East Newark site from 1899 to 1935, including a bleach house (APQ); AP believes POTW constructed in the area by 1924 (APQ)
8	#hours/day discharged (FDR) (PAP-000-50552)	
286	#days/yr discharged (PAP-00094033)	
5	#days/week discharged	
52	#weeks/yr discharged	
8,697,252	calc gal/yr discharge;	(FDR) (PAP-00050552, PAP-00054004, PAP-00054015, PAP-0050482, PAP-00050569, PAP-00054033)
1957	Yr Ops started (FDR)	
2009	Yr Ops ceased (FDR)	
52	calc #yrs facility operated	
Copper (Cu)		
52	#yrs facility operated	
0.67	calc mg/L; (FDR) (PAP-00050552, PAP-00054004, PAP-00054015, PAP-00050504, PAP-000050569, PAP-00054033)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,153	calc kg COC discharged	
Lead (Pb)		
52	#yrs facility discharged	
0.157	calc mg/L; (FDR) (PAP-00050552, PAP-00054004, PAP-00054015, PAP-00050504, PAP000050569, PAP-00054033)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
268	calc kg COC discharged	
Mercury (Hg)		
52	#yrs facility discharged	
0.022	calc mg/L; (FDR) (PAP-00050552, PAP-00054004, PAP-00054015, PAP-00050504, PAP000050569, PAP-00054033)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
38	calc kg COC discharged	
HPAHs		
52	#yrs facility discharged	
9.4	calc O&G mg/L; (FDR) (PAP-00050552, PAP-00054004, PAP-00054015, PAP000050569, PAP-00054033)	use of PAH-containing materials, eg, fuel oil stored in ASTs/USTs used to power equipment; historic coal pile on northern part of site, use discontinued in 1970s; boilers/incinerators used on site
10%	% O&G that is considered HPAHs	
60%	% PAHs considered as PAHs	
0.6	calc mg/L HPAHs in reported TOC discharge analysis provided with 2000 permit application (PAP-00050573)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
964	calc kg COC discharged	
LPAHs		2000 permit application re LPAH naphthalene - "expected to be present" (PAP-00050571)
52	#yrs facility discharged	
9.4	calc O&G mg/L; (FDR) (PAP-00050552, PAP-00054004, PAP-00054015, PAP000050569, PAP-00054033)	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.4	calc mg/L LPAHs in reported TOC discharge analysis provided with 2000 permit application (PAP-00050573)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
643	calc kg COC discharged	
PCBs		2000 permit application - "known to be absent" (PAP-00050571)
21	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		2000 permit application - "known to be absent" (PAP-00050571)
16	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		2000 permit application - "known to be absent" (PAP-00050571)
31	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		2000 permit application - "known to be absent" (PAP-00050571)
52	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		2000 permit application - "known to be absent" (PAP-00050571)
53	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		2000 permit application - "known to be absent" (PAP-00050571)
29	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		2000 permit application - "known to be absent" (PAP-00050571)
19	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
1,153	kg Copper	
268	kg Lead	
38	kg Mercury	
964	kg HPAHs	
643	kg LPAHs	
-	kgPCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct DIscharge Information	COMMENTS/NOTES
	# hours/day discharged	
	#days/week discharged	Permit applications and surveys indicate storm water and other waste streams (e.g., boiler blowdown all piped to sanitary sewer); facility believes this was the case as early as 1948 (PAP-00054002, PAP-00054004, PAP-00050482, PAP-00050274, PAP-00054048, PAP-00050504, PAP-00050571)
	#weeks/yr discharged	
	gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres;	
43,560	ft2 per acre	
1957	Yr Ops started (FDR)	
2009	Yr Ops ceased (FDR)	
52	calc #yrs facility operated	
Copper (Cu)		
52	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
52	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
52	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
52	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
52	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
21	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
16	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
31	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
52	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
53	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
29	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
19	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
2.20	ACRES - TOTAL SITE AREA (acres)	Total site area changed based on the revised FDR (FDR, p 1).	Manufacturer of precious metal coating product-ink, powder, and solution (PAP-00050571).
1.10	ACRES - AFFECTED AREA	Affected area based on corrected total site area and estimating the percentage of site covered by buildings in Figure 2-2 (PAP-00336027).	
4,046.86	METERS^2/ACRE		
4,452	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1957	Year site operations began		
2009	Year site operations ceased	2009: Manufacturing operations ceased in May 2009 (PAP-00050655).	2010: The BASF Catalysts facility was demolished in 2010/2011 (PAP-00050655).
52	NUMBER YEARS DISCHARGE		
23	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,931	KG/M^3 SOIL DENSITY	Fill described as well graded sand and silty sand with gravel. Bulk density range 1378 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
44,687	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Copper was used in the production of precious and non-precious metal coatings and metal salts at the facility (PAP-00050733-34).	
52	YEARS DISCHARGED		
588	MG/KG (MAX CONCENTRATION)	Max copper concentration in soil sample B-124 at 2 feet bgs (PAP-00053922)	
0.000001	kg per mg (Merck Index)		
26	KILOGRAMS DISCHARGED		
Lead (Pb)		Lead was used as an intermediate in the production of precious and non-precious metal coatings and metal salts at the facility (PAP-00050733-34).	
52	YEARS DISCHARGED		
1,400	MG/KG MAX CONCENTRATION)	Max lead concentration in soil boring B-30 at 4 to 4.5 feet bgs sampled (PAP-00050686)	
0.000001	kg per mg (Merck Index)		
63	KILOGRAMS DISCHARGED		
Mercury (Hg)			
52	YEARS DISCHARGED		
383.0	MG/KG (MAX CONCENTRATION)	Max mercury concentration in soil boring B-122 at 1.5 feet bgs (PAP-00053921).	
0.000001	kg per mg (Merck Index)		
17	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	MAX PAH ON PDF PAGE 121 (PAP-00053930)
52	YEARS DISCHARGED		
10.6	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)			OTHERS APPLY TEF = 0.01
52	YEARS DISCHARGED		
75.37	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of max PAH values (PAP-00053930, pdf page 121)	
0.000001	kg per mg (Merck Index)		
3	KILOGRAMS DISCHARGED		
PCBs			
52	YEARS DISCHARGED		
0.44	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Shallow sample, Sample B-307-2 (2 ft bgs) (PAP-00053851, PAP-00053210 pdf p 146).	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
DDx			
0	YEARS DISCHARGED within DDx Timeline	NONE REPORTED	
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.000000	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7.410	1.0	7.4100
Benzo(a)anthracene	8.310	0.1	0.8310
Benzo(b)fluoranthene	8.950	0.1	0.8950
Benzo(k)fluoranthene	3.540	0.01	0.0354
Chrysene	8.370	0.001	0.0084
Dibenz(a,h)anthracene	1.010	1.0	1.0100
Indeno(1,2,3-cd)pyrene	4.440	0.1	0.4440

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **10.6**

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	NONE REPORTED
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dioxins/Furans		
52	YEARS DISCHARGED	
0.0000	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.0000	KILOGRAMS DISCHARGED	

SUMMARY FTMASS ESTIMATES:	
26.28	kg Copper
62.56	kg Lead
17.12	kg Mercury
0.48	kg PAHs (Benzo(a)pyrene Equivalent)
3.37	kg PAHs (Other)
0.02	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

109.82	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

BASF Catalysts LLC

1 West Central Avenue	**East Newark**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.174E-6	10.0%	Periodic Noncompliacne	Multiple Administrative Consent Orders - Civil Penalties from NJDEP regarding air permit violations, improper use of materials (PCBs, sodium nitrate), and waste manifest errors in the 1980s and 1990s; fines were paid by the company. No information for how the PCB material was misused (PAP-00050754). The facility received nine NOVs from PVSC and NJDEP (1994-1997) for pH levels below 5.0 and one Administrative Consent Order – Civil Penalty from NJDEP for the same violation on April 9, 1995. The Administrative Consent Order facilitated the construction of the waste water treatment system. Following correction, no further action was required on any of them (PAP-00050757-59). Primarily non-COC violations	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.756E-6

AP_ABS	3.756E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

BASF Catalysts LLC

1 West Central Avenue	**East Newark**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.869E-3	10.0%	Periodic Noncompliacne	Multiple Administrative Consent Orders - Civil Penalties from NJDEP regarding air permit violations, improper use of materials (PCBs, sodium nitrate), and waste manifest errors in the 1980s and 1990s; fines were paid by the company. No information for how the PCB material was misused (PAP-00050754). The facility received nine NOVs from PVSC and NJDEP (1994-1997) for pH levels below 5.0 and one Administrative Consent Order – Civil Penalty from NJDEP for the same violation on April 9, 1995. The Administrative Consent Order facilitated the construction of the waste water treatment system. Following correction, no further action was required on any of them (PAP-00050757-59). Primarily non-COC violations	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.482E-3

AP_ABS	3.482E-3

Allocation Facility Cmass Calculation

BASF Corporation	50 Central Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	2,286.14	100.00%	61.2	61.19	1.018817E-2	0.62
Mercury	100.00%	3.87	100.00%	-	0.00%	1,146.50	100.00%	30.7	34.59	1.018817E-2	0.35
HPAHs	100.00%	65.46	100.00%	-	0.00%	1,193.37	100.00%	31.8	97.28	1.018817E-2	0.99
LPAHs	100.00%	197.28	100.00%	-	0.00%	4,876.34	100.00%	130.5	327.8	1.018817E-2	3.34
PCBs	100.00%	281.88	100.00%	-	0.00%	-	100.00%	-	281.88	1.018817E-2	2.87
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

BASF Corporation	50 Central Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0.62	1.948E-7	1.948E-9
Mercury	0.95	42,000.00	0.35	8.390E-6	7.970E-6
HPAHs	0.05	240,000.00	0.99	4.130E-6	2.065E-7
LPAHs	0.01	170,000.00	3.34	1.965E-5	1.965E-7
PCBs	12.87	26,000.00	2.87	1.105E-4	1.422E-3
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

BASF Corporation	50 Central Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.120E-4	0.62	677.9	2.120E-4	2.120E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	8.002E-3	0.35	335.71	8.002E-3	7.602E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.238E-5	0.99	4.38	2.238E-5	1.119E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.088E-4	3.34	15.16	1.088E-4	1.088E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.405E-2	2.87	362.36	1.405E-2	1.808E-1
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

BASF Corporation	**50 Central Avenue**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
430,200	gal discharged per day PAP00058130, PAP00060973, PAS00054118	1971 PVSC Waste Effluent Survey
	# hours/per day discharged	1973 Industrial Waste Contribution to Municipal System
5	#days/week discharged	1980 EPA Questionnaire Form
52	#weeks/yr discharged	1988 Baseline Monitoring Report
111,852,000	calc gal/yr discharge	1989 BASF Letter to NJDEP
1936	Yr Ops started	Discharge to Kearny POTW then PVSC (permit started in 1989)
1990	Yr Ops ceased	
54	calc #yrs facility operated	
Copper (Cu)		
54	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
54	#yrs facility discharged	1973 Industrial Waste Contribution to Municipal System
0.100	calc mg/L COC discharged PAP00060973, PAS00054118	1988 Baseline Monitoring Report
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,286.14	calc kg COC discharged	
Mercury (Hg)		1973 Industrial Waste Contribution to Municipal System
54	#yrs facility discharged	1988 Baseline Monitoring Report
0.0502	calc mg/L COC discharged PAP00060973, PAS00054118	Mercury discharge concentration based on average of 1973 (.0003 mg/l) and 1988 (0.100 mg/l) reports.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,146.50	calc kg COC discharged	
HPAHs		
54	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	1988 Baseline Monitoring Report
0.052	calc mg/L HPAHs PAP00060951	Flouranthene = 24.7 ug/l
3.785	L per gallon (Merck Index)	Pyrene = 27.5 ug/l
0.000001	kg per mg (Merck Index)	
1,193.37	calc kg COC discharged	
LPAHs		
54	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	1988 Baseline Monitoring Report
0.2133	calc mg/L LPAHs	Anthracene = 213.3 ug/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,876.34	calc kg COC discharged	
PCBs		
42	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
54	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
45	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
2,286.14	kg Lead	
1,146.50	kg Mercury	
1,193.37	kg HPAHs	
4,876.34	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Discharged wastewater to sanitary sewer or incinerated on site. Storm water contained onsite to
	# days/week discharged	evaporate or be absorbed to ground
	# weeks/yr discharged	
17,962,561	# gals/yr directly discharged	NJPDES Permit for discharge to Newark Bay/Passaic from 1979-1988. Flow rate calculated based on 30 year average annual precipitation data per Rutgers Univ, and acreage with a 50% reduction in volume that reaches the Passaic River due to evaporation or soil infiltration.
4.08	ft; 30yr average annual precipitation per Rutgers information	COC information used same as for discharge to PVSC
27	acres	
43,560	ft2 per acre	
1979	Yr Ops started	
1988	Yr Ops ceased	
9	calc #yrs facility operated	
Copper (Cu)		
9	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
9	#yrs facility discharged	
0.10	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
61	calc kg COC discharged	
Mercury (Hg)		1973 Industrial Waste Contribution to Municipal System
9	#yrs facility discharged	1988 Baseline Monitoring Report
0.0502	calc mg/L COC discharged	Mercury discharge concentration based on average of 1973 (.0003 mg/l) and 1988 (0.100 mg/l) reports.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
31	calc kg COC discharged	
HPAHs		
9	#yrs facility discharged	
0.0520	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
31.8185	calc kg COC discharged	
LPAHs		
9	#yrs facility discharged	
0.2133	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
130.5171	calc kg COC discharged	
PCBs		
-1	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-6	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
9	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
9	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
10	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
7	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-3	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
61.1895	kg Lead	
30.7171	kg Mercury	
31.8185	kg HPAHs	
130.5171	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
27	ACRES - TOTAL SITE AREA (acres)	FDR, page 1; confirmed with Google Earth	
18	ACRES - AFFECTED AREA	FDR, page 1; Approximately 1/3 of the site or less historically (until 1969) covered with buildings (PAP-00061717)	
4,046.86	METERS^2/ACRE		
72,843	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
7	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1936	Year site operations began	FDR, page 1 Operator: 1936-1990 Owner: 1936-2008	
2008	Year site was sold		
72	NUMBER YEARS DISCHARGE		
524	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,843	KG/M^3 SOIL DENSITY	Overburden soil at the site consists of fill material (black to dark brown silty sand, silt, and clay) (PAP-00062541). Bulk density range 1410 KG/M^3 to 2275 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
966,342	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The entirety of the site is located on historic fill material (FDR page 14).	
Copper (Cu)			
72	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	1,200 mg/kg Max detection (PAP-00061704). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
72	YEARS DISCHARGED		
0	MG/KG MAX CONCENTRATION)	10,000 mg/kg Max detection from soil sample 07B1S (PAS-00107497). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
72	YEARS DISCHARGED		
4.0	MG/KG (MAX CONCENTRATION)	Max detection from soil sample AEC21-4A 0-0.5 FT (PAP-00058921)	
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
72	YEARS DISCHARGED	
67.7	MG/KG (TOTAL PAH MAX CONCENTRATION)	FDR PAH max concentrations at sample 9B(2)collected from 8 ft bgs; Exhibit B-2 Restricted Area Data Table (PAP-00061814).
0.000001	kg per mg (Merck Index)	
65	KILOGRAMS DISCHARGED	
PAHs (others detected)		
72	YEARS DISCHARGED	
204.15	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	Soil sample AEC2-8A 0-0.5 FT (PAP-00058811-2)
197	KILOGRAMS DISCHARGED	
PCBs		
72	YEARS DISCHARGED	
291.7	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Soil sample AEC7-ADD1 total PCB = 291.7 mg/kg. (PAP-00058841)
0.000001	kg per mg (Merck Index)	
282	KILOGRAMS DISCHARGED	
DDx		
72	YEARS DISCHARGED within DDx Timeline	
0.0508	MG/KG (MAX CONCENTRATION)	50.8 micrograms per kilogram (µg/kg) 4,4'-DDT in sample #AEC17-ADD1 collected from between 0.5 and 1 ft bgs (PAP-00058888).
0.000001	kg per mg (Merck Index)	
0.000004	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	NONE REPORTED
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	BASF stated dioxin precursors used in facility operations included chloranil, PA, maleic acid, and 2,6-dibromo-p-nitroaniline (PAS-00053985). Benzaldehyde was also handled at the facility (PAS-00054152).
0	YEARS DISCHARGED	BASF states it did not, to the best of its knowledge, receive, utilize, manufacture, discharge, release, or dispose of any pesticides, materials containing 2,3,7,8-tetrachlorodibenzo-p-dioxin, or any other dioxin compounds (PAS-No information regarding the detection or remediation of chlorinated dioxins or furans was identified in the available site files.
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	

OTHERS APPLY TEF = 0.01

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	47.000	1.0	47.0000
Benzo(a)anthracene	51.000	0.1	5.1000
Benzo(b)fluoranthene	82.000	0.1	8.2000
Benzo(k)fluoranthene	40.000	0.01	0.4000
Chrysene	42.000	0.001	0.0420
Dibenz(a,h)anthracene	3.300	1.0	3.3000
Indeno(1,2,3-cd)pyrene	37.000	0.1	3.7000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 67.7

SUMMARY FTMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
3.87	kg Mercury
65.46	kg PAHs (Benzo(a)pyrene Equivalent)
197.28	kg PAHs (Other)
281.88	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

548.49 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

BASF Corporation

50 Central Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.430E-3	10.0%	Periodic Noncompliacne	Multiple Administrative Consent Orders from NJDEP related to the air permits, incinerator air emissions, and waste handling and/or documentations in the 1980s and 1990. BASF received an "unacceptable" rating from NJDEP following a Compliance Evaluation Inspection conducted on February 9, 1988 for NJPDES Permit No. NJ0001112. In 1987, all permitted parameters (total organic carbon, petroleum hydrocarbons, temperature, and pH) exceeded established limitations in NPDES permit (PAP-00057827-28). In August 1988, BASF was given a Notification of Reportable Events #22-27 for violating PCB regulations. The July 1987 Annual Report noted PCB contaminated transformer YAR 49871 had been stored for disposal on site for more than one year and the area the unit was stored in did not comply with regulations (PAP-00061053-58). According to the PVSC Annual Report for 1971, dated January 18, 1972, on July 13, 1971 PVSC received a call ...about BASF discharging into the Passaic River. Upon inspection by PVSC, industrial waste was seen coming out of the ground and flowing into the Passaic River. BASF immediately ordered excavation of the area and found a break in a 3-inch pipe which was a temporary sanitary line for a construction trailer. The sewage from the main line was backing up and flowing out through the break. The break was repaired the same day and the line was later removed (PAS-00034592). The PVSC Annual Report for 1973... stated BASF ordered five truckloads of 2-ethyl-hexanol from Eldorado Terminal Corp. for delivery on Saturday, February 10, 1973. During delivery, a welded seam ruptured on the storage tank and 2,500 barrels of alcohol drained into the Passaic River. The loss was not detected by BASF until Sunday, February 11, 1973...(PAS-00034721). Barriers for drainage or flood control, and runoff control systems did not exist at the site (PAP-00062140).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.287E-3

AP_ABS	1.287E-3

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

BASF Corporation

50 Central Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.884E-1	10.0%	Periodic Noncompliacne	Multiple Administrative Consent Orders from NJDEP related to the air permits, incinerator air emissions, and waste handling and/or documentations in the 1980s and 1990. BASF received an "unacceptable" rating from NJDEP following a Compliance Evaluation Inspection conducted on February 9, 1988 for NJPDES Permit No. NJ0001112. In 1987, all permitted parameters (total organic carbon, petroleum hydrocarbons, temperature, and pH) exceeded established limitations in NPDES permit (PAP-00057827-28). In August 1988, BASF was given a Notification of Reportable Events #22-27 for violating PCB regulations. The July 1987 Annual Report noted PCB contaminated transformer YAR 49871 had been stored for disposal on site for more than one year and the area the unit was stored in did not comply with regulations (PAP-00061053-58). According to the PVSC Annual Report for 1971, dated January 18, 1972, on July 13, 1971 PVSC received a call ...about BASF discharging into the Passaic River. Upon inspection by PVSC, industrial waste was seen coming out of the ground and flowing into the Passaic River. BASF immediately ordered excavation of the area and found a break in a 3-inch pipe which was a temporary sanitary line for a construction trailer. The sewage from the main line was backing up and flowing out through the break. The break was repaired the same day and the line was later removed (PAS-00034592). The PVSC Annual Report for 1973... stated BASF ordered five truckloads of 2-ethyl-hexanol from Eldorado Terminal Corp. for delivery on Saturday, February 10, 1973. During delivery, a welded seam ruptured on the storage tank and 2,500 barrels of alcohol drained into the Passaic River. The loss was not detected by BASF until Sunday, February 11, 1973...(PAS-00034721). Barriers for drainage or flood control, and runoff control systems did not exist at the site (PAP-00062140).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.696E-1

AP_ABS	1.696E-1

Allocation Facility Cmass Calculation

Benjamin Moore & Co.	134 Lister Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	756.41	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	408.18	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	10.20	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	23.92	100.00%	-	0.00%	-	100.00%	-	23.92	1.018817E-2	0.24
LPAHs	100.00%	77.79	100.00%	-	0.00%	-	100.00%	-	77.79	1.018817E-2	0.79
PCBs	100.00%	12.78	100.00%	-	0.00%	-	100.00%	-	12.78	1.018817E-2	0.13
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Benjamin Moore & Co.	**134 Lister Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	9.703E-12	6.695E-12
Lead	0.01	3,200,000.00	0	1.401E-11	1.401E-13
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.24	1.015E-6	5.077E-8
LPAHs	0.01	170,000.00	0.79	4.662E-6	4.662E-8
PCBs	12.87	26,000.00	0.13	5.008E-6	6.445E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	1.434E-9	1.204E-7

Allocation Facility COC Base Scores - Alternative Calulcation

Benjamin Moore & Co.	134 Lister Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	7.221E-9	0	0.02	7.221E-9	4.983E-9
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.525E-8	0	0.05	1.525E-8	1.525E-10
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	5.503E-6	0.24	1.08	5.503E-6	2.752E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.582E-5	0.79	3.6	2.582E-5	2.582E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	6.369E-4	0.13	16.43	6.369E-4	8.197E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	1.434E-9	0	0	1.434E-9	1.204E-7

Facility Bypass Information

Benjamin Moore & Co.	**134 Lister Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	Discharge to PVSC from 1925-1980
	#days/week discharged	All wastewater recycled since 1980
	#weeks/yr discharged	
12,254,673	calc gal/yr discharge	1984-1995 flows = 8183261 gallons (PAS-00055119)
		1988 44729 GPD (PAS-00055368)
1925	Yr Ops started	2006 0.019 MGD (PAP-00478668)
1980	Yr Ops ceased	2016 0.009 MGD (PAP-00478689)
55	calc #yrs facility operated	FDR states since 1925 discharge was direct to PVSC.
Copper (Cu)		
55	#yrs facility discharged	Cu to PVSC 0.144 mg/l (PAP-00238096, 99)
0.30	calc mg/L COC discharged	1995 Discharge Sampling Cu=.449 mg/l (PAS-00055118-122)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
756.41	calc kg COC discharged	
Lead (Pb)		
55	#yrs facility discharged	Pb to PVSC 0.31 mg/l (PAP-00238096, 99)
0.16	calc mg/L COC discharged	1995 Discharge Sampling Pb = .010 mg/l (PAS-00055118-122)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
408.18	calc kg COC discharged	
Mercury (Hg)		
55	#yrs facility discharged	1995 Discharge Sampling Hg = .004 mg/l (PAS-00055118-122)
0.0040	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
10.20	calc kg COC discharged	
HPAHs		
55	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
55	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
31	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
55	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
35	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
36	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
756.41	kg Copper	
408.18	kg Lead	
10.20	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	Discharge to PVSC from 1925-1980
12,254,673	# gals/yr directly discharged	All wastewater recycled since 1980
4.08	ft; 30yr average annual precipitation per Rutgers information	1984-1995 flows = 8183261 gallons (PAS-00055119)
	acres	1988 44729 GPD (PAS-00055368)
43,560	ft2 per acre	2006 0.019 MGD (PAP-00478668)
	acres	2016 0.009 MGD (PAP-00478689)
50%	Percent Precip to River	
	Yr Ops started	
	Yr Ops ceased	
-	calc #yrs facility operated	FDR states since 1925 discharge was direct to PVSC.
Copper (Cu)		
-	#yrs facility discharged	Cu to PVSC 0.144 mg/l (PAP-00238096, 99)
0.30	calc mg/L COC discharged	1995 Discharge Sampling Cu=.449 mg/l (PAS-00055118-122)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
-	#yrs facility discharged	Pb to PVSC 0.31 mg/l (PAP-00238096, 99)
0.16	calc mg/L COC discharged	1995 Discharge Sampling Pb = .010 mg/l (PAS-00055118-122)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
-	#yrs facility discharged	1995 Discharge Sampling Hg = .004 mg/l (PAS-00055118-122)
0.0040	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
-	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
-	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
-	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
-	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
17	ACRES - TOTAL SITE AREA (acres)	FDR page 1	
8.13	ACRES - AFFECTED AREA	Roughly 50% of the property was unpaved before 1960 (PAP-CONF-00000851) PAP-00238238 states the property as 17 acres with approximately 32,000 SF of production buidlings. This results in a total area of 16.26 acres. Roughly 50% was not paved resulting in an affected areas of 8.13 acres.	
4,046.86	METERS^2/ACRE		
32,901	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
3	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1925	Year site operations began	FDR page 1.	
2020	Present owner/operator	FDR page 1	
95	NUMBER YEARS DISCHARGE		
313	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,842	KG/M^3 SOIL DENSITY	Fill reported as dark brown silty sand with brick, concrete, coal-like pieces, and woody fragments. (PAP-CONF-00000921). Bulk density range of Silty Sand at http://structx.com/Soil_Properties_002.html is 1,410 KG/M3 to 2,275 KG/M3, so use average of 1,842.5 kg/m3.	
575,734	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
	The facility site is located on regional Historic Fill (FDR page 10)		
Copper (Cu)			
95	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Soil boring SF02 (PAP-CONF-00000844), 63.8 ppm. Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Lead (Pb)		Lead compounds were used from approximately 1951 until at least 1971 (PAP-00238576).	
95	YEARS DISCHARGED		
0	MG/KG (AVERAGE CONCENTRATION)	Soil boring SF02 (PAP-CONF-00000844), 139 ppm. Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Mercury (Hg)		Mercury compounds were used by Benjamin Moore in the manufacture of paints from approximately 1953 until as late as 1971 (PAP-CONF-00010217).	
95	YEARS DISCHARGED	Soil boring SF02 (PAP-CONF-00000844), 0.6 ppm. Set to 0 since less than HF.	
0.0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)	Soil boring SF02 (PAP-CONF-00000844)	Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
95	YEARS DISCHARGED		
41.6	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
24	KILOGRAMS DISCHARGED		
PAHs (others detected)		Fluorene - 12.9 ppm Naphthalene - 19.3 ppm Phenanthrene - 75.7 ppm Anthracene - 16.7 ppm Acenaphthene - 9.19 ppm Acenaphthylene - 1.32 ppm Soil boring SF02H (0.0-0.5 ft) (PAP-CONF-00000845)	
95	YEARS DISCHARGED		
135.1	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
78	KILOGRAMS DISCHARGED		

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Soil boring SF02H (0.0-0.5 ft) (PAP-CONF-00000845)	Benzo(a)pyrene	27.900	1.0	27.9000
	Benzo(a)anthracene	31.900	0.1	3.1900
	Benzo(b)fluoranthene	39.100	0.1	3.9100
	Benzo(k)fluoranthene	14.300	0.01	0.1430
	Chrysene	29.100	0.001	0.0291
	Dibenz(a,h)anthracene	4.700	1.0	4.7000
	Indeno(1,2,3-cd)pyrene	16.800	0.1	1.6800

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **41.6**

PCBs		
51	YEARS DISCHARGED	FDR confirms that therminol was used on site from 1969 to 1972. PCB use from 1969 to 2020 - 51 years
22.2	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PAP-CONF-00000910 Ecological Assessment used PCB concentration of 22.2 mg/kg
0.000001	kg per mg (Merck Index)	
13	KILOGRAMS DISCHARGED	
DDx		
95	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
95	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		Max of low concentrations of dioxins found in all four samples (PAP-CONF-00000830)
95	YEARS DISCHARGED	
0.0000093	MG/KG (MAX CONCENTRATION)	PAP-CONF-00000868
0.000001	kg per mg (Merck Index)	
0.0000054	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
23.92	kg PAHs (Benzo(a)pyrene Equivalent)
77.79	kg PAHs (Other)
12.78	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00000535	kg Dioxins/Furans

114.49 MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
17	ACRES - TOTAL SITE AREA (acres)	FDR page 1	
0.20	ACRES - AFFECTED AREA	In the Terraphase 2019 Site Assessemnt, Section 2.8, Pits, Lagoons, or Basins (PAP-CONF-00010221) at the second paragraph, or 0.2 acres impacted by floods.	
4,046.86	METERS^2/ACRE		
809	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1925	Year site operations began	FDR page 1	
2020		FDR page 1	
95	NUMBER YEARS DISCHARGE		Report on Flood Control (Lockwood Greene Engineer, Inc., 1961) has 8 floods capable of washing out the lagoon from 1925 to 1961. This translates to approximately 14 additonal floods in from 1961 to 2006 or 22 flooding events during the liability period. (PAP-00238186)
8	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,842	KG/M^3 SOIL DENSITY	Fill reported at 0.5' – 4.0' as dark brown silty sand with brick, concrete, coal-like pieces, and woody fragments. (PAP-CONF-00000921). Bulk density range of Silty Sand at http://structx.com/Soil_Properties_002.html is 1,410 KG/M3 to 2,275 KG/M3, so use average of 1,842.5 kg/m3.	
14,163	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The facility site is located on regional Historic Fill (FDR page 10)	
Copper (Cu)			
95	YEARS DISCHARGED		
0.144	MG/KG (MAX CONCENTRATION)	Contents pumped into lagoon stated as 0.144 ppm Copper (PAP-00238099). Concentrations used to estimate sludge concentration.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Lead (Pb)		Lead compounds were used from approximately 1951 until at least 1971 (PAP-00238576).	
95	YEARS DISCHARGED		
0.31	MG/KG (AVERAGE CONCENTRATION)	Contents pumped into lagoon stated as 0.31 ppm Pb (PAP-00238099).	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Mercury (Hg)		Mercury compounds were used by Benjamin Moore in the manufacture of paints from approximately 1953 until as late as 1971 (PAP-CONF-00010217).	
95	YEARS DISCHARGED	Sludge not tested for mercury	
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
95	YEARS DISCHARGED	
	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Sludge not tested for PAHs
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PAHs (others detected)		Other PAHs = Benzo(g,h,i)perylene, Fluorene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Naphthalene, 2-Methylnaphthalene.
95	YEARS DISCHARGED	
	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sludge not tested for PAHs
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PCBs		
90	YEARS DISCHARGED	
	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Not found in sludge
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene		1.0	0.0000
Benzo(a)anthracene		0.1	0.0000
Benzo(b)fluoranthene		0.1	0.0000
Benzo(k)fluoranthene		0.01	0.0000
Chrysene		0.001	0.0000
Dibenz(a,h)anthracene		1.0	0.0000
Indeno(1,2,3-cd)pyrene		0.1	0.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.0**

SUMMARY CMASS ESTIMATES:

0.0020	kg Copper
0.0044	kg Lead
0.00	kg Mercury
0.00	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

0.0064 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Benjamin Moore & Co.

134 Lister Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
6.467E-5	10.0%	Periodic Noncompliacne	On August 15, 1969, the WPCP of the NJDOH issued an Administrative Order to Benjamin Moore pursuant to the provisions of R.S. 58:12-2. In response to a Benjamin Moore inquiry for the specific details on which the order was based, in a September 4, 1969 letter the State stated that the alleged violation was based on “pollution of the Passaic River in terms of odor, turbidity, color, biochemical oxygen demand, chemical oxygen demand, other soluble matter and suspended solids.” Benjamin Moore followed up and discovered 3 drains in the vehicle plant that discharged to the storm sewer. These were connected to the sanitary sewer (PAS-00055008-9, 21-22, 26). On March 23, 1978, the Coast Guard notified Benjamin Moore that a Coast Guard helicopter had noticed a spill from the plant in the River. Investigation with the Coast Guard found a 55-gal drum had been punctured approximately amid ships" and part of its contents had migrated to the Passaic River. At 12:50 PM, July 8, 1980, a valve malfunction spilled about 3,000 gallons of wash solvent. Although this was contained by the retaining dike around the tanks, about 25-50 gallons allegedly leaked from the dike into the Passaic River...According to the Site Assessment, “Given the date of the release, the only COC that could have been contained in the wash solvent was naphthalene...” (PAP-CONF-00010225).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.820E-5

AP_ABS	5.820E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Benjamin Moore & Co.

134 Lister Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.197E-3	10.0%	Periodic Noncompliacne	On August 15, 1969, the WPCP of the NJDOH issued an Administrative Order to Benjamin Moore pursuant to the provisions of R.S. 58:12-2. In response to a Benjamin Moore inquiry for the specific details on which the order was based, in a September 4, 1969 letter the State stated that the alleged violation was based on “pollution of the Passaic River in terms of odor, turbidity, color, biochemical oxygen demand, chemical oxygen demand, other soluble matter and suspended solids.” Benjamin Moore followed up and discovered 3 drains in the vehicle plant that discharged to the storm sewer. These were connected to the sanitary sewer (PAS-00055008-9, 21-22, 26). On March 23, 1978, the Coast Guard notified Benjamin Moore that a Coast Guard helicopter had noticed a spill from the plant in the River. Investigation with the Coast Guard found a 55-gal drum had been punctured approximately amid ships" and part of its contents had migrated to the Passaic River. At 12:50 PM, July 8, 1980, a valve malfunction spilled about 3,000 gallons of wash solvent. Although this was contained by the retaining dike around the tanks, about 25-50 gallons allegedly leaked from the dike into the Passaic River...According to the Site Assessment, “Given the date of the release, the only COC that could have been contained in the wash solvent was naphthalene...” (PAP-CONF-00010225).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.378E-3

AP_ABS	7.378E-3

Allocation Facility Cmass Calculation

Berol Corporation | **41 Dickinson Street** | **Newark** | **NJ**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	543.84	13.00%	7,831.27	100.00%	465.3	2,027.36	1.018817E-2	20.66
LPAHs	100.00%	-	100.00%	362.56	13.00%	5,220.85	100.00%	310.2	1,351.58	1.018817E-2	13.77
PCBs	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Berol Corporation	**41 Dickinson Street**	**Newark**	**NJ**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	20.66	8.606E-5	4.303E-6
LPAHs	0.01	170,000.00	13.77	8.100E-5	8.100E-7
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Berol Corporation	**41 Dickinson Street**	**Newark**	**NJ**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	4.664E-4	20.66	91.29	4.664E-4	2.332E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	4.486E-4	13.77	62.49	4.486E-4	4.486E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Berol Corporation	**41 Dickinson Street**	**Newark**	**NJ**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Clay St	CSO	0.90%	41.36%	
2	Clay St	Bypass	12.63%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day	Discharged wastewater and storm water to CSO and storm sewer, connected in 1924. discharged to
	# hours/per day discharged	Passaic from 1919-1924
	#days/week discharged	
	#weeks/yr discharged	
12,683,494.17	calc gal/yr discharge(PAP00102592, PAP00425704)	1975 PVSC Waste Effluent Survey, 1980 PVSC Permit, 1985 PVSC Permit, 1990 PVSC Permit, 1995 PVSC Permit
1924	Yr Ops started	
1996	Yr Ops ceased	
72	calc #yrs facility operated	
Copper (Cu)		
72	#yrs facility discharged	
-	calc mg/L COC discharged PAP00102679	PAP-0010593, 1975 Waste Effluent Survey notes no metallic ions including copper, lead and mercury. PAP-00102709 and PAP-00102636, PVSC permit applications noting copper/lead and mercury, known to be absent. PAP-00102618, PAP-00102620 and PAP-00102628, PVSC permit applications noting copper/lead/mercury not expected to be present in wastewater.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
72	#yrs facility discharged	
-	calc mg/L COC discharged PAP00102679	PAP-0010593, 1975 Waste Effluent Survey notes no metallic ions including copper, lead and mercury. PAP-00102709 and PAP-00102636, PVSC permit applications noting copper/lead and mercury, known to be absent. PAP-00102618, PAP-00102620 and PAP-00102628, PVSC permit applications noting copper/lead/mercury not expected to be present in wastewater.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
72	#yrs facility discharged	
-	calc mg/L COC discharged PAP00102679	PAP-0010593, 1975 Waste Effluent Survey notes no metallic ions including copper, lead and mercury. PAP-00102709 and PAP-00102636, PVSC permit applications noting copper/lead and mercury, known to be absent. PAP-00102618, PAP-00102620 and PAP-00102628, PVSC permit applications noting copper/lead/mercury not expected to be present in wastewater.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
72	#yrs facility discharged	
40.38	calc mg/L O&G (PAP00102592, PAP00425704)	
10%	% O&G that is considered PAHs	1975 PVSC Waste Effluent Survey, 1985 PVSC Permit, 1990 PVSC Permit, 1995 PVSC Permit
60%	% PAHs considered as HPAHs	
2	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
8,375.11	calc kg COC discharged	
LPAHs		
72	#yrs facility discharged	
40.38	calc mg/L O&G (PAP00102592, PAP00425704)	
10%	% O&G that is considered PAHs	1975 PVSC Waste Effluent Survey, 1985 PVSC Permit, 1990 PVSC Permit, 1995 PVSC Permit
40%	% PAHs considered as LPAHs	
2	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
5,583.41	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
72	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
51	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
8,375.11	kg HPAHs	
5,583.41	kg LPAHs	
-	kg PCBs	
-	kg DDx	

-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Discharged wastewater and storm water to CSO and storm sewer, connected in 1924. discharged to
	# days/week discharged	Passaic from 1919-1924
	# weeks/yr discharged	
12,683,494.17	# gals/yr directly discharged	COCs concentrations assumed same as to PVSC
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1919	Yr Ops started	
1923	Yr Ops ceased	
4	calc #yrs facility operated	
Copper (Cu)		
4	#yrs facility discharged	
-	calc mg/L COC discharged	PAP-0010593, 1975 Waste Effluent Survey notes no metallic ions including copper, lead and mercury. PAP-00102709 and PAP-00102636, PVSC permit applications noting copper/lead and mercury, known to be absent. PAP-00102618, PAP-00102620 and PAP-00102628, PVSC permit applications noting copper/lead/mercury not expected to be present in wastewater.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
4	#yrs facility discharged	
-	calc mg/L COC discharged	PAP-0010593, 1975 Waste Effluent Survey notes no metallic ions including copper, lead and mercury. PAP-00102709 and PAP-00102636, PVSC permit applications noting copper/lead and mercury, known to be absent. PAP-00102618, PAP-00102620 and PAP-00102628, PVSC permit applications noting copper/lead/mercury not expected to be present in wastewater.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
4	#yrs facility discharged	
-	calc mg/L COC discharged	PAP-0010593, 1975 Waste Effluent Survey notes no metallic ions including copper, lead and mercury. PAP-00102709 and PAP-00102636, PVSC permit applications noting copper/lead and mercury, known to be absent. PAP-00102618, PAP-00102620 and PAP-00102628, PVSC permit applications noting copper/lead/mercury not expected to be present in wastewater.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
4	#yrs facility discharged	
40.38	calc mg/L O&G (PAP00102592, PAP00425704)	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
2.4	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
465.2841	calc kg COC discharged	
LPAHs		
4	#yrs facility discharged	
40.38	calc mg/L O&G (PAP00102592, PAP00425704)	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
2	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
310.1894	calc kg COC discharged	
PCBs		
-5	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-16	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-26	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
4	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-22	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-21	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
465.28	kg HPAHs	
310.19	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Berol Corporation

41 Dickinson Street | **Newark** | **NJ**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.113E-6	0.0%	Historically Compliant or No Evidence	No information on NOVs was identified in the available file material. There were releases to the surface. Stained areas on compromised asphalt in courtyard area; excavated 227 tons soil due to PAHs to a depth of 36 in. Removed naptha UST in Feb 1995 and excavated 30 tons soil. Excavated 3.5 tons soil from sink drain discharge area to depth of 36 in (see FDR page 10 for more information).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	4.091E-6

AP_ABS	4.091E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Berol Corporation

41 Dickinson Street	**Newark**	**NJ**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.781E-5	0.0%	Historically Compliant or No Evidence	No information on NOVs was identified in the available file material. There were releases to the surface. Stained areas on compromised asphalt in courtyard area; excavated 227 tons soil due to PAHs to a depth of 36 in. Removed naptha UST in Feb 1995 and excavated 30 tons soil. Excavated 3.5 tons soil from sink drain discharge area to depth of 36 in (see FDR page 10 for more information).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.225E-5

AP_ABS	2.225E-5

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

BEROL

Berol argues that OxyChem released Berol and certain other parties (including Berol's parent company, Newell Brands Inc.) from OxyChem's claim for Remedial Design Costs related to OU2. Accordingly, any allocation of OU2 costs that includes OxyChem and Berol (and the other released parties) must reflect this release of liability.

ALLOCATOR'S DETERMINATION – Though I have not had the opportunity to review the underlying settlement document and other potentially relevant facts associated with the release provided by OCC, assuming its validity, it is apparent that there is a high likelihood of success in any action against OCC to enforce the release. Given OCC's lack of participation in the allocation process, however, the Allocator does not believe that it is appropriate to account for the amount of any such release in the assignment of allocated shares. Rather, the Allocator notes the existence of the release and recommends that it be taken into account in determining the appropriate amount of any future settlement with EPA.

Allocation Facility Cmass Calculation

Campbell Foundry Company	800 Bergen Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	23.72	100.00%	-	0.27%	10,845.27	100.00%	-	53.04	1.018817E-2	0.54
Lead	100.00%	174.75	100.00%	-	0.27%	154,229.41	100.00%	-	591.76	1.018817E-2	6.03
Mercury	100.00%	0.19	100.00%	-	0.27%	0.34	100.00%	-	0.19	1.018817E-2	0
HPAHs	100.00%	7.71	100.00%	-	0.27%	0.65	100.00%	-	7.71	1.018817E-2	0.08
LPAHs	100.00%	4.18	100.00%	-	0.27%	7.55	100.00%	-	4.2	1.018817E-2	0.04
PCBs	100.00%	2.64	100.00%	-	0.27%	-	100.00%	-	2.64	1.018817E-2	0.03
DDx	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Campbell Foundry Company	800 Bergen Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.54	2.573E-7	1.776E-7
Lead	0.01	3,200,000.00	6.03	1.884E-6	1.884E-8
Mercury	0.95	42,000.00	0	4.631E-8	4.399E-8
HPAHs	0.05	240,000.00	0.08	3.274E-7	1.637E-8
LPAHs	0.01	170,000.00	0.04	2.517E-7	2.517E-9
PCBs	12.87	26,000.00	0.03	1.034E-6	1.331E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Campbell Foundry Company	800 Bergen Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.915E-4	0.54	401.66	1.915E-4	1.321E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.051E-3	6.03	6,555.94	2.051E-3	2.051E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	4.417E-5	0	1.85	4.417E-5	4.196E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.774E-6	0.08	0.35	1.774E-6	8.871E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.394E-6	0.04	0.19	1.394E-6	1.394E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.316E-4	0.03	3.39	1.316E-4	1.693E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Campbell Foundry Company	**800 Bergen Street**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Worthington Ave	CSO	0.48%	56.33%	No metering was done at this location for the Killiam report. CSO percentages were calculated by the median of all CSOs in the Harrison municipality

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
15,000	gal discharged per day PAS00108465	1975-77 0.015MGD Discharge
	# hours/per day discharged	assumed to be 5 days per week, 52 weeks per year - no data
5	#days/week discharged	No discharge data - Estimating based on data from Revere Smelting Operations
52	#weeks/yr discharged	
3,900,000	calc gal/yr discharge	Facility was connected to the PVSC around 1921
		PAP00070209 states that sanitary has always been connected to public sewers.
1927	Yr Ops started	1987/88 PVSC report listed facility as "Company with Zero Discharge."
2020	Yr Ops ceased	
93	calc #yrs facility operated	
Copper (Cu)		
93	#yrs facility discharged	Based on Revere smelting - reduced by 50% due to nature of operation
7.90	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
10,845.27	calc kg COC discharged	
Lead (Pb)		
93	#yrs facility discharged	
112.35	calc mg/L COC discharged	Based on Revere smelting - reduced by 50% due to nature of operation
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
154,229.41	calc kg COC discharged	
Mercury (Hg)		
93	#yrs facility discharged	
0.0002	calc mg/L COC discharged	Based on Revere smelting - reduced by 50% due to nature of operation
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.336	calc kg COC discharged	
HPAHs		
93	#yrs facility discharged	
	calc mg/L O&G	Based on Revere smelting
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.00047	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.6452	calc kg COC discharged	
LPAHs		
93	#yrs facility discharged	
-	calc mg/L O&G	Based on Revere Smelting
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.0055	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
7.55	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	PCBS were found in gravel area at South end of the facility, opposite from a storm sewer drain. Minor discharge of hydraulic oil from onsite equipment. Did not migrate to or impact sewer.
-	calc mg/L COC discharged PAP00073048, PAP00073437	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
93	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
75	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
10,845.274	kg Copper	
154,229.407	kg Lead	
0.336	kg Mercury	
0.645	kg HPAHs	
7.551	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	PAS-00012495 - NO direct outfall to the Passaic River.
	# gals/yr directly discharged	Facility is located within the Worthington Avenue CSO District (PAS00012495-98)
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	Yr Ops started	
	Yr Ops ceased	
1	calc #yrs facility operated	
Copper (Cu)		
1	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
Lead (Pb)		
1	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
1	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
1	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
LPAHs		
1	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
PCBs		
-1928	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-1939	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-1949	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
1	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-1945	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-1944	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-1949	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
2.6	ACRES - TOTAL SITE AREA (acres)		
0.90	ACRES - AFFECTED AREA	Structures not on site until 1947 (PAP-00073054). After 1947, 85% covered (PAP-00070192). Estimated 0.9 acres over entire period of ownership	
4,046.86	METERS^2/ACRE		
3,642	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1927	Year site operations began	FDR page 1	
2020	Year site processing and storage operations ceased	Present (FDR page 1)	
93	NUMBER YEARS DISCHARGE	Campbell Foundry liability 93 years, 1927 to present (FDR, page 1)	
34	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,843	KG/M^3 SOIL DENSITY	Black medium to coarse sand, trace silt (PAP-00073044). Bulk density range for silty sand 1410 KG/M^3 to 2275 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
62,410	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
93	YEARS DISCHARGED		
380	MG/KG (MAX CONCENTRATION)	Copper was found in on-site soil sample E2C-1 (1.5-2) at 380 mg/kg. (PAP-00073468).	
0.000001	kg per mg (Merck Index)		
23.72	KILOGRAMS DISCHARGED		
Lead (Pb)			
93	YEARS DISCHARGED		
2800	MG/KG (MAX CONCENTRATION)	Lead was found in on-site soil sample E7-1 (0.5-1) at 2,800 mg/kg. (PAP-00073468).	
0.000001	kg per mg (Merck Index)		
174.75	KILOGRAMS DISCHARGED		
Mercury (Hg)			
93	YEARS DISCHARGED		
3.0	MG/KG (MAX CONCENTRATION)	Mercury was found in on-site soil sample E2C-1 (1.5-2) at 3 mg/kg. (PAP-00073469).	
0.000001	kg per mg (Merck Index)		
0.19	KILOGRAMS DISCHARGED		

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PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		
93	YEARS DISCHARGED	
123.6	MG/KG (TOTAL PAH MAX CONCENTRATION)	Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
0.000001	kg per mg (Merck Index)	
7.71	KILOGRAMS DISCHARGED	Sum of Benzo(a)pyrene Equivalent conversion concentrations
PAHs (others detected)		
93	YEARS DISCHARGED	
67	MG/KG (TOTAL PAH MAX CONCENTRATION)	Data below the Benzo(a)pyrene Equivalent Table
0.000001	kg per mg (Merck Index)	
4.18	KILOGRAMS DISCHARGED	
PCBs		
90	YEARS DISCHARGED	PCBs first used in 1930
4.3	MG/KG (MAX CONCENTRATION)	Total PCBs was found in on-site soil sample E2a-1N2 (4.5-5 ft bgs) (PAP-00073058).
0.000001	kg per mg (Merck Index)	
2.64	KILOGRAMS DISCHARGED	
DDx		
0	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		
0	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Maximum concentrations found in surface soil sample E7-1 (0.5-1 ft bgs) (PAP-00073557-58).

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	86.000	1.0	86.0000
Benzo(a)anthracene	62.000	0.1	6.2000
Benzo(b)fluoranthene	100.000	0.1	10.0000
Benzo(k)fluoranthene	34.000	0.01	0.3400
Chrysene	62.000	0.001	0.0620
Dibenz(a,h)anthracene	15.000	1.0	15.0000
Indeno(1,2,3-cd)pyrene	60.000	0.1	6.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **123.6**

Maximum PAH concentrations found in soil sample E7-1 (0.5-1 ft bgs) (PAP-00073557-58).

Anthracene	11
Acenaphthene	5.9
Acenaphthylene	0
Fluorene	3
Naphthalene	7.1
Phenanthrene	38
2-Methylnaphthalene	2
SUM	67

SUMMARY CMASS ESTIMATES:

23.72	kg Copper
174.75	kg Lead
0.19	kg Mercury
7.71	kg PAHs (Benzo(a)pyrene Equivalent)
4.18	kg PAHs (Other)
2.64	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

213.19 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Campbell Foundry Company

800 Bergen Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.018E-5	5.0%	Occasional Noncompliance	NJDEP issued several violations related to poor housekeeping (e.g., spilling hazardous waste - cupola dust on the ground, hazardous waste containers split open and the hazardous waste spilled on the ground, etc.) in 1983 (PAS-00012571; PAP-00070212).	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.069E-5

AP_ABS	1.069E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Campbell Foundry Company

800 Bergen Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.416E-3	5.0%	Occasional Noncompliance	NJDEP issued several violations related to poor housekeeping (e.g., spilling hazardous waste - cupola dust on the ground, hazardous waste containers split open and the hazardous waste spilled on the ground, etc.) in 1983 (PAS-00012571; PAP-00070212).	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.487E-3

AP_ABS	1.487E-3

Allocation Facility Cmass Calculation

Canning Gumm LLC	538 Forest Street	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	1.21%	636.74	100.00%	-	7.72	1.018817E-2	0.08
Lead	100.00%	-	100.00%	-	1.21%	72.46	100.00%	-	0.88	1.018817E-2	0.01
Mercury	100.00%	-	100.00%	-	1.21%	18.14	100.00%	-	0.22	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	1.21%	50.80	100.00%	-	0.62	1.018817E-2	0.01
LPAHs	100.00%	-	100.00%	-	1.21%	33.87	100.00%	-	0.41	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Canning Gumm LLC	538 Forest Street	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.08	3.744E-8	2.583E-8
Lead	0.01	3,200,000.00	0.01	2.796E-9	2.796E-11
Mercury	0.95	42,000.00	0	5.334E-8	5.068E-8
HPAHs	0.05	240,000.00	0.01	2.614E-8	1.307E-9
LPAHs	0.01	170,000.00	0	2.460E-8	2.460E-10
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Canning Gumm LLC	538 Forest Street	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	2.786E-5	0.08	58.44	2.786E-5	1.923E-5
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	3.043E-6	0.01	9.73	3.043E-6	3.043E-8
Mercury	0.95	42,000.00	4,322.53	41,955.96	5.087E-5	0	2.13	5.087E-5	4.833E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.417E-7	0.01	0.03	1.417E-7	7.083E-9
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.362E-7	0	0.02	1.362E-7	1.362E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Canning Gumm LLC	**538 Forest Street**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Ivy	CSO	1.83%	66.23%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
1,174,914	calc gal/yr discharge; (FDR) (PAS-00015782, 15855-68, 16003-19)	
1933	Yr Ops started (FDR)	
2002	Yr Ops ceased (FRD)	
18	yrs sanitary/industrial ww discharged to onsite septic system (FDR)	
51	calc #yrs facility operated	
Copper (Cu)		
51	#yrs facility discharged	
2.81	calc mg/L COC discharged; (FDR) (PAS-00015782, 15855-68, 16003-19; PAS-00016258, 16613-17)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
637	calc kg COC discharged	
Lead (Pb)		
51	#yrs facility discharged	
0.32	calc mg/L COC discharged; (FDR) (PAS-00015782, 16003-19; PAS-00015782, 16058-64, PAS-00016258, 16613-17)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
72	calc kg COC discharged	
Mercury (Hg)		
51	#yrs facility discharged	
0.08	calc mg/L COC discharged; (FDR) (PAS-00016258, 16613-17)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
18	calc kg COC discharged	
HPAHs		used stoddard solvent (petro based solvent), #2 fuel oil
51	#yrs facility discharged	
3.7	calc mg/L O&G discharged; (FDR) (PAS-00015782, 15855-68, 16003-19; PAS-00016258, 16613-17)	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.2	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
50.80	calc kg COC discharged	
LPAHs		used stoddard solvent (petro based solvent), #2 fuel oil
51	#yrs facility discharged	
3.7	calc mg/L O&G discharged; (FDR) (PAS-00015782, 15855-68, 16003-19; PAS-00016258, 16613-17)	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
33.87	calc kg COC discharged	
PCBs		no use/presence per AP
45	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		no use/presence per AP
33	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		no use/presence per AP
38	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		no use/presence per AP
51	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		no use/presence per AP
57	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		no use/presence per AP
41	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		no use/presence per AP
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
637	kg Copper	
72	kg Lead	
18	kg Mercury	
51	kg HPAHs	
34	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Canning Gumm LLC

538 Forest Street	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.809E-8	0.0%	Historically Compliant or No Evidence	No information on NOVs was identified in the available file material. The facility monitored their effluent discharged to the PVSC in the 1980s and 1990s and had occassional violations of the lead permit limit. Each time the facility responded to try to fix the issues, and noted that lead was not used in their processes. Leaking USTs led to onsite LNAPL contamination from No. 2 fuel oil, which is being remediated.	-10.0%	-10% SPG member - Provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory to address environmental or public harm created by own activities	7.028E-8

AP_ABS	7.028E-8

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Canning Gumm LLC

538 Forest Street	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
6.760E-5	0.0%	Historically Compliant or No Evidence	No information on NOVs was identified in the available file material. The facility monitored their effluent discharged to the PVSC in the 1980s and 1990s and had occassional violations of the lead permit limit. Each time the facility responded to try to fix the issues, and noted that lead was not used in their processes. Leaking USTs led to onsite LNAPL contamination from No. 2 fuel oil, which is being remediated.	-10.0%	-10% SPG member - Provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory to address environmental or public harm created by own activities	6.084E-5

AP_ABS	6.084E-5

Allocation Facility Cmass Calculation

CBS Corporation	95 Orange Street	Newark	NJ	07102

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	80.77	100.00%	14,281.75	13.00%	24,483.00	100.00%	-	17,545.86	1.018817E-2	178.76
Lead	100.00%	526.62	100.00%	5,824.47	13.00%	9,984.81	100.00%	-	7,649.34	1.018817E-2	77.93
Mercury	100.00%	2.09	100.00%	10.05	13.00%	17.23	100.00%	-	14.38	1.018817E-2	0.15
HPAHs	100.00%	1.11	100.00%	9,101.73	13.00%	15,602.96	100.00%	-	11,131.57	1.018817E-2	113.41
LPAHs	100.00%	0.26	100.00%	6,067.82	13.00%	10,401.97	100.00%	-	7,420.57	1.018817E-2	75.6
PCBs	100.00%	0.95	100.00%	-	13.00%	-	100.00%	-	0.95	1.018817E-2	0.01
DDx	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

CBS Corporation	95 Orange Street	Newark	NJ	07102

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	178.76	8.512E-5	5.874E-5
Lead	0.01	3,200,000.00	77.93	2.435E-5	2.435E-7
Mercury	0.95	42,000.00	0.15	3.488E-6	3.314E-6
HPAHs	0.05	240,000.00	113.41	4.725E-4	2.363E-5
LPAHs	0.01	170,000.00	75.6	4.447E-4	4.447E-6
PCBs	12.87	26,000.00	0.01	3.723E-7	4.791E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

CBS Corporation	95 Orange Street	Newark	NJ	07102

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	6.335E-2	178.76	132,859.48	6.335E-2	4.371E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.651E-2	77.93	84,744.64	2.651E-2	2.651E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	3.327E-3	0.15	139.58	3.327E-3	3.160E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.561E-3	113.41	501.26	2.561E-3	1.281E-4
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.463E-3	75.6	343.11	2.463E-3	2.463E-5
PCBs	12.87	26,000.00	20,066.54	25,795.56	4.734E-5	0.01	1.22	4.734E-5	6.093E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

CBS Corporation	**95 Orange Street**	**Newark**	**NJ**	**07102**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Clay St	CSO	0.90%	41.36%	
2	Clay St	Bypass	12.63%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
280	# days/yr (FDR) (PAS-00009867)	
104,198,573	calc gal/yr discharge (FDR) (PAS-00009660, PAS-00009860, PAS-00009867, PAP-00347467, PAP-00425582, PAP-00348950)	
1889	Yr Ops initially started (FDR)	
1894	Yr Ops initially ceased (FDR)	
5	calc #yrs facility initially operated	
1901	yr Ops restarted (FDR)	
1983	yr ops ceased (FDR)	
82	calc #yrs facility subsequently operated	
87	calc # yrs facility operated, total	
Copper (Cu)		
87	#yrs facility discharged	
1.39	calc mg/L COC discharged	(FDR) (PAS-00009660, PAS-00009860, PAS-00009867, PAP-00425582, PAP-00348950). 0.407 mg/l pre 1960
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
38,765	calc kg COC discharged	
Lead (Pb)		
87	#yrs facility discharged	
0.46	calc mg/L COC discharged (FDR) (PAS-00009660, PAS-00009860, PAS-00009867, PAP-00348950)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
15,809	calc kg COC discharged	
Mercury (Hg)		
87	#yrs facility discharged	
0.0008	calc mg/L COC discharged (FDR) (PAS-00009660, PAS-00009860, PAS-00009867, PAP-00425594, PAP-00348950)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
27	calc kg COC discharged	
HPAHs		
87	#yrs facility discharged	
12	calc mg/L O&G (FDR) (PAS-00009660, PAS-00009860, PAS-00009867)	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
24,705	calc kg COC discharged	
LPAHs		
87	#yrs facility discharged	
12	calc mg/L O&G (FDR) (PAS-00009660, PAS-00009860, PAS-00009867)	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
16,470	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
34	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
87	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
38	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
39	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
38,765	kg Copper	
15,809	kg Lead	
27	kg Mercury	
24,705	kg HPAHs	
16,470	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
3.45	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
1	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of historical aerial photographs 1930-2020 (Google Earth Pro and https://njdep.maps.arcgis.com/apps/webappviewer/index.html). Estimating 75% of the site was occupied by buildings	
4,046.86	METERS^2/ACRE		
3,490	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1889	Year site operations began (FDR p 1)	CBS (then Westinghouse) leased the site before they bought it in 1891 (FDR p 1)	
1983	Year site operations ceased (FDR p 1)	CBS ceased operations and sold the site in 1983 (FDR p 2)	
94	NUMBER YEARS DISCHARGE		
33	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,939	KG/M^3 SOIL DENSITY	Fill over much of the site was reported as pieces of bricks, blocks, and wood along with ash, slag, sand, and coal in a soil maxtrix. Native soils consist of red-brown clay, silt, sand, and gravel (PAP-00086836). Bulk density range 1378 KG/M^3 to 2499 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
63,602	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The allocation team determined that this site is not located on historic fill (FDR p 17)	
Copper (Cu)		Copper plating process on site (FDR p 3)	
94	YEARS DISCHARGED		
1270	MG/KG (MAX CONCENTRATION)	Sample Y-14 (1-1.5 ft bgs) (PAP-00086887)	
0.000001	kg per mg (Merck Index)		
81	KILOGRAMS DISCHARGED		
Lead (Pb)		Possible lead paint use (FDR p 3)	
94	YEARS DISCHARGED		
8280	MG/KG (MAX CONCENTRATION)	Sample D6A (1-1.5 ft bgs) (PAP-00086846)	
0.000001	kg per mg (Merck Index)		
527	KILOGRAMS DISCHARGED		
Mercury (Hg)		No info on storage or use of mercury on site (FDR)	
94	YEARS DISCHARGED		
32.9	MG/KG (MAX CONCENTRATION)	Sample BDFDS2 (1 ft bgs) (PAP-00086846)	
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
94	YEARS DISCHARGED	
17.5	MG/KG (TOTAL PAH MAX CONCENTRATION)	Naphthenic-base crude oil used on site (FDR p 3)
0.000001	kg per mg (Merck Index)	
1	KILOGRAMS DISCHARGED	
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table
94	YEARS DISCHARGED	
4	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PCBs		
53	YEARS DISCHARGED	Possible use of PCB-containing cutting oils (FDR p 3)
14.9	MG/KG MAX CONCENTRATION)	Sample 112A (0.5-1 ft bgs), combined Aroclor-1254 and -1260 (PAP-00086879)
0.000001	kg per mg (Merck Index)	
1	KILOGRAMS DISCHARGED	
DDx		No info on storage or use of DDx on site (FDR)
0	YEARS DISCHARGED within DDx Timeline	
0.148	MG/KG (MAX CONCENTRATION)	DDT concentration at Sample EXHFS1 (1 ft bgs) (PAP-00087049)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		No info on storage or use of dieldrin on site (FDR)
94	YEARS DISCHARGED within Dieldrin Timeline	
0.036	MG/KG (MAX CONCENTRATION)	Sample BHTRS1 (2.5 ft bgs) (PAP-00086958)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

All PAH data from Sample Y-22 (1-1.5 ft bgs) (PAP-00086884)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	12.300	1.0	12.3000
Benzo(a)anthracene	8.840	0.1	0.8840
Benzo(b)fluoranthene	22.000	0.1	2.2000
Benzo(k)fluoranthene	8.380	0.01	0.0838
Chrysene	17.400	0.001	0.0174
Dibenz(a,h)anthracene	1.580	1.0	1.5800
Indeno(1,2,3-cd)pyrene	4.160	0.1	0.4160

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **17.5**

All PAH data from Sample Y-22 (1-1.5 ft bgs) (PAP-00348613)

Fluorene	0.29
Naphthalene	0
Phenanthrene	0.609
Anthracene	1.4
Acenaphthene	0
Acenaphthylene	1.78
SUM	4.079

SUMMARY CMASS ESTIMATES:

80.77	kg Copper
526.62	kg Lead
2.09	kg Mercury
1.11	kg PAHs (Benzo(a)pyrene Equivalent)
0.26	kg PAHs (Other)
0.95	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

611.81 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

CBS Corporation

95 Orange Street	**Newark**	**NJ**	**07102**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
9.516E-5	0.0%	Historically Compliant or No Evidence	During a 1996 inspection of the facility (CBS owned/operated the site 1889-1984), inspection of the Transformer Areas showed oil staining and an actual puddle of oil was apparent on the concrete floor next to Transformer A2. Oil staining was also evident on the floor near the rear of the transformer room. Floor drains were observed (PAP-00347568). A 55-gallon drum of boiler treatment chemical was stored on top of, and leaking into a trench in the engine room. Miscellaneous oils in 55-gallon drums were also stored above the trenches. A leaking oil pump was observed on top of a trench in front of the active boiler in the engine room. Oil staining was also observed on the concrete floor in front of one of the inactive boilers (PAP-00347568). Given date of insepection, difficult to assertain whether actions resulting in contaminantion were during CBS operations on site.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.613E-5

AP_ABS	7.613E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

CBS Corporation

95 Orange Street	**Newark**	**NJ**	**07102**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.790E-2	0.0%	Historically Compliant or No Evidence	During a 1996 inspection of the facility (CBS owned/operated the site 1889-1984), inspection of the Transformer Areas showed oil staining and an actual puddle of oil was apparent on the concrete floor next to Transformer A2. Oil staining was also evident on the floor near the rear of the transformer room. Floor drains were observed (PAP-00347568). A 55-gallon drum of boiler treatment chemical was stored on top of, and leaking into a trench in the engine room. Miscellaneous oils in 55-gallon drums were also stored above the trenches. A leaking oil pump was observed on top of a trench in front of the active boiler in the engine room. Oil staining was also observed on the concrete floor in front of one of the inactive boilers (PAP-00347568). Given date of insepection, difficult to assertain whether actions resulting in contaminantion were during CBS operations on site.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.832E-2

AP_ABS	3.832E-2

Allocation Facility Cmass Calculation

Celanese Ltd./CAN Holdings LLC	226 Rome Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	158.09	11.93%	1,304.21	100.00%	-	313.67	1.018817E-2	3.2
LPAHs	100.00%	-	100.00%	105.39	11.93%	869.48	100.00%	-	209.11	1.018817E-2	2.13
PCBs	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Celanese Ltd./CAN Holdings LLC	226 Rome Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	3.2	1.332E-5	6.658E-7
LPAHs	0.01	170,000.00	2.13	1.253E-5	1.253E-7
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Celanese Ltd./CAN Holdings LLC	226 Rome Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	7.217E-5	3.2	14.12	7.217E-5	3.608E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	6.941E-5	2.13	9.67	6.941E-5	6.941E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Celanese Ltd./CAN Holdings LLC	**226 Rome Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Polk St.	CSO	0.10%	69.05%	
2	Polk St.	Bypass	11.86%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No information on discharges to sanitary sewer or river.
	# hours/per day discharged	Facility was a support facility to main plant and performed
	#days/week discharged	- cellulose acetate recycling
	#weeks/yr discharged	- camphor refinement
46,883,750	calc gal/yr discharge	- production of lindol
		After 1924 construction of PVSC sewer line effluent flowed to treatment facility on Wilson Ave and discharged to NY Harbor
1954	Yr Ops started	Estimated based on Ferry Street
1996	Yr Ops ceased	Since ancillary Facility assumed flow to be 50% of Ferry Street
42	calc #yrs facility operated	
Copper (Cu)		
42	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
42	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
42	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
42	#yrs facility discharged	Based on Celanese Ferry Street
3.27	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.20	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,462.30	calc kg COC discharged	
LPAHs		
42	#yrs facility discharged	
3.27	calc mg/L O&G	Based on Celanese Ferry Street
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.13	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
974.87	calc kg COC discharged	
PCBs		
24	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
19	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
34	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
42	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
43	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
32	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
22	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
1,462.30	kg HPAHs	
974.87	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Celanese Ltd./CAN Holdings LLC	290 Ferry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	11.93%	-	100.00%	195.1	195.1	1.018817E-2	1.99
Lead	100.00%	-	100.00%	-	11.93%	-	100.00%	83.2	83.18	1.018817E-2	0.85
Mercury	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0.02	1.018817E-2	0
HPAHs	100.00%	-	100.00%	3,804.65	11.93%	5,483.17	100.00%	19,846.6	24,305.29	1.018817E-2	247.63
LPAHs	100.00%	-	100.00%	2,536.43	11.93%	3,655.45	100.00%	13,231.0	16,203.53	1.018817E-2	165.08
PCBs	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	11.93%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Celanese Ltd./CAN Holdings LLC	290 Ferry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	1.99	9.465E-7	6.531E-7
Lead	0.01	3,200,000.00	0.85	2.648E-7	2.648E-9
Mercury	0.95	42,000.00	0	5.094E-9	4.839E-9
HPAHs	0.05	240,000.00	247.63	1.032E-3	5.159E-5
LPAHs	0.01	170,000.00	165.08	9.711E-4	9.711E-6
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Celanese Ltd./CAN Holdings LLC	290 Ferry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	7.044E-4	1.99	1,477.32	7.044E-4	4.861E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.882E-4	0.85	921.52	2.882E-4	2.882E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	4.858E-6	0	0.2	4.858E-6	4.615E-6
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	5.592E-3	247.63	1,094.47	5.592E-3	2.796E-4
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	5.378E-3	165.08	749.2	5.378E-3	5.378E-5
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Celanese Ltd./CAN Holdings LLC	**290 Ferry Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Polk St.	CSO	0.10%	69.05%	
2	Polk St.	Bypass	11.86%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
150,839,000	calc gal/yr discharge (PAP0010558)	1972 PVSC Waste Effluent Survey for discharge in 1971
		150,839,000 gal to sanitary & 786,836,000 gal to Storm Sewer
1890	Yr Ops started	
1973	Yr Ops ceased	
83	calc #yrs facility operated	
Copper (Cu)		
83	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
83	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
83	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
83	#yrs facility discharged	
3.27	calc mg/L O&G (PAP0010558)	1972 PVSC Waste Effluent Survey for discharge in 1971: Floatable oils 1.0mg/l, 4.6 mg/l and 4.2 mg/l
10%	% O&G that is considered PAHs	1987/88 found report found in sewer sediment: 1.944 mg/k Benzo(a)anthracene
60%	% PAHs considered as HPAHs	2.308 mg/kg Benzo(a)Pyrene
0.196	calc mg/L HPAHs	1.743 mg/kg Benzo (b) Flouranthene
3.785	L per gallon (Merck Index)	2.647 mg/kg Benzo (k) Flouranthene
0.000001	kg per mg (Merck Index)	2.171 mg/kg Chrysene
9,287.82	calc kg COC discharged	3.522 mg/kg Pyrene
LPAHs		
83	#yrs facility discharged	
3.27	calc mg/L O&G (PAP0010558)	1972 PVSC Waste Effluent Survey for discharge in 1971: Floatable oils 1.0mg/l, 4.6 mg/l and 4.2 mg/l
10%	% O&G that is considered PAHs	1987/88 found report found in sewer sediment: 1.944 mg/k Benzo(a)anthracene
40%	% PAHs considered as LPAHs	2.308 mg/kg Benzo(a)Pyrene
0.13	calc mg/L LPAHs	1.743 mg/kg Benzo (b) Flouranthene
3.785	L per gallon (Merck Index)	2.647 mg/kg Benzo (k) Flouranthene
0.000001	kg per mg (Merck Index)	2.171 mg/kg Chrysene
6,191.88	calc kg COC discharged	3.522 mg/kg Pyrene
PCBs		
45	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
24	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
83	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
28	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
29	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
24	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
9,287.82	kg HPAHs	
6,191.88	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	1972 PVSC Waste Effluent Survey for discharge in 1971
786,836,000	# gals/yr directly discharged	150,839,000 gal to sanitary & 786,836,000 gal to Storm Sewer
		assumed to be connected to PVSC in 1924
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1890	Yr Ops started	
1924	Yr Ops ceased	
34	calc #yrs facility operated	
Copper (Cu)		
34	#yrs facility discharged	1987/88 found in sewer sediment @ 90.2 mg/kg and 6140 mg/kg
-	calc mg/L COC discharged	62633.25 kg x ((6140+90.2)/2) mg/kg x .000001 kg/mg = 195.1 kg Cu
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
195.10	calc kg COC discharged	
Lead (Pb)		
34	#yrs facility discharged	1987/88 found in sewer sediment @ 2232 mg/k and 424 mg/kg
	calc mg/L COC discharged	62633.25 kg x ((2232+424)/2) mg/kg x .000001 kg/mg = 83.18 kg Pb
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
83.2	calc kg COC discharged	
Mercury (Hg)		
34	#yrs facility discharged	1987/88 found in sewer sediment @ 0.253 mg/kg and 0.408 mg/kg
	calc mg/L COC discharged	62633.25 kg x ((.253+.408)/2) mg/kg x .000001 kg/mg = .021 kg Hg
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.021	calc kg COC discharged	
HPAHs		
34	#yrs facility discharged	1972 PVSC Waste Effluent Survey for discharge in 1971: Floatable oils 1.0mg/l, 4.6 mg/l and 4.2 mg/l
3.27	calc mg/L O&G (PAP0010558)	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.196	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
19,846.5533	calc kg COC discharged	
LPAHs		
34	#yrs facility discharged	1972 PVSC Waste Effluent Survey for discharge in 1971: Floatable oils 1.0mg/l, 4.6 mg/l and 4.2 mg/l
3.27	calc mg/L O&G (PAP0010558)	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.13	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
13,231.0355	calc kg COC discharged	
PCBs		
-4	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-15	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-25	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
34	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-21	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-20	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-25	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
195.10	kg Copper	
83.18	kg Lead	
0.02	kg Mercury	
19,846.55	kg HPAHs	
13,231.04	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Celanese Ltd./CAN Holdings LLC	354 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	55.46	100.00%	2.3	2.32	1.018817E-2	0.02
Lead	100.00%	-	100.00%	-	0.00%	277.31	100.00%	10.6	10.59	1.018817E-2	0.11
Mercury	100.00%	4.4	100.00%	-	0.00%	1.66	100.00%	-	4.4	1.018817E-2	0.04
HPAHs	100.00%	36.46	100.00%	-	0.00%	-	100.00%	-	36.46	1.018817E-2	0.37
LPAHs	100.00%	199.4	100.00%	-	0.00%	44.37	100.00%	0.5	199.93	1.018817E-2	2.04
PCBs	100.00%	19.81	100.00%	-	0.00%	0.23	100.00%	0.9	20.71	1.018817E-2	0.21
DDx	100.00%	1.39	100.00%	-	0.00%	-	100.00%	-	1.41	1.018817E-2	0.01
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Celanese Ltd./CAN Holdings LLC	354 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.02	1.124E-8	7.758E-9
Lead	0.01	3,200,000.00	0.11	3.371E-8	3.371E-10
Mercury	0.95	42,000.00	0.04	1.067E-6	1.014E-6
HPAHs	0.05	240,000.00	0.37	1.548E-6	7.739E-8
LPAHs	0.01	170,000.00	2.04	1.198E-5	1.198E-7
PCBs	12.87	26,000.00	0.21	8.116E-6	1.045E-4
DDx	1.37	27,000.00	0.01	5.326E-7	7.297E-7
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Celanese Ltd./CAN Holdings LLC	354 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	8.368E-6	0.02	17.55	8.368E-6	5.774E-6
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	3.669E-5	0.11	117.29	3.669E-5	3.669E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.018E-3	0.04	42.71	1.018E-3	9.670E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	8.389E-6	0.37	1.64	8.389E-6	4.194E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	6.636E-5	2.04	9.24	6.636E-5	6.636E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.032E-3	0.21	26.63	1.032E-3	1.328E-2
DDx	1.37	27,000.00	2,516.93	26,974.36	5.608E-4	0.01	15.13	5.608E-4	7.683E-4
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Celanese Ltd./CAN Holdings LLC	**354 Doremus Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Flowrates from PAS-00071742 from 1980, 1986 and 1991
	# hours/per day discharged	All discharges to PVSC including surface drainage
7	#days/week discharged	
24	#weeks/yr discharged	
17,038,497	calc gal/yr discharge	
1954	Yr Ops started	
1996	Yr Ops ceased	
43	calc #yrs facility operated	
Copper (Cu)		
43	#yrs facility discharged	Sampling Effluent Data, 1981
0.02	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
55.46	calc kg COC discharged	
Lead (Pb)		
43	#yrs facility discharged	Sampling Effluent Data, 1981
0.10	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
277.31	calc kg COC discharged	
Mercury (Hg)		
43	#yrs facility discharged	Sampling Effluent Data, 1981
0.0006	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.66	calc kg COC discharged	
HPAHs		
43	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
43	#yrs facility discharged	Sampling Effluent Data, 1981
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
0.016	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
44.37	calc kg COC discharged	
PCBs		
24	#yrs facility discharged within PCBs Timeline	Sampling Effluent Data, 1981
0.00015	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.23	calc kg COC discharged	
DDx		
19	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
34	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
43	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
43	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
32	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
22	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
55.46	kg Copper	
277.31	kg Lead	
1.66	kg Mercury	
-	kg HPAHs	
44.37	kg LPAHs	
0.232	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	
6,626,614	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
43,560	ft2 per acre	
9.96	acres	Acreage revised
50%	Percent Precip to River	
1954	Yr Ops started	
1996	Yr Ops ceased	
42	calc #yrs facility operated	
Copper (Cu)		
42	#yrs facility discharged	Plum Creek COC ranges
0.0022	calc mg/L COC discharged	PAS-00072645-49, 56
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2.32	calc kg COC discharged	
Lead (Pb)		
42	#yrs facility discharged	Plum Creek COC ranges
0.010	calc mg/L COC discharged	PAS-00072645-49, 56
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
10.59	calc kg COC discharged	
Mercury (Hg)		
42	#yrs facility discharged	NON DETECT
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
42	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
42	#yrs facility discharged	Plum Creek COC ranges
0.0005	calc mg/L COC discharged	PAS-00072645-49, 56
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.5267	calc kg COC discharged	
PCBs		
24	#yrs facility discharged within PCBs Timeline	Plum Creek COC ranges
0.0015	calc mg/L COC discharged	PAS-00072645-49, 56
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.90	calc kg COC discharged	
DDx		
19	#yrs facility discharged within DDx Timeline	Plum Creek COC ranges
0.000045	calc mg/L COC discharged	PAS-00072645-49, 56
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0214	calc kg COC discharged	
Dieldrin		
34	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
42	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
43	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
32	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
22	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
2.3176	kg Copper	
10.5870	kg Lead	
-	kg Mercury	
-	kg HPAHs	
0.5267	kg LPAHs	
0.9029	kg PCBs	
0.0214	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.083333333	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
27	ACRES - TOTAL SITE AREA (acres)	Two areas: the East Farm, a 7.5 acre lot situated east of Doremus Avenue and abutting Newark Bay; and, the West Farm, a 19.3 acre lot located west of Doremus Avenue (FDR page 1-2).	
11	ACRES - AFFECTED AREA	According to the facility layout map on page 4 of the FDR, the site appears to be about 40% unpaved. Therefore, the estimated affected area for this calcualtion is about 10.8 or 11 acres	
4,046.86	METERS^2/ACRE		
44,515	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
4	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES AND PLUM CREEK	
1954	Year site operations began	Celanese purchased the eastern portion of the site in 1954 and the purchased the West Farm in 1957 (FDR page 1)	
1996	Year site operations ceased	FDR page 1	
42	NUMBER YEARS DISCHARGE		
187	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill reported as brown to black fine-to coarse-grained sand with some silt or clayey silt. Gravel-sized particles are frequently present in the form of glass, ceramic, brick, plastic, metal or wood fragments (PAP-00020891). Bulk density range for silty sand and gravel is 1442 KG/M3 to 2483 KG/M3, so use average. (http://structx.com/Soil_Properties_002.html)	
366,919	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
42	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Copper was found in surface soil at AEC 36 at a max concentration of 447 mg/kg in soil boring 700A-3603-SB03 (depth of 0.0 to 0.5 ft bgs) (PAP-00020849 PDF page 108). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
42	YEARS DISCHARGED		
0	MG/KG (AVERAGE CONCENTRATION)	Lead was found in surface soil at sample ID 700A-3604-SB01 at a max concentration of 3670 mg/kg (depth 0.0-0.5 ft bgs) PAP-00020849 pdf page 108. Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
42	YEARS DISCHARGED		
12.0	MG/KG (MAX CONCENTRATION)	Mercury was found in surface soil at sample 700A-3603-SB02 at a max concentraiton of 2.8 mg/kg (depth 2.5-3.0 ft bgs) PAP-00020849, pdf page 108. Due to the density of mercury, a deeper sample may be more representative because sampling was not conducted immediately after the release occured.	
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
42	YEARS DISCHARGED	
99.4	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations listed in FDR TABLE, PAGE 18
0.000001	kg per mg (Merck Index)	
36	KILOGRAMS DISCHARGED	
PAHs (others detected)		
42	YEARS DISCHARGED	
400	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Other LMW PAHs = Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Napthalene, and Phenanthrene. Concentrations from AEC 59 in surface soil (FDR page 18)
0.000001	kg per mg (Merck Index)	
199	KILOGRAMS DISCHARGED	
PCBs		
42	YEARS DISCHARGED	The highest concentration of PCBs was collected from test pit TP-1, which was located in a non-operational area in the south-central portion of the southern portion of the West Farm
54	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PCBs were detected at a concentration of 54 ppm in a sample collected at a depth of three feet bgs (FDR page 16)
0.000001	kg per mg (Merck Index)	
20	KILOGRAMS DISCHARGED	
DDx		In the shallowest soil sample collected from Retention Pond "D" area located in the northwest corner of the site (1.0 feet bgs), 4,4-DDE (0.058 mg/kg) and 4,4-DDD (0.018 mg/kg) were detected. (FDR page 7) The sum of both 4,4-DDE and 4,4-DDD = 0.076 mg/kg
42	YEARS DISCHARGED within DDx Timeline	
0.076	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1	KILOGRAMS DISCHARGED	

NOTE: FDR page 18 lists maximum concentrations of PAHs in surface soil (0.5 to 1 foot bgs) detected at AEC 59 (in ppb). This table has adjusted the concentrations to mg/kg.

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	62.000	1.0	62.0000
Benzo(a)anthracene	82.000	0.1	8.2000
Benzo(b)fluoranthene	68.000	0.1	6.8000
Benzo(k)fluoranthene	29.000	0.01	0.2900
Chrysene	77.000	0.001	0.0770
Dibenz(a,h)anthracene	18.000	1.0	18.0000
Indeno(1,2,3-cd)pyrene	40.000	0.1	4.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **99.4**

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
4.40	kg Mercury
36.46	kg PAHs (Benzo(a)pyrene Equivalent)
199.40	kg PAHs (Other)
19.81	kg PCBs
1.39	kg DDx

261.47 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Celanese Ltd./CAN Holdings LLC

290 Ferry Street | Newark | NJ | 07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
6.196E-5	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-15.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities 5% Failure to fully cooperate with conduct of the allocation or requests for related information (Ceased particiation in allcoation in December 2019)	5.267E-5

354 Doremus Avenue | Newark | NJ | 07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.064E-4	5.0%	Occasional Noncompliance	A 1969 Administrative Order issued for discharging industrial waste and “other polluting matter” into the Passaic River (PAS-00071180-81). On May 17, 1991, the facility received a NOV for failure to monitor their effluent for lead to comply with General Pretreatment Regulations (PAS-00071202). Older Celanese employees noted that in the mid-1970s, persons were sometimes seen dumping materials into Plum Creek north of the northwest corner of the Celanese property at night. Employees stated that a certain material deposited was a thick white liquid (PAP-00021048). No evidence of Involvement of Celenese staff.	-15.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities 5% Failure to fully cooperate with conduct of the allocation or requests for related information (Ceased particiation in allcoation in December 2019)	9.577E-5

226 Rome Street | Newark | NJ | 07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.911E-7	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-15.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities 5% Failure to fully cooperate with conduct of the allocation or requests for related information (Ceased particiation in allcoation in December 2019)	6.724E-7

AP_ABS	1.491E-4

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Celanese Ltd./CAN Holdings LLC

290 Ferry Street | Newark | NJ | 07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.269E-4	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-15.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities 5% Failure to fully cooperate with conduct of the allocation or requests for related information (Ceased particiation in allcoation in December 2019)	7.029E-4

354 Doremus Avenue | Newark | NJ | 07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.503E-2	5.0%	Occasional Noncompliance	A 1969 Administrative Order issued for discharging industrial waste and “other polluting matter” into the Passaic River (PAS-00071180-81). On May 17, 1991, the facility received a NOV for failure to monitor their effluent for lead to comply with General Pretreatment Regulations (PAS-00071202). Older Celanese employees noted that in the mid-1970s, persons were sometimes seen dumping materials into Plum Creek north of the northwest corner of the Celanese property at night. Employees stated that a certain material deposited was a thick white liquid (PAP-00021048). No evidence of Involvement of Celenese staff.	-15.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities 5% Failure to fully cooperate with conduct of the allocation or requests for related information (Ceased particiation in allcoation in December 2019)	1.352E-2

226 Rome Street | Newark | NJ | 07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.302E-6	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-15.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities 5% Failure to fully cooperate with conduct of the allocation or requests for related information (Ceased particiation in allcoation in December 2019)	3.657E-6

AP_ABS	1.423E-2

Allocation Facility Cmass Calculation

Chevron Environmental Management Co.	86 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	3.18	100.00%	-	0.00%	539.59	100.00%	-	3.18	1.018817E-2	0.03
LPAHs	100.00%	3.71	100.00%	-	0.00%	359.73	100.00%	62.3	66.01	1.018817E-2	0.67
PCBs	100.00%	8.02	100.00%	-	0.00%	-	100.00%	-	8.02	1.018817E-2	0.08
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Chevron Environmental Management Co.	**86 Doremus Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.03	1.350E-7	6.750E-9
LPAHs	0.01	170,000.00	0.67	3.956E-6	3.956E-8
PCBs	12.87	26,000.00	0.08	3.143E-6	4.045E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Chevron Environmental Management Co.	86 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	7.316E-7	0.03	0.14	7.316E-7	3.658E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.191E-5	0.67	3.05	2.191E-5	2.191E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	3.997E-4	0.08	10.31	3.997E-4	5.144E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Chevron Environmental Management Co.	**86 Doremus Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	West Yard Sanitary and Storm water discharge was to the PVSC. No evidence of any permit
	# hours/per day discharged	for these discharges
	#days/week discharged	
	#weeks/yr discharged	Assume similar flow as for direct discharge to the Passaic River
9,600,000	calc gal/yr discharge	
1951	Yr Ops started	
1984	Yr Ops ceased	
33	calc #yrs facility operated	
Copper (Cu)		
33	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
33	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
33	#yrs facility discharged	1980 Permit NJ0026034 daily max for Oil and Grease =15mg/l
7.50	calc mg/L O&G PAP00084091	assume 7.5 mg/l in discharge
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.45	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
539.59	calc kg COC discharged	
LPAHs		
33	#yrs facility discharged	1980 Permit NJ0026034 daily max for Oil and Grease =15mg/l
7.50	calc mg/L O&G PAP00084091	assume 7.5 mg/l in discharge
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.30	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
359.73	calc kg COC discharged	
PCBs		
27	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
22	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
34	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
34	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
34	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
25	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
539.59	kg HPAHs	
359.73	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	2014 PA/SI Report states NJPDES Permit indicates oil/water separator discharges directly to Passaic River
	# days/week discharged	No Operational Effluent or Process Discharge
	# weeks/yr discharged	Assume storm water flow only directly to river
1,663,307	# gals/yr directly discharged PAP00084091	
4.08	ft; 30yr average annual precipitation per Rutgers information	
43,560	ft2 per acre	
2.50	acres	Final FDR
50%	Percent Precip to River	
1951	Yr Ops started	
1984	Yr Ops ceased	
33	calc #yrs facility operated	
Copper (Cu)		
33	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
33	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
33	#yrs facility discharged	1980 Permit NJ0026034 daily max for Oil and Grease =15mg/l
7.50	calc mg/L O&G PAP00084091	assume 7.5 mg/l in discharge
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.45	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
93.49	calc kg COC discharged	
LPAHs		
33	#yrs facility discharged	
7.50	calc mg/L O&G PAP00084091	1980 Permit NJ0026034 daily max for Oil and Grease =15mg/l
10%	% O&G that is considered PAHs	assume 7.5 mg/l in discharge
40%	% PAHs considered as LPAHs	
0.30	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
62.33	calc kg COC discharged	
PCBs		
27	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
22	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
34	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
34	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
34	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
25	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
62.30	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.083333333	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
14.5	ACRES - TOTAL SITE AREA (acres)		
4.5	ACRES - AFFECTED AREA	Area A consists of 2.5 undeveloped acres located south of the West Yard (FDR p 2). Additional 2 acres of bare soil surrounding the tanks in the West and East Yard combined were estimated (Google Earth).	Facility is adjacent to Passaic River (East Yard of property boundary abuts river). FDR page 1.
4,046.86	$METERS^2$/ACRE		
18,211	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1951	Year site operations began	Operated and owned by Chevron from July 1951 to December 1984 (FDR p 1)	
1984	Year ownership ceased	Texaco aquired Getty Oil Company in 1984, property was transferred to Power Test Realty Company Limited Partnership (FDR p 1)	
33.5	NUMBER YEARS DISCHARGE		
61.0064145	METERS3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1962.5	KG/M3 SOIL DENSITY	Shallow borings were composed of a mixture of sand, silt, and gravel with varying amounts of brick fragments, rocks, wood and other debris (PAP-00066671, PDF page 8). Used "silty sand and gravel" soil type from http://structx.com/Soil_Properties_002.html. Bulk density range 1442 KG/M3 to 2483 KG/M3, so use average. Average is 1962.5 kg/m3	
119,725	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
33.5	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Maximum concentration from table on PAP-00066720 (Sample A-2A, 0-0.5 ft bgs). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
33.5	YEARS DISCHARGED	Concentration set at 0 mg/kg because the FDR incorrectly has a concentration of 84,200 mg/kg. The referenced source shows a maximum lead concentration of 8,200 mg/kg (PAP-00339532). This is set to 0 because it is less than HF.	
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
33.5	YEARS DISCHARGED		
26.586	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations	
0.000001	kg per mg (Merck Index)		
3	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
33.5	YEARS DISCHARGED		
	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of other detected PAHs from Figure PAP-00066671, pdf pg 38 from Sample ID A-2A (0.0-0.5 ft).	
31.02			
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		

Maximum concentrations from Figure of PAH concentrations remaining in soil at Area A (surface sample A-2A (0.0-0.5 ft) (PAP-00066671, pdf pg 38). Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	19.000	1.0	19.0000
Benzo(a)anthracene	12.000	0.1	1.2000
Benzo(b)fluoranthene	23.000	0.1	2.3000
Benzo(k)fluoranthene	26.000	0.01	0.2600
Chrysene	26.000	0.001	0.0260
Dibenz(a,h)anthracene	2.800	1.0	2.8000
Indeno(1,2,3-cd)pyrene	10.000	0.1	1.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **26.6**

PCBs

33.5 YEARS DISCHARGED

67 MG/KG (MAX OF REPORTED CONCENTRATIONS)

PCB (Aroclor 1254) highest concentration (Area 2; SW-75C at 0-0.5 ft) (FDR page 4)
Historic fill was not a consideration for PCB concentrations for the purpose of this calculation.

0.000001 kg per mg (Merck Index)

8 KILOGRAMS DISCHARGED

SUMMARY CMASS ESTIMATES:

0.00	kg Copper
0.00	kg Lead
3.18	kg PAHs (Benzo(a)pyrene Equivalent)
3.71	kg PAHs (Other)
8.02	kg PCBs

14.92 MASS (KG) DISCHARGED FROM SURFACE SOIL

Sample A-2A (PAP-00066708)	
Anthracene	2.2
Acenaphthene	1.1
Acenaphthylene	0.52
Fluorene	1.2
Naphthalene	0
Phenanthrene	26
SUM	31.02

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Chevron Environmental Management Co.

86 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.049E-5	0.0%	Historically Compliant or No Evidence	Although a couple spills were noted, they were minor amounts (less than 4 gallons) of diesel and gasoline (Questionnaire, p. 22; PAP-00067539-56; PAP-00066946-67). No information on NOVs identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.239E-5

AP_ABS	3.239E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Chevron Environmental Management Co.

86 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.144E-3	0.0%	Historically Compliant or No Evidence	Although a couple spills were noted, they were minor amounts (less than 4 gallons) of diesel and gasoline (Questionnaire, p. 22; PAP-00067539-56; PAP-00066946-67). No information on NOVs identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	4.115E-3

AP_ABS	4.115E-3

Allocation Facility Cmass Calculation

Coats & Clark, Inc.	735 Broad Street	Bloomfield	NJ	07003

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	140.82	100.00%	-	12.41%	-	100.00%	-	140.82	1.018817E-2	1.43
Lead	100.00%	255.02	100.00%	-	12.41%	-	100.00%	-	255.02	1.018817E-2	2.6
Mercury	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	41.19	100.00%	-	12.41%	-	100.00%	-	41.19	1.018817E-2	0.42
LPAHs	100.00%	58.58	100.00%	-	12.41%	-	100.00%	-	58.58	1.018817E-2	0.6
PCBs	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Coats & Clark, Inc.	735 Broad Street	Bloomfield	NJ	07003

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	1.43	6.832E-7	4.714E-7
Lead	0.01	3,200,000.00	2.6	8.119E-7	8.119E-9
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.42	1.749E-6	8.743E-8
LPAHs	0.01	170,000.00	0.6	3.511E-6	3.511E-8
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Coats & Clark, Inc.	735 Broad Street	Bloomfield	NJ	07003

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	5.084E-4	1.43	1,066.31	5.084E-4	3.508E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	8.837E-4	2.6	2,825.29	8.837E-4	8.837E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	9.477E-6	0.42	1.85	9.477E-6	4.738E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.944E-5	0.6	2.71	1.944E-5	1.944E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Coats & Clark, Inc.	**735 Broad Street**	**Bloomfield**	**NJ**	**07003**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Union Outlet	Bypass	12.41%	100.00%	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	No information on sewer discharges or permits
	# days/week discharged	Thread Manufacturing/Dyeing process
	# weeks/yr discharged	1922 through "late" 1940s....some information say 1949
1,000,000	# gals/yr directly discharged	"Limited" Copper use at the facility
		1988 and 2000 sediment sampling results indicate Copper, Lead and Mercury both up gradient
4.08	ft; 30yr average annual precipitation per Rutgers information	and down gradient.
	acres	Assuming discharge to the Third River and Passaic at 1MG per year. Assumption/Guesstimate
43,560	ft2 per acre	discharge following wastewater treatment plant.
1922	Yr Ops started	
1949	Yr Ops ceased	
27	calc #yrs facility operated	
Copper (Cu)		
27	#yrs facility discharged	
-	calc mg/L COC discharged	Per Dr. Martin Bide's Expert Report, FDR Page 6
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
27	#yrs facility discharged	
-	calc mg/L COC discharged	Per Dr. Martin Bide's Expert Report, FDR Page 6
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
27	#yrs facility discharged	
-	calc mg/L COC discharged	Per Dr. Martin Bide's Expert Report, FDR Page 6
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
27	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
27	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
21	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
10	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
0	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
27	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
4	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
5	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
0	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
40	ACRES - TOTAL SITE AREA	FDR p 1	
30	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of 1938 map (PAP-00075242). Estimating that 25% of the site had buildings	The Third River is a tributary to the Passaic and formed the southern and eastern boundaries of the site (FDR p 8)
4,046.86	METERS^2/ACRE		
121,406	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
12	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1921	Year site operations began	Coats and Clark (as Clark Thread Company) bought the land 8/10/1921 (FDR p 1)	
1947	Year site processing and storage operations ceased	Coats and Clark (as Clark Thread Company) sold the land on 9/17/1947 to Scientific Glass Apparatus Company Inc (FDR p 1)	
26	NUMBER YEARS DISCHARGE		
316	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,875	KG/M^3 SOIL DENSITY	Surface soil is 1-5' of sand atop 2-3' silty sand (PAP-00077857). Density of silty sand and gravel ranges from 1378 to 2371 kg/m^3, so the average is used. (http://structx.com/Soil_Properties_002.html)	
591,695	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Site is partially located on regional Historic Fill (FDR p 7)	AOCs were COCs have been detected in soil but are not specifcally related to Scientific Glass Apparatus Co operations (later owner/operator at this site) were evaluated (FDR p 10)
Copper (Cu)			
26	YEARS DISCHARGED	Copper sulfate was used as part of the dyeing processes (FDR p 1-2)	
238	MG/KG (MAX CONCENTRATION)	Max concentration at AOC 14 Sample TP-12S (1-2 ft bgs) (PAP-00075799, PAP-00076155)	
0.000001	kg per mg (Merck Index)		
141	KILOGRAMS DISCHARGED		
Lead (Pb)		No info regarding storage or use of lead on site (FDR p 6)	
26	YEARS DISCHARGED		
431	MG/KG (MAX CONCENTRATION)	Max concentration at AOC 15 Sample TP-14S (0-1 ft bgs) (PAP-00075800, PAP-000777868)	
0.000001	kg per mg (Merck Index)		
255	KILOGRAMS DISCHARGED		
Mercury (Hg)		No info regarding storage or use of mercury on site (FDR p 5)	
26	YEARS DISCHARGED		
0.0	MG/KG (MAX CONCENTRATION)	Mercury concentration set at 0 mg/kg because the mercury detections in soil were associated with thermometer manufacturing by the subsequent operator, Scientific Glass Apparatus Company, Inc. (FDR page 5).	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)	
26	YEARS DISCHARGED
69.6	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)
0.000001	kg per mg (Merck Index)
41	KILOGRAMS DISCHARGED
PAHs (others detected)	
26	YEARS DISCHARGED
99	MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
59	KILOGRAMS DISCHARGED
PCBs	
26	YEARS DISCHARGED
0	MG/KG (MAX OF REPORTED CONCENTRATIONS)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
DDx	
0	YEARS DISCHARGED within DDx Timeline
	MG/KG (MAX CONCENTRATION)
0	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dieldrin	
0	YEARS DISCHARGED within Dieldrin Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED
	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	calc kg COC discharged

SUMMARY CMASS ESTIMATES:	
140.82	kg Copper
255.02	kg Lead
0.00	kg Mercury
41.19	kg PAHs (Benzo(a)pyrene Equivalent)
58.58	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

495.61	MASS (KG) DISCHARGED FROM SURFACE SOIL

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

Data below the Benzo(a)pyrene Equivalent table

No info regarding storage or use of PCBs on site (FDR p 4)

PCBs concentration set at 0 mg/kg because the PCB detections in soil were were not associated with site operations, but were likely the result of PCBs in historical building material formulations that were filled on site (such as caulk). PCB-containing caulks were used in buildings between 1950 and 1978, after Coats and Clark owned and operated at the site (FDR pages 1 and 4).

PAH contamination is not attributable to site-specific operations (FDR p 5)

AOC 16 Sample TP-21S (0-1 ft bgs). (PAP-00075806-7, PAP-0007582)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	55.000	1.0	55.0000
Benzo(a)anthracene	68.000	0.1	6.8000
Benzo(b)fluoranthene	44.000	0.1	4.4000
Benzo(k)fluoranthene	43.000	0.01	0.4300
Chrysene	79.000	0.001	0.0790
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	29.000	0.1	2.9000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **69.6**

All PAH values from AOC 16 Sample TP-21S (0-1 ft bgs). (PAP-00075806-7, PAP-00075822)

Anthracene	0
Acenaphthene	0
Acenaphthylene	0
Fluorene	0
Naphthalene	0
Phenanthrene	99
2-Methylnaphthalene	0
SUM	99

Allocation Facility Cmass Calculation

Coats & Clark, Inc.	900 Passaic Avenue /260 Ogden Street	East Newark	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	243.51	100.00%	-	0.23%	-	100.00%	33.1	276.63	1.018817E-2	2.82
Lead	100.00%	579.79	100.00%	-	0.23%	-	100.00%	-	579.79	1.018817E-2	5.91
Mercury	100.00%	-	100.00%	-	0.23%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	1.78	100.00%	-	0.23%	-	100.00%	-	1.78	1.018817E-2	0.02
LPAHs	100.00%	4.9	100.00%	-	0.23%	-	100.00%	-	4.9	1.018817E-2	0.05
PCBs	100.00%	-	100.00%	-	0.23%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.23%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.23%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.23%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Coats & Clark, Inc.	900 Passaic Avenue /260 Ogden Street	East Newark	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	2.82	1.342E-6	9.260E-7
Lead	0.01	3,200,000.00	5.91	1.846E-6	1.846E-8
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.02	7.556E-8	3.778E-9
LPAHs	0.01	170,000.00	0.05	2.937E-7	2.937E-9
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Coats & Clark, Inc.	900 Passaic Avenue /260 Ogden Street	East Newark	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	9.988E-4	2.82	2,094.67	9.988E-4	6.892E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.009E-3	5.91	6,423.31	2.009E-3	2.009E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	4.095E-7	0.02	0.08	4.095E-7	2.048E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.626E-6	0.05	0.23	1.626E-6	1.626E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	No information on sewer discharges or permits
	# days/week discharged	Thread Manufacturing/Dyeing process
	# weeks/yr discharged	1922 through "late" 1940s....some information say 1949
1,000,000	# gals/yr directly discharged	"Limited" Copper use at the facility
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	Assuming discharge to the Passaic at 1MG per year. Assumption/Guesstimate
43,560	ft2 per acre	Direct discharge w/o wastewater treatment
	acres	
50%	Percent Precip to River	
1865	Yr Ops started	
1926	Yr Ops ceased	
61	calc #yrs facility operated	
Copper (Cu)		
35	#yrs facility discharged	
0.250	calc mg/L COC discharged	Per Dr. Martin Bide's Expert Report, FDR Page 7-8
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
33.12	calc kg COC discharged	
Lead (Pb)		
61	#yrs facility discharged	
-	calc mg/L COC discharged	Per Dr. Martin Bide's Expert Report, FDR Page 7-8
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
61	#yrs facility discharged	
-	calc mg/L COC discharged	Per Dr. Martin Bide's Expert Report, FDR Page 8
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
61	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
61	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
-2	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-13	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-23	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
61	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-19	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-18	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-23	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
33.12	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
17.1	ACRES - TOTAL SITE AREA (acres)	Acreage in 1920, both Newark mill and East Newark mill (FDR p 1)	
4.28	ACRES - AFFECTED AREA	Looks to be around 75% buildings in 1930-current aerial photos here https://njdep.maps.arcgis.com/apps/webappviewer/index.html and Google Earth Pro	
4,046.86	METERS^2/ACRE		
17,300	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES	
1865	Year Coats and Clark operations began	FDR p 1	
1989	Year Coats and Clark sold the Newark mill site (FDR p 1)	Coats & Clark Newark mill operations ceased in 1947, alothough a reseach and development operation remained until 1963. (FDR p 1)	East Newark mill operations ened in 1931 and the site was sold in 1935 (FDR p 2-3)
124	NUMBER YEARS DISCHARGE		
215	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,931	KG/M^3 SOIL DENSITY	Below foundation slab - silty sand or sell-graded sand with varying amounts of gravel (PAP-00080266). Density ranges from 1378 to 2483 kg/m3, average is used (http://structx.com/Soil_Properties_002.html)	
414,139	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		This site is partially located on regional historic fill (FDR p 9)	
Copper (Cu)		Copper sulfate used on site (FDR p 4)	
124	YEARS DISCHARGED		
588	MG/KG (MAX CONCENTRATION)	Data from sample B-124-2 (1.5-2 ft bgs) collected in 2013 (PAP-00080359)	
0.000001	kg per mg (Merck Index)		
244	KILOGRAMS DISCHARGED		
Lead (Pb)		No info on use of lead on site (FDR p 8)	
124	YEARS DISCHARGED		
1400	MG/KG (MAX CONCENTRATION)	Data from sample B-30-4.5(3.5-4 ft bgs) collected in 2012 (PAP-00080346)	
0.000001	kg per mg (Merck Index)		
580	KILOGRAMS DISCHARGED		
Mercury (Hg)		No info on use of mercury on site (FDR p 8)	
124	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Mercury concentration set at 0 mg/kg because the mercury detections in soil were not associated with the pre-1935 mill complex operations (FDR pages 8-9) and the portion of the site that has mercury data (East Newark Mill) was sold in 1935 (FDR page 1).	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	No specific info on use of SVOCs on site but thread making operations often used coal-tar based aniline dyes (FDR p 7)
124	YEARS DISCHARGED		
4.3	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
124	YEARS DISCHARGED		
11.84	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
5	KILOGRAMS DISCHARGED		

Sample B-131-1.5 (1-1.5 ft bgs) collected in 2013 (PAP-00080363)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	2.960	1.0	2.9600
Benzo(a)anthracene	3.760	0.1	0.3760
Benzo(b)fluoranthene	4.350	0.1	0.4350
Benzo(k)fluoranthene	1.560	0.01	0.0156
Chrysene	4.120	0.001	0.0041
Dibenz(a,h)anthracene	0.404	1.0	0.4040
Indeno(1,2,3-cd)pyrene	1.100	0.1	0.1100
DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg			
Total Benzo(a)pyrene Equivalents =			4.3

PCBs	
124	YEARS DISCHARGED
0	MG/KG MAX OF REPORTED CONCENTRATIONS)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
DDx	
124	YEARS DISCHARGED within DDx Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dieldrin	
124	YEARS DISCHARGED within Dieldrin Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION
124	YEARS DISCHARGED
	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	kg COC discharged

No info on use or presence of PCBs on site (FDR p 6)
Only data from the East Newark mill site is available and has been used as sitewide data. Max of most shallow data (0.5-1 ft bgs) used

PCBs concentrations set at 0 mg/kg because the PCB detections in soil were not associated with the pre-1935 mill complex operations (FDR page 6) and the portion of the site that has mercury data (East Newark Mill) was sold in 1935 (FDR page 1).

Sample B-131-1.5 (1-1.5 ft bgs) collected in 2013 (PAP-00080363)	
Anthracene	1.52
Acenaphthene	0.37
Acenaphthylene	0.236
Fluorene	0.653
Naphthalene	0.314
Phenanthrene	8.51
2-Methylnaphthalene	0.239
SUM	11.842

SUMMARY CMASS ESTIMATES:	
243.51	kg Copper
579.79	kg Lead
0.00	kg Mercury
1.78	kg PAHs (Benzo(a)pyrene Equivalent)
4.90	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

829.99 MASS (KG) DISCHARGED FROM SURFACE SOIL

Facility Bypass Information

Coats & Clark, Inc.	**900 Passaic Avenue /260 Ogden Street**	**East Newark**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Central Ave	CSO	0.37%	61.94%	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Coats & Clark, Inc.

900 Passaic Avenue /260 Ogden Street	**East Newark**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
9.512E-7	0.0%	Historically Compliant or No Evidence	Facilty was identified by the PVSC as polluting the Passaic River in 1926, but this pollution was subsequently eliminated when the wet operations were moved to Bloomfield (which had a water treatment plant) in 1926 (PAS-00027177-78; PAP-00128118). No information on violations was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.610E-7

735 Broad Street	**Bloomfield**	**NJ**	**07003**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
6.021E-7	0.0%	Historically Compliant or No Evidence	EPA performed a Potential Hazardous Waste Site Preliminary Assessment in 1982 in response to a complaint that mercury was disposed on-site in a shallow pit and surface water. Facilty was indicated to be abating pollution with their water treatment plant when processes were moved there in 1926 (PAP-00128118; PAP-00129824). Given date of insepection, difficult to assertain whether actions resulting in contaminantion were during Coats & Clark operations on site.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	4.816E-7

AP_ABS	1.243E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Coats & Clark, Inc.

900 Passaic Avenue /260 Ogden Street	**East Newark**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.093E-4	0.0%	Historically Compliant or No Evidence	Facilty was identified by the PVSC as polluting the Passaic River in 1926, but this pollution was subsequently eliminated when the wet operations were moved to Bloomfield (which had a water treatment plant) in 1926 (PAS-00027177-78; PAP-00128118). No information on violations was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.674E-4

735 Broad Street	**Bloomfield**	**NJ**	**07003**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.603E-4	0.0%	Historically Compliant or No Evidence	EPA performed a Potential Hazardous Waste Site Preliminary Assessment in 1982 in response to a complaint that mercury was disposed on-site in a shallow pit and surface water. Facilty was indicated to be abating pollution with their water treatment plant when processes were moved there in 1926 (PAP-00128118; PAP-00129824). Given date of insepection, difficult to assertain whether actions resulting in contaminantion were during Coats & Clark operations on site.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.883E-4

AP_ABS	8.557E-4

Allocation Facility Cmass Calculation

Congoleum Corp.	**195 Belgrove Drive**	**Kearny**	**NJ**	**07032**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	982.92	100.00%	-	0.04%	-	100.00%	-	982.92	1.018817E-2	10.01
Lead	100.00%	1,369.24	100.00%	-	0.04%	-	100.00%	-	1,369.24	1.018817E-2	13.95
Mercury	100.00%	13.71	100.00%	-	0.04%	-	100.00%	-	13.71	1.018817E-2	0.14
HPAHs	100.00%	13.87	100.00%	1,013.78	0.04%	1,333.92	100.00%	1,798.6	2,826.87	1.018817E-2	28.8
LPAHs	100.00%	29.74	100.00%	675.85	0.04%	889.28	100.00%	1,199.1	1,905.07	1.018817E-2	19.41
PCBs	100.00%	382.96	100.00%	-	0.04%	-	100.00%	-	382.96	1.018817E-2	3.9
DDx	100.00%	1.56	100.00%	-	0.04%	-	100.00%	-	1.56	1.018817E-2	0.02
Dieldrin	100.00%	-	100.00%	-	0.04%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.04%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Congoleum Corp.	**195 Belgrove Drive**	**Kearny**	**NJ**	**07032**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	10.01	4.769E-6	3.290E-6
Lead	0.01	3,200,000.00	13.95	4.359E-6	4.359E-8
Mercury	0.95	42,000.00	0.14	3.326E-6	3.159E-6
HPAHs	0.05	240,000.00	28.8	1.200E-4	6.000E-6
LPAHs	0.01	170,000.00	19.41	1.142E-4	1.142E-6
PCBs	12.87	26,000.00	3.9	1.501E-4	1.931E-3
DDx	1.37	27,000.00	0.02	5.886E-7	8.065E-7
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Congoleum Corp.	**195 Belgrove Drive**	**Kearny**	**NJ**	**07032**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	3.549E-3	10.01	7,442.8	3.549E-3	2.449E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	4.745E-3	13.95	15,169.37	4.745E-3	4.745E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	3.172E-3	0.14	133.07	3.172E-3	3.013E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	6.504E-4	28.8	127.29	6.504E-4	3.252E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	6.323E-4	19.41	88.08	6.323E-4	6.323E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.908E-2	3.9	492.3	1.908E-2	2.456E-1
DDx	1.37	27,000.00	2,516.93	26,974.36	6.198E-4	0.02	16.72	6.198E-4	8.491E-4
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Congoleum Corp.	**195 Belgrove Drive**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Nairne Ave	CSO	0.22%	19.85%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day	1972 Waste Effluent Survey used for flow rates
	# hours/per day discharged	39,158,000 gallons to Sanitary Sewer
	#days/week discharged	PAP-00056086,8
	#weeks/yr discharged	
39,158,000.00	calc gal/yr discharge	
1886	Yr Ops started	
1974	Yr Ops ceased	
88	calc #yrs facility operated	
Copper (Cu)		
88	#yrs facility discharged	
-	calc mg/L COC discharged	PAP-0056085-00056088
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
88	#yrs facility discharged	
-	calc mg/L COC discharged	PAP-0056085-00056088
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
88	#yrs facility discharged	
-	calc mg/L COC discharged	PAP-0056085-00056088
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
88	#yrs facility discharged	
-	calc mg/L O&G	PAP-0056085-00056088
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.18	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,347.69	calc kg COC discharged	
LPAHs		
88	#yrs facility discharged	
-	calc mg/L O&G	PAP-0056085-00056088
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,565.13	calc kg COC discharged	
PCBs		
46	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
25	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
88	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
29	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
30	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
25	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
2,347.69	kg HPAHs	
1,565.13	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1972 Waste Effluent Survey used for flow rates
	# days/week discharged	30,000,000 gallons to Storm Sewer to Passaic River
	# weeks/yr discharged	PAP-00056086,8
30,000,000	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1886	Yr Ops started	
1974	Yr Ops ceased	
88	calc #yrs facility operated	
Copper (Cu)		
88	#yrs facility discharged	PAP-0056085-00056088
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
88	#yrs facility discharged	PAP-0056085-00056088
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
88	#yrs facility discharged	PAP-0056085-00056088
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
88	#yrs facility discharged	
-	calc mg/L O&G	PAP-0056085-00056088
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.18	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,798.63	calc kg COC discharged	
LPAHs		
88	#yrs facility discharged	
-	calc mg/L O&G	PAP-0056085-00056088
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.12	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,199.09	calc kg COC discharged	
PCBs		
46	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
25	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
88	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
29	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
30	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
25	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
1,798.63	kg HPAHs	
1,199.09	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time. Even with the fill events, the site is still subject to periodic flooding from the Passaic River (PAP-00054694).	Data from Rutgers University.
66	ACRES - TOTAL SITE AREA (acres)	FDR, page 1; confirmed on Google Earth	The Kearny Manufacturing Facilities were approximately 58.5 acres and the Kearny Administrative Facilities were approximately 7.5 acres (PAP-00724224).
19	ACRES - AFFECTED AREA	Exclude 46.5 acres of buildings and pavement from total 66 acre area for erosion potential (1995-2020 Google Earth aerial photos)	
4,046.86	METERS^2/ACRE	CONVERSION TO METERS	
76,890	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
8	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC	
1886	Year site operations began	Congoleum entities: approximately 1886 – to 1979 (PAP-00220483; PAP-00402989- 90).	
1976	Year site was sold to Franklin Burlington Plastics	FDR page 5.	
90	NUMBER YEARS DISCHARGE		
692	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,251	KG/M^3 SOIL DENSITY	Fill material consisting of silt and clay with miscellaneous debris (PAP-00056120). Bulk density range 2002 KG/M^3 to 2499 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
1,557,721	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Some of the site perimeter is located on historic fill material (FDR PDF PAGE 22-3)	
Copper (Cu)			
90	YEARS DISCHARGED		
631	MG/KG (MAX CONCENTRATION)	PAP-00056226	
0.000001	kg per mg (Merck Index)		
983	KILOGRAMS DISCHARGED		
Lead (Pb)		Lead may have been used in pigments as part of the production of linoleum (PAP-00233588)	
90	YEARS DISCHARGED		
879	MG/KG MAX CONCENTRATION)	Max concentration of lead from Table 8 (PAP-00056224)	
0.000001	kg per mg (Merck Index)		
1,369	KILOGRAMS DISCHARGED		

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
Mercury (Hg)		Small amounts of mercury were used as an anti-bacteria agent in floor adhesives (PAP-00233591).	
90	YEARS DISCHARGED		
8.8	MG/KG (MAX CONCENTRATION)	Max concentration of mercury from Table 8 (PAP-00056224)	
0.000001	kg per mg (Merck Index)		
14	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)			
90	YEARS DISCHARGED		
8.9	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations	
0.000001	kg per mg (Merck Index)		
14	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
90	YEARS DISCHARGED		
19	MG/KG (TOTAL PAH MAX CONCENTRATION)	LMW PAH concentration at sample HF-4(DUP) from 0.5-1.0 ft bgs (PAP-00056223)	
0.000001	kg per mg (Merck Index)		
30	KILOGRAMS DISCHARGED		
PCBs			
46	YEARS DISCHARGED	Reduced discharge period to 1930-1976 (46 years)	
481.0	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PAP-00223757	
0.000001	kg per mg (Merck Index)		
383	KILOGRAMS DISCHARGED		
DDx			
90	YEARS DISCHARGED within DDx Timeline		
0.000021	MG/KG (MAX CONCENTRATION)	4,4-DDD from Table 8 (PAP-00056223)	
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		
Dieldrin			
90	YEARS DISCHARGED within Dieldrin Timeline	NONE REPORTED	
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dioxins/Furans			
90	YEARS DISCHARGED	NONE REPORTED	
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

SUMMARY CMASS ESTIMATES:	
982.92	kg Copper
1,369.24	kg Lead
13.71	kg Mercury
13.87	kg PAHs (Benzo(a)pyrene Equivalent)
29.74	kg PAHs (Other)
382.96	kg PCBs
1.56	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

2793.99	TOTAL MASS (KG) DISCHARGED FROM SURFACE SOIL

Results from sample F-4 collected at 5.5-6 FT (FDR page 23, PAP-00231557)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7.200	1.0	7.2000
Benzo(a)anthracene	6.800	0.1	0.6800
Benzo(b)fluoranthene	6.000	0.1	0.6000
Benzo(k)fluoranthene	6.500	0.01	0.0650
Chrysene	8.100	0.001	0.0081
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	3.500	0.1	0.3500

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 8.9

Sample MW33-004 (PAS-00088281-2)	
Anthracene	2.9
Acenaphthene	1.3
Acenapthylene	0.13
Fluorene	1.2
Naphthalene	0.32
Phenanthrene	13
2-methylnaphthalene	0.24
SUM	19.09

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Congoleum Corp.

195 Belgrove Drive	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.946E-3	5.0%	Occasional Noncompliance	Poor housekeeping identified in the 1950s during an inspection (fire hazards noted, oil dumped in the weeds) (PAP-00056081). In April 1990 three areas of abandoned drums in poor condition were discovered along the Passaic River, and solidified sludge from a vinyl tile manufacturing process was observed on the property (PAP-00337307; PAP-00054201-02). Congoleum employees had heard stories over the years had stated “scrap vinyl may have been buried on some portions of the Kearny Facility” (PAS-00104956; PAS-00104961). On or about August 19, 1943, during World War II, there was an explosion at the Kearny Facility. (PAP-00233575). According to an October 18, 1943, memo to the Kearny Fire Department the explosion occurred at Building No. 12 in the Number 6 stove, as a result of an explosion of vapors of Sovosol No. 5 used as a solvent for the paint used in the treating of camouflage nets (PAP-00232310).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.654E-3

AP_ABS	1.654E-3

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Congoleum Corp.

195 Belgrove Drive	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.520E-1	5.0%	Occasional Noncompliance	Poor housekeeping identified in the 1950s during an inspection (fire hazards noted, oil dumped in the weeds) (PAP-00056081). In April 1990 three areas of abandoned drums in poor condition were discovered along the Passaic River, and solidified sludge from a vinyl tile manufacturing process was observed on the property (PAP-00337307; PAP-00054201-02). Congoleum employees had heard stories over the years had stated “scrap vinyl may have been buried on some portions of the Kearny Facility” (PAS-00104956; PAS-00104961). On or about August 19, 1943, during World War II, there was an explosion at the Kearny Facility. (PAP-00233575). According to an October 18, 1943, memo to the Kearny Fire Department the explosion occurred at Building No. 12 in the Number 6 stove, as a result of an explosion of vapors of Sovosol No. 5 used as a solvent for the paint used in the treating of camouflage nets (PAP-00232310).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.142E-1

AP_ABS	2.142E-1

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

CONGOLEUM

Congoleum argues that the current Congoleum never owned and/or operated the Kearny Manufacturing Facilities property that is the subject of this OU2 Allocation proceeding and Current Congoleum is not the successor to any entity or business which did own and/or operate the Kearny Manufacturing Facilities. Accordingly, pursuant to Step 2(d)(9) of the Allocation Protocol, Current Congoleum submits that these facts establish a complete defense to liability for alleged discharges from the Kearny Facility.

ALLLOCATOR'S DETERMINATION – Congoleum states a credible argument regarding the timing of its purchase of assets from its predecessor and the sale of the Kearny Manufacturing facility. However, uncertainties regarding the evolution of the corporation and its predecessor and its use of Kearny facility property raise doubts about its ability to prevail in an action to overturn EPA's determination of Congoleum as a PRP based on the supplied information. Though the Allocator presumes a substantial chance of success should this matter go to litigation, we leave this matter as a topic for settlement discussions between Congoleum and EPA.

Allocation Facility Cmass Calculation

Conopco, Inc.	540 New York Avenue	Lyndhurst	NJ	07071

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	40.44	100.00%	-	2.32%	79,883.53	100.00%	-	1,893.74	1.018817E-2	19.29
Lead	100.00%	218.21	100.00%	-	2.32%	1,656.12	100.00%	-	256.63	1.018817E-2	2.61
Mercury	100.00%	4.	100.00%	-	2.32%	9.74	100.00%	-	4.23	1.018817E-2	0.04
HPAHs	100.00%	150.66	100.00%	-	2.32%	10,209.51	100.00%	983.1	1,370.66	1.018817E-2	13.96
LPAHs	100.00%	849.6	100.00%	-	2.32%	6,806.34	100.00%	655.4	1,662.93	1.018817E-2	16.94
PCBs	100.00%	0.12	100.00%	-	2.32%	-	100.00%	-	0.12	1.018817E-2	0
DDx	100.00%	88.48	100.00%	-	2.32%	-	100.00%	-	88.48	1.018817E-2	0.9
Dieldrin	100.00%	0.02	100.00%	-	2.32%	-	100.00%	-	0.02	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Conopco, Inc.	**540 New York Avenue**	**Lyndhurst**	**NJ**	**07071**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	19.29	9.187E-6	6.339E-6
Lead	0.01	3,200,000.00	2.61	8.171E-7	8.171E-9
Mercury	0.95	42,000.00	0.04	1.025E-6	9.739E-7
HPAHs	0.05	240,000.00	13.96	5.819E-5	2.909E-6
LPAHs	0.01	170,000.00	16.94	9.966E-5	9.966E-7
PCBs	12.87	26,000.00	0	4.702E-8	6.052E-7
DDx	1.37	27,000.00	0.9	3.339E-5	4.574E-5
Dieldrin	0.13	390.00	0	5.225E-7	6.792E-8
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Conopco, Inc.	540 New York Avenue	Lyndhurst	NJ	07071

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	6.838E-3	19.29	14,339.62	6.838E-3	4.718E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	8.893E-4	2.61	2,843.14	8.893E-4	8.893E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	9.777E-4	0.04	41.02	9.777E-4	9.288E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	3.154E-4	13.96	61.72	3.154E-4	1.577E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	5.519E-4	16.94	76.89	5.519E-4	5.519E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	5.980E-6	0	0.15	5.980E-6	7.696E-5
DDx	1.37	27,000.00	2,516.93	26,974.36	3.515E-2	0.9	948.25	3.515E-2	4.816E-2
Dieldrin	0.13	390.00	1.27	389.99	1.580E-2	0	6.16	1.580E-2	2.054E-3
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Conopco, Inc.	**540 New York Avenue**	**Lyndhurst**	**NJ**	**07071**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Dicharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No data Conopco, using Goodrich and Purdue as a similar operation
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
114,391,833	calc gal/yr discharge (FDR)	
365	#day per yr operated (FDR) (	
1941	Yr Ops started (FDR)	
1986	Yr Ops ceased (FDR)	
45	calc #yrs facility operated	
Copper (Cu)		
45	#yrs facility discharged	
4.10	calc mg/L COC discharged	Based on Goodrich
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
79,884	calc kg COC discharged	
Lead (Pb)		
45	#yrs facility discharged	Based on Purdue
0.085	calc mg/L COC discharged; (FDR) PAP00128020	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,656.12	calc kg COC discharged	
Mercury (Hg)		
45	#yrs facility discharged	
0.0005	calc mg/L COC discharged; (FDR)	Based on Goodrich
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
9.74	calc kg COC discharged	
HPAHs		
45	#yrs facility discharged	
8.7	calc mg/L O&G (FDR)	Based on Goodrich
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.52	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
10,210	calc kg COC discharged	
LPAHs		
45	#yrs facility discharged	
8.7	calc mg/L O&G (FDR)	Based on Goodrich
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.35	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
6,806	calc kg COC discharged	
PCBs		
37	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
32	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
37	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
45	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
41	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
79,884	kg Copper	
1,656	kg Lead	
10	kg Mercury	
10,210	kg HPAHs	
6,806	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Dicharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	No information using Goodrich and Purdue as similar operations
	# days/week discharged	
	# weeks/yr discharged	
481,009,150	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
365	#day operated per yr (PAP-00206119, PAP-00433684)	
1941	Yr Ops started	
1986	Yr Ops ceased	
45	calc #yrs facility operated	
Copper (Cu)		
45	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
45	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
45	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
45	#yrs facility discharged	
0.2	calc mg/L O&G discharged (PAP-00206137)	special calcs to use PAHs to determine PAH mass discharged via outside catch basins
10%	% PAHs assumed in O&G	
60%	% PAHs assumed in HPAHs	
0.01	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
983.13	calc kg COC discharged	
LPAHs		
45	#yrs facility discharged	
0.2	calc mg/L O&G discharged (PAP-00206137)	special calcs to use PAHs to determine PAH mass discharged via outside catch basins
10%	% PAHs assumed in O&G	
40%	% PAHs assumed in LPAHs	
0.01	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
655.42	calc kg COC discharged	
PCBs		
37	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
32	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
37	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
45	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
41	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
983	kg HPAHs	
655	kg LPAHs	
-	kg PCBs	

-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
17	ACRES - TOTAL SITE AREA (acres)		
6	ACRES - AFFECTED AREA	90 percent of site was covered with impervious material and 40 percent was buildings (FDR Page 24, PAS-00113240). Estimate 20 years (1941-1961) 40 percent buildings without asphalt, 25 years 90 percent impervious with buildings = 5.6 acres	
4,046.86	$METERS^2$/ACRE		
22,662	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1941	Year site operations began	FDR page 2 PAS-00113112, 2741, 3149; PAP-00048761	
1986	Year site processing and storage operations ceased	FDR page 2 PAS-00113112, 2741, 3149; PAP-00048761	
45	NUMBER YEARS DISCHARGE	Conopco liability 45 years, 1941 to 1986 (FDR, page 2)	
102	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill reported as fine to medium sand with trace gravel (PAS-00113242). Bulk density range for silty sand and gravel 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
200,188	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Facility is partially located on historic fill (FDR, page 15)	
Copper (Cu)			
45	YEARS DISCHARGED		
202	MG/KG (MAX CONCENTRATION)	Copper concentration in on-site surface soil sample TSA-5 (PAS-00113344).	
0.000001	kg per mg (Merck Index)		
40	KILOGRAMS DISCHARGED		
Lead (Pb)			
45	YEARS DISCHARGED		
1090	MG/KG (MAX CONCENTRATION)	Lead concentration in on-site soil sample OPA-29 (PAS-00113345, depth unknown).	
0.000001	kg per mg (Merck Index)		
218	KILOGRAMS DISCHARGED		
Mercury (Hg)			
45	YEARS DISCHARGED		
20.0	MG/KG (MAX CONCENTRATION)	Mercury concentration in on-site soil sample OPA-37 (PAS-00113284, depth unknown).	
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
45	YEARS DISCHARGED	
752.6	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using Deed Restriction maximum concentrations found in surface soil sample LB-33 (0-0.5 ft bgs) (PAS-00113306).
0.000001	kg per mg (Merck Index)	
151	KILOGRAMS DISCHARGED	
PAHs (others detected)		Other PAHs = Acenaphthene = 130, Acenaphthylene = 65, Anthracene = 420,Fluorene = 250, Fluoranthene = 1200, Naphthalene = 39, Phenanthrene = 1200, Pyrene = 940 (mg/kg) (PAS-00113306)
45	YEARS DISCHARGED	
4244	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
850	KILOGRAMS DISCHARGED	
PCBs		
45	YEARS DISCHARGED	
0.62	MG/KG (MAX CONCENTRATION)	Maximum surface soil concentration found in surface soil (0-3 ft bgs) (PAP-00328282).
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		
45	YEARS DISCHARGED within DDx Timeline	DDT use began in 1940s - assume present between 1941 and 1986
442	MG/KG (MAX CONCENTRATION SUM)	DDD and DDT concentrations from INI4-2 (1 foot bgs) (PAS-00113127)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
88	KILOGRAMS DISCHARGED	
Dieldrin		
45	NONE FOUND IN AVAILABLE DOCUMENTATION	
0.1	MG/KG (MAX CONCENTRATION)	Maximum surface soil concentration found in soil (2-2.5 ft bgs) (PAP-00328282).
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.02	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Used PAH concentrations documented in sample LB-33 (0-0.5 ft bgs) (PAS-00113306).

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	480.000	1.0	480.0000
Benzo(a)anthracene	840.000	0.1	84.0000
Benzo(b)fluoranthene	770.000	0.1	77.0000
Benzo(k)fluoranthene	0.000	0.01	0.0000
Chrysene	580.000	0.001	0.5800
Dibenz(a,h)anthracene	83.000	1.0	83.0000
Indeno(1,2,3-cd)pyrene	280.000	0.1	28.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **752.6**

SUMMARY CMASS ESTIMATES:

40.44	kg Copper
218.21	kg Lead
4.00	kg Mercury
150.66	kg PAHs (Benzo(a)pyrene Equivalent)
849.60	kg PAHs (Other)
0.12	kg PCBs
88.48	kg DDx
0.02	kg Dieldrin
0.00	kg Dioxins/Furans

1351.53 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Conopco, Inc.

540 New York Avenue	**Lyndhurst**	**NJ**	**07071**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.764E-5	10.0%	Periodic Noncompliacne	The PVSC documented discharges of unknown off-color materials in the storm sewer that were traced to be coming from the facility in 1947, 1948, 1956, 1970-1971, 1974, 1976, 1977, and 1978. Several of these were noted as violations (see Section 6 of Data Report). An October 23, 1990, Progress Report on Cleanup of South Drainage Trench referred to notices of violations Penco of Lyndhurst received concerning unpermitted discharges to the storm sewer and from the drainage ditch (PAS-00113370, 372-73). According to the PVSC Weekly Summary of Inspections by Inspector, on May 3, 1956, inspection of the Lyndhurst storm sewer showed a jet black discharge into the Passaic River that had killed a number of small fish. In May [1977], suppression of a fire on para-nitrophenol (PNP) pallets washed PNP into the storm sewer (PAS-00112802). Many of the chemicals were stored in above- and below-ground tanks and in 55-gallon drums in various locations. Prior to construction Buildings 38 and 39, the area occupied by Building 39 was used for storage of solvents in drums. Infrequently, materials were spilled or drums ruptured. (see FDR p. 6)	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.188E-5

AP_ABS	5.188E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Conopco, Inc.

540 New York Avenue	**Lyndhurst**	**NJ**	**07071**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.597E-2	10.0%	Periodic Noncompliacne	The PVSC documented discharges of unknown off-color materials in the storm sewer that were traced to be coming from the facility in 1947, 1948, 1956, 1970-1971, 1974, 1976, 1977, and 1978. Several of these were noted as violations (see Section 6 of Data Report). An October 23, 1990, Progress Report on Cleanup of South Drainage Trench referred to notices of violations Penco of Lyndhurst received concerning unpermitted discharges to the storm sewer and from the drainage ditch (PAS-00113370, 372-73). According to the PVSC Weekly Summary of Inspections by Inspector, on May 3, 1956, inspection of the Lyndhurst storm sewer showed a jet black discharge into the Passaic River that had killed a number of small fish. In May [1977], suppression of a fire on para-nitrophenol (PNP) pallets washed PNP into the storm sewer (PAS-00112802). Many of the chemicals were stored in above- and below-ground tanks and in 55-gallon drums in various locations. Prior to construction Buildings 38 and 39, the area occupied by Building 39 was used for storage of solvents in drums. Infrequently, materials were spilled or drums ruptured. (see FDR p. 6)	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.037E-2

AP_ABS	5.037E-2

Allocation Facility Cmass Calculation

Cooper Industries LLC	7, 13, & 26 Bank Street	Newark	NJ	07102

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	100.00%	-	100.00%	0.6	0.58	1.018817E-2	0.01
Mercury	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Cooper Industries LLC	7, 13, & 26 Bank Street	Newark	NJ	07102

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0.01	1.838E-9	1.838E-11
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Cooper Industries LLC	7, 13, & 26 Bank Street	Newark	NJ	07102

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.000E-6	0.01	6.39	2.000E-6	2.000E-8
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Cooper Industries LLC	**7, 13, & 26 Bank Street**	**Newark**	**NJ**	**07102**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Passaic River		100.00%	100.00%	Facility operation prior to PVSC (1924)

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	No information on discharges - estimating entirely based on Cooper Littleton ave
	# days/week discharged	Sheer and Scissors manufacturer
	# weeks/yr discharged	J Wiss and Sons operator, sold to Cooper but Cooper states they are not the legal successor to any
5,200	# gals/yr directly discharged	CERCLA liabilities associated with Bank Street. FDR pages 5-6
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1848	Yr Ops started	
1887	Yr Ops ceased	
39	calc #yrs facility operated	
Copper (Cu)		
39	#yrs facility discharged	Based on Cooper Littleton Ave
-	calc mg/L COC discharged	FDR Page 5
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
39	#yrs facility discharged	Based on Cooper Littleton Ave
0.752	calc mg/L COC discharged	Lead may have been present FDR Page 5
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.58	calc kg COC discharged	
Mercury (Hg)		
39	#yrs facility discharged	Based on Cooper Littleton Ave
-	calc mg/L COC discharged	FDR Page 5
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
39	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
39	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
39	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
39	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
39	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
39	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
39	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
39	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
39	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
0.58	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Cooper Industries LLC	33 Littleton Avenue	Newark	NJ	07107

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	13.00%	10.54	100.00%	-	1.37	1.018817E-2	0.01
Lead	100.00%	-	100.00%	-	13.00%	566.42	100.00%	-	73.65	1.018817E-2	0.75
Mercury	100.00%	-	100.00%	-	13.00%	29.81	100.00%	-	3.88	1.018817E-2	0.04
HPAHs	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	13.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Cooper Industries LLC	**33 Littleton Avenue**	**Newark**	**NJ**	**07107**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.01	6.648E-9	4.587E-9
Lead	0.01	3,200,000.00	0.75	2.345E-7	2.345E-9
Mercury	0.95	42,000.00	0.04	9.402E-7	8.932E-7
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Cooper Industries LLC	33 Littleton Avenue	Newark	NJ	07107

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	4.948E-6	0.01	10.38	4.948E-6	3.414E-6
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.552E-4	0.75	815.91	2.552E-4	2.552E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	8.967E-4	0.04	37.62	8.967E-4	8.519E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Cooper Industries LLC	**33 Littleton Avenue**	**Newark**	**NJ**	**07107**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Clay St	CSO	0.90%	41.36%	
2	Clay St	Bypass	12.63%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	PVSC Sewer Permit No. 20400752 (PAP-0004752)
8-16 hrs/day	# hours/per day discharged	Sanitary and wastewaters to combined sewer, no way for direct discharge to river.
5	#days/week discharged	
52	#weeks/yr discharged	
22,098,798	calc gal/yr discharge	1977 Semi Annual Report = 50000 gpd (PAS-00027647,50), including data from 1981-1985
		1978 PVSC Ind Wastewater Questionnaire (PAS-00000743) = 32403360 gallons
1976	Yr Ops started	1980 PVSC Sewer Connection Permit App = 183327 gpd (PAP-00332124)
1985	Yr Ops ceased	1980 0.1320 MGD (PAS-00027508,681)
9	calc #yrs facility operated	December 1, 1976 through December 1985
Copper (Cu)		
9	#yrs facility discharged	1980 PVSC Sewer App = 0.236 mg/l
0.014	calc mg/L COC discharged	Background CU concentration in Source Water 0.222 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
10.54	calc kg COC discharged	
Lead (Pb)		
9	#yrs facility discharged	
0.752	calc mg/L COC discharged	1980 PVSC Sewer Connection App; PB = .284, .482 and .457 mg/l
3.785	L per gallon (Merck Index)	1980 sampling 2.56 mg/l
0.000001	kg per mg (Merck Index)	1981 PVSC Sewer Connection Ap; 0.042 mg/l Pb
566.42	calc kg COC discharged	
Mercury (Hg)		
9	#yrs facility discharged	1980 PVSC Sewer Connection App; Hg = .045, .116, and .037 mg/l
0.0396	calc mg/L COC discharged	June 1981 ND, and 48 hr composite sample ND
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
29.81	calc kg COC discharged	
HPAHs		
9	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
9	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
2	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-3	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
10	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
9	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
10	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
10	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
0	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
10.54	kg Copper	
566.42	kg Lead	
29.81	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Cooper Industries LLC	75 Belmont Avenue	Belleville	NJ	07109

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	54,902.33	100.00%	204.20	12.41%	367.56	100.00%	4,154.9	59,307.03	1.018817E-2	604.23
Lead	100.00%	1,578.47	100.00%	120.64	12.41%	217.15	100.00%	167.2	1,893.31	1.018817E-2	19.29
Mercury	100.00%	2,423.69	100.00%	91.84	12.41%	165.31	100.00%	195.3	2,731.35	1.018817E-2	27.83
HPAHs	100.00%	0.38	100.00%	-	12.41%	-	100.00%	-	0.38	1.018817E-2	0
LPAHs	100.00%	28.65	100.00%	-	12.41%	-	100.00%	-	28.65	1.018817E-2	0.29
PCBs	100.00%	1.7	100.00%	-	12.41%	-	100.00%	-	1.7	1.018817E-2	0.02
DDx	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Cooper Industries LLC	**75 Belmont Avenue**	**Belleville**	**NJ**	**07109**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	604.23	2.877E-4	1.985E-4
Lead	0.01	3,200,000.00	19.29	6.028E-6	6.028E-8
Mercury	0.95	42,000.00	27.83	6.626E-4	6.294E-4
HPAHs	0.05	240,000.00	0	1.613E-8	8.066E-10
LPAHs	0.01	170,000.00	0.29	1.717E-6	1.717E-8
PCBs	12.87	26,000.00	0.02	6.661E-7	8.573E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Cooper Industries LLC	75 Belmont Avenue	Belleville	NJ	07109

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	2.141E-1	604.23	449,080.36	2.141E-1	1.478E-1
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	6.561E-3	19.29	20,975.34	6.561E-3	6.561E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.319E-1	27.83	26,511.37	6.319E-1	6.003E-1
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	8.743E-8	0	0.02	8.743E-8	4.371E-9
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	9.509E-6	0.29	1.32	9.509E-6	9.509E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	8.472E-5	0.02	2.19	8.472E-5	1.090E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Cooper Industries LLC	**75 Belmont Avenue**	**Belleville**	**NJ**	**07109**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Union Outlet	Bypass	12.41%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	From 1966-1987 discharge to PVSC, Prior to that discharge was to Belleville Sewer and Meadow Brook
	# hours/per day discharged	
	#days/week discharged	1966 - 32gpm x 236 days/year (PAP-00333570)
	#weeks/yr discharged	1978 Selected Substance Report - 75000 gpd (PAP-00334489)
25,955,562	calc gal/yr discharge	1979 PVSC Sewer Connection Ap - 51495409 gallons (PAP-00402951, 57, 60, 62, 66)
		1980 PVSC Heavy Metal Source Determination Study - 0.1090 MGD (PAS-00027741-46)
1966	Yr Ops started	1986 Jan-Mar - 6449000 x 4 quarters (PAP-00402968-70)
1987	Yr Ops ceased	
21	calc #yrs facility operated	
Copper (Cu)		Background influent water copper concentration=.222mg/l
21	#yrs facility discharged	1980 PVSC Sewer Connection Ap cu=.748 mg/l
-	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study cu=.144mg/l
3.785	L per gallon (Merck Index)	1984 Sampling cu=.026 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	1985 sampling cu=.052 mg/l PAP-00333499
-	calc kg COC discharged	
Lead (Pb)		
21	#yrs facility discharged	Background influent water Lead concentration=.03mg/l
0.0304	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study cpb=.300mg/l
3.785	L per gallon (Merck Index)	1984 Sampling pb=.025 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	1985 sampling pb=.025 mg/l PAP-00333499
62.72	calc kg COC discharged	
Mercury (Hg)		Background influent water mercury concentration=.0004mg/l
21	#yrs facility discharged	1980 PVSC Sewer Connection Ap Hg = .15 mg/l
0.0355	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study Hg = .025 mg/l
3.785	L per gallon (Merck Index)	1984 Sampling Hg=.059 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	
73.24	calc kg COC discharged	
HPAHs		
21	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
21	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
12	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
7	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
22	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
21	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
22	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
20	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
10	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
62.72	kg Lead	
73.24	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	From 1966-1987 discharge to PVSC, Prior to that discharge was to Belleville Sewer and Meadow Brook
	# hours/per day discharged	
	#days/week discharged	1966 - 32gpm x 236 days/year (PAP-00333570)
	#weeks/yr discharged	1978 Selected Substance Report - 75000 gpd (PAP-00334489)
25,955,562	calc gal/yr discharge	1979 PVSC Sewer Connection Ap - 51495409 gallons (PAP-00402951, 57, 60, 62, 66)
		1980 PVSC Heavy Metal Source Determination Study - 0.1090 MGD (PAS-00027741-46)
1942	Yr Ops started	1986 Jan-Mar - 6449000 x 4 quarters (PAP-00402968-70)
1966	Yr Ops ceased	
24	calc #yrs facility operated	
Copper (Cu)		
24	#yrs facility discharged	1980 PVSC Sewer Connection Ap cu=.748 mg/l
0.24	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study cu=.144mg/l
3.785	L per gallon (Merck Index)	1984 Sampling cu=.026 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	1985 sampling cu=.052 mg/l PAP-00333499
571.77	calc kg COC discharged	
Lead (Pb)		
24	#yrs facility discharged	
0.12	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study cpb=.300mg/l
3.785	L per gallon (Merck Index)	1984 Sampling pb=.025 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	1985 sampling pb=.025 mg/l PAP-00333499
275.08	calc kg COC discharged	
Mercury (Hg)		
24	#yrs facility discharged	1980 PVSC Sewer Connection Ap Hg = .15 mg/l
0.0780	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study Hg = .025 mg/l
3.785	L per gallon (Merck Index)	1984 Sampling Hg=.059 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	
183.91	calc kg COC discharged	
HPAHs		
24	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
24	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
25	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
25	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
17	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
24	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
21	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
22	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
17	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
571.77	kg Copper	
275.08	kg Lead	
183.91	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1889-1942
	# days/week discharged	Direct Discharge to Meadow Brook which flows to Second River to Passaic River
	# weeks/yr discharged	
25,955,562	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1909	Yr Ops started	FDR page 3
1965	Yr Ops ceased	FDR page 3
56	calc #yrs facility operated	FDR page 3
Copper (Cu)		Background influent water copper concentration=.222mg/l
56	#yrs facility discharged	1980 PVSC Sewer Connection Ap cu=.748 mg/l
-	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study cu=.144mg/l
3.785	L per gallon (Merck Index)	1984 Sampling cu=.026 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	1985 sampling cu=.052 mg/l PAP-00333499
-	calc kg COC discharged	
Lead (Pb)		
56	#yrs facility discharged	Background influent water Lead concentration=.03mg/l
0.0304	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study cpb=.300mg/l
3.785	L per gallon (Merck Index)	1984 Sampling pb=.025 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	1985 sampling pb=.025 mg/l PAP-00333499
167.25	calc kg COC discharged	
Mercury (Hg)		Background influent water mercury concentration=.0004mg/l
56	#yrs facility discharged	1980 PVSC Sewer Connection Ap Hg = .15 mg/l
0.0355	calc mg/L COC discharged	1980 PVSC Heavy Metals Source Determination Study Hg = .025 mg/l
3.785	L per gallon (Merck Index)	1984 Sampling Hg=.059 mg/l PAP-00334524
0.000001	kg per mg (Merck Index)	
195.30	calc kg COC discharged	
HPAHs		
56	#yrs facility discharged	
-	calc mg/L O&G	
25%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
56	#yrs facility discharged	
-	calc mg/L O&G	
25%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
56	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
56	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
56	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
56	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
56	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
56	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
56	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
167.25	kg Lead	
195.30	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1913-1939 discharge from lagoons to Meadow Brook
	# days/week discharged	
	# weeks/yr discharged	
14,123,892	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1900	Yr Ops started	FDR Page 7
1960	Yr Ops ceased	FDR Page 7
55	calc #yrs facility operated	FDR Page 7 - w/ adjustment for facility being closed 1904-1909
Copper (Cu)		Background influent water copper concentration=.222mg/l
55	#yrs facility discharged	PAP-00334684
3.92	calc mg/L COC discharged	PAP-00049910 and PAP-00335678
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,154.88	calc kg COC discharged	
Lead (Pb)		
55	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
55	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
55	#yrs facility discharged	
	calc mg/L O&G	
25%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
55	#yrs facility discharged	
	calc mg/L O&G	
25%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
55	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
55	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
55	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
55	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
55	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
55	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
55	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
4,154.88	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES	
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.	
15	ACRES - TOTAL SITE AREA (acres) FDR pg 1	Approx 7 acres within property line when surface soil sampled 1986 ECRA SES, (PAP-00049203 pg. 114)		
8	ACRES - AFFECTED AREA	1925 drawing of Silver Lake Plant (PAP-00332567) with 'coke' and 'cake' piles adjacent to 50,000 ga. fuel oil AST, north of Red Iron Oxide Bldg. Preliminary Assessment Report, (Stantec May 24, 2012) Fig 2 has overlay of former buildings prior to parking lot (PAP-00334892). F and T Figures is 9 acres. With parking lot (Google Earth figure), 15 acres includes former sludge pond location.	Due to confirmed airborne surface soil deposition of Hg (FDR pg. 10), 100% of the property is deemed impacted for Hg. Other COCs will be 50% of 1986 acreage or calculations due to presence of buildings.	Per FDR (pp 1 & 2) combined site covers 15 acres.
4,046.86	$METERS^2$/ACRE			
30,351	$METERS^2$ (AFFECTED AREA)			
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.		
3	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED		
1900	Year site operations began	Originally operated as Edison Manufacturing Company, a battery manufacturer in the early 1900s. Year operation began is 1900, as supported with FDR Section 3 dating the construction of buildings.		
1987	Year site processing and storage operations ceased	The Final Preliminary Assessment Final Remedial Investigation Report, dated May 6, 2017 (Final RI Report), stated that the buildings associated with the Thomas A. Edison, Inc. Chemical Plant were demolished in the early 1970's, and the property remained vacant until it was redeveloped as a retail grocery store and laundromat with associated parking lots in 1980 (PAP-00334737, 840).		
87	NUMBER YEARS DISCHARGE			
264	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)			
1,979	KG/M^3 SOIL DENSITY	layers of unconsolidated sand, silt, and clay. (PAP-00049305). Bulk density range 1602 kg/m^3 to 2355 kg/m^3, so use average of 1978.5 kg/m^3. Sandy or silty clay	The Allocation Team has concluded that the Site is not on regional Historic Fill as designated by the NJDEP.	
522,438	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)			
Copper (Cu)		1986 ECRA SES TABLE IV-1 (PAP-00049327)		
87	YEARS DISCHARGED	Subsurface soil value (1-2 ft bgs) as surface soil is similar and was assumed to be at least that high to impact two feet down.		
80000	MG/KG (MAX CONCENTRATION)	The highest concentration of copper in subsurface soil (1-3 ft bgs) was 80,000 ppm (PAP-00049316-17, 28-29).		
0.000001	kg per mg (Merck Index)			
41,795	KILOGRAMS DISCHARGED			
Lead (Pb)		1986 ECRA SES TABLE IV-1 (PAP-00049327)		
87	YEARS DISCHARGED			
2300	MG/KG (AVERAGE CONCENTRATION)	Soil sample S-5 result from 2.5 feet bgs, listed in Summary of Historical Analytical Results in Area B (FDR page 13; PAP-00065653)		
0.000001	kg per mg (Merck Index)			
1,202	KILOGRAMS DISCHARGED			
Mercury (Hg)		Operation of Hg/Zn amalgamation may have resulted in disposition elemental Hg on property. August 20, 1986 ECRA SES Pg. 36.		
87	YEARS DISCHARGED			
2,005	MG/KG (MAX CONCENTRATION)	The highest concentration of mercury in surface soil was 2,005 ppm, detected between the main building and Building No. 57 (PAP-00049327)		
0.000001	kg per mg (Merck Index)			
2,095	KILOGRAMS DISCHARGED			

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
87	YEARS DISCHARGED	
0.552	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.29	KILOGRAMS DISCHARGED	
PAHs (others detected)		Phenanthrene - 7.7 ppm
87	YEARS DISCHARGED	Acenaphthylene - 2.4 ppm
54.20	MG/KG (TOTAL PAH MAX CONCENTRATION)	2-methylnaphthalene - 35 ppm
0.000001	kg per mg (Merck Index)	Naphthalene - 3.4 ppm
28	KILOGRAMS DISCHARGED	Fluorene - 5.7 ppm
		Table 9, Sample ID B-P31S (5.0-6.0 ft bgs)
PCBs		
57	YEARS DISCHARGED	
3.36	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PCBs were detected in TCLP composite sample 3.36 ppm (PAP-00332584). Reduced discharge period to 1930-1987.

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Table 9, Sample IDB-P10S (1.8-2.8 ft bgs) (PAP-00334938)	Benzo(a)pyrene	0.390	1.0	0.3900
	Benzo(a)anthracene	0.430	0.1	0.0430
	Benzo(b)fluoranthene	0.690	0.1	0.0690
	Benzo(k)fluoranthene	0.250	0.01	0.0025
	Chrysene	0.560	0.001	0.0006
	Dibenz(a,h)anthracene	0.037	1.0	0.0370
	Indeno(1,2,3-cd)pyrene	0.100	0.1	0.0100
DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg				
			Total Benzo(a)pyrene Equivalents =	**0.552**

0.000001	kg per mg (Merck Index)
1	KILOGRAMS DISCHARGED
DDx	
0	YEARS DISCHARGED within DDx Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dieldrin	
0	YEARS DISCHARGED within Dieldrin Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED
0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	calc kg COC discharged

NOT DETECTED (FDR)

SUMMARY CMASS ESTIMATES:	
41,795.04	kg Copper
1,201.61	kg Lead
2,094.98	kg Mercury
0.29	kg PAHs (Benzo(a)pyrene Equivalent)
28.32	kg PAHs (Other)
1.15	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

45121.38	MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	NOTES, COMMENTS, REFERENCES	
0.46	FEET for 6 flooding events	AVERAGE SHOULD INCLUDE FLOODS AND HURRICANE EVENTS OVER TIME	6 qty, 11,532 gallon release events (6 foot deep 1,992 sf basin), equals 0.46 feet in a 1,992 basin.
15	ACRES - TOTAL SITE AREA (acres)	FDR pg 1	
0.04	ACRES - AFFECTED AREA	ESTIMATED LAGOON AND NEUTRALIZATION AREA (PAS-00109548)	
4,046.86	METERS^2/ACRE	Preliminary Assessment Report, Fig 2 (PAP-00334892) has overlay of former buildings prior to parking lot with former sludge pond in upper left corner. Approximately 1,922 sqft.	Unknown, but given 100,000-gal water released in 1948 flood event and 1,922 sq ft area of lagoon, assume greater than 1,000 gal released. On **May 30, 1984, the sedimentation impoundment overflowed**. The accidental discharge was due to a blockage of the discharge line and extremely heavy rains. The overflow went to a neighboring homeowner's property and accumulated in an area being prepared for an in-ground swimming pool. (PAP-00049278)
162	METERS^2 (AFFECTED AREA)		
0.0170	METERS/YEAR (ERODED SOIL THICKNESS)	With 3.7% solids in sludge (PAP-00332945) and a one time event, 0.037*0.46 feet of flood water in 1,992 basin, eroded soil thickness is 0.01702	12755.10204
2.76	METERS^3/YEAR (ERODED SOIL VOLUME)	ASSUME VOLUME/YEAR DISCHARGED TO DITCHES AND FIRST CREEK	
	YEAR STARTED DISCHARGING TO LAGOON SITE REMEDIATION, GEOTEXTILE, ASPHALT COVER		
1	NUMBER YEARS DISCHARGE	Years of discharge (6 flooding events) converted to one time depth in 1,992 sf pond.	
2.76	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,024	KG/M^3 SOIL DENSITY	sludge density is 1.024 kg/L at 1000L/m3 = 1024 kg/m3	McGraw-Edison Company to Caldwell Trucking Company, Inc. may 9, 1973 re: sludge contents (PAP-00332945). Total solids of 33,500 mg/L or 3.7% by weight equals a density of 1.024 kg/L for converting the estimated concentration of sludge to solid released during flooding events.
2,821	KILOGRAMS (TOTAL WT OF SOIL AFFECTED OVER TIME)		
Copper (Cu)			
1	YEARS DISCHARGED		
31.25	MG/KG (MAX CONCENTRATION)	Copper from sludge,(32 mg/L * 1000 L/m3)/1024 kg/m3 density of sludge. (FDR, PAGE 6, 2nd paragraph and PAP-00332945).	
0.000001	kg per mg (Merck Index)		
0.088	KILOGRAMS DISCHARGED		
Lead (Pb)			
1	YEARS DISCHARGED		
10	MG/KG (MAX CONCENTRATION)	Samples of the settling pit were collected January 18, 1983 and reported up to 75.53 mg/kg mercury and 10.03 mg/kg lead (note units of measure were not clearly identified). Copper was not reported (PAP-CONF-00009957).	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
1	YEARS DISCHARGED		
75.5	MG/KG (MAX CONCENTRATION)	Samples of the settling pit were collected January 18, 1983 and reported up to 75.53 mg/kg mercury and 10.03 mg/kg lead (note units of measure were not clearly identified). Copper was not reported (PAP-CONF-00009957).	
0.000001	kg per mg (Merck Index)		
0.21	KILOGRAMS DISCHARGED		

SUMMARY CMASS ESTIMATES:

0.09	kg Copper
0.03	kg Lead
0.21	kg Mercury

0.33	MASS (KG) DISCHARGED BY OVERLAND FLOW

Discharge Calcs	Direct Discharge Information	NOTES, COMMENTS, REFERENCES
0.46	FEET for 6 flooding events	AVERAGE SHOULD INCLUDE FLOODS AND HURRICANE EVENTS OVER TIME
	ACRES - TOTAL SITE AREA (acres)	
	ACRES - AFFECTED AREA	ESTIMATED 30-ft DIA Scoured hole from 10" pipe break on May 12, 1948 (PAS-00050268) Fire sprinkler line would be below the frost line (6' bgs) so with scour of a 30-ft diameter hole with an average depth of 8-feet would release asproximately 5,652 cubic feet or 160 m^3 of soil. Using the same density as for surface erosion, 1978.5 mg/m^3 equals 163,840 kg
4,046.86	$METERS^2$/ACRE	
0	$METERS^2$ (AFFECTED AREA)	
		PVSC inspection records 1938-1948 noted events such as heavy rains caused flooding at facility site. **5/12/1948 wastes flowed** into Second River from Meadow Brook storm sewer; Second River looked like "river of blood all the way down to its confluence with the Passaic River." Discharge from facility site, caused by waterline break, releasing 100,000 gals water, flooded all north side bldgs, undermined bldgs, produced 30-ft hole in yard resulting in collapse of all 3 industrial sewers. (PAP-00050259)
0.0170	METERS/YEAR (ERODED SOIL THICKNESS)	
0.00	$METERS^3$/YEAR (ERODED SOIL VOLUME)	ASSUME VOLUME/YEAR DISCHARGED
	YEAR STARTED DISCHARGING TO LAGOON SITE REMEDIATION, GEOTEXTILE, ASPHALT COVER	
1	NUMBER YEARS DISCHARGE	
0.00	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)	
1,979	KG/M^3 SOIL DENSITY	Layers of unconsolidated sand, silt, and clay. (PAP-00049305). Bulk density range 1602 kg/m^3 to 2355 kg/m^3, so use average of 1978.5 kg/m^3. Sandy or silty clay forhttp://structx.com/Soil_Properties_002.html
163,840	KILOGRAMS (TOTAL WT OF SOIL AFFECTED FROM SCOUR)	
Copper (Cu)		1986 ECRA SES TABLE IV-1 (PAP-00049327)
1	YEARS DISCHARGED	Subsurface soil value (1-2 ft bgs) as surface soil is similar and was assumed to be at least that high to impact two feet down.
80000	MG/KG (MAX CONCENTRATION)	The highest concentration of copper in subsurface soil (1-3 ft bgs) was 80,000 ppm (PAP-00049316-17, 28-29).
0.000001	kg per mg (Merck Index)	
13,107.200	KILOGRAMS DISCHARGED	
Lead (Pb)		1986 ECRA SES TABLE IV-1 (PAP-00049327)
1	YEARS DISCHARGED	
2300	MG/KG (MAX CONCENTRATION)	Soil sample S-5 result from 2.5 feet bgs, listed in Summary of Historical Analytical Results in Area B (FDR page 13; PAP-00065653)
0.000001	kg per mg (Merck Index)	
377	KILOGRAMS DISCHARGED	
Mercury (Hg)		Operation of Hg/Zn amalgamation may have resulted in disposition elemental Hg on property. August 20, 1986 ECRA SES Pg. 36.
1	YEARS DISCHARGED	
2,005	MG/KG (MAX CONCENTRATION)	The highest concentration of mercury in surface soil was 2,005 ppm, detected between the main building and Building No. 57 (PAP-00049327)
0.000001	kg per mg (Merck Index)	
328.50	KILOGRAMS DISCHARGED	
PAHs (listed in Benzoic Pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
1	YEARS DISCHARGED	
0.552	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Attributed to historic fill - The 2017 Final RI Report attributed the PAHs (except 2-methylnaphthalene) concentrations in soil to historic fill (PAP-00334877).
0.000001	kg per mg (Merck Index)	
0.09	KILOGRAMS DISCHARGED	
PAHs (others detected)		Benzo (g,h,i) perylene - 0.09J ppm
28	YEARS DISCHARGED	Fluoranthene - 0.63 ppm
2.00	MG/KG (TOTAL PAH MAX CONCENTRATION)	Phenanthrene - 0.2J
0.000001	kg per mg (Merck Index)	Pyrene - 0.49 ppm
0.33	KILOGRAMS DISCHARGED	Anthracene - 0.59J

Table 9, Sample IDB-P10S (1.8-2.8 ft bgs) (PAP-00334938)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene (0.39mg/kg< HF 1.89)	0.390	1.0	0.3900
Benzo(a)anthracene (0.43mg/kg< HF 1.37)	0.430	0.1	0.0430
Benzo(b)fluoranthene (0.69g/kg< HF 1.91)	0.690	0.1	0.0690
Benzo(k)fluoranthene (0.25mg/kg< HF 1.79)	0.250	0.01	0.0025
Chrysene	0.560	0.001	0.0006
Dibenz(a,h)anthracene (0.024mg/kg< HF 1.24)	0.037	1.0	0.0370
Indeno(1,2,3-cd)pyrene	0.100	0.1	0.0100
DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg		**Total Benzo(a)pyrene Equivalents =**	**0.552**

PCBs		
28	YEARS DISCHARGED within PCBs Timeline	
3.36	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PCBs were detected in TCLP composite sample 3.36 ppm (PAP-00332584).
0.000001	kg per mg (Merck Index)	
1	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (CONCENTRATION)	NO CONCENTRATION INFO
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	NO CONCENTRATION INFO
	MG/KG (CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		
0	YEARS DISCHARGED	
	MG/KG (CONCENTRATION)	NO CONCENTRATION INFO
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
13,107.20	kg Copper
376.83	kg Lead
328.50	kg Mercury
0.09	kg PAHs MAX
0.33	kg PAHs MAX
0.55	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

13,813.50	MASS (KG) DISCHARGED BY OVERLAND FLOW

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Cooper Industries LLC

7, 13, & 26 Bank Street | Newark | NJ | 07102

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.838E-11	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.470E-11

75 Belmont Avenue | Belleville | NJ | 07109

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.366E-4	10.0%	Periodic Noncompliacne	PVSC issued a notice to desist pollution to Edison Chemical Company at Belleville on May 1, 1939 (PAS-00028126). A record of ten years of inspections performed by the PVSC on the Edison Company, Storage Battery Division, in Silver Lake, Belleville, dated June 15, 1948, documented the investigation of contamination entering the Second River. NJDEP issued a Directive Letter to McGraw Edison on June 6, 1984, to cease operation of the unlined pretreatment lagoons (PAP-00049811). An August 4, 1987, NJDEP Inspection Report stated that the facility did not have a hazardous waste management program consistent with hazardous waste regulations. A NOV would have been issued, but the operations had ceased (PAP-00050211-13). On May 12, 1948, "exceptionally strong iron wastes were found flowing into the Second River from the Meadow Brook storm sewer of such intensity that Second River looked like a river of blood all the way down to its confluence with the Passaic River." The discharge emanated from Edison Storage Battery Division, Belmont Avenue, Belleville facility. The cause was a waterline break that resulted in releasing 100,000 gallons of water that flooded all north side buildings, undermined the buildings and producing a 30-foot hole in the yard and resulting in subsequent collapse of all three industrial sewers. Chemicals, sand, and finished chemical materials were washed into the sewer and caused a blockage. The broken water line was repaired with a sleeve and the pipes broke again. The large hole filled with an acid and iron solution. A pump line from the hole drained the mixture into the clear water line directly to the storm sewer and into Second River. The waste could not be put into the sanitary sewer until new sewer pipes had been installed. The acid corroded the pumps and caused them to fail...(PAP-00050268-69).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.530E-4

33 Littleton Avenue | Newark | NJ | 07107

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
9.002E-7	0.0%	Historically Compliant or No Evidence	The report stated that two wipe samples collected from stained areas on the concrete floor near the transformers inside the building contained PCB levels of 58 and 119 ppm. The report stated that "it is presumed that the elevated PCB levels PCBs were assumed to have resulted from historical spills from the transformers prior to retrofilling" (PAS-00027729). No indication of release of contamination to exterior of building. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.201E-7

AP_ABS	7.537E-4

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Cooper Industries LLC

7, 13, & 26 Bank Street | Newark | NJ | 07102

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.000E-8	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.600E-8

75 Belmont Avenue | Belleville | NJ | 07109

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.492E-1	10.0%	Periodic Noncompliacne	PVSC issued a notice to desist pollution to Edison Chemical Company at Belleville on May 1, 1939 (PAS-00028126). A record of ten years of inspections performed by the PVSC on the Edison Company, Storage Battery Division, in Silver Lake, Belleville, dated June 15, 1948, documented the investigation of contamination entering the Second River. NJDEP issued a Directive Letter to McGraw Edison on June 6, 1984, to cease operation of the unlined pretreatment lagoons (PAP-00049811). An August 4, 1987, NJDEP Inspection Report stated that the facility did not have a hazardous waste management program consistent with hazardous waste regulations. A NOV would have been issued, but the operations had ceased (PAP-00050211-13). On May 12, 1948, "exceptionally strong iron wastes were found flowing into the Second River from the Meadow Brook storm sewer of such intensity that Second River looked like a river of blood all the way down to its confluence with the Passaic River." The discharge emanated from Edison Storage Battery Division, Belmont Avenue, Belleville facility. The cause was a waterline break that resulted in releasing 100,000 gallons of water that flooded all north side buildings, undermined the buildings and producing a 30-foot hole in the yard and resulting in subsequent collapse of all three industrial sewers. Chemicals, sand, and finished chemical materials were washed into the sewer and caused a blockage. The broken water line was repaired with a sleeve and the pipes broke again. The large hole filled with an acid and iron solution. A pump line from the hole drained the mixture into the clear water line directly to the storm sewer and into Second River. The waste could not be put into the sanitary sewer until new sewer pipes had been installed. The acid corroded the pumps and caused them to fail...(PAP-00050268-69).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.743E-1

33 Littleton Avenue | Newark | NJ | 07107

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.578E-4	0.0%	Historically Compliant or No Evidence	The report stated that two wipe samples collected from stained areas on the concrete floor near the transformers inside the building contained PCB levels of 58 and 119 ppm. The report stated that "it is presumed that the elevated PCB levels PCBs were assumed to have resulted from historical spills from the transformers prior to retrofilling" (PAS-00027729). No indication of release of contamination to exterior of building. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.863E-4

AP_ABS	6.750E-1

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

COOPER INDUSTRIES – Bank Street

Cooper argues that it has no connection to or CERCLA liability for the Wiss Family Operations at these locations. The FDR acknowledges that Cooper never owned any of these locations or was connected to the operations at them. When Cooper acquired the assets of a New Jersey corporation, J. Wiss & Sons Co., in 1976, it acquired assets related to J. Wiss & Sons Co.'s then-operations at several locations, including at the Littleton Avenue location in Newark. Cooper assumed only specific and narrowly defined liabilities of J. Wiss & Sons Co. It did not assume any CERCLA liabilities of that corporation, much less those associated with these operations involving individual Wiss family members that ended more than a decade before J. Wiss & Sons Co. was incorporated. *United States v. Gen. Battery Corp.*, 423 F.3d 294, 305 (3d Cir. 2005) (appropriate indirect liability standard for CERCLA actions is the general rule of corporate-successor non-liability, *i.e.*, an acquiring company is generally not liable for the debts and liabilities of a selling company except in certain instances).

Cooper never owned or conducted any operations at any of the Bank Street locations. J. Wiss & Sons, Co. never operated at the Bank Street locations and was not formed until over ten years after the Bank Street real property was sold to Prudential Insurance Company (PAP-00332550; PAP-00331502).

In the 1976 transaction wherein Cooper acquired certain assets of J. Wiss & Sons Co., Cooper did not assume any CERCLA liabilities of J. Wiss & Sons Co. or of any alleged predecessors to J. Wiss & Sons Co., including any such liabilities with respect to the Bank Street locations.

Cooper disputes that it has any liability associated with the Primary Battery Facility operations prior to that period, when those operations were owned and operated by Thomas A. Edison, Inc. ('TAE') or after McGraw-Edison's ownership/operations of the Primary Battery Facility ended in 1985 (i.e., Battery Products, Inc. operations).

In addition, the following statement was provided regarding the Storage Battery Business (Chemical Works plant): Cooper's liability, if any, for purposes of the Allocation does not extend to operations associated with the Storage Battery Business. When Cooper merged with McGraw-Edison in 1985, any liabilities that McGraw-Edison may have had with respect to the Storage Battery Business had already been transferred to and assumed by Electric Storage Battery Company (later referred to as Exide Technologies). Any operations in and after 1960 would be the responsibility of Exide, and Cooper has no connection to or liabilities for any such operations.

In addition, regarding the liabilities transferred to Exide, Cooper contends that those liabilities would not include any liabilities related to the operations prior to the 1957 TAE transaction.

ALLOCATOR'S DETERMINATION – Though Cooper Industries may have a sustainable argument regarding its allegation that it did not accept the CERCLA liability of J. Wiss & Sons, there is an

insufficient demonstration of applicable case law and facts to support this claim based on available data. Though the Allocator presumes a substantial chance of success should this matter go to litigation with sufficient evidence, we leave this matter as a topic for settlement discussions between Cooper Industries and EPA.

Allocation Facility Cmass Calculation

Covanta Essex Company	66 &183 Raymond Blvd.	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	16.0	15.98	1.018817E-2	0.16
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Covanta Essex Company	**66 &183 Raymond Blvd.**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0.16	5.087E-8	5.087E-10
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Covanta Essex Company	66 &183 Raymond Blvd.	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	5.536E-5	0.16	177.	5.536E-5	5.536E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Covanta Essex Company	**66 &183 Raymond Blvd.**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	NJDPES Storm water Discharge Permit for discharge to Passaic River
	# days/week discharged	1990 permit flow rates PAS-00049021
	# weeks/yr discharged	DNS001 = 2.8-40gpm
9,276,840	# gals/yr directly discharged	DNS002 = 2.8-25gpm
		No Discharge to the PVSC, "other water" Recycled
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1990	Yr Ops started	
1997	Yr Ops ceased	Facility went to 0 discharge in 1997
7	calc #yrs facility operated	
Copper (Cu)		
7	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
7	#yrs facility discharged	Lead Results
0.22	calc mg/L COC discharged	196 ug/l PAS-00082812-14
3.785	L per gallon (Merck Index)	169-260ug/l PAS-00049054
0.000001	kg per mg (Merck Index)	196-295 ug/l
52.84	calc kg COC discharged	204 ug/l PAS00106082
Mercury (Hg)		
7	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
7	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
7	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
7	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
7	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
7	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
7	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
7	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
7	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
7	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
15.98	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Covanta Essex Company

66 &183 Raymond Blvd.	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.815E-10	5.0%	Occasional Noncompliance	According to a NJDEP letter, dated June 22, 1988, the site was given an "unacceptable" rating for failing to monitor stormwater discharges and inaccurately reporting on discharge monitoring reports that there were no stormwater discharges (PAS-00082684). A 1991 compliance inspection gave the facility an “unacceptable” rating due to lead effluent violations, operational deficiencies (including the presence of ash piles on the ground), and the facility's effluent at outfall DSN001 was black at inspection, violating the facility’s permit which is for stormwater only (PAS-00082812-14). On or about December 1, 1992, NJDEP and ARF entered into an Administrative Consent Order. ARF had exceeded certain discharge limits for lead, among others, in its NJPDES permit (PAS-00106056). Potential for contamination to be caused by preexisting conditions not CE actions	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.243E-10

AP_ABS	3.243E-10

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Covanta Essex Company

66 &183 Raymond Blvd.	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.152E-7	5.0%	Occasional Noncompliance	According to a NJDEP letter, dated June 22, 1988, the site was given an "unacceptable" rating for failing to monitor stormwater discharges and inaccurately reporting on discharge monitoring reports that there were no stormwater discharges (PAS-00082684). A 1991 compliance inspection gave the facility an “unacceptable” rating due to lead effluent violations, operational deficiencies (including the presence of ash piles on the ground), and the facility's effluent at outfall DSN001 was black at inspection, violating the facility’s permit which is for stormwater only (PAS-00082812-14). On or about December 1, 1992, NJDEP and ARF entered into an Administrative Consent Order. ARF had exceeded certain discharge limits for lead, among others, in its NJPDES permit (PAS-00106056). Potential for contamination to be caused by preexisting conditions not CE actions	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.529E-7

AP_ABS	3.529E-7

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

COVANTA

Covanta argues that it is not and has never been the current owner or operator or former owner or operator of the LPRSA [Lower Passaic River Study Area]. Nor is there any evidence or suggestion that Covanta was a transporter of hazardous substances to the LPRSA. Accordingly, it appears that USEPA [United States Environmental Protection Agency] is contending that Covanta may be liable under CERCLA [Comprehensive Environmental Response, Compensation and Liability Act] as an arranger. Arranger liability requires that Covanta took intentional steps to dispose of a hazardous substance.…As the United States Supreme Court has explained, intentional steps means that it must be proven that Covanta actually intended to dispose of hazardous substances in the LPRSA.…Covanta operates, and since 1997 has operated, the ECRRF as a zero discharge facility, except during unusual storm events.…The only evidence allegedly connecting Covanta to the LPRSA is the stormwater exceedances in ditches at the Property. These exceedances, however, are not attributable to the ECRRF or Covanta. Instead, these exceedances all stem from pre-existing contamination on the Property – property subjected to illegal dumping, previously owned by the NRHA [Newark Redevelopment and Housing Authority], and currently owned by the Port Authority – as well as offsite, upgradient sources and surface water backflow from the Passaic River. Simply put, there is no evidence that Covanta disposed of anything in the LPRSA (i.e., engaged in some active conduct that caused the discharge, deposit, injection, dumping, spilling, leaking, or placing of any hazardous substances in the LPRSA)….Even if evidence of the disposal of hazardous substances by Covanta did exist (and it does not), there is no evidence that Covanta intended to dispose of any hazardous substances in the LPRSA. Without intent, Covanta cannot be an arranger under CERCLA – even if Covanta knew or should have known that stormwater runoff carrying pre-existing contamination at the Property or contamination from other parties could discharge to the LPRSA.

In addition, Covanta asserts that, even putting aside the lack of evidence that Covanta is an arranger, there is another problem with seeking to hold Covanta liable under CERCLA for LPRSA impacts: Covanta's hazardous substances, if any, have not caused and will not cause the incurrence of response costs. In order to be liable under CERCLA, Covanta's releases of hazardous substances must cause the incurrence of response costs…. although lead is a COC for the LPRSA, USEPA has determined…that lead is not driving any response actions. In addition, none of the other substances detected in stormwater at the Property are COCs for the LPRSA. As hazardous substances in the Property's stormwater discharges will not cause the incurrence of LPRSA response costs, Covanta cannot be liable under CERCLA. Covanta reserves the right to assert additional defenses in the future.

ALLOCATOR'S DETERMINATION – As noted in the information regarding the site submitted by Covanta, it is clear the Covanta had stormwater discharges from their property that have contributed lead, one of the COCs identified by EPA, to the Lower Passaic. While they may be correct that the lead was deposited on their property by a former owner, that they have not intended to have stormwater discharges, and that lead is not the primary driver for the remediation, none of those arguments avoid liability under CERCLA. The Allocator does not

believe that Covanta will prevail in an action to overturn EPA's determination of Covanta as a PRP based on the available information. The possibility that a COC was transported to the facility site from an offsite location was taken into account in determining Covanta's allocated share.

Allocation Facility Cmass Calculation

Curtiss-Wright Corporation	**1 Passaic Avenue**	**Wood-Ridge**	**NJ**	**07075**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	1,762.36	100.00%	-	2.32%	1,986.37	100.00%	-	1,808.44	1.018817E-2	18.42
Lead	100.00%	12,817.15	100.00%	-	2.32%	744.89	100.00%	-	12,834.43	1.018817E-2	130.76
Mercury	100.00%	45.93	100.00%	-	2.32%	3.35	100.00%	-	46.01	1.018817E-2	0.47
HPAHs	100.00%	72.86	100.00%	-	2.32%	2,234.66	100.00%	-	124.7	1.018817E-2	1.27
LPAHs	100.00%	66.01	100.00%	-	2.32%	1,489.78	100.00%	-	100.57	1.018817E-2	1.02
PCBs	100.00%	18.69	100.00%	-	2.32%	-	100.00%	-	18.69	1.018817E-2	0.19
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Curtiss-Wright Corporation	1 Passaic Avenue	Wood-Ridge	NJ	07075

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	18.42	8.774E-6	6.054E-6
Lead	0.01	3,200,000.00	130.76	4.086E-5	4.086E-7
Mercury	0.95	42,000.00	0.47	1.116E-5	1.060E-5
HPAHs	0.05	240,000.00	1.27	5.294E-6	2.647E-7
LPAHs	0.01	170,000.00	1.02	6.027E-6	6.027E-8
PCBs	12.87	26,000.00	0.19	7.324E-6	9.426E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Curtiss-Wright Corporation	1 Passaic Avenue	Wood-Ridge	NJ	07075

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	6.530E-3	18.42	13,693.77	6.530E-3	4.505E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	4.447E-2	130.76	142,188.58	4.447E-2	4.447E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.064E-2	0.47	446.57	1.064E-2	1.011E-2
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.869E-5	1.27	5.62	2.869E-5	1.435E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	3.338E-5	1.02	4.65	3.338E-5	3.338E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	9.314E-4	0.19	24.03	9.314E-4	1.199E-2
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Curtiss-Wright Corporation	**1 Passaic Avenue**	**Wood-Ridge**	**NJ**	**07075**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Limited information on Discharge COCs and no information on Discharge Flows.
	# hours/per day discharged	Based on Otis Elevator assuming 24MGY to PVSC
	#days/week discharged	
	#weeks/yr discharged	
24,000,000	calc gal/yr discharge	
1942	Yr Ops started	
1983	Yr Ops ceased	
41	calc #yrs facility operated	
Copper (Cu)		
41	#yrs facility discharged	1979-1984 Data Cu=.2 mg/l PAP-0456964-101
0.53	calc mg/L COC discharged	1983 sample Cu = .72 and .68 mg/l PAP-00457009
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,986.37	calc kg COC discharged	
Lead (Pb)		
41	#yrs facility discharged	1979-1984 Data Pb=.2 mg/l PAP-0456964-101
0.20	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
744.89	calc kg COC discharged	
Mercury (Hg)		
41	#yrs facility discharged	1981 Sample Data Hg=.0009mg/l PAP-00457060
0.0009	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3.35	calc kg COC discharged	
HPAHs		
41	#yrs facility discharged	Assuming 10 mg/l O&G
10.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,234.66	calc kg COC discharged	
LPAHs		
41	#yrs facility discharged	Assuming 10 mg/l O&G
10.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,489.78	calc kg COC discharged	
PCBs		
36	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
31	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
34	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
41	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
38	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
39	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
1,986.37	kg Copper	
744.89	kg Lead	
3.35	kg Mercury	
2,234.66	kg HPAHs	
1,489.78	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
160	ACRES - TOTAL SITE AREA (acres)	FDR page 1	
115.0	ACRES - AFFECTED AREA	In 1951, the main, shared occupancy building is 38 acres, 6 NE-SW orientated buildings cover approximately 7 acres (PAP-00190307). Removing the building coverage from the 160 acres total leaves 115 acres subject to erosion.	
4,046.86	METERS^2/ACRE		
465,389	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
47	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1943	Year site operations began	Curtiss-Wright Corp operated an aircraft engine manufacturing palnt at the site from March 1943 until November 1983. (PAP-00190346).	
2001	Year site processing and storage operations ceased	Curtiss-Wright Corp owned site through 2001 (FDR page 1)	
58	NUMBER YEARS DISCHARGE		
2,699	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,979	KG/M^3 SOIL DENSITY	Unconsolidated surface deposits generally consist of sand, silt, clay, and fine sand (PAP-00393240). Bulk density range 1,602 KG/M^3 to 2,355 KG/M^3, so use average 1978.5 kg/m3 for Sandy or Silty Clay on (http://structx.com/Soil_Properties_002.html)	
5,340,477	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)	Facility is not located on historic fill (FDR page 4)	
Copper (Cu)			
58	YEARS DISCHARGED		
330	MG/KG (MAX CONCENTRATION)	Soil boring sample (PAP-00393057)	
0.000001	kg per mg (Merck Index)		
1,762	KILOGRAMS DISCHARGED		
Lead (Pb)			
58	YEARS DISCHARGED		
2400	MG/KG (AVERAGE CONCENTRATION)	Soil boring sample (PAP-00393057)	
0.000001	kg per mg (Merck Index)		
12,817	KILOGRAMS DISCHARGED		
Mercury (Hg)			
58	YEARS DISCHARGED		
8.6	MG/KG (MAX CONCENTRATION)	Soil boring sample (PAP-00393057)	
0.000001	kg per mg (Merck Index)		
46	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
58	YEARS DISCHARGED		
13.6	MG/KG (TOTAL PAH MAX CONCENTRATION)	No documentation of PAHs can be located other than the Rotary Power 1987 Post Excavation Soil Sample Results, Table 7.1-1 (PAP-00393180)	
0.000001	kg per mg (Merck Index)		
73	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
58	YEARS DISCHARGED		
12	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
66	KILOGRAMS DISCHARGED		
PCBs			
58	YEARS DISCHARGED		
3.5	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Soil sample OF-29.1A from 5.5-6.0 ft below grade (PAP-00393154)	
0.000001	kg per mg (Merck Index)		
19	KILOGRAMS DISCHARGED		

SUMMARY CMASS ESTIMATES:	
1,762.36	kg Copper
12,817.15	kg Lead
45.93	kg Mercury
72.86	kg PAHs (Benzo(a)pyrene Equivalent)
66.01	kg PAHs (Other)
18.69	kg PCBs
14782.99	MASS (KG) DISCHARGED FROM SURFACE SOIL

TABLE 7.1-1 Sample SS-C 0.0-0.5 ft bgs (PAP-00393180)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	9.300	1.0	9.3000
Benzo(a)anthracene	8.900	0.1	0.8900
Benzo(b)fluoranthene	0.000	0.1	0.0000
Benzo(k)fluoranthene	12.400	0.01	0.1240
Chrysene	9.300	0.001	0.0093
Dibenz(a,h)anthracene	3.000	1.0	3.0000
Indeno(1,2,3-cd)pyrene	3.200	0.1	0.3200

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 13.6

TABLE 7.1-1 Sample SS-C 0.0-0.5 ft bgs (PAP-00393180)

Anthracene	1.7
Acenaphthene	0.82
Acenaphthylene	0
Fluorene	0.44
Naphthalene	0.1
Phenanthrene	9.3
2-Methylnaphthalene	0
SUM	12.36

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Curtiss-Wright Corporation

1 Passaic Avenue	**Wood-Ridge**	**NJ**	**07075**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.116E-4	5.0%	Occasional Noncompliance	A PVSC letter report of pollutions corrected in 1969, dated March 31, 1970, identified intermittent polluting discharges containing oil in 1968 from Curtiss-Wright to Felds Brook, which the report described as a tributary to the Passaic River (PAS-00008279). A letter reporting the results of an Inspection and Insulating Fluid Evaluation by Burlington Testing Company dated September 7, 1984 stated that 27 of 62 transformers showed evidence of slight leakage at various points, such as gauges, fins, valves, gaskets, tap changer, and bushing throats. Spills at two of the askarel (PCB)-filled transformers were also noted (PAP-00191030).	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.172E-4

AP_ABS	1.172E-4

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Curtiss-Wright Corporation

1 Passaic Avenue	**Wood-Ridge**	**NJ**	**07075**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.705E-2	5.0%	Occasional Noncompliance	A PVSC letter report of pollutions corrected in 1969, dated March 31, 1970, identified intermittent polluting discharges containing oil in 1968 from Curtiss-Wright to Felds Brook, which the report described as a tributary to the Passaic River (PAS-00008279). A letter reporting the results of an Inspection and Insulating Fluid Evaluation by Burlington Testing Company dated September 7, 1984 stated that 27 of 62 transformers showed evidence of slight leakage at various points, such as gauges, fins, valves, gaskets, tap changer, and bushing throats. Spills at two of the askarel (PCB)-filled transformers were also noted (PAP-00191030).	0.0%	0% Cooperation with conduct of allocation and requests for related information	2.840E-2

AP_ABS	2.840E-2

Allocation Facility Cmass Calculation

DII Industries, LLC	401 Worthington Avenue	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	3,023.03	100.00%	-	0.27%	-	100.00%	-	3,023.03	1.018817E-2	30.8
Lead	100.00%	391.51	100.00%	-	0.27%	-	100.00%	-	391.51	1.018817E-2	3.99
Mercury	100.00%	1.75	100.00%	-	0.27%	0.41	100.00%	-	1.75	1.018817E-2	0.02
HPAHs	100.00%	9.18	100.00%	-	0.27%	-	100.00%	-	9.18	1.018817E-2	0.09
LPAHs	100.00%	1.06	100.00%	-	0.27%	-	100.00%	-	1.06	1.018817E-2	0.01
PCBs	100.00%	1.54	100.00%	-	0.27%	-	100.00%	-	1.54	1.018817E-2	0.02
DDx	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

DII Industries, LLC	401 Worthington Avenue	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	30.8	1.467E-5	1.012E-5
Lead	0.01	3,200,000.00	3.99	1.246E-6	1.246E-8
Mercury	0.95	42,000.00	0.02	4.248E-7	4.035E-7
HPAHs	0.05	240,000.00	0.09	3.897E-7	1.948E-8
LPAHs	0.01	170,000.00	0.01	6.353E-8	6.353E-10
PCBs	12.87	26,000.00	0.02	6.035E-7	7.766E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

DII Industries, LLC	401 Worthington Avenue	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.092E-2	30.8	22,890.77	1.092E-2	7.531E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.357E-3	3.99	4,337.41	1.357E-3	1.357E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	4.051E-4	0.02	17.	4.051E-4	3.849E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.112E-6	0.09	0.41	2.112E-6	1.056E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	3.518E-7	0.01	0.05	3.518E-7	3.518E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	7.674E-5	0.02	1.98	7.674E-5	9.877E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

DII Industries, LLC	**401 Worthington Avenue**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Worthington Ave	CSO	0.48%	56.33%	No metering was done at this location for the Killiam report. CSO percentages were calculated by the median of all CSOs in the Harrison municipality

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No Permitted discharges to Surface Water
	# hours/per day discharged	PVSC Permit No. 13402044 (PAS-00023275)
	#days/week discharged	Non contact cooling water and floor drains to PVSC w/ sanitary water
	#weeks/yr discharged	Did not generate process wastewater
13,500,000	calc gal/yr discharge	1989-1990 flows
		4.3 MGY Cooling Water
1985	Yr Ops started	9.2 MGY Sanitary
1993	Yr Ops ceased	
8	calc #yrs facility operated	Water from catch basins were discharged to PVSC
Copper (Cu)		
8	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
8	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		Only monitoring data from 1986 for Mercury
8	#yrs facility discharged	
0.0010	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.41	calc kg COC discharged	
HPAHs		
8	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
8	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
-7	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-12	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
3	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
9	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
1	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-9	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
0.41	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.083	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
23	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
5.2	ACRES - AFFECTED AREA	Soil piles and unpaved areas (PAS-00022928 and PAS-0002293)	5.2 acres is based on the estimated pervious area in the figure on PAS-00022928.
4,046.86	METERS^2/ACRE		
21,044	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1985	Year site operations began	Operated and owned by DII/Dresser from January 1985 to February 1997. (FDR page 1)	
1997	Year site processing and storage operations ceased	Dresser/DII ceased commercial or manufacturing operations at the plant in October 1993 (FDR page 1; PAS-0063866, PAS-00122467).	Dresser/DII sold site in 1997 (FDR page 1; PAS-0063866, PAS-00122467)
12	NUMBER YEARS DISCHARGE		
25.2524064	METERS3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1962.5	KG/M3 SOIL DENSITY	Fill is red-brown line sands and silts with lesser quantities of medium to coarse-grained sands, gravels, and clays. (PAS-00023130, PDF page 212). Used "silty sand and gravel" soil type from http://structx.com/Soil_Properties_002.html. Bulk density range 1442 KG/M3 to 2483 KG/M3, so use average. Average is 1962.5 kg/m3	
49,558	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP (FDR page 8)	
Copper (Cu)			
12	YEARS DISCHARGED		
61000	MG/KG (MAX CONCENTRATION)	Sample 4b-2 at a depth of 0-6 inches bgs (PAS-00023061)	
0.000001	kg per mg (Merck Index)		
3,023	KILOGRAMS DISCHARGED		
Lead (Pb)			
12	YEARS DISCHARGED		
7900	MG/KG (MAX CONCENTRATION)	Sample 4b-2 at a depth of 0-6 inches bgs (PAS-00023061)	
0.000001	kg per mg (Merck Index)		
392	KILOGRAMS DISCHARGED		
Mercury			
12	YEARS DISCHARGED		
35.4	MG/KG (MAX CONCENTRATIONS)	Maximum mercury concentration (PAS-00023178).	
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

12 YEARS DISCHARGED

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00023024; PAS-00023178; PAS-00023171). (FDR page 8).

185.231262 MG/KG (TOTAL PAH AVERAGE CONCENTRATION)

Sum of Benzo(a)pyrene Equivalent conversion concentrations

0.000001 kg per mg (Merck Index)

9 KILOGRAMS DISCHARGED

PAHs (others detected)

Phenanthrene - 14.958 ppm
Acenaphthylene - 0.597 ppm
2-methylnaphthalene - 0.353J ppm
Naphthalene - 0.732 ppm
Fluorene - 0.812 ppm
Acenaphthene - 1.21 ppm
Anthracene - 2.653 ppm

12 YEARS DISCHARGED

21.315 MG/KG (TOTAL PAH MAX CONCENTRATION)

Sample EPL-R8-5A(PAS-0023171, Table 26)

0.000001 kg per mg (Merck Index)

1 KILOGRAMS DISCHARGED

Maximum concentrations from surface sample (EPL-RB-5A (0.5-1.0 ft)) (PAS-00023171).

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	148.489	1.0	148.4890
Benzo(a)anthracene	104.440	0.1	10.4440
Benzo(b)fluoranthene	122.640	0.1	12.2640
Benzo(k)fluoranthene	54.352	0.01	0.5435
Chrysene	103.142	0.001	0.1031
Dibenz(a,h)anthracene	11.240	1.0	11.2400
Indeno(1,2,3-cd)pyrene	21.476	0.1	2.1476

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **185.2**

PCBs

12 YEARS DISCHARGED

31 MG/KG (MAX OF REPORTED CONCENTRATIONS)

The maximum detected PCB concentration was Aroclor-1254 in soil sample 4c-4 at a depth of 0-6 inches (PAS-00023060)

0.000001 kg per mg (Merck Index)

1.5 KILOGRAMS DISCHARGED

SUMMARY CMASS ESTIMATES:

3023.03	kg Copper
391.51	kg Lead
1.75	Mercury
9.18	kg PAHs (Benzo(a)pyrene Equivalent)
1.06	kg PAHs (Other)
1.54	kg PCBs
0.00	kg Dieldrin
0.00	kg Dioxins/Furans
3428.06	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

DII Industries, LLC

401 Worthington Avenue	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.832E-5	0.0%	Historically Compliant or No Evidence	There is one violation citing N.J.A.C. 7:26-9.4 (g) 8 et seq. – failure to conduct semi-annual drills. 9.6(f) 4 – failure to familiarize local hospitals with properties of hazardous waste handled onsite. 9.7(a) – failure to have a written contingency plan (PAS-00122350).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.466E-5

AP_ABS	1.466E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

DII Industries, LLC

401 Worthington Avenue	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.918E-3	0.0%	Historically Compliant or No Evidence	There is one violation citing N.J.A.C. 7:26-9.4 (g) 8 et seq. – failure to conduct semi-annual drills. 9.6(f) 4 – failure to familiarize local hospitals with properties of hazardous waste handled onsite. 9.7(a) – failure to have a written contingency plan (PAS-00122350).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.134E-3

AP_ABS	7.134E-3

Allocation Facility Cmass Calculation

Drum Service of Newark Inc.	120 Lister Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	170.10	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	38.54	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	0.43	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	136.76	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	91.17	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Drum Service of Newark Inc.	120 Lister Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Drum Service of Newark Inc.	120 Lister Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Drum Service of Newark Inc.	**120 Lister Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	PVSC Permit
	# hours/per day discharged	No COC or Discharge Information
	#days/week discharged	Drum Refurbishing, so consider similar to Truck Washwater
	#weeks/yr discharged	
3,225,100	calc gal/yr discharge	
1997	Yr Ops started	
2004	Yr Ops ceased	
7	calc #yrs facility operated	
Copper (Cu)		
7	#yrs facility discharged	Estimate based on Quality Carriers
1.99	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
170.10	calc kg COC discharged	
Lead (Pb)		
7	#yrs facility discharged	Estimate based on Quality Carriers
0.45	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
38.54	calc kg COC discharged	
Mercury (Hg)		
7	#yrs facility discharged	Estimate based on Quality Carriers
0.0050	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.43	calc kg COC discharged	
HPAHs		
7	#yrs facility discharged	
1,067.00	calc mg/L O&G	Estimate based on Quality Carriers
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1.60	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
136.76	calc kg COC discharged	
LPAHs		
7	#yrs facility discharged	
1,067.00	calc mg/L O&G	Estimate based on Quality Carriers
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
1	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
91.17	calc kg COC discharged	
PCBs		
-19	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-24	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-9	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
7	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
8	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-11	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-21	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
170.10	kg Copper	
38.54	kg Lead	
0.43	kg Mercury	
136.76	kg HPAHs	
91.17	kg LPAHs	
-	kg PCBs	
-	kg DDx	

-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Drum Service of Newark Inc.

120 Lister Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	5.0%	Occasional Noncompliance	Drum Services is listed as a company that was issued fines from PVSC during the August 1, 1997 to July 31, 1998; August 1, 1998 to July 31, 1999 and the August 1, 2000 to July 31, 2001 time periods (PAS-00017752; PAS-00021364). No additional information was provided in the files reviewed.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	0

AP_ABS	0

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Drum Service of Newark Inc.

120 Lister Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	5.0%	Occasional Noncompliance	Drum Services is listed as a company that was issued fines from PVSC during the August 1, 1997 to July 31, 1998; August 1, 1998 to July 31, 1999 and the August 1, 2000 to July 31, 2001 time periods (PAS-00017752; PAS-00021364). No additional information was provided in the files reviewed.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	0

AP_ABS	0

Allocation Facility Cmass Calculation

Elan Chemical Co., Inc.	268 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	2,284.50	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	340.83	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	6.59	100.00%	-	0.00%	736.93	100.00%	-	6.59	1.018817E-2	0.07
LPAHs	100.00%	1.39	100.00%	-	0.00%	491.29	100.00%	-	1.39	1.018817E-2	0.01
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Elan Chemical Co., Inc.	268 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.07	2.798E-7	1.399E-8
LPAHs	0.01	170,000.00	0.01	8.330E-8	8.330E-10
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Elan Chemical Co., Inc.	268 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.516E-6	0.07	0.3	1.516E-6	7.581E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	4.614E-7	0.01	0.06	4.614E-7	4.614E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Elan Chemical Co., Inc.	**268 Doremus Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
72,562	gal discharged per day PAS00014428, PAS00014536, PAS00061069, PAS00059971	1975 sampling for PVSC Sewer App Permit, 1979 PVSC Sewer App Permit, Phase I Environmental Assessment, 1995 Permit
24	# hours/per day discharged	
5	#days/week discharged	Runoff from facility is treated in onsite effluent sump, which is part of onsite wastewater system.
52	#weeks/yr discharged	NJPDES permit is for operation of onsite treatment system.
18,866,156	calc gal/yr discharge	All drains and outside storm water connect to effluent sump pit to PVSC.
1977	Yr Ops started	
2020	Yr Ops ceased	
43	calc #yrs facility operated	
Copper (Cu)		
43	#yrs facility discharged	
0.744	calc mg/L COC discharged PAS00014428, PAS00014536	1975 sampling for PVSC Sewer App Permit - - permit discharge limits not used
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,284.50	calc kg COC discharged	
Lead (Pb)		
43.000	#yrs facility discharged	
0.111	calc mg/L COC discharged PAS00014428, PAS00014536	1975 sampling for PVSC Sewer App Permit - - permit discharge limits not used
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
341	calc kg COC discharged	
Mercury (Hg)		
43	#yrs facility discharged	
-	calc mg/L COC discharged PAS00014428	1975 sampling for PVSC Sewer App Permit - - permit discharge limits not used
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
43	#yrs facility discharged	
4.00	calc mg/L COC discharged PAS00014428	calcs used to convert mg/kg O&G to HPAHs; remove if not needed
10%	% O&G that is considered PAHs	1975 sampling for PVSC Sewer App Permit - - permit discharge limits not used
60%	% PAHs considered as HPAHs	
0.24	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
736.93	calc kg COC discharged	
LPAHs		
43	#yrs facility discharged	
4.00	calc mg/L COC discharged PAS00014428	calcs used to convert mg/kg O&G to LPAHs; remove if not needed
10%	% O&G that is considered PAHs	1975 sampling for PVSC Sewer App Permit - - permit discharge limits not used
40%	% PAHs considered as LPAHs	
0.16	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
491.29	calc kg COC discharged	
PCBs		
1	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-4	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
11	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
43	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
44	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
9	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-1	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
2,284.50	kg Copper	
340.83	kg Lead	
-	kg Mercury	
736.93	kg HPAHs	
491.29	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
4	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
1	ACRES - AFFECTED AREA	Approximately 25% buildings in 1977 aerial photo here https://njdep.maps.arcgis.com/apps/webappviewer/index.html	
4,046.86	METERS^2/ACRE		
4,047	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES	
1977	Year site operations began	Elan-Conn acquired the site in 1968 but current Elan Chemical Co acquired it in 1977 (FDR p 1)	
2020	Site operations continue to the present (FDR p 1) but no soil data for other soil areas		
43	NUMBER YEARS DISCHARGE		
17	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,915	KG/M^3 SOIL DENSITY	Fill reported as fine to medium and fine to coarse samds with gravel and residue consisting of crushed brick and cinders (PAS-00060192). Bulk density range 1346 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
33,315	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Site is located on regional historic fill (FDR p 6)	
Copper (Cu)		Copper chromite and copper powder inventoried on site since 1977 (FDR p 5; PAS-00059885 p 89 AKA PAS-00059973). Copper shot and copper chromite was used from approx 2002 to 2006 (FDR p 5)	
43	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Sample S4-B (1.5-2.0 ft bgs) 2,040 mg/kg (PAP-00115569). **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)		No info on lead use (FDR p 6)	
43	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Sample S4-A (0-0.5 ft bgs) 1,940 mg/kg(PAP-00115569). **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)		No info on mercury use (FDR p 6)	
43	YEARS DISCHARGED	3.5 mg/kg	
0	MG/KG (MAX CONCENTRATION)	1.1 mg/kg Sample A-1 (1.5-2.0 ft bgs) (PAP-00115568). **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)			
43	YEARS DISCHARGED		
25.7	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
43	YEARS DISCHARGED		
38	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		

Sample S4-A (0-0.5 ft bgs). S4-A is from outside the drum storage area and therefore represents background contamination level (PAS-00060200)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	21.600	1.0	21.6000
Benzo(a)anthracene	17.100	0.1	1.7100
Benzo(b)fluoranthene	21.900	0.1	2.1900
Benzo(k)fluoranthene	17.800	0.01	0.1780
Chrysene	16.400	0.001	0.0164
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.000	0.1	0.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **25.7**

PCBs		
43		YEARS DISCHARGED
		MG/KG AVG OF REPORTED CONCENTRATIONS)
0.000001		kg per mg (Merck Index)
0		KILOGRAMS DISCHARGED
DDx		
43		YEARS DISCHARGED within DDx Timeline
		MG/KG (MAX CONCENTRATION)
3.785		L per gallon (Merck Index)
0.000001		kg per mg (Merck Index)
0		KILOGRAMS DISCHARGED
Dieldrin		
43		YEARS DISCHARGED within Dieldrin Timeline
		MG/KG (MAX CONCENTRATION)
3.785		L per gallon (Merck Index)
0.000001		kg per mg (Merck Index)
0		KILOGRAMS DISCHARGED
Dioxins/Furans		NONE FOUND IN AVAILABLE DOCUMENTATION
43		YEARS DISCHARGED
		MG/KG (MAX CONCENTRATION)
0.000001		kg per mg (Merck Index)
0		calc kg COC discharged

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
0.86	kg PAHs (Benzo(a)pyrene Equivalent)
1.27	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

2.12	MASS (KG) DISCHARGED FROM SURFACE SOIL

Sample S4-A (0-0.5 ft bgs) (PAS-00060200)	
Anthracene	7.09
Acenaphthene	2.56
Acenaphthylene	0
Fluorene	0
Naphthalene	0
Phenanthrene	28.4
2-Methylnaphthalene	0
SUM	38.05

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
4	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
0.367	ACRES - AFFECTED AREA	Unpaved, gravel drum storage area is approx 100' x 160' (Fig 3, PAP-00115573). 16000 sf = 0.36730946 acre	
4,046.86	METERS^2/ACRE		
1,486	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES	
1977	Year site operations began	Elan-Conn acquired the site in 1968 but the current Elan Chemical Co acquired it in 1977 (FDR p 1)	
1992	Year drum storage area was capped (FDR p 12; PAP-00115565)		
15	NUMBER YEARS DISCHARGE		
2	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,915	KG/M^3 SOIL DENSITY	Fill reported as fine to medium and fine to coarse samds with gravel and residue consisting of crushed brick and cinders (PAS-00060192). Bulk density range 1346 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
4,269	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Site is located on regional historic fill (FDR p 6) Copper chromite and copper powder inventoried on site since 1977 (FDR p 5; PAS-00059885 p 89 AKA PAS-00059973). Copper shot and copper chromite was used from approx 2002 to 2006 (FDR p 5)	
15	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Sample S3-A (0-0.5 ft bgs) 1,120 mg/kg collected in 1991 prior to capping (PAP-00115569). **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)		No info on lead use (FDR p 6)	
15	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Sample S3-A (0-0.5 ft bgs) 1,370 mg/kg collected in 1991 prior to capping (PAP-00115569). **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)		No info on mercury use (FDR p 6)	
15	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Sample E-1 (1.5-2.0 ft bgs) collected in 1992 prior to capping (PAP-00060199).**Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

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PAHs (listed in Benzo(a)pyrene Equivalent conversion table)	
15	YEARS DISCHARGED
5.7	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
PAHs (others detected)	
15	YEARS DISCHARGED
28	MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
PCBs	
15	YEARS DISCHARGED
	MG/KG AVG OF REPORTED CONCENTRATIONS)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
DDx	
15	YEARS DISCHARGED within DDx Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dieldrin	
15	YEARS DISCHARGED within Dieldrin Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION
15	YEARS DISCHARGED
0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	calc kg COC discharged

Data below the Benzo(a)pyrene Equivalent Table

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Sample A-1 (1.5-2.0 ft bgs) collected in 1992 prior to capping (PAP-00060200). Highest concentrations within drum storage area	Benzo(a)pyrene	4.100	1.0	4.1000
	Benzo(a)anthracene	5.150	0.1	0.5150
	Benzo(b)fluoranthene	8.650	0.1	0.8650
	Benzo(k)fluoranthene	0.000	0.01	0.0000
	Chrysene	4.480	0.001	0.0045
	Dibenz(a,h)anthracene	0.000	1.0	0.0000
	Indeno(1,2,3-cd)pyrene	2.460	0.1	0.2460
	DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg			
	Total Benzo(a)pyrene Equivalents =			**5.7**

Sample A-1 (1.5-2.0 ft bgs) collected in 1992 prior to capping (PAP-00060200). Highest concentrations within drum storage area	
Anthracene	0.28
Fluoranthene	18.2
Phenanthrene	10
SUM	28.48

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
5.73	kg PAHs (Benzo(a)pyrene Equivalent)
0.12	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

5.85	MASS (KG) DISCHARGED FROM SURFACE SOIL

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Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Elan Chemical Co., Inc.

268 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.112E-8	5.0%	Occasional Noncompliance	PVSC filed suit against Elan alleging that Elan discharged pollutants in excess of the discharge limitations of its PVSC Permit No. 20403242 (PAS-00059893, PAS-00060847 et seq.). No OU2 COCs were alleged to be associated with these discharges (PAS-00060849-50). An inspection of Elan by the NJDEP in December 1988 noted a drum storage area was sloped down into drainage depressions, which flowed to the Passaic River. Oil was observed to be leaking from the drums and evidence was found of past spills of other materials in the area. (PAS-00061334-37).	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.167E-8

AP_ABS	1.167E-8

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Elan Chemical Co., Inc.

268 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
6.032E-8	5.0%	Occasional Noncompliance	PVSC filed suit against Elan alleging that Elan discharged pollutants in excess of the discharge limitations of its PVSC Permit No. 20403242 (PAS-00059893, PAS-00060847 et seq.). No OU2 COCs were alleged to be associated with these discharges (PAS-00060849-50). An inspection of Elan by the NJDEP in December 1988 noted a drum storage area was sloped down into drainage depressions, which flowed to the Passaic River. Oil was observed to be leaking from the drums and evidence was found of past spills of other materials in the area. (PAS-00061334-37).	0.0%	0% Cooperation with conduct of allocation and requests for related information	6.333E-8

AP_ABS	6.333E-8

Allocation Facility Cmass Calculation

EnPro Holdings, Inc.	900-1000 South 4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	1,458.70	0.00%	1,397.92	100.00%	50,705.1	52,163.83	1.018817E-2	531.45
Lead	100.00%	-	100.00%	1,222.69	0.00%	1,171.75	100.00%	42,501.3	43,724.02	1.018817E-2	445.47
Mercury	100.00%	9.87	100.00%	-	0.00%	-	100.00%	-	9.87	1.018817E-2	0.1
HPAHs	100.00%	5.52	100.00%	55,138.10	0.00%	52,840.68	100.00%	1,916,623.3	1,971,766.87	1.018817E-2	20,088.7
LPAHs	100.00%	9.47	100.00%	36,772.05	0.00%	35,239.88	100.00%	1,278,211.6	1,314,993.14	1.018817E-2	13,397.38
PCBs	100.00%	4.11	100.00%	-	0.00%	-	100.00%	-	4.11	1.018817E-2	0.04
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

EnPro Holdings, Inc.	900-1000 South 4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	531.45	2.531E-4	1.746E-4
Lead	0.01	3,200,000.00	445.47	1.392E-4	1.392E-6
Mercury	0.95	42,000.00	0.1	2.394E-6	2.275E-6
HPAHs	0.05	240,000.00	20,088.7	8.370E-2	4.185E-3
LPAHs	0.01	170,000.00	13,397.38	7.881E-2	7.881E-4
PCBs	12.87	26,000.00	0.04	1.611E-6	2.073E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

EnPro Holdings, Inc.	900-1000 South 4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.883E-1	531.45	394,991.18	1.883E-1	1.300E-1
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.515E-1	445.47	484,404.44	1.515E-1	1.515E-3
Mercury	0.95	42,000.00	4,322.53	41,955.96	2.283E-3	0.1	95.8	2.283E-3	2.169E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	4.537E-1	20,088.7	88,788.83	4.537E-1	2.268E-2
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	4.365E-1	13,397.38	60,801.45	4.365E-1	4.365E-3
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.048E-4	0.04	5.28	2.048E-4	2.636E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

EnPro Holdings, Inc.	**900-1000 South 4th Street**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Steel Mill/Arms Production
	# hours/per day discharged	No available data on any discharge volumes or COCs.
	#days/week discharged	Prior to 1971 directly discharged to Passaic River
	#weeks/yr discharged	From 1971-1974 discharged to POTW
951,012,000	calc gal/yr discharge	All information based on Research from various sources:
		- EPA Sector Notebook
1971	Yr Ops started	- Studies of Environmental Science, Volume 5, 1979 pages 217-227
1974	Yr Ops ceased	10m^3 of wastewater per ton of steel produced
4	calc #yrs facility operated	assume 360,000 tons/per year steel
Copper (Cu)		
4	#yrs facility discharged	1574.10 #/year based on EPA Sector Notebook, Exhibit 8
0.1984	calc mg/L COC discharged	converted to 0.198 mg/l based on volume
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,856.63	calc kg COC discharged	
Lead (Pb)		
4	#yrs facility discharged	1319.83 #/year based on EPA Sector Notebook, Exhibit 8
0.1663	calc mg/L COC discharged	converted to 0.1663 mg/l based on volume
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,394.44	calc kg COC discharged	
Mercury (Hg)		
4	#yrs facility discharged	No Mercury
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
4	#yrs facility discharged	5% Oil and Grease in Wastewater per Studies of Env Science Reference
124.99	calc mg/L O&G	assume .25% of the 5% is discharged = 124.99 mg/l oil and grease
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
7.4994	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
107,978.77	calc kg COC discharged	
LPAHs		
4	#yrs facility discharged	
124.99	calc mg/L O&G	5% Oil and Grease in Wastewater per Studies of Env Science Reference
10%	% O&G that is considered PAHs	assume .25% of the 5% is discharged = 124.99 mg/l oil and grease
40%	% PAHs considered as LPAHs	plus
5.0014	calc mg/L LPAHs	Naphthalene = .0015mg/l
3.785	L per gallon (Merck Index)	Anthracene = .000311 mg/l
0.000001	kg per mg (Merck Index)	
72,011.92	calc kg COC discharged	
PCBs		
4	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
2	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
4	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
4	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
4	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
4	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
4	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
2,856.63	kg Copper	
2,394.44	kg Lead	
-	kg Mercury	
107,978.77	kg HPAHs	
72,011.92	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	
951,012,000	# gals/yr directly discharged	COC concentrations same as for PVSC
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1900	Yr Ops started	
1971	Yr Ops ceased	
71	calc #yrs facility operated	
Copper (Cu)		
71	#yrs facility discharged	
0.1984	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
50,705.13	calc kg COC discharged	
Lead (Pb)		
71	#yrs facility discharged	
0.1663	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
42,501.33	calc kg COC discharged	
Mercury (Hg)		
71	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
71	#yrs facility discharged	
7.4994	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,916,623.23	calc kg COC discharged	
LPAHs		
71	#yrs facility discharged	
5.0014	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,278,211.66	calc kg COC discharged	
PCBs		
43	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
32	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
22	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
71	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
26	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
27	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
22	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
50,705.13	kg Copper	
42,501.33	kg Lead	
-	kg Mercury	
1,916,623.23	kg HPAHs	
1,278,211.66	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
48	ACRES - TOTAL SITE AREA (acres)	FDR, Page 1	
24	ACRES - AFFECTED AREA	Approximately half of site was covered by buildings (Sanborn).	
4,046.86	METERS^2/ACRE		
97,125	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
10	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1900	Year site operations began	FDR, Page 1.	
1947	Year site processing and storage operations ceased	FDR, Page 1.	
48	NUMBER YEARS DISCHARGE		
466	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Site soil to depths of 15 feet bgs consists of fill (black cinders, gravel, sand, and silt with varying degrees of refuse (paper, plastic, concrete, brick, etc.) and slag (PAP-00031288). Bulk density range for silty sand and gravel 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
915,147	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
48	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Copper concentration in post-excavation soil sample S-202 (PAP-00083223). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Lead (Pb)			
48	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Lead concentration in post-excavation soil sample S-202 (PAP-00083223). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Mercury (Hg)			
48	YEARS DISCHARGED		
10.20	MG/KG (MAX CONCENTRATION)	Mercury concentration in post-excavation soil sample S-203 (PAP-00083223).	
0.000001	kg per mg (Merck Index)		
9.33	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds forBenzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
48	YEARS DISCHARGED		
5.4	MG/KG (TOTAL PAH MAC CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations.	
0.000001	kg per mg (Merck Index)		
4.90	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
48	YEARS DISCHARGED		
10	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
9.04	KILOGRAMS DISCHARGED		
PCBs			
17	YEARS DISCHARGED	Number of years reflect a 1930 start date for PCBs.	
3.8	MG/KG (MAX CONCENTRATION)	Maximum total PCB soil concentration in sample RR Tracks (PAP-00083250)	
0.000001	kg per mg (Merck Index)		
3.48	KILOGRAMS DISCHARGED		
DDx		NONE FOUND IN AVAILABLE DOCUMENTATION	
0	YEARS DISCHARGED within DDx Timeline		
0	MG/KG (MAX CONCENTRATION)		
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Surface soil sample B-7 (PAP-00030278)	Benzo(a)pyrene	3.900	1.0	3.9000
	Benzo(a)anthracene	4.000	0.1	0.4000
	Benzo(b)fluoranthene	6.100	0.1	0.6100
	Benzo(k)fluoranthene	0.000	0.01	0.0000
	Chrysene	4.600	0.001	0.0046
	Dibenz(a,h)anthracene	0.340	1.0	0.3400
	Indeno(1,2,3-cd)pyrene	0.990	0.1	0.0990
	DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg		**Total Benzo(a)pyrene Equivalents =**	**5.4**

Sample B-6 (0-0.5 ft bgs) (PAP-00030278-9)	
Anthracene	1.6
Acenaphthene	0.89
Acenaphthylene	0.17
Fluorene	0.54
Naphthalene	0.48
Phenanthrene	6.2
2-Methylnaphthalene	0
SUM	9.88

Dieldrin		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED within Dieldrin Timeline	
0	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dioxins/Furans		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
9.33	kg Mercury
4.90	kg PAHs (Benzo(a)pyrene Equivalent)
9.04	kg PAHs (Other)
3.48	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

26.75	MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
14.85	ACRES - TOTAL SITE AREA (acres)	(FDR, Page 1)	
4	ACRES - AFFECTED AREA	Estimated 75 percent of site was covered by buildings as early as 1942 (PAP-00027959).	
4,046.86	METERS^2/ACRE		
14,973	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1938	Year site operations began	FDR, Page 1.	
1974	Year site processing and storage operations ceased	FDR, Page 1.	
36	NUMBER YEARS DISCHARGE		
54	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Site reported as located on Historic Fill (FDR, Page 7). Historic Fill reported as sand with silt and fine gravel. Bulk density range for silty sand and gravel 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
105,814	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
36	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Copper concentration in on-site surface soil sample AOC1e-2 (PAP-00028401). **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Lead (Pb)			
36	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Lead concentration in on-site soil sample AOC4-9 (PAP-00028404). **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Mercury (Hg)			
36	YEARS DISCHARGED		
5.10	MG/KG (MAX CONCENTRATION)	Mercury concentration in on-site soil sample SSS-5 (PAP-00028412).	
0.000001	kg per mg (Merck Index)		
0.54	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
36	YEARS DISCHARGED		
5.9	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations.	
0.000001	kg per mg (Merck Index)		
0.62	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
36	YEARS DISCHARGED		
4.1	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.43	KILOGRAMS DISCHARGED		
PCBs			
36	YEARS DISCHARGED		
5.97	MG/KG (MAX CONCENTRATION)	PCBs concentration in on-site post-excavation soil sample AOEB/C-S1(PW) (PAP-00028874). Sample collected between 6-6.5 feet bgs.	
0.000001	kg per mg (Merck Index)		
0.63	KILOGRAMS DISCHARGED		
DDx	NONE FOUND IN AVAILABLE DOCUMENTATION		
0	YEARS DISCHARGED within DDx Timeline		
0.0061	MG/KG (MAX CONCENTRATION)	4,4-DDE concentration in on-site soil sample GREEN-S1 (PAP-00028849). Sample collected bewteen 3-3.5 feet bgs.	
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Surface soil sample AOC1e-2 (PAP-00028401)	Benzo(a)pyrene	3.740	1.0	3.7400
	Benzo(a)anthracene	4.770	0.1	0.4770
	Benzo(b)fluoranthene	5.820	0.1	0.5820
	Benzo(k)fluoranthene	2.550	0.01	0.0255
	Chrysene	4.980	0.001	0.0050
	Dibenz(a,h)anthracene	0.784	1.0	0.7840
	Indeno(1,2,3-cd)pyrene	2.640	0.1	0.2640

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **5.9**

Sample AOC1e-2 (PAP-00028401)	
Anthracene	0.61
Acenaphthene	0.07
Acenaphthylene	0.43
Fluorene	0.06
Naphthalene	0.31
Phenanthrene	2.62
2-Methylnaphthalene	0
SUM	4.1

Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
0.0133	MG/KG (MAX CONCENTRATION)	Dieldrin concentration in on-site soil sample AOED-4S (PAP-00028885). Sample collected between 6-6.5 feet bgs.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.54	kg Mercury
0.62	kg PAHs (Benzo(a)pyrene Equivalent)
0.43	kg PAHs (Other)
0.63	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

2.23	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

EnPro Holdings, Inc.

900-1000 South 4th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.172E-3	0.0%	Historically Compliant or No Evidence	"Small amounts" of oily waste were released to soil at the Spiegel property during the late 1960s (Questionnaire, p. 5). Specific information regarding volumes, locations, or waste types released could not be located in the file material. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	4.138E-3

AP_ABS	4.138E-3

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

EnPro Holdings, Inc.

900-1000 South 4th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.633E-1	0.0%	Historically Compliant or No Evidence	"Small amounts" of oily waste were released to soil at the Spiegel property during the late 1960s (Questionnaire, p. 5). Specific information regarding volumes, locations, or waste types released could not be located in the file material. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.307E-1

AP_ABS	1.307E-1

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

ENPRO HOLDINGS

Enpro Holdings asserts that Respondent [EnPro Holdings, Inc.] and Crucible Steel Corporation had, no relationship to any parties that released or disposed of COCs at the Facility following Crucible Steel Corporation's sales of the western portion (Guyon Property) in 1947 and 1967 and the eastern portion (Spiegel Property) in 1974.

ALLOCATOR'S DETERMINATION - While EnPro alleges that it was not an owner or operator under CERCLA, it fails to provide a substantial factual or legal basis to support that claim. The Allocator does not believe that EnPro will prevail in an action to overturn EPA's determination of EnPro as a PRP based on the supplied information.

Allocation Facility Cmass Calculation

EPEC Polymers, Inc.	290 River Drive	Garfield	NJ	07026

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	747.87	100.00%	12,973.94	2.32%	31,353.69	100.00%	-	14,449.22	1.018817E-2	147.21
Lead	100.00%	1,115.01	100.00%	1,161.85	2.32%	2,807.79	100.00%	-	2,342.	1.018817E-2	23.86
Mercury	100.00%	25.29	100.00%	4.36	2.32%	10.53	100.00%	-	29.89	1.018817E-2	0.3
HPAHs	100.00%	18.8	100.00%	-	2.32%	-	100.00%	-	18.8	1.018817E-2	0.19
LPAHs	100.00%	28.79	100.00%	-	2.32%	-	100.00%	-	28.79	1.018817E-2	0.29
PCBs	100.00%	2.99	100.00%	-	2.32%	-	100.00%	-	2.99	1.018817E-2	0.03
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

EPEC Polymers, Inc.	**290 River Drive**	**Garfield**	**NJ**	**07026**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	147.21	7.010E-5	4.837E-5
Lead	0.01	3,200,000.00	23.86	7.456E-6	7.456E-8
Mercury	0.95	42,000.00	0.3	7.251E-6	6.888E-6
HPAHs	0.05	240,000.00	0.19	7.981E-7	3.990E-8
LPAHs	0.01	170,000.00	0.29	1.725E-6	1.725E-8
PCBs	12.87	26,000.00	0.03	1.172E-6	1.508E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

EPEC Polymers, Inc.	290 River Drive	Garfield	NJ	07026

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	5.217E-2	147.21	109,411.32	5.217E-2	3.600E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	8.116E-3	23.86	25,946.23	8.116E-3	8.116E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.915E-3	0.3	290.13	6.915E-3	6.569E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	4.325E-6	0.19	0.85	4.325E-6	2.163E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	9.556E-6	0.29	1.33	9.556E-6	9.556E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.490E-4	0.03	3.84	1.490E-4	1.918E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

EPEC Polymers, Inc.	**290 River Drive**	**Garfield**	**NJ**	**07026**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
696,600	gal discharged per day	
24	# hours/day discharged (PAP-00039955, PAP-00040041)	
7	# days/week discharged (PAP-00039955, PAP-00040041)	
52	# weeks/yr (PAP-00039955, PAP-00040041)	
229,996,000	calc gal/yr discharge	(FDR) (PAP-00039955-59, PAP-0040041-47, PAP-00040062-154, PAP-00040165-67, PAP-00040181-198, PAP-00040199-212)
1963	Yr Ops started	
1982	Yr Ops ceased	
19	calc #yrs facility operated	PAP-00323278
Copper (Cu)		
19	#yrs facility discharged	
2.68	calc mg/L COC discharged	(FDR) (PAP-00039955-59, PAP-0040041-47, PAP-00322628-710, PAP-00040199-212)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
44,328	calc kg COC discharged	
Lead (Pb)		
19	#yrs facility discharged	
0.24	calc mg/L COC discharged	(FDR) (PAP-00039955-59, PAP-0040041-47, PAP-00322628-710, PAP-00040199-212)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3,970	calc kg COC discharged	
Mercury (Hg)		
19	#yrs facility discharged	
0.0009	calc mg/L COC discharged	(FDR) (PAP-0040041-47, PAP-00322628-710, PAP-00040199-212)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
15	calc kg COC discharged	
HPAHs		
19	#yrs facility discharged	
-	calc mg/L O&G;	(FDR) (PAP-0040041-47, PAP-00040199-212, PAP-00040211)
10%	% O&G that is considered PAHs	
60%	% PAHS considered as HPAHs	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
19	#yrs facility discharged	
-	calc mg/L O&G;	(FDR) (PAP-0040041-47, PAP-00040199-212, PAP-00040211)
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		(ND at ppb)
15	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
DDx		(ND at ppb)
10	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		(ND at ppb)
20	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		(believed absent in permit application)
19	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		(believed absent in permit application)
20	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		(believed absent in permit application)
20	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		(believed absent in permit application)
13	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
44,328	kg Copper	
3,970	kg Lead	
15	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
24	# hours/day discharged (FDR) (PAP-00039955, PAP-00040041)	
7	# days/week discharged (FDR) (PAP-00039955, PAP-00040041)	No Credit for NJPDES permit as there are no discharge limits for COCs in the permit
52	# weeks/yr (PAP-00039955, PAP-00040041)	
3,347,250	# gals/day directly discharged (FDR) (PAP-00039895, PAP-00039875, PAP-00324732, PAP-00040062, PAP-00324732, PAP-0039955)	
463,679,800	#gal/yr; (FDR) (PAP-00039895, PAP-00039875, PAP-00040041-47, PAP-00324732, PAP-00040181, PAP-00040062)	
1940	Yr Ops started for Outfall 1 (PAP-00324732)	
1953	Yr Ops started for Outfall 2 (PAP-00324732)	
1982	Yr Ops ceased for both Outfalls 1/2	
13	calc #yrs facility operated only Outfall 1	
29	calc #yrs facility operated Outfall 1 and Outfall 2	
Copper (Cu)		
29	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
29	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
29	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
	#yrs facility discharged	
-	#/day TOC daily discharge long term average Outfall #1	PAP-00040181-198
-	#/day TOC daily discharge long term average Outfall #2	
2.5%	% O&G assumed in TOC	
10%	% PAHs assumed in O&G	
60%	% HPAHs assumed in PAHs	
-	calc #/day COC for Outfall #1	
-	calc #/day COC for Outfall 2	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
	#yrs facility discharged	
-	#/day TOC daily discharge long term average Outfall #1	PAP-00040181-198
-	#/day TOC daily discharge long term average Outfall #2	
2.5%	% O&G assumed in TOC	
10%	% PAHs assumed in O&G	
40%	% LPAHs assumed in PAHs	
-	calc #/day COC for Outfall #1	
-	calc #/day COC for Outfalls 2	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
14	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
14	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
4	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
29	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
8	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
9	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
4	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
6.9	ACRES - TOTAL SITE AREA (acres)	PAP-00039956	
2.87	ACRES - AFFECTED AREA	Buildings occupy approximately 50 percent of the facility; paved areas (primarily asphalt) cover an estimated 25 percent of the facility (After 1960). The remaining 25 percent of the surface is unpaved (1991)(PAP-00040989)	
4,046.86	METERS^2/ACRE		
11,614	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1919	Year site operations began - 1919.	The first buildings at the Garfield Plant were constructed in 1891 by Fritzche Brothers to facilitate chemical manufacturing. Heyden had owned and operated the facility since the early 1900s as several forms of the Heyden name (PAP-00040999)	In 1919, the site was purchased by a newly formed New York corporation called Heyden Chemical Company of America Inc. The company was consolidated into the Heyden Chemical Corporation in 1925, and in 1956 changed its name to the Heyden Newport Chemical Corporation. Heyden Newport Chemical Corporation was purchased in 1963 by Tenneco. Kalama Chemical Inc. purchased the site from Tenneco in December 1982 (PAP-00032378).
1982	Year site processing and storage operations ceased	In an agreement dated December 1, 1982 between Tenneco and Kalama Chemical, all liabilities arising out of the condition of the plant, shall remain the respnsibilities of Tenneco (PAP-00039799)	
63	NUMBER YEARS DISCHARGE	Tenneson liability 91 years, 1891 to 1982 (PAP-00040999)	
738	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,843	KG/M^3 SOIL DENSITY	The facility was built over a sequence of unconsolidated deposits consisiting of fine to coarse sand, silt and clay (PAP-00040396). Cross referencing as Silty Sand at http://structx.com/Soil_Properties_002.html) has a bulk density range 1410 KG/M3 to 2275 KG/M3, so use average of 1842.5 kg/m3.	
1,359,765	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)	The average bulk density reflects cross reference result.	
		The majority of the facility site is not located on regional historic fill (FDR pg 11)	
Copper (Cu)			
63	YEARS DISCHARGED		
550	MG/KG (MAX CONCENTRATION)	Table 18 Sample ID B-47-Fill, 0.0-0.5 ft bgs. (PAP-00041872)	
0.000001	kg per mg (Merck Index)		
748	KILOGRAMS DISCHARGED		
Lead (Pb)			
63	YEARS DISCHARGED		
820	MG/KG (AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)	Lead was detected in surface soil (Sample B-47-Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at an elevated concentration (PAP-00042177, 80).	
1,115	KILOGRAMS DISCHARGED		
Mercury (Hg)		Although mercury was not identified as used in the facility processes, purchase orders from 1973 identified the purchased caustic soda as mercury cell material. Analytical results from the caustic soda manufactured using the mercury cell process were not available to verify that the caustic soda did not contain any trace impurities of mercury (PAP-00324677; PAP-00324679; PAP-00324684).	It is assumed that a spill was the source of the soil contamination and that the contamination would have migrated from the surface to the depth confirmed by soil sample analysis in 1991. Given the initial erosion would transport Hg impacted soil of greater concentrations than compared to the soil at depth in 1991, the use of the concentration at depth for the OFT estimate is conservative, with decreased soil concentration/mass than experienced at the time of the spill.
63	YEARS DISCHARGED	A NJDEP Pretreatment/Residual Waste Survey, dated July 27, 1981, stated mercury was present in the discharge to the POTW (PAP-00040183, 188).	
18.6	MG/KG (MAX CONCENTRATION)	Max concentration of mercury was detected in subsurface soil (depth of 4 to 4.5 feet, Sample B-53 Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) (PAP-00041873).	
0.000001	kg per mg (Merck Index)		
25	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
63	YEARS DISCHARGED	
13.8	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
19	KILOGRAMS DISCHARGED	
PAHs (others detected)	Fluorene - 14.8 ppm	All LMW PAHs from sample B-52-A on PAP-00041872
	Naphthalene - 0.12J ppm	
	Phenanthrene - 4.6 ppm	
	Anthracene - 1.3 ppm	
	Acenaphthene - 0.11J ppm	
	Acenaphthylene - 0.24J ppm	
63	YEARS DISCHARGED	
21	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
29	KILOGRAMS DISCHARGED	
PCBs		
63	YEARS DISCHARGED	PCBs were detected in soil samples collected from AEC-24 (Transformer at Building 12) at a maximum of 2.2 milligrams/kilogram (mg/kg) for Aroclor-1260 (PAP-00041881-2).
2.2	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PAP-00044392 PCB concentration in TP-1
0.000001	kg per mg (Merck Index)	
3	KILOGRAMS DISCHARGED	
DDx		Not a COC at this Site
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		Not a COC at this Site
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	Not a COC at this Site
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

	Contaminant (PAP-00040243)	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Sample B-52-A on PAP-00041872; FDR Table page 6.	Benzo(a)pyrene	10.000	1.0	10.0000
	Benzo(a)anthracene	12.000	0.1	1.2000
	Benzo(b)fluoranthene	13.000	0.1	1.3000
	Benzo(k)fluoranthene	2.500	0.01	0.0250
	Chrysene	12.000	0.001	0.0120
	Dibenz(a,h)anthracene	1.000	1.0	1.0000
	Indeno(1,2,3-cd)pyrene	2.900	0.1	0.2900
	DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg			
			Total Benzo(a)pyrene Equivalents =	**13.8**

SUMMARY CMASS ESTIMATES:	
747.87	kg Copper
1,115.01	kg Lead
25.29	kg Mercury
18.80	kg PAHs (Benzo(a)pyrene Equivalent)
28.79	kg PAHs (Other)
2.99	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

1,938.75 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

EPEC Polymers, Inc.

290 River Drive	**Garfield**	**NJ**	**07026**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.047E-5	0.0%	Historically Compliant or No Evidence	PVSC identified violations for pollution entering the Passaic River in 1972, 1972, and 1976 (due to leaks and a polluting boiler blow down line), but the facility addressed the issues promptly and resolved the pollution (PAS-00008606, 10, 12-13). No evidence that COCs involved.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.637E-5

AP_ABS	5.637E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

EPEC Polymers, Inc.

290 River Drive	**Garfield**	**NJ**	**07026**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.457E-2	0.0%	Historically Compliant or No Evidence	PVSC identified violations for pollution entering the Passaic River in 1972, 1972, and 1976 (due to leaks and a polluting boiler blow down line), but the facility addressed the issues promptly and resolved the pollution (PAS-00008606, 10, 12-13). No evidence that COCs involved.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.565E-2

AP_ABS	3.565E-2

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

EPEC Polymers

EPEC and El Paso argue that they should receive a zero share of responsibility in the Allocation because neither party owned or operated the Garfield Facility, were successors to owners or operators of the Garfield Facility, and never assumed any liability for the alleged discharges at the site that are at issue in this Allocation. EPEC and El Paso have provided the relevant corporate history and supporting documents in prior allocation submissions and have attached the relevant information as Exhibits A and B to this Position Paper. There is no basis to attribute any liabilities associated with TCI's ownership and operation of the Garfield Facility to EPEC and El Paso because TCI retained any and all liabilities associated with the Garfield Facility, and those liabilities ceased to exist upon its dissolution in 1985. See PAP00039823.

EPEC asserts that EPEC Polymers, Inc. ("EPI") and El Paso Tennessee Pipeline Co. ("EPTP") received GNL letters from EPA *(it is assumed that GNL stands for General Notice Letter)*; however, EPI and EPTP never owned or operated the Facility, nor were either company ever successors to any party or parties that owned or operated the Facility. Further, neither party assumed any liability for the alleged discharges at the Facility that are at issue in this allocation. EPI and EPTP respond on behalf of Tenneco Chemicals, Inc. ("TCI"), which was a former owner and operator of the Facility during the Relevant Time Period [October 4, 1963 to December 1, 1983].

The letter from Saul Ewing, Arnstein, & Lehr LLP, dated September 9, 2019, to Mr. David Batson stated that the "Heyden Newport" entity that changed its name to Tenneco Chemicals, Inc. in 1965 was not the same entity that owned the Garfield Facility prior to Tenneco's acquisition. The following statement was provided: "In 1919, Heyden Chemical Company of America, Inc., a New York corporation, reportedly acquired the Garfield Site. In 1925, Heyden Chemical Company of America was consolidated with Denhey Corporation to form Heyden Chemical Corporation, a New York corporation. In March 1943, Heyden Chemical Corporation merged into its parent company, Denhey Holding Corporation, a Delaware corporation, and Denhey Holding Corporation was renamed Heyden Chemical Corporation, also incorporated in Delaware. In March 1943, the Garfield Site was transferred by deed from Heyden Chemical Corporation, a New York corporation, to Heyden Chemical Corporation, a Delaware corporation. Heyden Chemical Corporation then changed its name to Heyden Newport Chemical Corporation ("Old Heyden"). In 1963, Tennessee Gas Transmission Company ("TGT"), Old Heyden, and HDN Corporation, a subsidiary of TGT, entered into a transaction whereby Old Heyden sold its assets to HDN in exchange for shares of TGT common stock and the assumption by HDN of certain of Old Heyden's liabilities. After the transaction, HDN changed its name to "Heyden Newport Chemical Corporation" ("Heyden Newport") and filed and recorded in Delaware a change of name amendment on October 4, 1963. At the same time, Old Heyden changed its name to "Denport Corporation" and dissolved (2019 Letter, p. 2).

EPEC asserts that on December 15, 1982, Tenneco Chemicals and Tenneco Polymers entered into an agreement whereby Tenneco Chemicals transferred certain assets to Tenneco Polymers. Pursuant to that agreement, Tenneco Chemicals did not transfer any liabilities related to the Garfield Site, and any transfer of liabilities was limited to litigations and claims known or existing at the time of the conveyance—and expressly referenced in exhibits consisting of litigation dockets generated at the time of the transaction. In 1983, Tenneco Chemicals changed its name to Tenneco Resins, Inc. ("Resins"), and filed for dissolution two years later, in 1985. Tenneco Polymers changed its name to EPEC Polymers, Inc. in 1996,

shortly following El Paso Merger Company's acquisition of the energy assets of Tenneco Inc. As the aforementioned facts demonstrate, at no time did Tenneco Polymers merge or consolidate with Resins. In addition, Tenneco Chemicals was a separate corporation from Tenneco Polymers with assets and operations. Although Tenneco Chemicals was a party to various asset transfers over the course of its corporate existence, it retained any and all liabilities associated with the Garfield Site, and those liabilities ceased to exist upon its dissolution in 1985.

ALLOCATOR'S DETERMINATION – EPEC Polymers provides a persuasive argument that has the potential for litigation success, but which cannot be definitively determined based on the available data. Though the Allocator presumes a substantial chance of success should this matter go to litigation, we leave this matter as a topic for settlement discussions between EPEC Polymers and EPA.

Allocation Facility Cmass Calculation

Essex Chemical Corporation	**330 & 352 Doremus Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	1.1	100.00%	-	0.00%	-	100.00%	-	1.1	1.018817E-2	0.01
Lead	100.00%	70.09	100.00%	-	0.00%	-	100.00%	-	70.09	1.018817E-2	0.71
Mercury	100.00%	0.43	100.00%	-	0.00%	-	100.00%	-	0.43	1.018817E-2	0
HPAHs	100.00%	0.49	100.00%	-	0.00%	1.02	100.00%	2.4	2.86	1.018817E-2	0.03
LPAHs	100.00%	0.23	100.00%	-	0.00%	0.68	100.00%	1.6	1.81	1.018817E-2	0.02
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Essex Chemical Corporation	**330 & 352 Doremus Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.01	5.337E-9	3.682E-9
Lead	0.01	3,200,000.00	0.71	2.232E-7	2.232E-9
Mercury	0.95	42,000.00	0	1.043E-7	9.909E-8
HPAHs	0.05	240,000.00	0.03	1.214E-7	6.069E-9
LPAHs	0.01	170,000.00	0.02	1.084E-7	1.084E-9
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Essex Chemical Corporation	330 & 352 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	3.972E-6	0.01	8.33	3.972E-6	2.740E-6
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.429E-4	0.71	776.5	2.429E-4	2.429E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	9.948E-5	0	4.17	9.948E-5	9.450E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	6.579E-7	0.03	0.13	6.579E-7	3.289E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	6.006E-7	0.02	0.08	6.006E-7	6.006E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Essex Chemical Corporation	**330 & 352 Doremus Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Non Contact Cooling Water, condensate water and storm water runoff discharged to Passaic River
	# hours/per day discharged	
	#days/week discharged	Discharged wastewater to sanitary sewer, direct discharge storm water, non contact cooling water and
	#weeks/yr discharged	boiler blowdown to Passaic River via 3 outlets
2,900,000	calc gal/yr discharge	
1956	Yr Ops started	
1989	Yr Ops ceased	
33	calc #yrs facility operated	
Copper (Cu)		
33	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
33	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
33	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
33	#yrs facility discharged	
1.868	mg/L TOC discharged; PAP-00116140	NJDEPs Discharge Monitoring Reports - used weighted average based on flows from each outlet and TOC concentration
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.003	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.02	calc kg COC discharged	
LPAHs		
33	#yrs facility discharged	
1.868	mg/L TOC discharged; PAP-00116140	NJDEPs Discharge Monitoring Reports - used weighted average based on flows from each outlet and TOC concentration
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.002	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.68	calc kg COC discharged	
PCBs		
22	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
17	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
32	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
33	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
34	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
30	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
20	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
1.02	kg HPAHs	
0.68	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Limited data available
	# days/week discharged	PAP-00115965
	# weeks/yr discharged	PAP-00116075
14,410,000	# gals/yr directly discharged	NJDEPS Permit No. 0002283 Discharge to Passaic River
		PAP-00116140 includes NJDEPs Discharge Monitoring Reports for 1984, 1985 and 1986
4.08	ft; 30yr average annual precipitation per Rutgers information	Only data for TOC (Total Organic Solids) and Volumes through 3 "Outlets)
	acres	No Monitoring for other OU2 COCs
43,560	ft2 per acre	Permit Volumes = Outlet 1, 12.51MGD; Outlet 2, 1.9MGD
1956	Yr Ops started	
1989	Yr Ops ceased	
33	calc #yrs facility operated	
Copper (Cu)		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
33	#yrs facility operated	
1.868	mg/L TOC discharged; PAP-00116140	NJDEPs Discharge Monitoring Reports - used weighted average based on flows from each outlet and TOC concentration
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.003	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
5.044	calc kg COC discharged	
LPAHs		
33	#yrs facility operated	
1.868	mg/L TOC discharged; PAP-00116140	NJDEPs Discharge Monitoring Reports - used weighted average based on flows from each outlet and TOC concentration
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.002	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3.363	calc kg COC discharged	
PCBs		
22	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
17	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
32	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
33	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
34	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
30	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
20	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
2.369	kg HPAHs	
1.580	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
15	ACRES - TOTAL SITE AREA (acres)		
2.4	ACRES - AFFECTED AREA	Based on the figure in the FDR (Page 2), it appears that the paved, manufacturing operations used 80% of the site, so affected area is estimated as 20% of the site	
4,046.86	METERS^2/ACRE		
9,712	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES AND PASSAIC	
1956	Year site operations began	330 Doremus was operating from 1956-1989 and 352 Doremus was operating from 1965 to 1989 (FDR Page 1). To be conservative, used the earlier date as the beginning of operations.	
1989	Year site processing and storage operations ceased		
33	NUMBER YEARS DISCHARGE		
32	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,003	KG/M^3 SOIL DENSITY	Most soils at the Newark site consisted of fine grained, clayey silt with organic matter (PAP-00116565). Used structx.com/Soil_Properties_002.html for density. Used the average of silt and clay min (1506 kg/m3) and max (2499 kg/m3).	
64,182	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Site is located on regional historic fill (FDR page 5) Detected at soil sample location Q-3 (3.5-4 ft bgs) at 110,000 ug/kg (110 ppm); collected 11/21/1990 at the Truck Maintenance Building and Quantum Chemical Areas (PAP-00116914). Selected maximum from shallowest depth.	
33	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Max concentration 110 mg/kg. Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)		Detected at soil sample location Q-3 (3.5-4 ft bgs) at 7,000 mg/kg; collected 11/21/1990 at the Quantum Chemical Area (PAP-00116914; PAP-00117022). Selected maximum from shallowest depth.	
33	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	7,000 mg/kg max concentration. Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
33	YEARS DISCHARGED	Detected at soil sample location TMB-2 (4-4.5 ft bgs) at 5.8 mg/kg; collected 11/19/1990 at the Truck Maintenance Building (PAP-00117155). Detected 680 J ug/kg at Q-1 (3.5-4 ft) on 11/21/1990 (PAP-00117156). Selected maximum from shallowest depth.	
5.8	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
33	YEARS DISCHARGED		
6.5	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)			
33	YEARS DISCHARGED		
0	MG/KG (TOTAL PAH MAX CONCENTRATION)	PAP-00116913	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Selected maximum from shallowest depth. PAP-00116959

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	4.500	1.0	4.5000
Benzo(a)anthracene	4.500	0.1	0.4500
Benzo(b)fluoranthene	4.600	0.1	0.4600
Benzo(k)fluoranthene	4.000	0.01	0.0400
Chrysene	5.100	0.001	0.0051
Dibenz(a,h)anthracene	0.830	1.0	0.8300
Indeno(1,2,3-cd)pyrene	2.500	0.1	0.2500

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **6.5**

PCBs		NOT DETECTED (FDR)
	YEARS DISCHARGED	
	MG/KG (MAX OF REPORTED CONCENTRATIONS)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		NOT DETECTED (FDR)
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		NOT DETECTED (FDR)
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	NOT DETECTED (FDR)
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.37	kg Mercury
0.42	kg PAHs (Benzo(a)pyrene Equivalent)
0.02	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

0.81	MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
15	ACRES - TOTAL SITE AREA (acres)		
2.4	ACRES - AFFECTED AREA	Based on the figure in the FDR (Page 2), it appears that the paved, manufacturing operations used 80% of the site, so affected area is estimated as 20% of the site	
4,046.86	METERS^2/ACRE		
9,712	METERS^2 (AFFECTED AREA)		
0.0010	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
5	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1974	Year of spill	330 Doremus was operating from 1956-1989 and 352 Doremus was operating from 1965 to 1989 (FDR Page 1). For this pathway, a release occurred in 1972, where nitric acid overflowed from a 20,000 gallon tank car. The ground was covered with soda ash and water and the fire department washed the residue into the Passaic (FDR Page 9).	
1975	Year of spill	Will conservatively assume 1 year. The 20,000 gallon release likely carved a channel to the Passaic.	
1	NUMBER YEARS DISCHARGE		
5	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,003	KG/M^3 SOIL DENSITY	Most soils at the Newark site consisted of fine grained, clayey silt with organic matter (PAP-00116565). Used structx.com/Soil_Properties_002.html for density. Used the average of silt and clay min (1506 kg/m3) and max (2499 kg/m3).	
10,013	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Site is located on regional historic fill (FDR page 5)	
1	YEARS DISCHARGED	Detected at soil sample location Q-3 (3.5-4 ft bgs) at 110,000 ug/kg (110 ppm); collected 11/21/1990 at the Truck Maintenance Building and Quantum Chemical Areas (PAP-00116914). Selected maximum from shallowest depth.	
110	MG/KG (MAX CONCENTRATION)	Max concentration 110 mg/kg. HF washed into River by 20,000 gallon acid release and by firehose, which washed all impacted/stained soil into the River	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
Lead (Pb)			
1	YEARS DISCHARGED	Detected at soil sample location Q-3 (3.5-4 ft bgs) at 7,000 mg/kg; collected 11/21/1990 at the Quantum Chemical Area (PAP-00116914; PAP-00117022). 7,000 mg/kg max concentration.HF washed into River by 20,000 gallon acid release and by firehose, which washed all impacted/stained soil into the River.	
7000	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
70	KILOGRAMS DISCHARGED		
Mercury (Hg)			
1	YEARS DISCHARGED	Detected at soil sample location TMB-2 (4-4.5 ft bgs) at 5.8 mg/kg; collected 11/19/1990 at the Truck Maintenance Building (PAP-00117155). Detected 680 J ug/kg at Q-1 (3.5-4 ft) on 11/21/1990 (PAP-00117156). Selected maximum from shallowest depth.	
5.8	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
1	YEARS DISCHARGED	
6.5	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.07	KILOGRAMS DISCHARGED	
PAHs (others detected)		
1	YEARS DISCHARGED	
21	MG/KG (TOTAL PAH MAX CONCENTRATION)	PAP-00116913
0.000001	kg per mg (Merck Index)	
0.21	KILOGRAMS DISCHARGED	
PCBs		NOT DETECTED (FDR)
	YEARS DISCHARGED	
	MG/KG (MAX OF REPORTED CONCENTRATIONS)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		NOT DETECTED (FDR)
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		NOT DETECTED (FDR)
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	NOT DETECTED (FDR)
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Selected maximum from shallowest depth. PAP-00116959

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	4.500	1.0	4.5000
Benzo(a)anthracene	4.500	0.1	0.4500
Benzo(b)fluoranthene	4.600	0.1	0.4600
Benzo(k)fluoranthene	4.000	0.01	0.0400
Chrysene	5.100	0.001	0.0051
Dibenz(a,h)anthracene	0.830	1.0	0.8300
Indeno(1,2,3-cd)pyrene	2.500	0.1	0.2500

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **6.5**

SUMMARY CMASS ESTIMATES:

1.10	kg Copper
70.09	kg Lead
0.06	kg Mercury
0.07	kg PAHs (Benzo(a)pyrene Equivalent)
0.21	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

71.52 MASS (KG) DISCHARGED

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Essex Chemical Corporation

330 & 352 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.412E-8	10.0%	Periodic Noncompliacne	Criminal charges were filed against Essex in United States District Court, District of New Jersey on July 11, 1974, arising from a 1972 release to the Passaic River from Essex (PAS-00062740). As described by a PVSC inspector, a 20,000 gallon tank car with oleum and nitric acid overflowed through a vent pipe due to internal pressure. The ground was covered with soda ash and water to neutralize the overflow, and the fire department then washed the residue into the Passaic River (PAS-00062745). New Jersey State Department of Health issued “pollution abatement orders” to Essex in 1969 (PAP-00140967). No further information was available.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.571E-8

AP_ABS	7.571E-8

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Essex Chemical Corporation

330 & 352 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.478E-5	10.0%	Periodic Noncompliacne	Criminal charges were filed against Essex in United States District Court, District of New Jersey on July 11, 1974, arising from a 1972 release to the Passaic River from Essex (PAS-00062740). As described by a PVSC inspector, a 20,000 gallon tank car with oleum and nitric acid overflowed through a vent pipe due to internal pressure. The ground was covered with soda ash and water to neutralize the overflow, and the fire department then washed the residue into the Passaic River (PAS-00062745). New Jersey State Department of Health issued “pollution abatement orders” to Essex in 1969 (PAP-00140967). No further information was available.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.731E-5

AP_ABS	6.731E-5

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

ESSEX CHEMICAL

Essex argues that it received a partial release of liability from Occidental Chemical (see attached), in the Maxus bankruptcy, along with 41 other parties. The releasing parties explained the rationale for providing this release in that proceeding as follows: "The debtors sought to eliminate those parties that (a) appeared to either be de minimis contributors or (b) had previously contributed to the investigation and the remediation costs in amounts roughly proportionate to their share of liability." Maxus bankruptcy docket no. 1232 at 24, filed April 19, 2017.

ALLOCATOR'S DETERMINATION – Though I have not had the opportunity to review the underlying settlement document and other potentially relevant facts associated with the release provided by OCC, assuming its validity, it is apparent that there is a high likelihood of success in any action against OCC to enforce the release. Given OCC's lack of participation in the allocations process, however, the Allocator does not believe that it is appropriate to account for the amount of any such release in the assignment of allocated shares. Rather, the Allocator notes the existence of the release and recommends that it be taken into account in determining the appropriate amount of any future settlement with EPA.

Allocation Facility Cmass Calculation

Everett Smith Group	20 Bruen Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Everett Smith Group	20 Bruen Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Everett Smith Group	20 Bruen Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Everett Smith Group	**20 Bruen Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	City Dock	CSO	0.11%	61.80%	
2	City Dock	Bypass	9.96%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Leather Tannery
	# hours/per day discharged	No information on flows or COC discharges
5	#days/week discharged	Facility would have discharged to the PVSC by the City Dock CSO
52	#weeks/yr discharged	S. Lange Expert Report, FDR
88,441,160	calc gal/yr discharge	
1937	Yr Ops started	
1939	Yr Ops ceased	
2.5	calc #yrs facility operated	PAP-00000053, PAS-00032775
Copper (Cu)		
2.5	#yrs facility discharged	S. Lange Expert Report, FDR
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
2.5	#yrs facility discharged	S. Lange Expert Report, FDR
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
2.5	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
2.5	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
2.5	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
3.0	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
0	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-10	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
3	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-6	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-5	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-10	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Everett Smith Group

20 Bruen Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	0.0%	0% Cooperation with conduct of allocation and requests for related information	0

AP_ABS	0

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Everett Smith Group

20 Bruen Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	0.0%	0% Cooperation with conduct of allocation and requests for related information	0

AP_ABS	0

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

EVERETT SMITH GROUP

Everett Smith Group states that Blanchard Bro. & Lane, Inc. was incorporated on June 29, 1937 and operated at 20 Bruen Street until sometime in 1939. (PAP-00000007; PAS-00032775). The property was sold in December 1941. (PAP-00000058). Eighteen years later, in 1959, 100% of Blanchard's stock was purchased by Eagle Ottawa Leather Company ("Eagle Ottawa"). (PAP-00432364 thru PAP-00432365). Eagle Ottawa maintained Blanchard as a wholly owned subsidiary until February 24, 1965 when it caused Blanchard to be dissolved. (PAP-00432366 thru PAP-00432367; PAP-00432369). In anticipation of such dissolution, Eagle Ottawa assumed on August 31, 1964 all "fixed or contingent" debts, obligations and liabilities of Blanchard existing as of that date. (PAP-00432368). There was no merger of the Blanchard and Eagle Ottawa Leather Company corporate entities. (PAP-00432364 thru PAP-00432369). There was no assumption of Blanchard's debts, obligations, or liabilities that did not exist on August 31, 1964. Eagle Ottawa Leather Company later merged with Albert Trostel & Sons Company. (PAS-0003297 thru PAS-0003298). ESG purchased the stock of Albert Trostel & Sons Company.

Eagle Ottawa's assumption of Blanchard's "contingent" debts, obligations, and liabilities in 1964 did not include CERCLA liabilities that might otherwise have been created in 1981 by CERCLA, a full 17 years later. The Court of Appeals for the Third Circuit interpreted the meaning of "contingent" liabilities in an analogous case addressing whether CERCLA liability had been discharged in a bankruptcy proceeding. Matter of Reading Co., 115 F.3d 1111, 1122 (3d Cir. 1997) (abrogated on other grounds by E.I. DuPont De Nemours & Co. v. United States, 460 F.3d 515, 518 (3d Cir.2006)). In that case, Reading Co. emerged from a bankruptcy proceeding in 1981 with a "consummation order" granting it protection from all pre-consummation debts and liabilities. Matter of Reading Co., 115 F.3d at 1114. Sixteen years later, Consolidated Rail Corporation ("Conrail") commenced a contribution action seeking recovery of cleanup costs from Reading Co. for pre-consummation releases of hazardous substances. Id. Reading Co. argued that the potential CERCLA liability was a pre-consummation claim for which Reading Co. was protected by the bankruptcy court's consummation order. Id. at 1121. Under the bankruptcy law, claims included "contingent" debts, liabilities and obligations. Id. at 1121-1123. The Third Circuit held that the potential for CERCLA liability had not matured to the level of a claim, or even a contingent claim, before CERCLA was enacted in 1980. Id. In an earlier case, the Third Circuit had succinctly noted:

[I]t was not until the passage of CERCLA that a legal relationship was created between the petitioners and PCC relevant to the petitioners' potential causes of action such that an interest could flow. Because this legal relationship did not evolve until after the Consummation Date, the petitioners did not have contingent claims against PCTC. In re Penn Central Trans. Co., 944 F.2d 164, 167-168 (3d Cir. 1991). Thus, there was no actual or contingent CERCLA debt, obligation, or liability to be assumed by Eagle Ottawa in 1964 when the company was dissolved.

ALLOCATOR'S DETERMINATION – Though the Everett Smith Group makes an argument regarding its lack of successor liability, the Allocator does not believe that Everett has a substantial likelihood of success at litigation based on the abrogated bankruptcy case cited as the

Allocation Facility Cmass Calculation

Foundry Street Corporation (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Foundry Street Corporation (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Foundry Street Corporation (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Foundry Street Corporation (Foundry Street Complex)	**185 Foundry Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Foundry Street Corporation (Foundry Street Complex)

185 Foundry Street	Newark	NJ	07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.052E-7	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	6.063E-7

AP_ABS	6.063E-7

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Foundry Street Corporation (Foundry Street Complex)

185 Foundry Street	Newark	NJ	07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
6.490E-5	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	7.788E-5

AP_ABS	7.788E-5

Allocation Facility Cmass Calculation

Franklin Burlington Plastics Inc.	113 Passaic Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	141.4	100.00%	-	0.00%	-	100.00%	16.6	157.98	1.018817E-2	1.61
Lead	100.00%	564.71	100.00%	-	0.00%	-	100.00%	2.8	567.53	1.018817E-2	5.78
Mercury	100.00%	1.97	100.00%	-	0.00%	-	100.00%	-	1.97	1.018817E-2	0.02
HPAHs	100.00%	59.79	100.00%	-	0.00%	-	100.00%	221.4	281.18	1.018817E-2	2.86
LPAHs	100.00%	494.35	100.00%	-	0.00%	-	100.00%	147.6	641.94	1.018817E-2	6.54
PCBs	100.00%	0.46	100.00%	-	0.00%	-	100.00%	-	0.46	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Franklin Burlington Plastics Inc.	**113 Passaic Avenue**	**Kearny**	**NJ**	**07032**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	1.61	7.664E-7	5.288E-7
Lead	0.01	3,200,000.00	5.78	1.807E-6	1.807E-8
Mercury	0.95	42,000.00	0.02	4.779E-7	4.540E-7
HPAHs	0.05	240,000.00	2.86	1.194E-5	5.968E-7
LPAHs	0.01	170,000.00	6.54	3.847E-5	3.847E-7
PCBs	12.87	26,000.00	0	1.803E-7	2.320E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Franklin Burlington Plastics Inc.	113 Passaic Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	5.704E-4	1.61	1,196.23	5.704E-4	3.936E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.967E-3	5.78	6,287.47	1.967E-3	1.967E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	4.558E-4	0.02	19.12	4.558E-4	4.330E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	6.469E-5	2.86	12.66	6.469E-5	3.235E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.131E-4	6.54	29.68	2.131E-4	2.131E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.292E-5	0	0.59	2.292E-5	2.950E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Franklin Burlington Plastics Inc.	**113 Passaic Avenue**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
23,500	gal discharged per day/week/month	PARS RIR, 2016 - plant was connect to sewer system since 1946
	# hours/per day discharged	Process Flow diagram: 2500 gpd Sanitary and 21000gpd boilers to PVSC
5	#days/week discharged	
52	#weeks/yr discharged	
-	calc gal/yr discharge	
1976	Yr Ops started	
2010	Yr Ops ceased	
34	calc #yrs facility operated	
Copper (Cu)		
34	#yrs facility discharged	Sampling data 1990, 2008, 2010 and Permit for O&G
0.0365	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
34	#yrs facility discharged	Sampling data 1990, 2008, 2010 and Permit for O&G
0.0304	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
34	#yrs facility discharged	
-	calc mg/L COC discharged	NON DETECT
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
34	#yrs facility discharged	Permit Limit
10.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.60	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
34	#yrs facility discharged	Permit Limit
10.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.40	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
2	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-3	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
12	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
34	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
35	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
10	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
0	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1976-2004 Direct discharge to Passaic River via Permit (NJPDES)
5	# days/week discharged	1200 gpd (PAP-00057219)
50	# weeks/yr discharged	PAP-CONF-00010094
4,289,500	# gals/yr directly discharged	PAP-00057219
4.08	ft; 30yr average annual precipitation per Rutgers information	Credit for NJPDES Permit oil and grease discharge limit of 10 mg/l
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1976	Yr Ops started	
2004	Yr Ops ceased	
28	calc #yrs facility operated	
Copper (Cu)		
28	#yrs facility discharged	
0.0365	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
16.58	calc kg COC discharged	
Lead (Pb)		
28	#yrs facility discharged	
0.0062	calc mg/L COC discharged	PAP-00337332
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2.82	calc kg COC discharged	
Mercury (Hg)		
28	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
28	#yrs facility discharged	
10.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.60	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
272.76	calc kg COC discharged	
LPAHs		
28	#yrs facility discharged	
10.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.40	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
181.84	calc kg COC discharged	
PCBs		
2	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-3	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
12	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
28	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
29	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
10	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
0	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
16.58	kg Copper	
2.82	kg Lead	
-	kg Mercury	
221.39	kg HPAHs	
147.59	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
8.44	ACRES - TOTAL SITE AREA (acres)	FDR, page 1; confirmed with Google Earth	
6	ACRES - AFFECTED AREA	A 55,000-square foot production plant and 840-square foot boiler house were located at the Site. (PAP-00056121) Covering approximatley 1.2 acres of the 8.44 acre site.	
4,046.86	METERS^2/ACRE	CONVERSION TO METERS	
24,281	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED to Passaic.	
1976	Year site operations began	Franklin Burlington Plastics or its predecessor manufactured plastics at the Site from approximately 1976 to 2010 (PAP-00056120).	
2017	Year site ownership ceased	On May 22, 2017, Urban Renewal, LLC acquired the site from Franklin-Burlington Plastics (FDR page 4; PAP-00338807).	Site manufacturing operations ceased in 2010 and all buildings were razed in April 2014 (PAP-00056121).
41	NUMBER YEARS DISCHARGE		
100	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,251	KG/M^3 SOIL DENSITY	The fill was comprised of silty sand, course sand, cinders, gravel, brick fragments, rod, wood pieces, glass, ceramics and scrap metal. (PAP-00056120). Bulk density range 2002 KG/M^3 to 2499 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
224,093	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
41	YEARS DISCHARGED		
631	MG/KG (MAX CONCENTRATION)	Max concentration at maximum shallow sample, RL-3 (1.6-2.1 ft bgs) (PAP-00056226).	
0.000001	kg per mg (Merck Index)		
141	KILOGRAMS DISCHARGED		
Lead (Pb)		Lead compounds were used as a PVC stabilizer in electrical insulators. (PAP-00338386-87).	
41	YEARS DISCHARGED		
2,520	MG/KG MAX CONCENTRATION)	Max concentration at the maximum shallow sample, NJEP-S6 (0.0-0.5 ft bgs) (PAP-00337333)	
0.000001	kg per mg (Merck Index)		
565	KILOGRAMS DISCHARGED		

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
Mercury (Hg)			
41	YEARS DISCHARGED		
8.8	MG/KG (MAX CONCENTRATION)	Max concentration of mercury from Table 8; soil from AOC 12 - Fill Area, sample HF-7 collected at 5-5.5 ft bgs (PAP-00056224). Due to density of mercury, it is not expected to remain on the surface.	
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
41	YEARS DISCHARGED		
266.8	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
60	KILOGRAMS DISCHARGED		
PAHs (others detected)			
41	YEARS DISCHARGED	LMW PAH concentrations from soil sample SB13/A collected at 0.5-1 ft January 2002 (PAP-00056325-6).	
2,206	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
494	KILOGRAMS DISCHARGED		
PCBs			
41	YEARS DISCHARGED		
2.05	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Max concentration based on maximum shallow sample from this site, TS-24 (0.0-0.5 ft bgs) (PAP-00056220)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
DDx			
41	YEARS DISCHARGED within DDx Timeline		
	MG/KG (MAX CONCENTRATION)		NONE REPORTED
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dieldrin			
41	YEARS DISCHARGED		NONE REPORTED
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dioxins/Furans			
41	YEARS DISCHARGED		
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Max PAH compounds identified in various samples listed in Table 1, Historical Soil. For example, see results for soil sample SB13/A (PAP-00056325-6).

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	190.000	1.0	190.0000
Benzo(a)anthracene	290.000	0.1	29.0000
Benzo(b)fluoranthene	270.000	0.1	27.0000
Benzo(k)fluoranthene	97.000	0.01	0.9700
Chrysene	240.000	0.001	0.2400
Dibenz(a,h)anthracene	12.000	1.0	12.0000
Indeno(1,2,3-cd)pyrene	76.000	0.1	7.6000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 266.8

SUMMARY CMASS ESTIMATES:	
141.40	kg Copper
564.71	kg Lead
1.97	kg Mercury
59.79	kg PAHs (Benzo(a)pyrene Equivalent)
494.35	kg PAHs (Other)
0.46	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

1,262.69	TOTAL MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Franklin Burlington Plastics Inc.

113 Passaic Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.302E-6	10.0%	Periodic Noncompliacne	According to the 1990 EPA SI, at an unknown date Franklin Plastics received a Notice of Violation for oily spills along the eastern wall of the Production Plant (PAP-00337303). In 1984, there were numerous violations that included spillage, discolored soils, oil saturated soils, improperly labeled drums, unmarked drums, disposal of drums, and other storage of material concerns (PAP-00337237). NJDEP Division of Water Resources, inspected the facility in July 1985 and gave it an “unacceptable” rating due to permit limit exceedances of temperature, chromium, and zinc concentrations (PAP-00057085-89;). A 1980 EPA Potential Hazardous Waste Site Identification and Preliminary Assessment form identified an open dump, landfill, drums, aboveground tanks, a railroad, and other hazardous major site activities. Overturned drums potentially contaminating the soil were noted onsite, as well as “many” 55-gallon drums that were leaking and overflowing. An August 1, 1984 Investigative Report for Franklin Plastics Corporation noted an oil-like substance that heavily contaminated the southwestern corner inside of the Production Plant. Two spills being cleaned by the workers were noted on the ground during the inspection in an area where a liquid plasticizer was discharged from tank trailers into pipes for storage (PAP-00338659). During sampling "spill and vegetative stress area near the air pollution control units" as noted and another sample was collected where "the soils were covered with a silvery material"	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.872E-6

AP_ABS	3.872E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Franklin Burlington Plastics Inc.

113 Passaic Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.147E-3	10.0%	Periodic Noncompliacne	According to the 1990 EPA SI, at an unknown date Franklin Plastics received a Notice of Violation for oily spills along the eastern wall of the Production Plant (PAP-00337303). In 1984, there were numerous violations that included spillage, discolored soils, oil saturated soils, improperly labeled drums, unmarked drums, disposal of drums, and other storage of material concerns (PAP-00337237). NJDEP Division of Water Resources, inspected the facility in July 1985 and gave it an “unacceptable” rating due to permit limit exceedances of temperature, chromium, and zinc concentrations (PAP-00057085-89;). A 1980 EPA Potential Hazardous Waste Site Identification and Preliminary Assessment form identified an open dump, landfill, drums, aboveground tanks, a railroad, and other hazardous major site activities. Overturned drums potentially contaminating the soil were noted onsite, as well as “many” 55-gallon drums that were leaking and overflowing. An August 1, 1984 Investigative Report for Franklin Plastics Corporation noted an oil-like substance that heavily contaminated the southwestern corner inside of the Production Plant. Two spills being cleaned by the workers were noted on the ground during the inspection in an area where a liquid plasticizer was discharged from tank trailers into pipes for storage (PAP-00338659). During sampling "spill and vegetative stress area near the air pollution control units" as noted and another sample was collected where "the soils were covered with a silvery material"	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.032E-3

AP_ABS	1.032E-3

Allocation Facility Cmass Calculation

Garfield Molding Company, Inc.	10 Midland Avenue	Wallington	NJ	07057

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	456.73	100.00%	-	2.32%	-	100.00%	80.3	537.06	1.018817E-2	5.47
Lead	100.00%	130.39	100.00%	-	2.32%	-	100.00%	67.1	197.46	1.018817E-2	2.01
Mercury	100.00%	0.44	100.00%	-	2.32%	-	100.00%	-	0.44	1.018817E-2	0
HPAHs	100.00%	0.95	100.00%	-	2.32%	-	100.00%	2,418.6	2,419.56	1.018817E-2	24.65
LPAHs	100.00%	5.58	100.00%	-	2.32%	-	100.00%	1,612.4	1,617.99	1.018817E-2	16.48
PCBs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Garfield Molding Company, Inc.	10 Midland Avenue	Wallington	NJ	07057

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	5.47	2.606E-6	1.798E-6
Lead	0.01	3,200,000.00	2.01	6.287E-7	6.287E-9
Mercury	0.95	42,000.00	0	1.067E-7	1.014E-7
HPAHs	0.05	240,000.00	24.65	1.027E-4	5.136E-6
LPAHs	0.01	170,000.00	16.48	9.697E-5	9.697E-7
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Garfield Molding Company, Inc.	10 Midland Avenue	Wallington	NJ	07057

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.939E-3	5.47	4,066.7	1.939E-3	1.338E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	6.842E-4	2.01	2,187.54	6.842E-4	6.842E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.018E-4	0	4.27	1.018E-4	9.670E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	5.567E-4	24.65	108.95	5.567E-4	2.783E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	5.370E-4	16.48	74.81	5.370E-4	5.370E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Garfield Molding Company, Inc.	**10 Midland Avenue**	**Wallington**	**NJ**	**07057**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No information on Discharges or Flows
	# hours/per day discharged	Connection to PVSC in 1917, but flows to Saddle River
	#days/week discharged	
	#weeks/yr discharged	
-	calc gal/yr discharge	
	Yr Ops started	
	Yr Ops ceased	
1	calc #yrs facility operated	
Copper (Cu)		
1	#yrs facility discharged	
0.0365	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
1	#yrs facility discharged	
0.0304	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
1	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
1	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
1	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
-1928	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-1939	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-1949	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
1	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-1945	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-1944	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-1949	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Direct Discharge to Saddle River, through PVSC sewer system?
	# days/week discharged	NJPDES Permit NJ0027146 (PAS-00102810)
	# weeks/yr discharged	Based on Franklin Burlington
6,000,000	# gals/yr directly discharged	
		Credit for NJPDES Permit for TPH discharge limit of 15 mg/l
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1917	Yr Ops started	
2014	Yr Ops ceased	
97	calc #yrs facility operated	
Copper (Cu)		
97	#yrs facility discharged	From Franklin Burlington
0.0365	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
80.33	calc kg COC discharged	
Lead (Pb)		
97	#yrs facility discharged	From Franklin Burlington
0.0304	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
67.07	calc kg COC discharged	
Mercury (Hg)		
97	#yrs facility discharged	From Franklin Burlington
-	calc mg/L COC discharged	Non Detect
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
97	#yrs facility discharged	From Franklin Burlington
1.5000	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3,304.3050	calc kg COC discharged	
LPAHs		
97	#yrs facility discharged	From Franklin Burlington
1.0000	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,202.8700	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
97	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
69	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
80.33	kg Copper	
67.07	kg Lead	
-	kg Mercury	
2,418.62	kg HPAHs	
1,612.41	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
3.43	ACRES - TOTAL SITE AREA (acres)	FDR and PAS-00102867, PAS-00123366	
2.0	ACRES - AFFECTED AREA	Estimation based on Google Earth	
4,046.86	METERS^2/ACRE		
8,094	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1917	Year site operations began	PAS-00123364	
2014	Year site processing and storage operations ceased	PAS-00123364	
97	NUMBER YEARS DISCHARGE		
79	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,251	KG/M^3 SOIL DENSITY	Fill underlain by fine to coarse well sorted sands/coarse gravely sands/fine sands and silt (PAS-00102913). Bulk density range 2002 KG/M^3 to 2499 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
176,685	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Site is partially located on historic fill (FDR, pg. 9)	
Copper (Cu)			
97	YEARS DISCHARGED		
2585	MG/KG (MAX CONCENTRATION)	Maximum concentration in soil at VE-1 (24-30") (PAS-00102887 and PAS-00102889)	
0.000001	kg per mg (Merck Index)		
457	KILOGRAMS DISCHARGED		
Lead (Pb)			
97	YEARS DISCHARGED		
738	MG/KG (AVERAGE CONCENTRATION)	Max concentration in soil at VE-3 (24-30") (PAS-00102889)	
0.000001	kg per mg (Merck Index)		
130	KILOGRAMS DISCHARGED		
Mercury (Hg)			
97	YEARS DISCHARGED		
2.5	MG/KG (MAX CONCENTRATION)	Max concentration in soil at VE-3 (24-30") (PAS-00102889)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
97	YEARS DISCHARGED		
4.6	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations (FDR Tables, page 10; PAS-00102888-892)	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
PAHs (others detected)			
97	YEARS DISCHARGED		
30.30	MG/KG (TOTAL PAH MAX CONCENTRATION)	Other PAHs = Benzo (a) pyrene, Phenanthrene, Flouranthene, Pyrene (FDR Tables; PAS-0010288-892)	
0.000001	kg per mg (Merck Index)		
5	KILOGRAMS DISCHARGED		
PCBs			
84	YEARS DISCHARGED	PCB sample result at T-W-5 (PAS-00102882); years reflect a 1930 start date for PCBs.	
0	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PCB concentration relected as 0 mg/kg because the only detection was from a sample taken at 9 ft bgs below a UST, which is too far below ground surface for this calculation. (FDR p 15, PAS-00102882)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	3.800	1.0	3.8000
Benzo(a)anthracene	2.800	0.1	0.2800
Benzo(b)fluoranthene	5.400	0.1	0.5400
Benzo(k)fluoranthene	2.100	0.01	0.0210
Chrysene	3.400	0.001	0.0034
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.000	0.1	0.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **4.6**

DDx		
	YEARS DISCHARGED within DDx Timeline	None
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	None
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		
	YEARS DISCHARGED	None
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
456.73	kg Copper
130.39	kg Lead
0.44	kg Mercury
0.82	kg PAHs (Benzo(a)pyrene Equivalent)
5.35	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

593.74	MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	NOTES, COMMENTS, REFERENCES	
4.08	FEET/YEAR AVERAGE PRECIPITATION per Rutgers Univ.	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
0	ACRES - TOTAL SITE AREA (acres)	Eight catch basins sampled for sediment (PAS-001028894-95)	
0.00	ACRES - AFFECTED AREA	Assume catch basin size as 4' x 5'	
0.00	METERS^2/ACRE	Assume 3 inches deep sediment	
15	METERS^2 (AFFECTED AREA)	Each catch basin = 20 ft2 = 1.858 m2 1.858 m2 x 8 = 14.86 m2	
0.0010	METERS/YEAR (ERODED SOIL THICKNESS)	changed erosion rate to 0.1 mm/yr.	
0.015	METERS^3/YEAR (ERODED SOIL VOLUME)		
1917	Year site operations began	PAS-00123364	
2014	Year site processing and storage operations ceased	PAS-00123364	
97	NUMBER YEARS DISCHARGE		
1	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,746	KG/M^3 SOIL DENSITY	Assume organic silts. Bulk density range 1394 KG/M^3 to 2098 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
2,517	KILOGRAMS (TOTAL WT OF SOIL AFFECTED OVER TIME)		
Copper (Cu)			
0	YEARS DISCHARGED		
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
0	YEARS DISCHARGED		
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
0	YEARS DISCHARGED		
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
97	YEARS DISCHARGED		
49.896	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations (FDR Table page 17; PAS-001028894-95)	
0.000001	kg per mg (Merck Index)		
0.126	KILOGRAMS DISCHARGED		
PAHs (others detected)		Other PAHs = Dibenzfuran, Napthalene, Acenaphthalene, Flourene, Phenanthrene, Anthracene, Flouranthene, Pyrene (FDR Table page 17)	
97	YEARS DISCHARGED		
92.3	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.232	KILOGRAMS DISCHARGED		
PCBs			
0	YEARS DISCHARGED within PCBs Timeline		
	MG/KG (MAX OF REPORTED CONCENTRATIONS)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
DDx			
0	YEARS DISCHARGED within DDx Timeline		
	MG/KG (CONCENTRATION)		
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	27.000	1.0	27.0000
Benzo(a)anthracene	19.000	0.1	1.9000
Benzo(b)fluoranthene	34.000	0.1	3.4000
Benzo(k)fluoranthene	12.000	0.01	0.1200
Chrysene	26.000	0.001	0.0260
Dibenz(a,h)anthracene	17.000	1.0	17.0000
Indeno(1,2,3-cd)pyrene	4.500	0.1	0.4500

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **49.9**

Dieldrin	
0	YEARS DISCHARGED within Dieldrin Timeline
	MG/KG (CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dioxins/Furans	
0	YEARS DISCHARGED
	MG/KG (CONCENTRATION)
0.000001	kg per mg (Merck Index)
	calc kg COC discharged

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
0.13	kg PAHs (Benzo(a)pyrene Equivalent)
0.23	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

0.36	MASS (KG) DISCHARGED BY OVERLAND FLOW

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Garfield Molding Company, Inc.

10 Midland Avenue	**Wallington**	**NJ**	**07057**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.011E-6	5.0%	Occasional Noncompliance	On July 2, 1974, PVSC wrote to Garfield confirming that their boiler blowdown was polluting (PAS-00102945). This violation was eliminated August 1974 (PAS-00102945). Several unpermitted discharges and other violations of the NJPDES-discharge permit were noted to have occurred during the historical operations, as well as deficiences of the facility (e.g., spreading waste oil on the unpaved driveways to control dust) (PAS-00102947-9). There were several drum storage areas noted. The floor of Building 16 was heavily stained and a portion of the roof was missing.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.809E-6

AP_ABS	6.809E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Garfield Molding Company, Inc.

10 Midland Avenue	**Wallington**	**NJ**	**07057**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.475E-3	5.0%	Occasional Noncompliance	On July 2, 1974, PVSC wrote to Garfield confirming that their boiler blowdown was polluting (PAS-00102945). This violation was eliminated August 1974 (PAS-00102945). Several unpermitted discharges and other violations of the NJPDES-discharge permit were noted to have occurred during the historical operations, as well as deficiences of the facility (e.g., spreading waste oil on the unpaved driveways to control dust) (PAS-00102947-9). There were several drum storage areas noted. The floor of Building 16 was heavily stained and a portion of the roof was missing.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.254E-3

AP_ABS	1.254E-3

Allocation Facility Cmass Calculation

General Electric Company	415 South 5th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	3.52	100.00%	-	0.21%	-	100.00%	-	3.52	1.018817E-2	0.04
Lead	100.00%	6.21	100.00%	-	0.21%	-	100.00%	-	6.21	1.018817E-2	0.06
Mercury	100.00%	0.57	100.00%	-	0.21%	-	100.00%	-	0.57	1.018817E-2	0.01
HPAHs	100.00%	0.02	100.00%	17,315.98	0.21%	21,438.83	100.00%	-	17,361.34	1.018817E-2	176.88
LPAHs	100.00%	0.01	100.00%	11,543.99	0.21%	14,292.56	100.00%	-	11,574.23	1.018817E-2	117.92
PCBs	100.00%	0.36	100.00%	-	0.21%	-	100.00%	-	0.36	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.21%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.21%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.21%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

General Electric Company	415 South 5th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.04	1.708E-8	1.178E-8
Lead	0.01	3,200,000.00	0.06	1.977E-8	1.977E-10
Mercury	0.95	42,000.00	0.01	1.383E-7	1.314E-7
HPAHs	0.05	240,000.00	176.88	7.370E-4	3.685E-5
LPAHs	0.01	170,000.00	117.92	6.936E-4	6.936E-6
PCBs	12.87	26,000.00	0	1.411E-7	1.816E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

General Electric Company	415 South 5th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.271E-5	0.04	26.65	1.271E-5	8.769E-6
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.152E-5	0.06	68.8	2.152E-5	2.152E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.319E-4	0.01	5.53	1.319E-4	1.253E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	3.994E-3	176.88	781.78	3.994E-3	1.997E-4
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	3.842E-3	117.92	535.16	3.842E-3	3.842E-5
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.794E-5	0	0.46	1.794E-5	2.309E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

General Electric Company	**415 South 5th Street**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Bergen Street	CSO	0.33%	64.09%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
79,346	gal discharged per day PAS00122721-22	
8	# hours/per day discharged	1972 PVSC Waste Effluent Survey & 1975 PVSC Waste Effluent Survey
5	#days/week discharged	
52	#weeks/yr discharged	
165,039,543	calc gal/yr discharge	
1882	Yr Ops started	
1976	Yr Ops ceased	
94	calc #yrs facility operated	
Copper (Cu)		
94	#yrs facility discharged	
-	calc mg/L COC discharged PAS00122721-22	1972 PVSC Waste Effluent Survey & 1975 PVSC Waste Effluent Survey
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
94	#yrs facility discharged	
-	calc mg/L COC discharged PAS00122721-22	1975 PVSC Waste Effluent Survey
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
94	#yrs facility discharged	
-	calc mg/L COC discharged	(NOTE BE SURE TO CONVERT TO MG/L)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
94	#yrs facility discharged	
11.00	calc mg/L O&G PAS00122721-22	1972 PVSC Waste Effluent Survey & 1975 PVSC Waste Effluent Survey
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.66	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
38,754.82	calc kg COC discharged	
LPAHs		
94	#yrs facility discharged	
11.00	calc mg/L O&G PAS00122721-22	1972 PVSC Waste Effluent Survey & 1975 PVSC Waste Effluent Survey
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.44	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
25,836.54	calc kg COC discharged	
PCBs		
48	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
27	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
94	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
31	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
32	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
38,754.82	kg HPAHs	
25,836.54	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
12.75	ACRES - TOTAL SITE AREA (acres)	FDR Page 1	
2.25	ACRES - AFFECTED AREA	Area of Building A, B, and C, as seen in the FDR Page 3, is approx 10.5 acres using Google Earth.	
4,046.86	METERS^2/ACRE		
9,105	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	Lot appears mostly paved. For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1882	Year site operations began	FDR Page 1	
1976	Year site processing and storage operations ceased	FDR Page 1	
94	NUMBER YEARS DISCHARGE	FDR Page 1	
86	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill is a variable mix of sand, silt, clay, gravel, cobbles, rock (PAP-00074667). Bulk density range 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
167,973	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Site is not on historic fill (FDR pg 8).	
Copper (Cu)			
94	YEARS DISCHARGED		
21	MG/KG (MAX CONCENTRATION)	Max concentration in soil at exterior location, SB-A-01, 5.5-6 ft bgs (PAP-00074770, PAP-00074715)	
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		
Lead (Pb)		Max concentration in soil at exterior location, SB-A-01, 5.5-6 ft bgs (PAP-00074770, PAP-00074715).	
94	YEARS DISCHARGED		
37	MG/KG (AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
6	KILOGRAMS DISCHARGED		
Mercury (Hg)			
94	YEARS DISCHARGED		
3.4	MG/KG (MAX CONCENTRATION)	Max concentration in soil at exterior location, SB-A-03A, 5.5-6 ft bgs (PAP-00074776, PAP-00074715).	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
94	YEARS DISCHARGED		
0.11	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
94	YEARS DISCHARGED		
0.08	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sample used - exterior location, SB-A-01, 5.5-6 ft bgs (PAP-00074770, PAP-00074715) Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Sample used - exterior location, SB-A-01, 5.5-6 ft bgs (PAP-00074770, PAP-00074715) Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.	Benzo(a)pyrene	0.090	1.0	0.0900
	Benzo(a)anthracene	0.000	0.1	0.0000
	Benzo(b)fluoranthene	0.090	0.1	0.0090
	Benzo(k)fluoranthene	0.000	0.01	0.0000
	Chrysene	0.050	0.001	0.0001
	Dibenz(a,h)anthracene	0.000	1.0	0.0000
	Indeno(1,2,3-cd)pyrene	0.100	0.1	0.0100

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.1**

PCBs		
46	YEARS DISCHARGED	Highest concentration identfied in sample J1-02 from 3-3.5 ft bgs (PAP-00074723). Number of years reflect a 1930 start date for PCBs.
2.12	MG/KG (MAX OF REPORTED CONCENTRATIONS)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	NOT DETECTED (FDR)
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Sample changed to exterior location, SB-A-01, 5.5-6 ft bgs (PAP-00074770, PAP-00074715)

Anthracene	0
Acenaphthene	0
Acenaphthylene	0
Fluorene	0
Naphthalene	0
Phenanthrene	0.08
2-Methylnaphthalene	0
SUM	0.08

SUMMARY CMASS ESTIMATES:

3.53	kg Copper
6.21	kg Lead
0.57	kg Mercury
0.02	kg PAHs (Benzo(a)pyrene Equivalent)
0.01	kg PAHs (Other)
0.36	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

10.70 MASS (KG) DISCHARGED FROM SURFACE SOIL

Allocation Facility Cmass Calculation

General Electric Company	1000 South 2nd Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	296.01	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	30.52	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	2,929.59	100.00%	102.5	102.54	1.018817E-2	1.04
LPAHs	100.00%	-	100.00%	-	0.00%	1,953.06	100.00%	68.4	68.36	1.018817E-2	0.7
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

General Electric Company	1000 South 2nd Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	1.04	4.353E-6	2.176E-7
LPAHs	0.01	170,000.00	0.7	4.097E-6	4.097E-8
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

General Electric Company	1000 South 2nd Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.359E-5	1.04	4.62	2.359E-5	1.180E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.269E-5	0.7	3.16	2.269E-5	2.269E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

General Electric Company	**1000 South 2nd Street**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	PVSC Waste Effluent Survey 1971 (PAP-00075204)
	# hours/per day discharged	32250000 gallons to PVSC
	#days/week discharged	
	#weeks/yr discharged	
32,250,000	calc gal/yr discharge	
1950	Yr Ops started	
1975	Yr Ops ceased	
25	calc #yrs facility operated	
Copper (Cu)		
25	#yrs facility discharged	PVSC Waste Effluent Survey 1971 (PAP-00075204)
0.10	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
296.01	calc kg COC discharged	
Lead (Pb)		
25	#yrs facility discharged	PVSC Waste Effluent Survey 1971 (PAP-00075204)
0.01	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
30.52	calc kg COC discharged	
Mercury (Hg)		
25	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
25	#yrs facility discharged	1972 16 mg/l floatable oils
16.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.96	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,929.59	calc kg COC discharged	
LPAHs		
25	#yrs facility discharged	1972 16 mg/l floatable oils
16.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.64	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,953.06	calc kg COC discharged	
PCBs		
26	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
23	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
26	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
25	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
26	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
26	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
296.01	kg Copper	
30.52	kg Lead	
-	kg Mercury	
2,929.59	kg HPAHs	
1,953.06	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	PVSC Waste Effluent Survey 1971 (PAP-00075204)
	# days/week discharged	12900000 gallons to PVSC
	# weeks/yr discharged	
12,900,000	# gals/yr directly discharged	COC Concentrations used per PVSC
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1950	Yr Ops started	
1975	Yr Ops ceased	
25	calc #yrs facility operated	
Copper (Cu)		
25	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
25	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
25	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
25	#yrs facility discharged	
1.40	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.08	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
102.54	calc kg COC discharged	
LPAHs		
25	#yrs facility discharged	
1.40	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.06	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
68.36	calc kg COC discharged	
PCBs		
25	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
25	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
25	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
25	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
25	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
25	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
25	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
102.54	kg HPAHs	
68.36	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

General Electric Company

415 South 5th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.575E-5	5.0%	Occasional Noncompliance	No information on violations was identified in the available file material.UST Spill information; during the 2012 UST removals, visual evidence of a release from the 550-gallon UST was observed in soil. NJDEP was notified and case No.12-06-06-0920-51 was assigned to the 550 gallon UST (contents unknown). Case No.12-06-07-1005-05 was assigned to the 3,000 gallon trichloroethene (TCE) UST when holes were noted in the UST (PAP-00074242; PAP-00074662). 750 square foot area excavated to address PCB contamination of soil. Numerous areas inside and outside buildings were contaminated with mercury.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.888E-5

1000 South 2nd Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.586E-7	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.069E-7

AP_ABS	3.909E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

General Electric Company

415 South 5th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
6.033E-4	5.0%	Occasional Noncompliance	No information on violations was identified in the available file material.UST Spill information; during the 2012 UST removals, visual evidence of a release from the 550-gallon UST was observed in soil. NJDEP was notified and case No.12-06-06-0920-51 was assigned to the 550 gallon UST (contents unknown). Case No.12-06-07-1005-05 was assigned to the 3,000 gallon trichloroethene (TCE) UST when holes were noted in the UST (PAP-00074242; PAP-00074662). 750 square foot area excavated to address PCB contamination of soil. Numerous areas inside and outside buildings were contaminated with mercury.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.128E-4

1000 South 2nd Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.406E-6	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.125E-6

AP_ABS	5.139E-4

Allocation Facility Cmass Calculation

Givaudan Fragrances Corp.	125 Delawanna Avenue	Clifton	NJ	07014

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	1,622.48	100.00%	-	2.32%	43,309.05	100.00%	-	2,627.25	1.018817E-2	26.77
Lead	100.00%	64,899.19	100.00%	-	2.32%	16,968.34	100.00%	-	65,292.87	1.018817E-2	665.22
Mercury	100.00%	91.71	100.00%	-	2.32%	1,044.61	100.00%	-	115.95	1.018817E-2	1.18
HPAHs	100.00%	71.7	100.00%	-	2.32%	2,691.83	100.00%	-	134.16	1.018817E-2	1.37
LPAHs	100.00%	-	100.00%	-	2.32%	2,561.05	100.00%	-	59.42	1.018817E-2	0.61
PCBs	100.00%	2.85	100.00%	-	2.32%	-	100.00%	-	2.85	1.018817E-2	0.03
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	0.1	100.00%	-	2.32%	-	100.00%	-	0.1	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Givaudan Fragrances Corp.	**125 Delawanna Avenue**	**Clifton**	**NJ**	**07014**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	26.77	1.275E-5	8.795E-6
Lead	0.01	3,200,000.00	665.22	2.079E-4	2.079E-6
Mercury	0.95	42,000.00	1.18	2.813E-5	2.672E-5
HPAHs	0.05	240,000.00	1.37	5.695E-6	2.848E-7
LPAHs	0.01	170,000.00	0.61	3.561E-6	3.561E-8
PCBs	12.87	26,000.00	0.03	1.117E-6	1.437E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	2.681E-5	2.250E-3

Allocation Facility COC Base Scores - Alternative Calulcation

Givaudan Fragrances Corp.	125 Delawanna Avenue	Clifton	NJ	07014

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	9.486E-3	26.77	19,893.9	9.486E-3	6.545E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.263E-1	665.22	723,358.89	2.263E-1	2.263E-3
Mercury	0.95	42,000.00	4,322.53	41,955.96	2.682E-2	1.18	1,125.4	2.682E-2	2.548E-2
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	3.087E-5	1.37	6.04	3.087E-5	1.543E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.972E-5	0.61	2.75	1.972E-5	1.972E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.420E-4	0.03	3.66	1.420E-4	1.828E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	2.681E-5	0	0	2.681E-5	2.250E-3

Facility Bypass Information

Givaudan Fragrances Corp.	**125 Delawanna Avenue**	**Clifton**	**NJ**	**07014**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
306,307,069	cal gal/yr avg discharge; (FDR) PAS-00035825, PAS-00035834, PAP-00180554, PAP-00181684, FDR App A4)	
21,600	gal/month discharged for outfall 4 starting in 1991	
8	# yrs outfall 4 discharged to POTW	
24	# hours/per day discharged; three shifts per day) FDR)	
270	#days/yr discharged (FDR - 1996 permit PAP-00172521)	
	#weeks/mon discharged	
	# months/per yr	
1,134,470.63	calc gal/day discharge	FDR Page 20
1951	Yr Ops started (FDR)	FDR Page 18
1998	Yr Ops ceased (FDR)	
47	calc #yrs facility operated	
1926	assumed Yr POTW discharge started; reportedly connected to Clifton City sewer as early as 1926 (FDR)	
1998	Yr POTW discharge ceased	
72	calc # years facility discharged to POTW	
Copper (Cu)		
47	#yrs facility discharged to POTW	FDR Page 18
0.79	calc mg/L COC discharged; (FDR) (PAS-00035825, PAP-00172474, PAP-00172521, FDR AppA4)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
43,309	calc kg COC discharged	
Lead (Pb)		
47	#yrs facility discharged to POTW	FDR Page 18
0.31	calc mg/L COC discharged; (FDR) (PAS-00035825, PAP-00172474, PAP-00172521, PAP-00170725, FDR AppA4)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
16,968	calc kg COC discharged	
Mercury (Hg)		
47	#yrs facility discharged to POTW	FDR Page 18
0.0192	calc mg/L COC discharged; (FDR) (PAS-00035825, PAP-00172474, PAP-00172521, FDR AppA4)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,045	calc kg COC discharged	
HPAHs		
47	#yrs facility discharged to POTW	FDR Page 18
0.049	calc mg/L HPAHs; (FDR) (PAP-00172521)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,692	calc kg COC discharged	
LPAHs		
47	#yrs facility discharged to POTW	FDR Page 18
0.047	calc mg/L HPAHs; (FDR) (PAP-00172521)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,561	calc kg COC discharged	
PCBs		believed absent in permit application PAP00172474
27	#yrs facility operated within PCBs Timeline	
	calc mg/kg	
0.0075%	assumed %mg of material in conveyance carried away via 1L discharge flow through the conveyance	
	calc gal/yr discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		believed absent in permit application PAP00172474
22	#yrs facility operated within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		believed absent in permit application PAP00172474
37	#yrs facility operated within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		present in [low] in trichlorophenol which was used to make hexaxchlorophene/G11 (bactericide) (APQ)
1951	yr facility started COC use (APQ)	R&D on TCP in early 1940s;manufactured TCP 1947-1949, then purchased as raw mat'l from other beginning in 1948; est up to 6804 grams TCDD used, stored, disposed generated otherwise used(APQ)
1984	yr facility ceased COC use (APQ)	process ww discharged to ponds
33	#calc yrs facility discharged COC to POTW	FDR Page 18
1,212	lbs, amt 8/1982 spill of HCP washed down sewer (FDR)	
4.00E-09	amt COC assumed detected in Hexachlorophene (HCP) based on PAP's 1976-1977 anlaytical data results of up to 4ppb TCDD detected in HCP (FDR)	1.00E-07 = COC assumed detected in 245 TCP; based on manufacturer/supplier Hooker Chemical's "firm assurance" of < 0.1 ppm, and Dow Chemical spec sheet (FDR)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0000022	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
48	#yrs facility operated within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
35	#yrs facility operated within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
25	#yrs facility operated within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
43,309	kg Copper	
16,968	kg Lead	
1,045	kg Mercury	
2,692	kg HPAHs	
2,561	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
0.0000022	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
1	# day - assumed spill duration (PAP-00181220)	
24	hr per day	
2	# spill events (3/15/1978, 3/21/1978) (PAP-00181220)	
5	# days/week discharged	
52	# weeks/yr discharged	
100	# gals/hr directly discharged (PAP-00181220-23)	
4,800	# calc gals directly discharged total during two spill (PAP-00181220-23)	
4.08	ft; 30yr average annual precipitation per Rutgers information	
31	acres (FDR)	
43,560	ft2 per acre	
1951	Yr Ops started (FDR)	
1998	Yr Ops ceased (FDR)	
47	calc #yrs facility operated	
Copper (Cu)		
1.0000	#yrs COC discharged	PAP-00181225
0.21	calc mg/L COC discharged; (FDR) (PAP-00181213, 222)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0039	calc kg COC discharged	
Lead (Pb)		
1.0000	#yrs facility operated	PAP-00181225
0.77	calc mg/L COC discharged; (FDR) (PAP-00181213, 222)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0139	calc kg COC discharged	
Mercury (Hg)		
1.0000	#yrs facility operated	PAP-00181225
0.0038	calc mg/L COC discharged; (FDR) (PAP-00181213, 222)	
3.785	calc mg/L COC discharged; (FDR) (PAP-00181213, 222)	
0.000001	kg per mg (Merck Index)	
0.0001	calc kg COC discharged	
HPAHs		
1	#yrs facility operated	PAP-00181225
279	mg/L TOC discharged; (FDR) (PAP-00181220-23)	PAP-00181223
2.50%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
0	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0076	calc kg COC discharged	
LPAHs		
1	#yrs facility operated	PAP-00181225
279	mg/L TOC discharged; per facility report (PAP-00181220-23)	PAP-00181223
2.50%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
0	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0051	calc kg COC discharged	
PCBs		
27	#yrs facility operated within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
22	#yrs facility operated within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
37	#yrs facility operated within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
47	#yrs facility operated	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
48	#yrs facility operated within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
35	#yrs facility operated within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
1940	yr facility started use of COC	
1984	yr facility ceased use COC	
25	#yrs facility operated within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
0.0039	kg Copper	
0.0139	kg Lead	
0.0001	kg Mercury	
0.0076	kg HPAHs	
0.0051	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
31	ACRES - TOTAL SITE AREA (acres)	FDR, page 1; confirmed on Google Earth	
12	ACRES - AFFECTED AREA	Exclude 19 acres of buildings and pavement (1995-2020 Google Earth aerial photos)	
4,046.86	METERS^2/ACRE	CONVERSION TO METERS	
48,562	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
5	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED to Yantacaw Pond and Third River discharging to Passaic.	
1924	Year site operations began	Givaudan Fragrances Corporation (Givaudan) purchased the assets of Burton T. Bush, Inc. in 1924 (PAS-00048099).	
1998	Year site operations ceased	Givaudan ceased manufacturing operations in June 1998. The cleaning of plant processing equipment continued until September 1998. All raw materials and chemicals were removed from the facility by the end of October 1998 (FDR page 1; PAP-00178473).	
74	NUMBER YEARS DISCHARGE		
359	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	The unconsolidated overburden at the site consists of stratified sand, gravel, silt, and some clay (PAP-00182257). Bulk density range 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
705,426	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Some of the site perimeter is located on historic fill material (FDR page 16)	
Copper (Cu)			
74	YEARS DISCHARGED		
2,300	MG/KG (MAX CONCENTRATION)	Used sample SSF-30-SW-W (PAP-00033881)	
0.000001	kg per mg (Merck Index)		
1,622	KILOGRAMS DISCHARGED		
Lead (Pb)			
74	YEARS DISCHARGED		
92,000	MG/KG MAX CONCENTRATION)	PAS-00033880, depth unknown	
0.000001	kg per mg (Merck Index)		
64,899	KILOGRAMS DISCHARGED		
Mercury (Hg)			
74	YEARS DISCHARGED		
130.0	MG/KG (MAX CONCENTRATION)	PAS-00033880, depth unknown	
0.000001	kg per mg (Merck Index)		
92	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
74	YEARS DISCHARGED		
101.6	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations listed on PAS-00033886, depth unknown	
0.000001	kg per mg (Merck Index)		
72	KILOGRAMS DISCHARGED		
PAHs (others detected)			
74	YEARS DISCHARGED		
0	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	79.000	1.0	79.0000
Benzo(a)anthracene	49.000	0.1	4.9000
Benzo(b)fluoranthene	0.000	0.1	0.0000
Benzo(k)fluoranthene	120.000	0.01	1.2000
Chrysene	40.000	0.001	0.0400
Dibenz(a,h)anthracene	14.000	1.0	14.0000
Indeno(1,2,3-cd)pyrene	25.000	0.1	2.5000
DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg			
		Total Benzo(a)pyrene Equivalents =	**101.6**

PCBs			
68	YEARS DISCHARGED		
4.4	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Sample SBRR-07 (5-6) had the max concentration of Aroclor-1260 (PAP-00175755); Years of discharge - 68.	According to a Hazardous Waste Investigation, dated June 5, 1980, it was ascertained that Givaudan was generating and storing polychlorinated biphenyls (PCBs) onsite. The report states that U.S. EPA inspectors had a report concerning Givaudan's PCB practices, but additional details were not available (PAP-00172019). An undated record titled "Exhibit No. 2, Transformers - PCB Oil-Filled Electrical Transformers" states that the facility historically had 30 PCB-containing transformers (PAP-00176671-72). According to a Plans for Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR), dated July 1982, Givaudan had 38 transformers in operation containing PCBs (PAP-00182108).
0.000001	kg per mg (Merck Index)		
3	KILOGRAMS DISCHARGED		
DDx			
0	YEARS DISCHARGED within DDx Timeline	NONE REPORTED	
	MG/KG (MAX CONCENTRATION)		
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dieldrin			
0	YEARS DISCHARGED within Dieldrin Timeline	NONE REPORTED	
	MG/KG (MAX CONCENTRATION)		
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dioxins/Furans			
51	YEARS DISCHARGED		
0.2	MG/KG (MAX CONCENTRATION)	Max concentration in soil samples. Sample depths ranged from zero to 12 inches bgs (PAP-00179717-18).	Givaudan produced hexachlorophene (HCP), which was contaminated with dioxins (1990 NIOSH Report), but production did not begin until 1947 (PAS-00083414) Modified period discharged to 1947-1998, 51 years
0.000001	kg per mg (Merck Index)		
0.10	KILOGRAMS DISCHARGED		

SUMMARY CMASS ESTIMATES:	
1,622.48	kg Copper
64,899.19	kg Lead
91.71	kg Mercury
71.70	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
2.85	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.10	kg Dioxins/Furans

66,688.02	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Givaudan Fragrances Corp.

125 Delawanna Avenue	**Clifton**	**NJ**	**07014**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.302E-3	10.0%	Periodic Noncompliacne	On June 17, 1983, the governor of New Jersey issued an Executive Order declaring a state of emergency due to TCDD contamination at the site (PAS-00001801). Givaudan entered into an Administrative Consent Order with NJDEP on March 5, 1987; an Amended Administrative Consent Order TCDD was signed on February 16, 1988. These consent orders required the investigation and remediation of TCDD contamination in soil (PAS-00001767-73).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.072E-3

AP_ABS	2.072E-3

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Givaudan Fragrances Corp.

125 Delawanna Avenue	**Clifton**	**NJ**	**07014**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.837E-2	10.0%	Periodic Noncompliacne	On June 17, 1983, the governor of New Jersey issued an Executive Order declaring a state of emergency due to TCDD contamination at the site (PAS-00001801). Givaudan entered into an Administrative Consent Order with NJDEP on March 5, 1987; an Amended Administrative Consent Order TCDD was signed on February 16, 1988. These consent orders required the investigation and remediation of TCDD contamination in soil (PAS-00001767-73).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.453E-2

AP_ABS	3.453E-2

Allocation Facility Cmass Calculation

Goodrich Corporation	290 River Drive	Garfield	NJ	07026

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	29.05	100.00%	-	2.32%	17,574.38	100.00%	-	436.78	1.018817E-2	4.45
Lead	100.00%	43.31	100.00%	-	2.32%	385.78	100.00%	-	52.26	1.018817E-2	0.53
Mercury	100.00%	0.06	100.00%	-	2.32%	-	100.00%	-	0.06	1.018817E-2	0
HPAHs	100.00%	0.73	100.00%	-	2.32%	2,495.66	100.00%	240.3	298.95	1.018817E-2	3.05
LPAHs	100.00%	0.34	100.00%	-	2.32%	1,663.77	100.00%	160.2	199.15	1.018817E-2	2.03
PCBs	100.00%	0.12	100.00%	-	2.32%	-	100.00%	-	0.12	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Goodrich Corporation	**290 River Drive**	**Garfield**	**NJ**	**07026**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	4.45	2.119E-6	1.462E-6
Lead	0.01	3,200,000.00	0.53	1.664E-7	1.664E-9
Mercury	0.95	42,000.00	0	1.455E-8	1.383E-8
HPAHs	0.05	240,000.00	3.05	1.269E-5	6.345E-7
LPAHs	0.01	170,000.00	2.03	1.194E-5	1.194E-7
PCBs	12.87	26,000.00	0	4.702E-8	6.052E-7
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Goodrich Corporation	290 River Drive	Garfield	NJ	07026

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.577E-3	4.45	3,307.32	1.577E-3	1.088E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.811E-4	0.53	578.97	1.811E-4	1.811E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.388E-5	0	0.58	1.388E-5	1.319E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	6.878E-5	3.05	13.46	6.878E-5	3.439E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	6.610E-5	2.03	9.21	6.610E-5	6.610E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	5.980E-6	0	0.15	5.980E-6	7.696E-5
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Goodrich Corporation	**290 River Drive**	**Garfield**	**NJ**	**07026**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	0.00%	0.00%	Date of operation 1982-1994

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
114,391,833	calc gal/yr discharge (FDR) (PAP-00016712, 16715; PAP-00433684; PAP-00206119, PAP-00206137, PAP-00433614, PAP-00016698)	
365	#day per yr operated (FDR) (PAP-00016712, 16715, PAP-00206119)	
1983	Yr Ops started (FDR)	
1994	Yr Ops ceased (FDR)	
11	calc #yrs facility operated	
Copper (Cu)		
11	#yrs facility discharged	
3.69	calc mg/L COC discharged (PAP-00016712, 16715; PAP-00433684; PAP-00206119)	FDR, Discharge Report Pages 15-17
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
17,574	calc kg COC discharged	
Lead (Pb)		
11	#yrs facility discharged	
0.08	calc mg/L COC discharged; (FDR) (PAP-00433684)	FDR, Discharge Report Pages 15-17
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
386	calc kg COC discharged	
Mercury (Hg)		
11	#yrs facility discharged	FDR, Discharge Report Pages 17-19
-	calc mg/L COC discharged; (FDR) (PAP-00433684)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
11	#yrs facility discharged	
8.7	calc mg/L O&G (FDR) (PAP-00016712, 16715; PAP-00433684; PAP-00206119, PAP-00206137)	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
0.52	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,496	calc kg COC discharged	
LPAHs		
11	#yrs facility discharged	
8.7	calc mg/L O&G (FDR) (PAP-00016712, 16715; PAP-00433684; PAP-00206119, PAP-00206137)	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
0.35	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,664	calc kg COC discharged	
PCBs		
-5	#yrs facility discharged within PCBs Timeline	
	calc mg/kg	
0.0075%	assumed %mg of material in conveyance carried away via 1L discharge flow through the conveyance	
	calc gal/yr discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-10	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
5	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
12	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
3	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-7	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
17,574	kg Copper	
386	kg Lead	
-	kg Mercury	
2,496	kg HPAHs	
1,664	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	
481,009,150	# gals/yr directly discharged (PAP-00016712, PAP-00206119, PAP-00206137, PAP-00016698)	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
365	#day operated per yr (PAP-00206119, PAP-00433684)	
1983	Yr Ops started	
1994	Yr Ops ceased	
11	calc #yrs facility operated	
Copper (Cu)		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
11	#yrs facility discharged	
0.2	calc mg/L O&G discharged (PAP-00206137)	
10%	% PAHs assumed in O&G	
60%	% COC assumed in PAHs	
0.01	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
240.32	calc kg COC discharged	
LPAHs		
11	#yrs facility discharged	
0.2	calc mg/L O&G discharged (PAP-00206137)	
10%	% PAHs assumed in O&G	
40%	% COC assumed in PAHs	
0.01	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
160.21	calc kg COC discharged	
PCBs		
-5	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-10	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
5	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
12	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
3	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-7	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
240	kg HPAHs	
160	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
7	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
1.8	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of historical aerial photograph from 1995 (Google Earth Pro). Estimating 50% of the site was occupied by buildings and approximately 25% of the site is paved.	
4,046.86	METERS^2/ACRE		
7,082	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1982	Year site operations began (FDR p 1)	Goodrich (as Kalama Chemical Inc) bought site in 1982 (FDR p 1)	
2020	Goodrich is current owner (FDR p 1)	Goodrich operations ceased in 1994. Manufacturing equipment and chemicals removed that year (FDR p 1)	
38	NUMBER YEARS DISCHARGE		
27	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill is described as poorly sorted sand and gravel, brick fragments, and cinders (PAP-00044391). Bulk density range is 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
52,814	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The majority of the site is not located on regional historic fill (FDR p 9)	
Copper (Cu)		Building 7 was a copper shop where sheet metal was fabricated (FDR p 7)	
38	YEARS DISCHARGED		
550	MG/KG (MAX CONCENTRATION)	Sample B-47-FILL (0-0.5 ft bgs) (PAP-00041872)	
0.000001	kg per mg (Merck Index)		
29	KILOGRAMS DISCHARGED		
Lead (Pb)		Lead-containing hazardous solid waste was shipped offsite (FDR p 7)	
38	YEARS DISCHARGED		
820	MG/KG (MAX CONCENTRATION)	Sample B-47-FILL (0-0.5 ft bgs) (PAP-00041872)	
0.000001	kg per mg (Merck Index)		
43	KILOGRAMS DISCHARGED		
Mercury (Hg)		Mercury-containing hazardous solid waste was shipped offsite (FDR p 9)	
38	YEARS DISCHARGED		
1.2	MG/KG (MAX CONCENTRATION)	Sample B-50-FILL (0-2 ft bgs) (PAP-00041872)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
38	YEARS DISCHARGED	Fuel oil USTs were present on the site (FDR p 6)	
13.8	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
38	YEARS DISCHARGED		
6.53	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Sample B-52-A (0-2 ft bgs) (PAP-00041872)	Benzo(a)pyrene	10.000	1.0	10.0000
	Benzo(a)anthracene	12.000	0.1	1.2000
	Benzo(b)fluoranthene	13.000	0.1	1.3000
	Benzo(k)fluoranthene	2.500	0.01	0.0250
	Chrysene	12.000	0.001	0.0120
	Dibenz(a,h)anthracene	1.000	1.0	1.0000
	Indeno(1,2,3-cd)pyrene	2.900	0.1	0.2900
	DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg			
	Total Benzo(a)pyrene Equivalents =			13.8

PCBs		
38	YEARS DISCHARGED	Several PCB transformers on site (FDR p 5)
2.2	MG/KG MAX CONCENTRATION)	Sample B-44-01 (0.3-0.8 ft bgs), Aroclor-1260 concentration (PAP-00041882)
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
0	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
38	YEARS DISCHARGED within Dieldrin Timeline	
0	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Sample B-52-A (0-2 ft bgs) (PAP-00041872)	
Anthracene	1.3
Acenaphthene	0.11
Acenapthylene	0.24
Fluorene	0
Naphthalene	0.12
Phenanthrene	4.6
2-methylnaphthalene	0.16
SUM	6.53

SUMMARY CMASS ESTIMATES:	
29.05	kg Copper
43.31	kg Lead
0.06	kg Mercury
0.73	kg PAHs (Benzo(a)pyrene Equivalent)
0.34	kg PAHs (Other)
0.12	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

73.61 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Goodrich Corporation

290 River Drive	**Garfield**	**NJ**	**07026**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.837E-6	5.0%	Occasional Noncompliance	The PVSC sent a notice of violation on May 2, 1991, for non-COCs (chloroform and toluene) but these were noted by the facility to be sampling error and subsequent results showed compliance (PAP-00208805). Another PVSC notice of violation for permit 0949429 based on a non-COC (methylene chloride) was dated April 13, 1994 (PAP-00208813). Violations were noted for Hart Chemical Co. (tenant) at the facility based on a December 15, 1988, inspection by the New Jersey Bureau of Fire Safety. The violations included permits needed for the flammable and corrosive areas, and a diked area for the manufacturing area (PAP-00433532). New Jersey Department of Health inspected on September 14, 1992 and noted violations for failure to label containers (PAP-00433862-65).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.411E-6

AP_ABS	2.411E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Goodrich Corporation

290 River Drive	**Garfield**	**NJ**	**07026**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.184E-3	5.0%	Occasional Noncompliance	The PVSC sent a notice of violation on May 2, 1991, for non-COCs (chloroform and toluene) but these were noted by the facility to be sampling error and subsequent results showed compliance (PAP-00208805). Another PVSC notice of violation for permit 0949429 based on a non-COC (methylene chloride) was dated April 13, 1994 (PAP-00208813). Violations were noted for Hart Chemical Co. (tenant) at the facility based on a December 15, 1988, inspection by the New Jersey Bureau of Fire Safety. The violations included permits needed for the flammable and corrosive areas, and a diked area for the manufacturing area (PAP-00433532). New Jersey Department of Health inspected on September 14, 1992 and noted violations for failure to label containers (PAP-00433862-65).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.007E-3

AP_ABS	1.007E-3

Allocation Facility Cmass Calculation

Goody Products Inc.	969 Newark Turnpike	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	136.94	100.00%	-	0.00%	-	100.00%	7.7	144.61	1.018817E-2	1.47
Lead	100.00%	728.83	100.00%	-	0.00%	-	100.00%	8.9	737.76	1.018817E-2	7.52
Mercury	100.00%	0.6	100.00%	-	0.00%	-	100.00%	-	0.6	1.018817E-2	0.01
HPAHs	100.00%	3.82	100.00%	-	0.00%	-	100.00%	4,094.7	4,098.57	1.018817E-2	41.76
LPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	2,729.8	2,729.83	1.018817E-2	27.81
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Goody Products Inc.	969 Newark Turnpike	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	1.47	7.016E-7	4.841E-7
Lead	0.01	3,200,000.00	7.52	2.349E-6	2.349E-8
Mercury	0.95	42,000.00	0.01	1.455E-7	1.383E-7
HPAHs	0.05	240,000.00	41.76	1.740E-4	8.699E-6
LPAHs	0.01	170,000.00	27.81	1.636E-4	1.636E-6
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Goody Products Inc.	969 Newark Turnpike	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	5.221E-4	1.47	1,095.04	5.221E-4	3.603E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.557E-3	7.52	8,173.44	2.557E-3	2.557E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.388E-4	0.01	5.82	1.388E-4	1.319E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	9.430E-4	41.76	184.56	9.430E-4	4.715E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	9.061E-4	27.81	126.22	9.061E-4	9.061E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Goody Products Inc.	**969 Newark Turnpike**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
5	# days/week discharged	
52	# weeks/yr discharged	
4915524	# gals/yr directly discharged; (PAP-00350464, PAP-00105300, 00105365-68, PAP-00447426, PAP-00446408)	PAP-00446050-00447531
4.08	ft; 30yr average annual precipitation per Rutgers information	no apparently municipal discharge when 1983 permit application completed (PAP-00105315)
	acres	
43,560	ft2 per acre	
1984	Yr Ops started (FDR)	(goody leased property in 5/1966)
1994	Yr Ops ceased (FDR)	
11	calc #yrs facility operated	FDR Pages 1-9, PAP-00103485, PAP-00104911, PAP-00104832, PAP-00105268, PAS-0001863 & FDR Page 17
Copper (Cu)		
11	#yrs facility discharged	
0.0375	calc mg/L COC discharged;	(FDR) (DMR data reported in FDR (pp. 11-15), PAP-00350464, PAP-00105300, 365-68)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
7.67	calc kg COC discharged	
Lead (Pb)		
11	#yrs facility discharged	
0.0437	calc mg/L COC discharged;	(FDR) (DMR data reported in FDR (pp. 11-15), PAP-00105300, 365-68)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
8.93	calc kg COC discharged	
Mercury (Hg)		NJ agrees HG in creek sediment samples is from another source not Goody (PAS-00001863, 76-77)
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
11	#yrs facility discharged	
333	calc mg/L O&G (FDR) (DMR data reported in FDR (pp. 11-15), PAP-00350464)	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
20	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,095	calc kg COC discharged	
LPAHs		
11	#yrs facility discharged	
333	calc mg/L O&G (FDR) (DMR data reported in FDR (pp. 11-15), PAP-00350464)	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
13	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,730	calc kg COC discharged	
PCBs		ND in periodic priority pollutant scans
-6	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		ND in periodic priority pollutant scans
-11	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		ND in periodic priority pollutant scans
4	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		no use/presence per AP
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
11	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
2	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-8	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
7.67	kg Copper	
9	kg Lead	
-	kg Mercury	
4,095	kg HPAHs	
2,730	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
10.3	ACRES - TOTAL SITE AREA (acres)	FDR, PDF PAGE 1	
2.6	ACRES - AFFECTED AREA	Affected area = 3 acres. A 1990 report states approximately 7.7 acres of the site are under roof or asphalt (PAP-00104322). Given the period of operation (1968-1996), it can be assumed that much of that was paved during operation.	
4,046.86	METERS^2/ACRE		
10,522	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES AND DEAD HORSE CREEK	
1968	Year site operations began	Site developed in 1968 (FDR page 9; PAP-00103480)	
1994	Year site operations ceased	Operations at the site ceased in May 1994 (PAP-00104911; PAP-00104832; PAP-00105268; PAS-00001863). Ending year reflectx the year Goody Products (as H Goodman & Sons, Inc.) stopped operations on the site, which they leased instead of owned (FDR p 1).	Owner: Jeryl Industries, Inc., from pre-1969 to at least 1996 (PAS-00001835; PAS-00002050)
26	NUMBER YEARS DISCHARGE		
27	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill reported as silty sand and gravel (FDR). Bulk density range 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
53,701	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The entirety of the site is located on historic fill material (FDR page 9)	
Copper (Cu)			
26	YEARS DISCHARGED		
2,550	MG/KG (MAX CONCENTRATION)	COCs Found in Onsite Soils, Max Detected Concentration (FDR page 8)	
0.000001	kg per mg (Merck Index)		
137	KILOGRAMS DISCHARGED		
Lead (Pb)			
26	YEARS DISCHARGED		
13,572	MG/KG MAX CONCENTRATION)	COCs Found in Onsite Soils, Max Detected Concentration (FDR page 8)	
0.000001	kg per mg (Merck Index)		
729	KILOGRAMS DISCHARGED		
Mercury (Hg)			
26	YEARS DISCHARGED		
11.2	MG/KG (MAX CONCENTRATION)	COCs Found in Onsite Soils, Max Detected Concentration (FDR page 8)	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)	Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene	total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
26	YEARS DISCHARGED	
71.1	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using PAH compounds listed in COCs Found in Onsite Soils, Max Detected Concentration (FDR page 8) Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.
0.000001	kg per mg (Merck Index)	
4	KILOGRAMS DISCHARGED	
PAHs (others detected)		No other PAH data in provided documents
26	YEARS DISCHARGED	
0	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PCBs		
26	YEARS DISCHARGED	
0	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Concentration set at 0 mg/kg. PCBs are not included in the FDR, indicating that they have not been found at the site.
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	NONE REPORTED
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	NONE REPORTED
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	NONE REPORTED
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	48.000	1.0	48.0000
Benzo(a)anthracene	49.000	0.1	4.9000
Benzo(b)fluoranthene	63.000	0.1	6.3000
Benzo(k)fluoranthene	24.000	0.01	0.2400
Chrysene	5.400	0.001	0.0054
Dibenz(a,h)anthracene	8.600	1.0	8.6000
Indeno(1,2,3-cd)pyrene	31.000	0.1	3.1000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **71.1**

SUMMARY CMASS ESTIMATES:	
136.94	kg Copper
728.83	kg Lead
0.60	kg Mercury
3.82	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

870.20 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Goody Products Inc.

969 Newark Turnpike	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.098E-5	10.0%	Periodic Noncompliacne	Multiple violations for discharging polluting materials into the waters of Dead Horse Creek, a tributary to the Passaic River in 1975 and 1978-9 (PAP-00105499; PAP-00105516-17; PAP-00103534-43; PAP-00105481-83). The Goody Products facility received a rating of "Unacceptable" due to several deficiencies in 1987 (the bypass of the effluent filter and filter press at Industrial Treatment, discharge 001, due to pump failure had not been reported as required, sanitary wastewater treatment plant was flooded). NOVs issued for copper exceedances of the permit limits in 1988-9, 1991 (PAP-00105282-84; PAP-00447388-91; PAP-00447037-38). In 1993, Administrative Consent Order Affidavit identified exceedances, alleged discharges to ground surface, and unpermitted discharges (PAP-00350695-98) .	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	9.883E-6

AP_ABS	9.883E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Goody Products Inc.

969 Newark Turnpike	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.739E-4	10.0%	Periodic Noncompliacne	Multiple violations for discharging polluting materials into the waters of Dead Horse Creek, a tributary to the Passaic River in 1975 and 1978-9 (PAP-00105499; PAP-00105516-17; PAP-00103534-43; PAP-00105481-83). The Goody Products facility received a rating of "Unacceptable" due to several deficiencies in 1987 (the bypass of the effluent filter and filter press at Industrial Treatment, discharge 001, due to pump failure had not been reported as required, sanitary wastewater treatment plant was flooded). NOVs issued for copper exceedances of the permit limits in 1988-9, 1991 (PAP-00105282-84; PAP-00447388-91; PAP-00447037-38). In 1993, Administrative Consent Order Affidavit identified exceedances, alleged discharges to ground surface, and unpermitted discharges (PAP-00350695-98) .	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.165E-4

AP_ABS	5.165E-4

Allocation Facility Cmass Calculation

Harris Corporation	**100 Kingsland Drive, Clifton, NJ; 77 River Road, Clifton, NJ ; 500 Washington Avenue, Nutley, NJ; 390 Washington Avenue, Nutley, NJ; 417 River Road, Nutley, NJ; 491/493 River Road, Nutley, NJ; 483 River Road, Nutley, NJ; 492 River Road, Nutley, NJ**	**Clifton**	**NJ**	**07014**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	186.26	100.00%	-	2.32%	9,358.53	100.00%	-	403.38	1.018817E-2	4.11
Lead	100.00%	367.75	100.00%	-	2.32%	648.50	100.00%	-	382.8	1.018817E-2	3.9
Mercury	100.00%	0.01	100.00%	-	2.32%	-	100.00%	-	0.01	1.018817E-2	0
HPAHs	100.00%	0.06	100.00%	-	2.32%	-	100.00%	-	0.06	1.018817E-2	0
LPAHs	100.00%	0.13	100.00%	-	2.32%	-	100.00%	-	0.13	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Harris Corporation	**100 Kingsland Drive, Clifton, NJ; 77 River Road, Clifton, NJ ; 500 Washington Avenue, Nutley, NJ; 390 Washington Avenue, Nutley, NJ; 417 River Road, Nutley, NJ; 491/493 River Road, Nutley, NJ; 483 River Road, Nutley, NJ; 492 River Road, Nutley, NJ**	**Clifton**	**NJ**	**07014**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	4.11	1.957E-6	1.350E-6
Lead	0.01	3,200,000.00	3.9	1.219E-6	1.219E-8
Mercury	0.95	42,000.00	0	2.426E-9	2.304E-9
HPAHs	0.05	240,000.00	0	2.547E-9	1.274E-10
LPAHs	0.01	170,000.00	0	7.791E-9	7.791E-11
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Harris Corporation	**100 Kingsland Drive, Clifton, NJ; 77 River Road, Clifton, NJ ; 500 Washington Avenue, Nutley, NJ; 390 Washington Avenue, Nutley, NJ; 417 River Road, Nutley, NJ; 491/493 River Road, Nutley, NJ; 483 River Road, Nutley, NJ; 492 River Road, Nutley, NJ**	**Clifton**	**NJ**	**07014**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.456E-3	4.11	3,054.43	1.456E-3	1.005E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.326E-3	3.9	4,240.86	1.326E-3	1.326E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	2.313E-6	0	0.1	2.313E-6	2.198E-6
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.380E-8	0	0	1.380E-8	6.902E-10
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	4.315E-8	0	0.01	4.315E-8	4.315E-10
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Harris Corporation	**100 Kingsland Drive, Clifton, NJ; 77 River Road, Clifton, NJ ; 500 Washington Avenue, Nutley, NJ; 390 Washington Avenue, Nutley, NJ; 417 River Road, Nutley, NJ; 491/493 River Road, Nutley, NJ; 483 River Road, Nutley, NJ; 492 River Road, Nutley, NJ**	**Clifton**	**NJ**	**07014**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
270,153	gal discharged per day (PAP00426063, PAP00203263, PAP00427182)	3 outfalls (OU3, 4 and 5)
	# hours/per day discharged	Combined numbers used in calculations
5	#days/week discharged	No information on people, shifts or hrs/day
52	#weeks/yr discharged	assumes 5 days per week, 52 weeks per year.
70,239,655	calc gal/yr discharge	
1946	Yr Ops started	
1975	Yr Ops ceased	
29	calc #yrs facility operated	FDR 15, PAP-00203263
Copper (Cu)		
29	#yrs facility discharged	Pretreatment Monitoring Reports from 1987, 1988, 1989, 1990, 1994, 1996, 1997, 1998
1.21	calc mg/L COC discharged PAP00203228, PAP00426083, PAP00203246, PAP00427182	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
9,358.53	calc kg COC discharged	
Lead (Pb)		
29	#yrs facility discharged	
0.0841	calc mg/L COC discharged PAP00203228, PAP00426083, PAP00203246, PAP00427182	Pretreatment Monitoring Reports from 1987, 1988, 1989, 1990, 1991, 1994, 1996, 1997
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
648.50	calc kg COC discharged	
Mercury (Hg)		
29	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
29	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
29	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
30	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
27	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
26	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
29	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
30	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
30	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
9,358.53	kg Copper	
648.50	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
26	ACRES - TOTAL SITE AREA (acres)	Kingsland Road Area - 50 acres from 1946 (PAP-00199502)	
13	ACRES - AFFECTED AREA	Area surrounding the building and the parking lot. Map on FDR pg 2). The Kingsland Road Area was subdivided into Block 83.01, Lot 1.01 and Block 83.01, Lot 1.02 in 2001. Lot 1.02 was sold for redevelopment. The address of the remaining 26 acres was changed from 100 Kingsland Road to 77 River Road (PAP-00204976; PAP-00199552;	
4,046.86	METERS^2/ACRE	Approximtely 50% of the remaining 26 acres is coverd with buidling or parking lots. The facility layout circa 1990 depicted on FDR page 2 (PAP-00202318) .	
52,609	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
5	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1945	Year site operations began	FDR	
2003	Year site processing and storage operations ceased	FDR	
58	NUMBER YEARS DISCHARGE		
305	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,965	KG/M^3 SOIL DENSITY		
599,587	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The Allocation Team has determined that the facility site is not located on regional Historic Fill (FDR).	
Copper (Cu)			
58	YEARS DISCHARGED		
	MG/KG (MAX CONCENTRATION)	No soil samples for analyzed for copper in provided documentation.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
58	YEARS DISCHARGED		
	MG/KG (AVERAGE CONCENTRATION)	No soil samples for analyzed for lead in provided documentation.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
58	YEARS DISCHARGED		
0.0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
58	YEARS DISCHARGED		
0.0	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations listed in (PAP-00199883). Use 0 mg/kg as concentration. Sample is a confirmation sample from UST removal, and therefore not applicable for PAHs surface erosion.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)		Other PAHs = Benzo(g,h,i)perylene, Fluorene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Naphthalene, 2-Methylnaphthalene (Table 2-7, Sample No. 7 (PAP-00199883)). Use 0 mg/kg as concentration. Sample is a confirmation sample from UST removal, and therefore not applicable for PAHs surface erosion.	
58	YEARS DISCHARGED		
0.00	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.250	1.0	0.2500
Benzo(a)anthracene	0.380	0.1	0.0380
Benzo(b)fluoranthene	0.360	0.1	0.0360
Benzo(k)fluoranthene	0.087	0.01	0.0009
Chrysene	0.400	0.001	0.0004
Dibenz(a,h)anthracene		1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.150	0.1	0.0150

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.3**

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PCBs		
52	YEARS DISCHARGED	Years of discharge ends in 1997.
0.317	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Sum of Aroclor 1016, 1254 & 1260 concentrations (PAP-00200026)
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	Area = 0.5 acres impacted surrounding the concrete pads.
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		NOT DETECTED (FDR)
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
0.00	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

0.00	MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
81	ACRES - TOTAL SITE AREA (acres)	Washington Avenue Area - 81 acres from 1941 (PAP-00205117)	
0.25	ACRES - AFFECTED AREA		
4,046.86	METERS^2/ACRE		
1,012	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1941	Year site operations began	ITT purchased the Washington Avenue Area in 1941 (PAP-00205092)	
1993	Year site was remediated	Dry well-affected subsurface soils were removed in 1993 and confirmation samples were collected (PAP-00200077-80; PAP-00199293).	
52	NUMBER YEARS DISCHARGE		
5	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,979	KG/M^3 SOIL DENSITY	Predominantly red-brown fine to coarse sand with traces of gravel silty sand, clayey silt and silty clay (PAP-00205099). Cross referencing as silty sand, the bulk density range 1602 KG/M^3 to 2355 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
10,409	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
52	YEARS DISCHARGED		
52.1	MG/KG (MAX CONCENTRATION)	Site Evaluation Submission and Cleanup Plan Report, dated July 1993, Tbl 3-8, PAP-00205137	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
Lead (Pb)			
52	YEARS DISCHARGED		
58	MG/KG (AVERAGE CONCENTRATION)	Site Evaluation Submission and Cleanup Plan Report, dated July 1993, Tbl 3-8, PAP-00205137	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
Mercury (Hg)			
52	YEARS DISCHARGED		
0.83	MG/KG (MAX CONCENTRATION)	Site Evaluation Submission and Cleanup Plan Report, dated July 1993, Tbl 3-8, PAP-00205137	
0.000001	kg per mg (Merck Index)		
0.01	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)	Site Evaluation Submission and Cleanup Plan Report, dated July 1993, Tbl 3-7, PAP-00205136	total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
52	YEARS DISCHARGED	
1.9	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PAHs (others detected)		Fluorene - 0.39 J ppm Naphthalene - 0.39 J ppm Anthracene -0. 560 ppm Acenaphthene - 0.39 J ppm Phenanthrene - 2.2 ppm Site Evaluation Submission and Cleanup Plan Report, dated July 1993, Table 3-7, MW-25 (PAP-00205136)
52	YEARS DISCHARGED	
3.93	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PCBs		
52	YEARS DISCHARGED	
	MG/KG (MAX OF REPORTED CONCENTRATIONS)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		NOT A COC
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		NOT A COC
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	NOT A COC
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Site Evaluation Submission and Cleanup Plan Report, dated July 1993, Table 3-7, MW-25 (PAP-00205136)

Note on Benzo(k)fluoranthene: Compound is not separable using this method and are therefore quantified together. (Footnote L Table 3-7, PAP-00205136)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	1.10	1.0	1.1000
Benzo(a)anthracene	1.20	0.1	0.1200
Benzo(b)fluoranthene	1.80	0.1	0.1800
Benzo(k)fluoranthene	0.00	0.01	0.0000
Chrysene	1.20	0.001	0.0012
Dibenz(a,h)anthracene	0.39	1.0	0.3900
Indeno(1,2,3-cd)pyrene	0.71	0.1	0.0710

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **1.9**

SUMMARY CMASS ESTIMATES:

0.54	kg Copper
0.60	kg Lead
0.01	kg Mercury
0.02	kg PAHs (Benzo(a)pyrene Equivalent)
0.04	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

1.21 MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
17.5	ACRES - TOTAL SITE AREA (acres)	River Road Area - 17.5 acres from 1952 (PAP-00202995)	
6	ACRES - AFFECTED AREA	East Lawn is approximately 6 acres (FDR).	
4,046.86	METERS^2/ACRE		
24,281	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1952	Year site operations began	River Road Area – (PAP-00199276).	
1997	Year site processing and storage operations ceased	Property sold and devoloped by Related Retail Corporation for commercial use. (PAP-00204915; PAP-00199552)	
45	NUMBER YEARS DISCHARGE		
109	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,965	KG/M^3 SOIL DENSITY	Fill classified for density as silty sand with trace of gravel (PAP-00199283). Bulk density range 1450 KG/M^3 to 2480 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
214,706	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The Allocation Team concurred that this site is not located on Historic fill (FDR).	
Copper (Cu)			
45	YEARS DISCHARGED		
865	MG/KG (MAX CONCENTRATION)	Table 1-3 (PAP-00199312)	The Allocation Team concluded that this site is not located on Historic fill (FDR).
0.000001	kg per mg (Merck Index)		
186	KILOGRAMS DISCHARGED		
Lead (Pb)			
45	YEARS DISCHARGED		
1710	MG/KG (AVERAGE CONCENTRATION)	Table 1-3 (PAP-00199312)	The Allocation Team concluded that this site is not located on Historic fill (FDR).
0.000001	kg per mg (Merck Index)		
367	KILOGRAMS DISCHARGED		
Mercury (Hg)			
45	YEARS DISCHARGED		
0.0	MG/KG (MAX CONCENTRATION)	Table 1-3 (PAP-00199312) Hg was non-detect	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
45	YEARS DISCHARGED		
0.2	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)		Anthracene - 0.08 ppm Phenanthrene - 0.32 ppm	
45	YEARS DISCHARGED	Table 1-6, Sample No. 5 (PAP-00199315)	
0.40	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PCBs		No history of COC use	
0	YEARS DISCHARGED		
	MG/KG (MAX OF REPORTED CONCENTRATIONS)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
DDx		No history of COC use	
0	YEARS DISCHARGED within DDx Timeline		
	MG/KG (MAX CONCENTRATION)		
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Table 1-6, Sample No. 5 (PAP-00199315)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.150	1.0	0.1500
Benzo(a)anthracene	0.160	0.1	0.0160
Benzo(b)fluoranthene	0.190	0.1	0.0190
Benzo(k)fluoranthene	0.089	0.01	0.0009
Chrysene	0.160	0.001	0.0002
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.080	0.1	0.0080

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.2**

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Dieldrin		No history of COC use
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	No history of COC use
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
185.72	kg Copper
367.15	kg Lead
0.00	kg Mercury
0.04	kg PAHs (Benzo(a)pyrene Equivalent)
0.09	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

553.00	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Harris Corporation

100 Kingsland Drive, Clifton, NJ; 77 River Road, Clifton, NJ ; 500 Washington Avenue, Nutley, NJ; 390 Washington Avenue, Nutley, NJ; 417 River Road, Nutley, NJ; 491/493 River Road, Nutley, NJ; 483 River Road, Nutley, NJ; 492 River Road, Nutley, NJ	**Clifton**	**NJ**	**07014**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.365E-6	0.0%	Historically Compliant or No Evidence	The threshold value for lead was noted to be exceeded in monitoring reports from January to March 1999 (PAP-00722741); however, these deficiencies were noted to not be violations of the permit (PAP-00722287-8, 738). According to a Preliminary Assessment and Site Investigation Report, dated June 26, 2012, during visual inspection of transformers and switchgear conducted at the Kingsland Road Area in May 1996, three transformers were identified as having stains on concrete pads adjacent to the transformers; PCBs detected in soil beneath pads. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.092E-6

AP_ABS	1.092E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Harris Corporation

100 Kingsland Drive, Clifton, NJ; 77 River Road, Clifton, NJ ; 500 Washington Avenue, Nutley, NJ; 390 Washington Avenue, Nutley, NJ; 417 River Road, Nutley, NJ; 491/493 River Road, Nutley, NJ; 483 River Road, Nutley, NJ; 492 River Road, Nutley, NJ	**Clifton**	**NJ**	**07014**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.020E-3	0.0%	Historically Compliant or No Evidence	The threshold value for lead was noted to be exceeded in monitoring reports from January to March 1999 (PAP-00722741); however, these deficiencies were noted to not be violations of the permit (PAP-00722287-8, 738). According to a Preliminary Assessment and Site Investigation Report, dated June 26, 2012, during visual inspection of transformers and switchgear conducted at the Kingsland Road Area in May 1996, three transformers were identified as having stains on concrete pads adjacent to the transformers; PCBs detected in soil beneath pads. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	8.163E-4

AP_ABS	8.163E-4

Allocation Facility Cmass Calculation

Hartz Consumer Group, Inc.	600, 700 South 4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.24%	229.37	100.00%	-	0.54	1.018817E-2	0.01
Mercury	100.00%	-	100.00%	-	0.24%	1.53	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.24%	642.23	100.00%	-	1.51	1.018817E-2	0.02
LPAHs	100.00%	-	100.00%	-	0.24%	428.15	100.00%	-	1.01	1.018817E-2	0.01
PCBs	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Hartz Consumer Group, Inc.	600, 700 South 4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0.01	1.720E-9	1.720E-11
Mercury	0.95	42,000.00	0	8.734E-10	8.297E-10
HPAHs	0.05	240,000.00	0.02	6.420E-8	3.210E-9
LPAHs	0.01	170,000.00	0.01	6.042E-8	6.042E-10
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Hartz Consumer Group, Inc.	600, 700 South 4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.872E-6	0.01	5.98	1.872E-6	1.872E-8
Mercury	0.95	42,000.00	4,322.53	41,955.96	8.330E-7	0	0.03	8.330E-7	7.913E-7
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	3.479E-7	0.02	0.07	3.479E-7	1.740E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	3.346E-7	0.01	0.05	3.346E-7	3.346E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Hartz Consumer Group, Inc.	**600, 700 South 4th Street**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Middlesex Street	CSO	0.51%	46.17%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Pet Products and Supplies
24	# hours/per day discharged	A lot of legacy contamination from GM Ownership
5	#days/week discharged	Connected all discharges to PVSC prior to site ownership in 1971
	#weeks/yr discharged	
8,079,892	calc gal/yr discharge	Flows based on information from 1971, 1974 and 1985
		PAP-00210437-38
1971	Yr Ops started	PAP-00210447-48
1996	Yr Ops ceased	PAS00002441-45
25	calc #yrs facility operated	PAS00125321
Copper (Cu)		
25	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
25	#yrs facility discharged	1986 Waste Effluent Survey PAS-00024450-53
0.30	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
229.37	calc kg COC discharged	
Mercury (Hg)		
25	#yrs facility discharged	1986 Waste Effluent Survey PAS-00024450-53
0.0020	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.53	calc kg COC discharged	
HPAHs		
25	#yrs facility discharged	1986 Waste Effluent Survey PAS-00024450-53
14.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
642.23	calc kg COC discharged	
LPAHs		
25	#yrs facility discharged	1986 Waste Effluent Survey PAS-00024450-53
14.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
1	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
428.15	calc kg COC discharged	
PCBs		
7	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
2	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
17	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
25	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
26	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
15	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
5	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
229.37	kg Lead	
1.53	kg Mercury	
642.23	kg HPAHs	
428.15	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Hartz Consumer Group, Inc.

600, 700 South 4th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.661E-9	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.729E-9

AP_ABS	3.729E-9

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Hartz Consumer Group, Inc.

600, 700 South 4th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.308E-7	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.646E-7

AP_ABS	6.646E-7

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

HARTZ CONSUMER GROUP

Hartz argues that it is neither responsible nor liable for General Motors; PCB and Metals Contamination United States District Court Judge Walls was similarly convinced. In granting summary judgment to Hartz in the Hartz v. General Motors case, holding GM liable for contribution under CERCLA §113(f) and the New Jersey Spill Compensation and Control Act, N.J.S.A. 58:10-23.11.f.a, the Court found as follows:

Plaintiffs have produced unrefuted expert testimony that the hazardous substances identified at the Site, including the PCBs and chlorinated volatile organic compounds, are expected byproducts from Hyatt's previous operations in Harrison. The facts overwhelmingly demonstrate that Hyatt used PCB laden Pydraul fluid in conjunction with its heat intensive processes, that these fluids regularly spilled and leaked, and that they contaminated the property, seeping into the soil and the sewer system. The Court notes that the locations of the more concentrated levels of hazardous chemicals correspond to areas used exclusively by Hyatt such as the former chip pit (AOC-8) the subsurface tunnels (AOC-11), and the subsurface process room. The highest quantities of PCBs were located in the interior of former Hyatt Building 12, where Hyatt conducted much of its heat treating operations. **PAP-00005302-03 (Citations to the court record omitted).**

General Motors has Settled its Liability for the Passaic River. Following its bankruptcy in the 2008 financial crisis, by Order entered January 30, 2012, General Motors settled its liability for the Diamond Alkalai Superfund Site, pursuant to which the United States received an Allowed General Unsecured Claim in the amount of $19,500,000, classified in Class 3 under the Plan of Liquidation. See PAP-00006549-50 (§V.4 of the Settlement Agreement). In exchange, the liquidating trust (known as the GUC Trust) obtained a Covenant-Not-To-Sue (§¶VII, ¶19), and contribution protection (§VIII, ¶25).

In so doing, General Motors resolved its liability for the Passaic River, as a settling party. Its contribution to the river, if any, must be deemed resolved, and such contribution cannot be treated as an orphan share. See 42 U.S.C. § 9613(f)(2), providing that "A person who has resolved its liability to the United States or a State in an administrative or judicially approved settlement shall not be liable for claims for contribution regarding matters addressed in the settlement. Such settlement does not discharge any of the other potentially liable persons unless its terms so provide, *but it reduces the potential liability of the others by the amount of the settlement."* See In re: Eagle-Picher Industries, 1997 US Dist. Lexis 15436 (S.D. OH) (approving settlement, and off-setting remaining liability by amount of settlement).

Hartz and its consultants and remediation contractors are "response action contractors" protected under §119(a) of CERCLA. They are thus protected from liability in connection with any incidental discharges or releases during its remediation of (GM- Hyatt's) contamination in cleaning up the Harrison Site. This is consistent with the law of the Third Circuit (See U.S. v. CMDG Realty Co., 96 F.3d 706 (3d Cir. 1996) (requiring a showing that contractor negligence exacerbated contamination before a remediation contractor would be

subject to "operator" liability). Hartz also claims "innocent landowner" status, having done the appropriate level of due diligence when it acquired the site in 1970. See 42 U.S.C. §9601(35). Remediation of petroleum hydrocarbons may also be covered by the CERCLA "petroleum exclusion" See 42 U.S.C. §9601(14).

ALLOCATOR'S DETERMINATION – Hartz Consumer Group appears to make two distinct legal arguments, that (1) any liability of Hartz for discharges of COCs during the ownership or operation of the facility by GM-Hyatt or for the subsequent discharge of COCs placed on the facility site by GM-Hyatt was resolved in the settlement between GM and the U.S. and (2) the protections for "response action contractors" afforded by §119(a) of CERCLA should apply to its ownership of the facility site and protect it from liability for any discharges of COCs that occurred after its purchase of the site from GM. Though a full evaluation of Hartz's possible liability for actions outside of those of their remediation contractor is not available from the available information, the Allocator presumes a substantial chance of success should this matter go to litigation. However, we leave this matter as a topic for settlement discussions between Hartz Consumer Group and EPA.

Allocation Facility Cmass Calculation

Hexcel Corp.	205 Main Street	Lodi	NJ	07644

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	12.26	100.00%	-	2.32%	-	100.00%	-	12.26	1.018817E-2	0.12
Lead	100.00%	28.91	100.00%	-	2.32%	-	100.00%	-	28.91	1.018817E-2	0.29
Mercury	100.00%	23.53	100.00%	-	2.32%	-	100.00%	-	23.53	1.018817E-2	0.24
HPAHs	100.00%	0.04	100.00%	-	2.32%	-	100.00%	-	0.04	1.018817E-2	0
LPAHs	100.00%	11.74	100.00%	-	2.32%	-	100.00%	-	11.74	1.018817E-2	0.12
PCBs	100.00%	889.28	100.00%	-	2.32%	220.78	100.00%	1.2	895.59	1.018817E-2	9.12
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Hexcel Corp.	205 Main Street	Lodi	NJ	07644

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.12	5.948E-8	4.104E-8
Lead	0.01	3,200,000.00	0.29	9.204E-8	9.204E-10
Mercury	0.95	42,000.00	0.24	5.708E-6	5.422E-6
HPAHs	0.05	240,000.00	0	1.698E-9	8.490E-11
LPAHs	0.01	170,000.00	0.12	7.036E-7	7.036E-9
PCBs	12.87	26,000.00	9.12	3.509E-4	4.517E-3
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Hexcel Corp.	**205 Main Street**	**Lodi**	**NJ**	**07644**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	4.427E-5	0.12	92.83	4.427E-5	3.054E-5
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.002E-4	0.29	320.28	1.002E-4	1.002E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	5.444E-3	0.24	228.39	5.444E-3	5.171E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	9.203E-9	0	0	9.203E-9	4.602E-10
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	3.897E-6	0.12	0.54	3.897E-6	3.897E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	4.463E-2	9.12	1,151.28	4.463E-2	5.744E-1
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Hexcel Corp.	**205 Main Street**	**Lodi**	**NJ**	**07644**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
77,575	gal discharged per day/week/month	1978 135,600 gpd, continuous 6 days per week
	# hours/per day discharged	1985 19550 gpd
6	#days/week discharged	
52	#weeks/yr discharged	
24,203,400	calc gal/yr discharge	
1973	Yr Ops started	Owned 1973-1986 and then again 1998-2017
1986	Yr Ops ceased	
34	calc #yrs facility operated	
Copper (Cu)		
34	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
34	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
34	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
34	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
34	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
5	#yrs facility discharged within PCBs Timeline	
0.4820	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
220.78	calc kg COC discharged	
DDx		
0	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
14	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
34	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
14	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
13	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
3	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
220.8	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	Discharged storm water to Saddle River, Tributary to Passaic River
	# weeks/yr discharged	
2,661,111	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
2	acres	
43,560	ft2 per acre	
1973	Yr Ops started	Owned 1973-1986 and then again 1998-2017
1986	Yr Ops ceased	
34	calc #yrs facility operated	
Copper (Cu)		
34	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
34	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
34	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
34	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
LPAHs		
34	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
PCBs		
5	#yrs facility discharged within PCBs Timeline	Reduce PCBs in storm water by 95% since not process water
0.024	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.21	calc kg COC discharged	
DDx		
0	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
14	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
34	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
14	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
13	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
3	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
1.19	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
2.00	ACRES - TOTAL SITE AREA (acres)	FDR, PDF PAGE 1	no spill containment adjacent to river until 1980-1. (FDR p.2). Leaking USTs resulted in investigation; 43 ppm PCBs found in oil layer in a monitoring well. (USTs were corroded; PCBs detected in excavation soil). PCBs used in heat exchange system in Building 1; investigation found PCBs up to 5,500 mg/kg. (FDR pg. 2)
1.50	ACRES - AFFECTED AREA	Estimate from map; FDR pg 3	
4,046.86	METERS^2/ACRE		
6,070	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1944	Year site operations began	FDR, PDF PAGE 1, Operator: Hexcel Corporation (1973-1986); Fine Organics, Inc. (1944-1973); Owner: Hexcel Corporation (1973-1986) and (1998-2017)	
2017	Year site operations ceased		
73	NUMBER YEARS DISCHARGE		
44	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,250	KG/M^3 SOIL DENSITY	SOIL reported as sand and gravels. Bulk density range 2002 KG/M^3 to 2499 KG/M^3, use average. (http://structx.com/Soil_Properties_002.html)	
99,705	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)	Site not located on Historic Fill (FDR pg. 9)	
Copper (Cu)			
73	YEARS DISCHARGED		
123	MG/KG (MAX CONCENTRATION)	SAMPLE 538A-0804-SB01 COPPER = 123 mg/kg (PAS-00088319)	
0.000001	kg per mg (Merck Index)		
12	KILOGRAMS DISCHARGED		
Lead (Pb)			
73	YEARS DISCHARGED		
290	MG/KG MAX CONCENTRATION)	538A-0807-SB01 LEAD = 290 mg/kg (PAS-00088319)	
0.000001	kg per mg (Merck Index)		
29	KILOGRAMS DISCHARGED		
Mercury (Hg)			
73	YEARS DISCHARGED		
236.0	MG/KG (MAX CONCENTRATION)	sample 538A-0608-5B01 236 mg/kg mercury PAS-00088320	
0.000001	kg per mg (Merck Index)		
24	KILOGRAMS DISCHARGED		

PAHs (listed in benzo(a)pyrene Equivalent conversion table)	blenzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.		
73	YEARS DISCHARGED		
0.4	MG/KG (TOTAL PAH MAX CONCENTRATION)	Max Detected Concentration. PAS-00088282.	Sum of benzo(a)pyrene Equivalent conversion concentrations
0.000001	kg per mg (Merck Index)		
0.04	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
73	YEARS DISCHARGED		
117.76	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)	MAX LMW PAH CONC'Ns IN SOIL SAMPLE FROM MW33-004 BORING. 123.1 mg/kg (PAS-00088281-2).	
12	KILOGRAMS DISCHARGED		
PCBs			
50	YEARS DISCHARGED		
		A list of Manufacturing Equipment from 1969 includes a reactor with a hot Therminol® heating system (PAP-00326349). Therminol would have contained PCBs. Date use began uncles, assumed PCBs used as described above starting in 1967; 50 years of discharge.	
13,000.00	MG/KG (MAX OF REPORTED CONCENTRATIONS)	2008 SELF-IMPLEMENTING PCB CLEANUP REPORT - MAX PCB = 13,000 mg/kg collected from 1.5 - 2 FEET BGS AT SAMPLE LOCATION HA-7-3 . (PAP-00325573). Also PAP-00047406 pdf page 183	
0.000001	kg per mg (Merck Index)		
888	KILOGRAMS DISCHARGED		
DDx			
73	YEARS DISCHARGED within DDx Timeline	NONE REPORTED	
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.000000	KILOGRAMS DISCHARGED		
Dieldrin			
0	YEARS DISCHARGED	NONE REPORTED	
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Dioxins/Furans			
73	YEARS DISCHARGED		
0.0000	MG/KG (MAX CONCENTRATION)	NONE DETECTED	
0.000001	kg per mg (Merck Index)		
0.0000	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.259	1.0	0.2593
Benzo(a)anthracene	0.033	0.1	0.0033
Benzo(b)fluoranthene	0.139	0.1	0.0139
Benzo(k)fluoranthene	0.253	0.01	0.0025
Chrysene	0.033	0.001	0.0000
Dibenz(a,h)anthracene	0.132	1.0	0.1316
Indeno(1,2,3-cd)pyrene	0.087	0.1	0.0087

Total Benzo(a)pyrene Equivalents = 0.4

Sample MW33-004 (PAS-00088281-2)	
Anthracene	2.10329
Acenaphthene	0.14335
Acenapthylene	0.03053
Fluorene	0.03061
Naphthalene	0.25697
Phenanthrene	115.198
1-methylnaphthalene	0
2-methylnaphthalene	0
SUM	117.76275

SUMMARY FTMASS ESTIMATES:	
12.26	kg Copper
28.91	kg Lead
23.53	kg Mercury
0.04	kg PAHs (Benzo(a)pyrene Equivalent)
11.74	kg PAHs (Other)
887.78	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

964.27 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Soil and groundwater at Purdue Pharma were contaminated with PCBs from Hexcel.	Data from Rutgers University.
1.73	ACRES - TOTAL SITE AREA (acres)		
0.73	ACRES - AFFECTED AREA	Purdue Pharma was operated by Napp from 1970 until 1995. On April 21, 1995 an industrial accident at the facility resulted in a fire and explosion, destroying a portion of the facility and causing the plant operations to be terminated. (PAS-00084999) The 1966 aerial photograph shows an unpaved area adjacent to the south side of the current facility parking lot, which was later paved and fenced-in for materials storage use. (PAS-00085007)	
4,046.86	METERS^2/ACRE		
2,954	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1971	Year site operations began	FDR, PDF PAGE 1, Operator: 1971 to 1995; Owner: Not Applicable	
1995	Year site operations ceased		
24	NUMBER YEARS DISCHARGE		
7	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,250	KG/M^3 SOIL DENSITY	SOIL reported as mix of clays, silts, sand and gravels. Bulk density range 2002 KG/M^3 to 2499 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	The fill material varied in its composition, and consists of a mix of clays, silts, sand and gravels, with fragments of brick, glass, wood and other materials interspersed throughout it. The fill material on the eastern side of the site is more typical of industrial fill, and consists of stone, brick, concrete and other fill material (PAP-00127504).
15,953	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		

Copper (Cu)

24	YEARS DISCHARGED
0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED

Lead (Pb)

24	YEARS DISCHARGED
0	MG/KG MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED

Mercury (Hg)

24	YEARS DISCHARGED
0.0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED

PAHs (listed in benzo(a)pyrene Equivalent conversion table)	Pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
24	YEARS DISCHARGED
0.0	MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
PAHs (others detected)	
24	YEARS DISCHARGED
0.00	MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
PCBs	
24	YEARS DISCHARGED
94	
0.000001	kg per mg (Merck Index)
1	KILOGRAMS DISCHARGED
DDx	
24	YEARS DISCHARGED within DDx Timeline
0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0.000000	KILOGRAMS DISCHARGED
Dieldrin	
0	YEARS DISCHARGED within Dieldrin Timeline
0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0.00	KILOGRAMS DISCHARGED
Dioxins/Furans	
24	YEARS DISCHARGED
0.0000	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0.0000	KILOGRAMS DISCHARGED

PCBs also were present in soil along approximately 200 feet of the Saddle River riverbank at concentrations as high as 94 mg/kg, as discussed in the Remedial Investigation Report/Remedial Action Work Plan, dated June 17, 2004. (PAP-00127627, 56).

Soil: Ranging from 0.6 milligrams per kilogram (mg/kg) at a depth of four feet below ground surface (bgs) to 8,500 mg/kg collected from seven to 7.5 feet bgs at sample location TP-7, and 1,700 mg/kg collected from nine to 9.5 feet bgs at sample location TP-7B (PAS-00084957; PAP-00127670).

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.000	1.0	0.0000
Benzo(a)anthracene	0.000	0.1	0.0000
Benzo(b)fluoranthene	0.000	0.1	0.0000
Benzo(k)fluoranthene	0.000	0.01	0.0000
Chrysene	0.000	0.001	0.0000
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.000	0.1	0.0000

Total Benzo(a)pyrene Equivalents = **0.0**

PCBs also were present in soil along approximately 200 feet of the Saddle River riverbank at concentrations as high as 94 mg/kg, as discussed in the Remedial Investigation Report/Remedial Action Work Plan, dated June 17, 2004. (PAP-00127627, 56). According to the 1999 RIR/RIWP Addendum, the presence of PCB Aroclors 1242 in site soils was a result of an upgradient off-site source. Aroclor 1242 was never used by PPTI, nor was it detected in any of the soil samples from PPTI's process areas. PPTI contends in the document that these PCB Aroclors were from the adjacent property, Hexcel's "signature compounds," and were associated with LNAPL that migrated onto the PPTI property via the industrial sewer line and other utility pipelines and trenches which traverse the PPTI property. Aroclor 1242 was detected only along the northern property boundary with Hexcel and in the western portion of the PPTI property along underground utilities that originated on Hexcel property. Reworking of soils as a result of earthmoving activities conducted in the western portion of the site (associated with periodic utility line maintenance) was believed to be responsible for the detection of Aroclor 1242 in the near-surface soils (PAS-

NONE REPORTED

NONE REPORTED

SUMMARY FTMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
0.00	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
1.50	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

1.50	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Hexcel Corp.

205 Main Street	**Lodi**	**NJ**	**07644**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.522E-3	10.0%	Periodic Noncompliacne	Two violations were noted in the ECRA application. One is stated to be related to failure to submit information to local agencies, while the other is a notice that spills and leaking drums were observed close to the east bank of the Saddle River during a state inspection in the September of 1984. Both violations were stated to be resolved (PAS-00091296-97). The document does not state these violations involved OU2 COCs. The Purdue Pharma facility property was impacted by PCBs from Hexcel. An industrial sewer line historically ran north to south across the site, beginning at the adjacent Hexcel property and continuing to the Hendricks pump station located adjacent to the Fortunato property (PAP-00127468, 559). Aroclor 1242, used by Hexcel, was detected in Purdue Pharma soil along the route of the industrial sewer line. Soil: Ranging from 0.6 milligrams per kilogram (mg/kg) at a depth of four feet below ground surface (bgs) to 8,500 mg/kg collected from seven to 7.5 feet bgs at sample location TP-7, and 1,700 mg/kg collected from nine to 9.5 feet bgs at sample location TP-7B (PAS-00084957; PAP-00127670). PCB-laden (Aroclor 1242) light non-aqueous phase liquid (LNAPL): 3,400 mg/kg at [Purdue Pharma] well MW-E14 installed just south of Molnar Avenue adjacent to Hexcel (PAS-00084957). PCBs also were present in [Purdue Pharma] soil along approximately 200 feet of the Saddle River riverbank at concentrations as high as 94 mg/kg, as discussed in the Remedial Investigation Report/Remedial Action Work Plan, dated June 17, 2004. The PCBs extended south from the Hexcel property line, where the primary Aroclor detected was 1242, to the Fortunato property line, where the primary Aroclors detected were 1254 and 1260. No new perspective provided	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	4.070E-3

AP_ABS	4.070E-3

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Hexcel Corp.

205 Main Street	**Lodi**	**NJ**	**07644**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.796E-1	10.0%	Periodic Noncompliacne	Two violations were noted in the ECRA application. One is stated to be related to failure to submit information to local agencies, while the other is a notice that spills and leaking drums were observed close to the east bank of the Saddle River during a state inspection in the September of 1984. Both violations were stated to be resolved (PAS-00091296-97). The document does not state these violations involved OU2 COCs. The Purdue Pharma facility property was impacted by PCBs from Hexcel. An industrial sewer line historically ran north to south across the site, beginning at the adjacent Hexcel property and continuing to the Hendricks pump station located adjacent to the Fortunato property (PAP-00127468, 559). Aroclor 1242, used by Hexcel, was detected in Purdue Pharma soil along the route of the industrial sewer line. Soil: Ranging from 0.6 milligrams per kilogram (mg/kg) at a depth of four feet below ground surface (bgs) to 8,500 mg/kg collected from seven to 7.5 feet bgs at sample location TP-7, and 1,700 mg/kg collected from nine to 9.5 feet bgs at sample location TP-7B (PAS-00084957; PAP-00127670). PCB-laden (Aroclor 1242) light non-aqueous phase liquid (LNAPL): 3,400 mg/kg at [Purdue Pharma] well MW-E14 installed just south of Molnar Avenue adjacent to Hexcel (PAS-00084957). PCBs also were present in [Purdue Pharma] soil along approximately 200 feet of the Saddle River riverbank at concentrations as high as 94 mg/kg, as discussed in the Remedial Investigation Report/Remedial Action Work Plan, dated June 17, 2004. The PCBs extended south from the Hexcel property line, where the primary Aroclor detected was 1242, to the Fortunato property line, where the primary Aroclors detected were 1254 and 1260. No new perspective provided	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.216E-1

AP_ABS	5.216E-1

Allocation Facility Cmass Calculation

Hoffman-La Roche Inc.	340 Kingsland Road	Nutley	NJ	07110

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	280.85	100.00%	-	2.32%	23,292.32	100.00%	-	821.93	1.018817E-2	8.37
Lead	100.00%	416.16	100.00%	-	2.32%	4,894.76	100.00%	-	529.87	1.018817E-2	5.4
Mercury	100.00%	4.47	100.00%	-	2.32%	168.78	100.00%	-	8.39	1.018817E-2	0.09
HPAHs	100.00%	15.82	100.00%	-	2.32%	-	100.00%	-	15.82	1.018817E-2	0.16
LPAHs	100.00%	8.1	100.00%	-	2.32%	-	100.00%	-	8.1	1.018817E-2	0.08
PCBs	100.00%	63.47	100.00%	-	2.32%	-	100.00%	-	63.47	1.018817E-2	0.65
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Hoffman-La Roche Inc.	**340 Kingsland Road**	**Nutley**	**NJ**	**07110**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	8.37	3.988E-6	2.751E-6
Lead	0.01	3,200,000.00	5.4	1.687E-6	1.687E-8
Mercury	0.95	42,000.00	0.09	2.035E-6	1.934E-6
HPAHs	0.05	240,000.00	0.16	6.716E-7	3.358E-8
LPAHs	0.01	170,000.00	0.08	4.854E-7	4.854E-9
PCBs	12.87	26,000.00	0.65	2.487E-5	3.201E-4
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Hoffman-La Roche Inc.	**340 Kingsland Road**	**Nutley**	**NJ**	**07110**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	2.968E-3	8.37	6,223.76	2.968E-3	2.048E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.836E-3	5.4	5,870.21	1.836E-3	1.836E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.941E-3	0.09	81.44	1.941E-3	1.844E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	3.640E-6	0.16	0.71	3.640E-6	1.820E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.688E-6	0.08	0.37	2.688E-6	2.688E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	3.163E-3	0.65	81.59	3.163E-3	4.071E-2
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Hoffman-La Roche Inc.	**340 Kingsland Road**	**Nutley**	**NJ**	**07110**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
3,898,000	gal discharged per day PAS00101246, PAP00717651, PAS00002877	1978 PVSC Heavy Metals Source Determination Study 6.304 MGD
	# hours/per day discharged	1990 PVSC Permit 3.59 MGD
5	#days/week discharged	2003 Site Inv. Report for AOCs 172 and 13 1.8 MGD
52	#weeks/yr discharged	Assumed discharge is 5 days per week, 52 weeks per year
1,013,480,000	calc gal/yr discharge	
1928	Yr Ops started	
2016	Yr Ops ceased	
88	calc #yrs facility operated	
Copper (Cu)		
88	#yrs facility discharged	
0.0690	calc mg/L COC discharged PAS00002879, PAS00101246	1978 PVSC Heavy Metals Source Determination Study
3.785	L per gallon (Merck Index)	per PVSC Permit No. 24402882 discharge limits (monthly avg and thresholds), from 1980-2011 Copper
0.000001	kg per mg (Merck Index)	occasionally exceeded threshold value but never exceeded discharge limit, Highest Result 1.03 mg/l
23,292.32	calc kg COC discharged	
Lead (Pb)		
88	#yrs facility discharged	
0.0145	calc mg/L COC discharged	1978 PVSC Heavy Metals Source Determination Study
3.785	L per gallon (Merck Index)	per PVSC Permit No. 24402882 discharge limits (monthly avg and thresholds), from 1980-2011 Lead
0.000001	kg per mg (Merck Index)	never above threshold value of 0.029 mg/l
4,894.76	calc kg COC discharged	
Mercury (Hg)		
88	#yrs facility discharged	
0.0005	calc mg/L COC discharged PAS00002879, PAS00101246	1978 PVSC Heavy Metals Source Determination Study
3.785	L per gallon (Merck Index)	per PVSC Permit No. 24402882 discharge limits (monthly avg and thresholds), from 1980-2011 Mercury
0.000001	kg per mg (Merck Index)	never above threshold value of 0.001 mg/l
168.78	calc kg COC discharged	
HPAHs		
88	#yrs facility discharged	
-	calc mg/L O&G	No data or information
10%	% O&G that is considered PAHs	Late 1970s or Early 1980s one large release of No. 6 fuel oil to process waste lines, and fuel migrated
60%	% COC in O&G considered as PAHs	through PVSC sewer system to treatment plant in Newark (per FDR)
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
88	#yrs facility discharged	
-	calc mg/L O&G	No data or information
10%	% O&G that is considered PAHs	Late 1970s or Early 1980s one large release of No. 6 fuel oil to process waste lines, and fuel migrated
40%	% COC in O&G considered as PAHs	through PVSC sewer system to treatment plant in Newark (per FDR)
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
88	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
71	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
23,292.32	kg Copper	
4,894.76	kg Lead	
168.78	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
-	# hours/day discharged	Two NJPDES Permits for storm water discharge to St. Paul's Brook with limits of 27MGD and 181g/day of Mercury
	# days/week discharged	No sampling data or information.
	# weeks/yr discharged	
-	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1928	Yr Ops started	
2016	Yr Ops ceased	
88	calc #yrs facility operated	
Copper (Cu)		
88	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
Lead (Pb)		
88	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
88	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
88	#yrs facility discharged	NJPDES Discharge limit of 100 mg/l Oil and Grease
0.10	calc mg/L O&G	Assume a discharge of .1 mg/l oil and grease over life of facility for calculations
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.01	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
89	#yrs facility discharged	NJPDES Discharge limit of 100 mg/l Oil and Grease
0.10	calc mg/L O&G	Assume a discharge of .1 mg/l oil and grease over life of facility for calculations
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.0040	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
88	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
71	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
100	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
20	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of historical aerial photographs 1930-2020 (https://njdep.maps.arcgis.com/apps/webappviewer/index.html and Google Earth aerial photos)	
4,046.86	METERS^2/ACRE		
80,937	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
8	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES	
1930	Year site operations began	Operations begain in 1930s (FDR p 1)	
2016	Year site processing and storage operations ceased	2015 - operations ceased (FDR p 1)	
86	NUMBER YEARS DISCHARGE		
696	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,834	KG/M^3 SOIL DENSITY	Fill reported as silt and sand PAP-00214764 p 20). Bulk density range 1297 KG/M^3 to 2371 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
1,276,574	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Site is not located on regional historic fill (FDR p 8)	
Copper (Cu)		Copper sulfate was used on site (FDR p 7, PAS-00002807 p 136 AKA PAS-00002942)	
86	YEARS DISCHARGED		
220	MG/KG (MAX CONCENTRATION)	Max concentration within IA-14 and IA-15 (0-2ft bgs) (PAP-00214764 p 35)	
0.000001	kg per mg (Merck Index)		
281	KILOGRAMS DISCHARGED		
Lead (Pb)		Lead catalyst coated with palladium was used in Building 68 in IA 3	
86	YEARS DISCHARGED		
326	MG/KG (MAX CONCENTRATION)	Max concentration within IA-14 and IA-15 (0-2ft bgs) (PAP-00214764 p 35)	
0.000001	kg per mg (Merck Index)		
416	KILOGRAMS DISCHARGED		
Mercury (Hg)			
86	YEARS DISCHARGED		
3.5	MG/KG (MAX CONCENTRATION)	Max concentration within IA-14 and IA-15 (0-2ft bgs) (PAP-00214764 p 35)	
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
86	YEARS DISCHARGED	
12.3	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
16	KILOGRAMS DISCHARGED	
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table
86	YEARS DISCHARGED	
6.03	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
8	KILOGRAMS DISCHARGED	
PCBs		
86	YEARS DISCHARGED	Roche did not use PCBs in their processes. PCBs are all attributed to impacted fill materal from AOC 66 - Former City of Clifton Dumping Area (PAP-00214315 p 127).
49.3	MG/KG MAX CONCENTRATIONS)	AOC 66 had max concentration of 5260 mg/kg but depth is not known, so average concentration of 49.3 is used (PAP-00214315 p 67)
0.000001	kg per mg (Merck Index)	
63	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
86	YEARS DISCHARGED within Dieldrin Timeline	
0.0003	MG/KG (MAX CONCENTRATION)	Dieldrin detected in 2013 Investigative Area 10 Remedial Investigation (PAP-00214380-1). AOC 66 had max concentration of .006 mg/kg but depth is not known, so average concentration of 0.0003 is used (PAP-00214315 p 67 AKA PAP-00214381)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.000	KILOGRAMS DISCHARGED	
Dioxins/Furans		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

HMW PAH data from AOC 155 Sample 5-277-4 (3.5-4 ft bgs) collected in 2002 (FDR p 6; PAS-00101494, PAS-00123427)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	8.500	1.0	8.5000
Benzo(a)anthracene	11.000	0.1	1.1000
Benzo(b)fluoranthene	11.000	0.1	1.1000
Benzo(k)fluoranthene	4.600	0.01	0.0460
Chrysene	11.000	0.001	0.0110
Dibenz(a,h)anthracene	1.100	1.0	1.1000
Indeno(1,2,3-cd)pyrene	4.700	0.1	0.4700

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **12.3**

Area 2 samples (PAP-00213098-99)

Anthracene	0.68
Acenaphthene	0.15
Acenaphthylene	0.19
Fluorene	0.5
Naphthalene	0.61
Phenanthrene	1.5
2-Methylnaphthalene	2.4
SUM	6.03

SUMMARY CMASS ESTIMATES:

280.85	kg Copper
416.16	kg Lead
4.47	kg Mercury
15.74	kg PAHs (Benzo(a)pyrene Equivalent)
7.70	kg PAHs (Other)
62.94	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

787.85 MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
100	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
1	ACRES - AFFECTED AREA	Disturbed area filled with concrete demolition materials is approx 250' x 150' (PAP-00189810 p 11, Figure 1)	
4,046.86	$METERS^2$/ACRE		
3,484	$METERS^2$ (AFFECTED AREA)		
0.0010	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
3	$METERS^3$/YEAR (ERODED SOIL VOLUME)		
2005	Year Building 96 was demo'd	PCBs, PAHs and Dieldrin found to be COCs within Building 96 demo debris	
2007	Year interim cap was placed in area	The 2007 interim remedy at Building 86 consisted of covering the lateral extent of contaminated concrete demolition materials with a minimum of four inches of clean sand, a geotextile, and dense graded aggregate to a minimum thickness of six inches (PAP-00189810 p 16, AKA PAP-00189825)	2012, year final cap was placed
2	NUMBER YEARS DISCHARGE		
7	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,160	KG/M^3 SOIL DENSITY	Gravel breakstone and coarse crushed concrete waste density of 1.21 cm/m3 found here https://llufb.llu.lv/conference/Civil_engineering/2011/Latvia-Univ-Agriculture_civil_engineering2011_7-13.pdf	
8,084	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
2	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Not a COC for demo materials	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
2	YEARS DISCHARGED		
0	MG/KG (AVERAGE CONCENTRATION)	Not a COC for demo materials	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
2	YEARS DISCHARGED		
0.00	MG/KG (MAX CONCENTRATION)	Not a COC for demo materials	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
2	YEARS DISCHARGED		
10.8	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)			
2	YEARS DISCHARGED		
49.278	MG/KG (TOTAL PAH MAX CONCENTRATION)	Data below Benzo(a)pyrene Equivalent Table	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Max of PCBs reported from Building 86 Demo Materials Remediation (PAP-00189810 p 23, Figure 7). Sample B86-17 is from 2-2.5 ft bgs to represent the 0-4 ft bgs horizon

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7.100	1.0	7.1000
Benzo(a)anthracene	8.670	0.1	0.8670
Benzo(b)fluoranthene	6.680	0.1	0.6680
Benzo(k)fluoranthene	3.850	0.01	0.0385
Chrysene		0.001	0.0000
Dibenz(a,h)anthracene	1.720	1.0	1.7200
Indeno(1,2,3-cd)pyrene	4.390	0.1	0.4390

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **10.8**

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PCBs		Roche did not use PCBs in their processes. Landfill material with PCBs was used as fill
2	YEARS DISCHARGED	
66.01	MG/KG MAX OF REPORTED CONCENTRATIONS)	Sample B86-7 (PAP-00189810 Figure 4, p 20). Sample from 2-2.5 ft bgs
0.000001	kg per mg (Merck Index)	
1	KILOGRAMS DISCHARGED	
DDx		Not a COC for demo materials
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
2	YEARS DISCHARGED within Dieldrin Timeline	
0.0626	MG/KG (MAX CONCENTRATION)	Sample B86-6 (PAP-00189810 p 107). Sample from 2-2.5 ft bgs
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	Not a COC for demo materials
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Data from PAP-00189810 p 89-90	
Benzo(g,h,i)perylene	3.85
Fluorene	2.42
Fluoranthene	21.2
Naphthalene	0.758
Phenanthrene	19.1
Acenaphthene	1.95
SUM	49.278

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
0.09	kg PAHs (Benzo(a)pyrene Equivalent)
0.40	kg PAHs (Other)
0.53	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

1.02	MASS (KG) DISCHARGED FROM Building Demolition Materials

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Hoffman-La Roche Inc.

340 Kingsland Road	**Nutley**	**NJ**	**07110**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.248E-4	5.0%	Occasional Noncompliance	Spills identified in the data report as occurring in the 1980s and 1990s (mostly fuel oil, one mercury). One large release of No. 6 fuel oil to the process waste lines migrated through the PVSC sewer system to the treatment plant in Newark in the late 1970s or early 1980s, which was a violation of Roche's connection permit (Nachman Synthesis, p. 8). On March 2, 1991, a 10-15 gallon, 100-foot trail of PCB-contaminated transformer oil was released to the roadway due to a broken valve during a transformer relocation by an outside contractor. On April 10, 1947, an inspector discovered oil on Nichol's Pond, a tributary to Third River. The source was traced to Roche's power plant upstream on Nichol's Brook. It was found that a tank truck delivering fuel oil had a spill and lost approximately 100 gallon of fuel oil which escaped through a yard drain into the ditch along the railroad and into Nichol's Brook. Also see spill/release table on pp 15-16 of the FDR.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.761E-4

AP_ABS	2.761E-4

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Hoffman-La Roche Inc.

340 Kingsland Road	**Nutley**	**NJ**	**07110**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.462E-2	5.0%	Occasional Noncompliance	Spills identified in the data report as occurring in the 1980s and 1990s (mostly fuel oil, one mercury). One large release of No. 6 fuel oil to the process waste lines migrated through the PVSC sewer system to the treatment plant in Newark in the late 1970s or early 1980s, which was a violation of Roche's connection permit (Nachman Synthesis, p. 8). On March 2, 1991, a 10-15 gallon, 100-foot trail of PCB-contaminated transformer oil was released to the roadway due to a broken valve during a transformer relocation by an outside contractor. On April 10, 1947, an inspector discovered oil on Nichol's Pond, a tributary to Third River. The source was traced to Roche's power plant upstream on Nichol's Brook. It was found that a tank truck delivering fuel oil had a spill and lost approximately 100 gallon of fuel oil which escaped through a yard drain into the ditch along the railroad and into Nichol's Brook. Also see spill/release table on pp 15-16 of the FDR.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.793E-2

AP_ABS	3.793E-2

Allocation Facility Cmass Calculation

Honeywell International, Inc.	65 Lodi Street	Passaic	NJ	07055

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	0.43	100.00%	-	2.32%	-	100.00%	-	0.43	1.018817E-2	0
HPAHs	100.00%	0.73	100.00%	-	2.32%	-	100.00%	-	0.73	1.018817E-2	0.01
LPAHs	100.00%	1.22	100.00%	0.60	2.32%	1.52	100.00%	-	1.86	1.018817E-2	0.02
PCBs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Honeywell International, Inc.	65 Lodi Street	Passaic	NJ	07055

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	1.043E-7	9.909E-8
HPAHs	0.05	240,000.00	0.01	3.099E-8	1.549E-9
LPAHs	0.01	170,000.00	0.02	1.114E-7	1.114E-9
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Honeywell International, Inc.	65 Lodi Street	Passaic	NJ	07055

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	9.948E-5	0	4.17	9.948E-5	9.450E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.680E-7	0.01	0.03	1.680E-7	8.398E-9
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	6.167E-7	0.02	0.09	6.167E-7	6.167E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Honeywell International, Inc.	**65 Lodi Street**	**Passaic**	**NJ**	**07055**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
4,000	gal discharged per day/week/month	No Information, estimated based on Essex Chemical
24	# hours/per day discharged	PAS-00109714, ECRA Investigation - no evidence of direct discharge to Passaic River
7	#days/week discharged	PAP00197571, 1978 Trip Report Memorandum - Municipal water and sanitary to municipal water system
52	#weeks/yr discharged	No Permits
1,456,000	calc gal/yr discharge	No Information on Sewer Flows or COCs
1899	Yr Ops started	
1976	Yr Ops ceased	FDR page 2
77	calc #yrs facility operated	
Copper (Cu)		
77	#yrs facility discharged	
-	calc mg/L COC discharged	From Essex Chemical
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
77	#yrs facility discharged	
-	calc mg/L COC discharged	From Essex Chemical
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
77	#yrs facility discharged	
-	calc mg/L COC discharged	From Essex Chemical
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
77	#yrs facility discharged	
-	calc mg/L HPAHs	From Essex Chemical
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
77	#yrs facility discharged	
0.005	calc mg/L LPAHs	From Essex Chemical
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2.12	calc kg COC discharged	
PCBs		
0	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
0	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
27	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
77	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
31	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
32	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
2.12	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

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Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
2	ACRES - TOTAL SITE AREA (acres)	PAP-00101453; PAS-00047956; FDR (page 1)	
0.75	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of historical aerial photographs 1995-2020 (Google Earth) and Figure 1 Allocation Facilities map.	
4,046.86	$METERS^2$/ACRE		
3,035	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1899	Year site operations began	General Chemical (predecessor to Allied Chemical & Dye Corp and Honewell International Inc.) purchased the site from Dundee Chemical Works in 1899 (PAP-00198135).	
1987	Year site processing and storage operations ceased	Allied Chemical &Dye Corp granted a portion of the site on eighth street to Donori Corp on 8/30/1954 (PAP-00198148).	Allied Corporation sold factility site on 5/18/1987 (PAP-00198137-38)
88	NUMBER YEARS DISCHARGE		
27	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Surface soil is fill material characterized by the presence of loose, poorly sorted sand, silt and clay which contained cobbles, brick, ceramics, glass, wood, and ash waste (FDR p 10). Density of silty sand and gravel ranges from 1442 to 2483 kg/m3, so the average is used. (http://structx.com/Soil_Properties_002.html)	
52,430	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		This site is located on historic fill (FDR pg 9)	
Copper (Cu)			
88	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Sample Area I max concentration = 257 mg/kg (surface soil sample at I4) (PAP-00101548-60). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
88	YEARS DISCHARGED		
0	MG/KG (AVERAGE CONCENTRATION)	Maximum lead concentration 8030 mg/kg at Area E (PAP-00102025-28; PAS-00047150). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
88	YEARS DISCHARGED		
8.2	MG/KG (MAX CONCENTRATION)	Maximum mercury concentration 8.2 mg/kg @ Area I location I4 (PAP-00101548, 60).	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
88	YEARS DISCHARGED		
14.0	MG/KG (TOTAL PAH MAX CONCENTRATION)	Carcinogenic PAH concentrations reflect a single sample close to the surface, sample I-4 (0-0.5 ft bgs). (PAP-00101560) Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
88	YEARS DISCHARGED		
23	MG/KG (TOTAL PAH MAX CONCENTRATION)	Concentration reflects a single sample close to the surface, sample I-1 (1.5-2 ft bgs) (PAP-00101560). Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	9.230	1.0	9.2300
Benzo(a)anthracene	7.910	0.1	0.7910
Benzo(b)fluoranthene	9.820	0.1	0.9820
Benzo(k)fluoranthene	6.840	0.01	0.0684
Chrysene	8.900	0.001	0.0089
Dibenz(a,h)anthracene	2.330	1.0	2.3300
Indeno(1,2,3-cd)pyrene	5.970	0.1	0.5970
		Total Benzo(a)pyrene Equivalents =	**14.0**

PCBs		
88	YEARS DISCHARGED	
0	MG/KG (MAX OF REPORTED CONCENTRATIONS)	None detected (PAP-00102011)
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	
0	YEARS DISCHARGED	
0	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Sample I-1 (1.5-2 ft bgs) (PAP-00101560)	
Anthracene	1.3
Acenaphthene	0.36
Acenaphthylene	0.28
Fluorene	0
Naphthalene	0.33
Phenanthrene	21
SUM	23.27

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.43	kg Mercury
0.73	kg PAHs (Benzo(a)pyrene Equivalent)
1.22	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

2.38	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Honeywell International, Inc.

65 Lodi Street	**Passaic**	**NJ**	**07055**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.018E-7	0.0%	Historically Compliant or No Evidence	Soil staining observed in Areas E and F. Area H contained a former drum wash disposal pit area that has been filled with cement preventing access to the pit. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	8.140E-8

AP_ABS	8.140E-8

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Honeywell International, Inc.

65 Lodi Street	**Passaic**	**NJ**	**07055**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
9.452E-5	0.0%	Historically Compliant or No Evidence	Soil staining observed in Areas E and F. Area H contained a former drum wash disposal pit area that has been filled with cement preventing access to the pit. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.562E-5

AP_ABS	7.562E-5

Allocation Facility Cmass Calculation

ISP Chemicals LLC	1 Main Street;11 William Street	Belleville	NJ	07109

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	5,583.48	100.00%	-	0	1.018817E-2	0
Lead	100.00%	9.92	100.00%	-	0.00%	115.76	100.00%	-	9.92	1.018817E-2	0.1
Mercury	100.00%	5.97	100.00%	-	0.00%	0.68	100.00%	-	5.97	1.018817E-2	0.06
HPAHs	100.00%	0.37	100.00%	-	0.00%	713.60	100.00%	-	0.37	1.018817E-2	0
LPAHs	100.00%	0.65	100.00%	-	0.00%	475.73	100.00%	-	0.65	1.018817E-2	0.01
PCBs	100.00%	524.43	100.00%	-	0.00%	-	100.00%	-	524.43	1.018817E-2	5.34
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

ISP Chemicals LLC	1 Main Street;11 William Street	Belleville	NJ	07109

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0.1	3.158E-8	3.158E-10
Mercury	0.95	42,000.00	0.06	1.448E-6	1.376E-6
HPAHs	0.05	240,000.00	0	1.571E-8	7.853E-10
LPAHs	0.01	170,000.00	0.01	3.895E-8	3.895E-10
PCBs	12.87	26,000.00	5.34	2.055E-4	2.645E-3
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

ISP Chemicals LLC	1 Main Street;11 William Street	Belleville	NJ	07109

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	3.438E-5	0.1	109.9	3.438E-5	3.438E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.381E-3	0.06	57.95	1.381E-3	1.312E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	8.513E-8	0	0.02	8.513E-8	4.256E-9
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.157E-7	0.01	0.03	2.157E-7	2.157E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.613E-2	5.34	674.16	2.613E-2	3.364E-1
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

ISP Chemicals LLC	**1 Main Street;11 William Street**	**Belleville**	**NJ**	**07109**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Flow data available
	# hours/per day discharged	1990 4th quarter = 9774683 gallons
	#days/week discharged	1991 First and Second quarters = 1637501 and 3642966 gallons
	#weeks/yr discharged	Discharged process water, sanitary waste and storm water to PVSC no discharges to Passaic River
39,977,228	calc gal/yr discharge (FDR)	
365	#day per yr operated (FDR)	
1992	Yr Ops started (FDR)	
2001	Yr Ops ceased (FDR)	
9	calc #yrs facility operated	
Copper (Cu)		
9	#yrs facility discharged	
4.10	calc mg/L COC discharged	Based on Goodrich
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
5,583	calc kg COC discharged	
Lead (Pb)		
9	#yrs facility discharged	Based on Purdue sampling data from 1990
0.085	calc mg/L COC discharged; (FDR) PAP00128020	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
115.76	calc kg COC discharged	
Mercury (Hg)		
9	#yrs facility discharged	
0.0005	calc mg/L COC discharged; (FDR)	Based on Goodrich
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.68	calc kg COC discharged	
HPAHs		
9	#yrs facility discharged	
8.7	calc mg/L O&G (FDR)	Based on Goodrich
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
714	calc kg COC discharged	
LPAHs		
9	#yrs facility discharged	
8.7	calc mg/L O&G (FDR)	Based on Goodrich
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
476	calc kg COC discharged	
PCBs		
-14	#yrs facility discharged within PCBs Timeline	
	calc mg/kg	
0.0075%	assumed %mg of material in conveyance carried away via 1L discharge flow through the conveyance	
	calc gal/yr discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-19	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-4	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
9	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
10	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-6	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-16	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
5,583	kg Copper	
116	kg Lead	
1	kg Mercury	
714	kg HPAHs	
476	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
2.28	ACRES - TOTAL SITE AREA (acres)	FDR page 1	
1.5350	ACRES - AFFECTED AREA	2 parcels, 0.79 acres (chemical plant south of William Street) and 1.49 acres (2 warehouses north of William Street) (PAS-00110586)	AOC #14 - Historic Filling Station (1.49 acres) (PAP-00092630)
4,046.86	METERS^2/ACRE		
6,212	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0.62119	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1991	Year site operations began	The portion of the subject property south of Williams Street has been used for chemical manufacturing since approximately 1940 (PAP-00092587).	
2020	Year site operations ceased	ISP Van Dyk, Inc. ceased operations at the facility on or about March 31, 2001 (PAS-00110294).	
29	NUMBER YEARS DISCHARGE		
18	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,843	KG/M^3 SOIL DENSITY	Fill reported fine to coarse silty sands (PAP-00093882). Bulk density range 1410 KG/M^3 to 2275 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
33,192	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The Allocation Team has determined that the facility site is not located on regional Historic Fill (FDR pg 6)	
Copper (Cu)			
29	YEARS DISCHARGED	Copper chloride 99.995%, copper iodide 99.999%, copper cyanide 99% were used at the site (FDR p 5)	
	MG/KG (MAX CONCENTRATION)	Soil samples apparently were not analyzed for copper	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
29	YEARS DISCHARGED		
299	MG/KG (AVERAGE CONCENTRATION)	PAP-00092672	
0.000001	kg per mg (Merck Index)		
10	KILOGRAMS DISCHARGED		
Mercury (Hg)			
29	YEARS DISCHARGED		
180.0	MG/KG (MAX CONCENTRATION)	PAP-00092676 (surface sample)	
0.000001	kg per mg (Merck Index)		
6	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)	AOC 27, Sample A27-9A (2-2.5 ft bgs) (PAP-00092687)	Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
29	YEARS DISCHARGED		
11.1	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations listed in FDR TABLE, PAGE 7.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)		AOC 27, Sample A27-9A (2-2.5 ft bgs) (PAP-00092687)	
29	YEARS DISCHARGED		
20	MG/KG (TOTAL PAH MAX CONCENTRATION)	Revised to delete HMW PAHs.	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7.640	1.0	7.6400
Benzo(a)anthracene	8.050	0.1	0.8050
Benzo(b)fluoranthene	5.800	0.1	0.5800
Benzo(k)fluoranthene	5.560	0.01	0.0556
Chrysene	8.580	0.001	0.0086
Dibenz(a,h)anthracene	1.580	1.0	1.5800
Indeno(1,2,3-cd)pyrene	4.390	0.1	0.4390

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **11.1**

PCBs		
29	YEARS DISCHARGED	
15,800	MG/KG (MAX OF REPORTED CONCENTRATIONS)	1 to 1.5 ft bgs samples(PAP-00092658, 90)
0.000001	kg per mg (Merck Index)	
524	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		NOT DETECTED (FDR)
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
9.92	kg Lead
5.97	kg Mercury
0.37	kg PAHs (Benzo(a)pyrene Equivalent)
0.65	kg PAHs (Other)
524.43	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

541.35	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

ISP Chemicals LLC

1 Main Street;11 William Street	**Belleville**	**NJ**	**07109**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.646E-3	0.0%	Historically Compliant or No Evidence	According to the 2002 Preliminary Assessment, the property was inspected by a representative of the NJDEP on June 14, 2001. The NJDEP inspector noted several areas of stained floors, paving, and walls during the site inspection. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.117E-3

AP_ABS	2.117E-3

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

ISP Chemicals LLC

1 Main Street;11 William Street	**Belleville**	**NJ**	**07109**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.377E-1	0.0%	Historically Compliant or No Evidence	According to the 2002 Preliminary Assessment, the property was inspected by a representative of the NJDEP on June 14, 2001. The NJDEP inspector noted several areas of stained floors, paving, and walls during the site inspection. No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.701E-1

AP_ABS	2.701E-1

Allocation Facility Cmass Calculation

Kearny Smelting & Refining	936 Harrison Ave	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	12,847.65	100.00%	-	0.27%	11,360.27	100.00%	318.2	13,196.61	1.018817E-2	134.45
Lead	100.00%	-	100.00%	-	0.27%	161,586.89	100.00%	4,526.6	4,963.53	1.018817E-2	50.57
Mercury	100.00%	2.41	100.00%	-	0.27%	0.35	100.00%	-	2.42	1.018817E-2	0.02
HPAHs	100.00%	4.36	100.00%	-	0.27%	3.36	100.00%	0.1	4.46	1.018817E-2	0.05
LPAHs	100.00%	4.68	100.00%	-	0.27%	3.93	100.00%	0.1	4.8	1.018817E-2	0.05
PCBs	100.00%	5.31	100.00%	-	0.27%	2.67	100.00%	0.3	5.57	1.018817E-2	0.06
DDx	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.27%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Kearny Smelting & Refining	**936 Harrison Ave**	**Kearny**	**NJ**	**07032**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	134.45	6.402E-5	4.418E-5
Lead	0.01	3,200,000.00	50.57	1.580E-5	1.580E-7
Mercury	0.95	42,000.00	0.02	5.872E-7	5.579E-7
HPAHs	0.05	240,000.00	0.05	1.895E-7	9.473E-9
LPAHs	0.01	170,000.00	0.05	2.877E-7	2.877E-9
PCBs	12.87	26,000.00	0.06	2.182E-6	2.808E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Kearny Smelting & Refining	936 Harrison Ave	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	4.765E-2	134.45	99,926.4	4.765E-2	3.288E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.720E-2	50.57	54,989.41	1.720E-2	1.720E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	5.600E-4	0.02	23.5	5.600E-4	5.320E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.027E-6	0.05	0.2	1.027E-6	5.134E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.593E-6	0.05	0.22	1.593E-6	1.593E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.775E-4	0.06	7.16	2.775E-4	3.571E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Kearny Smelting & Refining	**936 Harrison Ave**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Worthington Ave	CSO	0.48%	56.33%	No metering was done at this location for the Killiam report. CSO percentages were calculated by the median of all CSOs in the Harrison municipality

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No information on Discharge Flows or COCs
	# hours/per day discharged	Estimating based on Revere Smelting and Refining
	#days/week discharged	Information states that all buildings were connected to the PVSC so assuming everything to PVSC
	#weeks/yr discharged	
2,500,000	calc gal/yr discharge	
1944	Yr Ops started	
2020	Yr Ops ceased	
76	calc #yrs facility operated	
Copper (Cu)		
76	#yrs facility discharged	Estimated based on Revere
15.80	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
11,360.27	calc kg COC discharged	
Lead (Pb)		
76	#yrs facility discharged	Estimated based on Revere
224.69	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
161,586.89	calc kg COC discharged	
Mercury (Hg)		
76	#yrs facility discharged	Estimated based on Revere
0.00049	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.352	calc kg COC discharged	
HPAHs		
76	#yrs facility discharged	Estimated based on Revere
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
0.0047	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3.36	calc kg COC discharged	
LPAHs		
76	#yrs facility discharged	Estimated based on Revere
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
0.0055	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3.93	calc kg COC discharged	
PCBs		
34	#yrs facility discharged within PCBs Timeline	Estimated based on Revere
0.008	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2.670318	calc kg COC discharged	
DDx		
29	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
76	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
75	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
11,360.27	kg Copper	
161,586.89	kg Lead	
0.35	kg Mercury	
3.36	kg HPAHs	
3.93	kg LPAHs	
2.67	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Dicharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	
2,661,291	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
43,560	ft2 per acre	
4.00	acres	
50%	Percent Precip to River	
1970	Yr Ops started	
1972	Yr Ops ceased	
2	calc #yrs facility operated	
Copper (Cu)		
2	#yrs facility discharged	
15.80	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
318.24	calc kg COC discharged	
Lead (Pb)		
2	#yrs facility discharged	
224.69	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,526.63	calc kg COC discharged	
Mercury (Hg)		
2	#yrs facility discharged	
0.00049	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.010	calc kg COC discharged	
HPAHs		
2	#yrs facility discharged	
0.0047	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0942	calc kg COC discharged	
LPAHs		
2	#yrs facility discharged	
0.0055	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.1100	calc kg COC discharged	
PCBs		
3	#yrs facility discharged within PCBs Timeline	
0.008	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.25	calc kg COC discharged	
DDx		
3	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
3	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
2	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
3	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
3	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
3	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
318.24	kg Copper	
4,526.63	kg Lead	
0.0099	kg Mercury	
0.0942	kg HPAHs	
0.1100	kg LPAHs	
0	kg PCBs	
-	kg DDx	

-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
11.8	ACRES - TOTAL SITE AREA (acres)	FDR, Page 1	
8	ACRES - AFFECTED AREA	Approximately one third of site is covered by either buildings or impervious pavement (PAS-00032552).	No off-site migration or discharge of water from the lagoon occurred because there is no surface water pathway to the surrounding environment (PAP-00004536) and the lagoon on site is completely landlocked (PAP-00004634).
4,046.86	METERS^2/ACRE		
32,375	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
3	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1944	Year site operations began	FDR, Page 2	
2020	Year site processing and storage operations ceased	FDR, Page 2	
76	NUMBER YEARS DISCHARGE		
246	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Site reported as located on Historic Fill (FDR, Page 7). Historic Fill reported as sand with silt and fine gravel. Bulk density range for silty sand and gravel 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
482,994	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Site reported as located on Historic Fill (FDR, Page 7).	
76	YEARS DISCHARGED		
26,600	MG/KG (MAX CONCENTRATION)	Copper concentration in on-site surface soil sample SB 8 (PAS-00032616).	
0.000001	kg per mg (Merck Index)		
12,847.65	KILOGRAMS DISCHARGED		
Lead (Pb)			
76	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Lead concentration in on-site surface soil sample MW 5S (PAS-00032619). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Mercury (Hg)			
76	YEARS DISCHARGED		
5.00	MG/KG (MAX CONCENTRATION)	Mercury concentration in on-site surface soil sample SB 12 (PAS-00032617).	
0.000001	kg per mg (Merck Index)		
2.41	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
76	YEARS DISCHARGED	
9.0	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations found in surface soil sample SB 10 (PAS-00032616).
0.000001	kg per mg (Merck Index)	
4.36	KILOGRAMS DISCHARGED	
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table
76	YEARS DISCHARGED	
10	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
4.68	KILOGRAMS DISCHARGED	
PCBs		
76	YEARS DISCHARGED	
11	MG/KG (MAX CONCENTRATION)	Maximum total PCB surface soil concentration in sample SB 1B (PAS-00032615)
0.000001	kg per mg (Merck Index)	
5.31	KILOGRAMS DISCHARGED	
DDx		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dieldrin		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dioxins/Furans		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7.200	1.0	7.2000
Benzo(a)anthracene	8.600	0.1	0.8600
Benzo(b)fluoranthene	6.200	0.1	0.6200
Benzo(k)fluoranthene	6.600	0.01	0.0660
Chrysene	9.700	0.001	0.0097
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	2.700	0.1	0.2700

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **9.0**

From surface soil sample SB 10 in PAS-00032616	
Anthracene	2
Acenaphthene	0.48
Acenaphthylene	0
Fluorene	0
Naphthalene	0
Phenanthrene	7.2
2-Methylnaphthalene	0
SUM	9.68

SUMMARY CMASS ESTIMATES:

12,847.65	kg Copper
0.00	kg Lead
2.41	kg Mercury
4.36	kg PAHs (Benzo(a)pyrene Equivalent)
4.68	kg PAHs (Other)
5.31	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

12864.41 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Kearny Smelting & Refining

936 Harrison Ave	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.298E-5	10.0%	Periodic Noncompliacne	Poor housekeeping identified in 1984, 1986, and 1994 inspections (damaged drums and wastewater discharged to the ground; raw material, scrap, product, slag, and waste exposed to stormwater) (PAS-00003772-73, 79; PAS-00003766). Hudson Regional Health Commission sent KRSC a Notice of Violation for a discharge of a No. 4 Fuel Oil. The oil leak was from the pipes in the pump house which caused approximately 100 to 150 gallons of No. 4 Fuel Oil to spill to the ground (PAS-00032753-55). On October 11, 1991 KSRC entered into an ACO to address the violations that had occurred throughout the years of operation, including discharging of pollutants and hazardous substances at and around the site and the mismanagement of wastes (PAS-00003777-81).	0.0%	0% Cooperation with conduct of allocation and requests for related information	8.028E-5

AP_ABS	8.028E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Kearny Smelting & Refining

936 Harrison Ave	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.715E-2	10.0%	Periodic Noncompliacne	Poor housekeeping identified in 1984, 1986, and 1994 inspections (damaged drums and wastewater discharged to the ground; raw material, scrap, product, slag, and waste exposed to stormwater) (PAS-00003772-73, 79; PAS-00003766). Hudson Regional Health Commission sent KRSC a Notice of Violation for a discharge of a No. 4 Fuel Oil. The oil leak was from the pipes in the pump house which caused approximately 100 to 150 gallons of No. 4 Fuel Oil to spill to the ground (PAS-00032753-55). On October 11, 1991 KSRC entered into an ACO to address the violations that had occurred throughout the years of operation, including discharging of pollutants and hazardous substances at and around the site and the mismanagement of wastes (PAS-00003777-81).	0.0%	0% Cooperation with conduct of allocation and requests for related information	4.087E-2

AP_ABS	4.087E-2

Allocation Facility Cmass Calculation

Leemilt's Petroleum, Inc.	86 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	2.66	100.00%	-	0.00%	-	100.00%	61.7	64.4	1.018817E-2	0.66
LPAHs	100.00%	3.1	100.00%	-	0.00%	-	100.00%	41.2	44.26	1.018817E-2	0.45
PCBs	100.00%	6.7	100.00%	-	0.00%	-	100.00%	-	6.7	1.018817E-2	0.07
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Leemilt's Petroleum, Inc.	86 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.66	2.734E-6	1.367E-7
LPAHs	0.01	170,000.00	0.45	2.652E-6	2.652E-8
PCBs	12.87	26,000.00	0.07	2.625E-6	3.379E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Leemilt's Petroleum, Inc.	86 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.482E-5	0.66	2.9	1.482E-5	7.408E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.469E-5	0.45	2.05	1.469E-5	1.469E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	3.339E-4	0.07	8.61	3.339E-4	4.297E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Leemilt's Petroleum, Inc.	**86 Doremus Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	No information on discharge flows or COCs…estimating based on Chevron
	# days/week discharged	No Operational Effluent or Process Discharge
	# weeks/yr discharged	Assume storm water flow only directly to river
3,020,565	# gals/yr directly discharged PAP00084091	
4.08	ft; 30yr average annual precipitation per Rutgers information	
43,560	ft2 per acre	
2.27	acres	PAP-00195386
100%	Percent Precip to River	
1985	Yr Ops started	
1997	Yr Ops ceased	
12	calc #yrs facility operated	
Copper (Cu)		
12	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
12	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
12	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
12	#yrs facility discharged	Estimated based on Chevron
7.50	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
0.45	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
61.74	calc kg COC discharged	
LPAHs		
12	#yrs facility discharged	
7.50	calc mg/L O&G	Estimated based on Chevron
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
0.30	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
41.16	calc kg COC discharged	
PCBs		
-7	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-12	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
3	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
12	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
13	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
1	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-9	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
61.74	kg HPAHs	
41.16	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
		Long term average annual precipitation includes floods and hurricane events occurring over time.	
4.083333333	FEET/YEAR AVERAGE PRECIPITATION		
			Another source states that the property is 14.5 acres (FDR page 1; PAP-00066677)
15.3	ACRES - TOTAL SITE AREA (acres)	PAP-00086173	
4.5	ACRES - AFFECTED AREA	FDR page 4: Area A consists of 2.5 undeveloped acres located south of the West Yard. Additionally, based on google earth imagery, and creating polygons using measuring tool, an additional 2 acres of bare soil surrounding the tanks in the West and East Yard combined (grassy areas, see image on FDR page 4) were estimated. Total of 4.5 acres of exposed soil.	
4,046.86	$METERS^2$/ACRE		
18,211	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1985	Year site operations began	Operated and owned by Power Test Realty Company Limited Partnership (PTRC, an affiliate of Leemilt's Petroleum Inc.) (FDR page 1)	
2013	Year site ownership ceased	Year PTRC sold the Newark Terminal (FDR page 3)	
28	NUMBER YEARS DISCHARGE		
50.990436	METERS3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1962.5	KG/M3 SOIL DENSITY	Fill is composed of a mixture of sand, silt, and gravel with varying amounts of brick fragments, rocks, wood and other debris (PAP-00066671, PDF page 8). Used "silty sand and gravel" soil type from http://structx.com/Soil_Properties_002.html. Bulk density range 1442 KG/M3 to 2483 KG/M3, so use average.	
100,069	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
28	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	The table on FDR page 13 lists the maximum concentration found in onsite soils at AOC4-18GW collected from a depth of 2.5 - 3.0 ft bgs (PAP-00086279, pdf page 123). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
28	YEARS DISCHARGED		
		Maximum concentration in onsite soils (From Chevron FDR Page 10, Table) Concentration set to 0 mg/kg because the FDR incorrectly has a concentration of 84,200 mg/kg. The referenced source shows a maximum lead concentration of 8,200 mg/kg (PAP-00339532). This is set to 0 mg/kg because it is less than HF.	
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

28 YEARS DISCHARGED

26.586 MG/KG (TOTAL PAH MAX CONCENTRATION)

0.000001 kg per mg (Merck Index)

3 KILOGRAMS DISCHARGED

PAHs (others detected)

28 YEARS DISCHARGED

MG/KG (TOTAL PAH MAX CONCENTRATION)

31.02

0.000001 kg per mg (Merck Index)

3 KILOGRAMS DISCHARGED

PCBs

28 YEARS DISCHARGED

67 MG/KG (MAX OF REPORTED CONCENTRATIONS)

0.000001 kg per mg (Merck Index)

7 KILOGRAMS DISCHARGED

SUMMARY CMASS ESTIMATES:

0.00 kg Copper
0.00 kg Lead
2.66 kg PAHs (Benzo(a)pyrene Equivalent)
3.10 kg PAHs (Other)
6.70 kg PCBs

12.47 MASS (KG) DISCHARGED FROM SURFACE SOIL

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

Data below the Benzo(a)pyrene Equivalent Table

Sum of other detected PAHs from Figure PAP-00066671, pdf pg 38 from Sample ID A-2A (0.0-0.5 ft).

PCB (Aroclor 1254) highest concentration (Chevron FDR page 4)
Historic fill was not a consideration for PCB concentrations for the purpose of this calculation.

NOTE: MAX CONCENTRATIONS FOUND IN SURFACE SAMPLE ID A-2A (0.0-0.5 FT) (PAP-00066671, PDF pg 38). RESULTS IN MG/KG.

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	19.000	1.0	19.0000
Benzo(a)anthracene	12.000	0.1	1.2000
Benzo(b)fluoranthene	23.000	0.1	2.3000
Benzo(k)fluoranthene	26.000	0.01	0.2600
Chrysene	26.000	0.001	0.0260
Dibenz(a,h)anthracene	2.800	1.0	2.8000
Indeno(1,2,3-cd)pyrene	10.000	0.1	1.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 26.6

Sample A-2A (PAP-00066708)	
Anthracene	2.2
Acenaphthene	1.1
Acenaphthylene	0.52
Fluorene	1.2
Naphthalene	0
Phenanthrene	26
SUM	31.02

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Leemilt's Petroleum, Inc.

86 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.395E-5	0.0%	Historically Compliant or No Evidence	According to the PA/SIR, approximately 1,500 cubic yards of soil and debris were illegally placed in two piles at Area A in 1996. The material was subsequently removed (PAP-00084093). However, no indication disposal was by Leemilt. The PA/SIR also identified several NJDEP case numbers for spills (PAP-00084077, 91).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.716E-5

AP_ABS	2.716E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Leemilt's Petroleum, Inc.

86 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.298E-3	0.0%	Historically Compliant or No Evidence	According to the PA/SIR, approximately 1,500 cubic yards of soil and debris were illegally placed in two piles at Area A in 1996. The material was subsequently removed (PAP-00084093). However, no indication disposal was by Leemilt. The PA/SIR also identified several NJDEP case numbers for spills (PAP-00084077, 91).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.438E-3

AP_ABS	3.438E-3

Allocation Facility Cmass Calculation

Legacy Vulcan Corporation	600 Doremus Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	81.4	81.43	1.018817E-2	0.83
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	6.66	100.00%	-	0.00%	-	100.00%	16.5	23.18	1.018817E-2	0.24
LPAHs	100.00%	37.72	100.00%	-	0.00%	-	100.00%	11.0	48.73	1.018817E-2	0.5
PCBs	100.00%	56.29	100.00%	-	0.00%	-	100.00%	-	56.29	1.018817E-2	0.57
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Legacy Vulcan Corporation	**600 Doremus Ave**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0.83	2.592E-7	2.592E-9
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.24	9.841E-7	4.920E-8
LPAHs	0.01	170,000.00	0.5	2.921E-6	2.921E-8
PCBs	12.87	26,000.00	0.57	2.206E-5	2.839E-4
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Legacy Vulcan Corporation	600 Doremus Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.822E-4	0.83	902.08	2.822E-4	2.822E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	5.333E-6	0.24	1.04	5.333E-6	2.667E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.618E-5	0.5	2.25	1.618E-5	1.618E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.805E-3	0.57	72.36	2.805E-3	3.610E-2
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Legacy Vulcan Corporation	**600 Doremus Ave**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Direct Discharge to Newark Bay where the Passaic River enters.
	# days/week discharged	1971 Waste Effluent Survey 5387000 gallons per year
	# weeks/yr discharged	1976 NJPDES Application 10000 gpd
4,518,500	# gals/yr directly discharged	Facility not connected to PVSC System
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1952	Yr Ops started	
1975	Yr Ops ceased	
23	calc #yrs facility operated	
Copper (Cu)		
23	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		Lead Data: 4/73 Pb: .015-.076 mg/l (PAP-00217718) ; 1971 Pb=.5 mg/l
23	#yrs facility discharged	10/73: Pb .003 - .090 mg/l (PAP-00219175)
0.21	calc mg/L COC discharged	11/73: Pb .001-.009 mg/l (PAP-00219176)
3.785	L per gallon (Merck Index)	3/74: Pb 0.16-.45 mg/l (PAP00219181)
0.000001	kg per mg (Merck Index)	4/74: Pb 0.14-.65 mg/l (PAP-00188992)
81.43	calc kg COC discharged	6/74: Pb .004-.3 mg/l (PAP-00219184)
Mercury (Hg)		
23	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
23	#yrs facility discharged	1971 TOC = 28 mg/l
28.00	calc mg/L TOC	
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
0.0	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
16.52	calc kg COC discharged	
LPAHs		
23	#yrs facility discharged	1971 TOC = 28 mg/l
28.00	calc mg/L TOC	
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
0.0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
11.01	calc kg COC discharged	
PCBs		
23	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
23	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
23	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
23	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
23	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
23	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
23	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
81.43	kg Lead	
-	kg Mercury	
16.52	kg HPAHs	
11.01	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
29	ACRES - TOTAL SITE AREA (acres)	29 acres (FDR p 1, PAS-00010493 p 9)	Other docs say 9.5 acres (PAP-00188306, PAP-00362420, PAP-00364113)
19	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of Figure 1-2 (PAP-00364294) of the 1995 RI (PAP-00364113 p 182). Estimating that 33% of the site had buildings	
4,046.86	METERS^2/ACRE		
77,457	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
8	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES AND PLUM CREEK	
1952	Year site operations began	Kolker Chemical Co [later Vulcan] acquired facility (FDR p 1, PAP-00188319)	
1975	Year site processing and storage operations ceased	Vulcan sold to Inland in 1974 (FDR p 1, PAP-00186853)	Vulcan/Inland terminated operations of chlor-alkali and chloromethanes plants in May 1975 and dismantled plants in 1975-76 (FDR p 1, PAP-00186853). In 1975 operations were transferred from chemical manufacturing to solvent recovery (PAS-00091936 p 3)
23	NUMBER YEARS DISCHARGE		
178	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Surface soil is fill material with variable composition, including ash, wood, cinders, coal, smelter slag, brick, concrete rubble, cobble, sand, and gravel chips (PAP-00362420 p 16). Density of silty sand and gravel ranges from 1442 to 2483 kg/m^3, so the average is used. (http://structx.com/Soil_Properties_002.html)	
349,621	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Site is located on regional Historic Fill (FDR p 5)	Same concentrations used for Safety Kleen calculations are used here
Copper (Cu)			
23	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Copper concentration set to 0 mg/kg based on the conclusion accepted by NJDEP that metallic constituents detected in soil are related to operations conducted by Balbach (pre-1952) (FDR page 5)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
23	YEARS DISCHARGED		
0	MG/KG (AVERAGE CONCENTRATION)	Lead concentration set to 0 mg/kg based on the conclusion accepted by NJDEP that metallic constituents detected in soil are related to operations conducted by Balbach (pre-1952) (FDR p 5)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)		AEC 6 consisted of several tanks which were associated with chemical processing (FDR page 19)	
23	YEARS DISCHARGED		
0.0	MG/KG (MAX CONCENTRATION)	Mercury concentration set to 0 mg/kg based on the conclusion accepted by NJDEP that metallic constituents detected in soil are related to operations conducted by Balbach (pre-1952) (FDR page 5)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
23	YEARS DISCHARGED	
19.0	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
7	KILOGRAMS DISCHARGED	
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table
23	YEARS DISCHARGED	
108	MG/KG (TOTAL PAH MAX CONCENTRATION)	Concentration reflects a single sample, SB-5 (PAP-00364271). Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.
0.000001	kg per mg (Merck Index)	
38	KILOGRAMS DISCHARGED	
PCBs		Kolker Chemical Company's use of PCBs at the facility is documented (FDR pages 2, 4)
23	YEARS DISCHARGED	
161	MG/KG (MAX OF REPORTED CONCENTRATIONS)	The highest concentration of PCBs was detected in a surface soil sample collected from soil boring SB-24 at a depth of 0 to 0.5 feet bgs. (FDR page 6; PAP-00364274)
0.000001	kg per mg (Merck Index)	
56	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

Surface soil samples with highest concentrations from sample SB-5 (1.0-1.5 ft bgs) (PAP-00364271, PAP-00188365-6)
Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7.300	1.0	7.3000
Benzo(a)anthracene	17.000	0.1	1.7000
Benzo(b)fluoranthene	26.000	0.1	2.6000
Benzo(k)fluoranthene	12.000	0.01	0.1200
Chrysene	29.000	0.001	0.0290
Dibenz(a,h)anthracene	6.100	1.0	6.1000
Indeno(1,2,3-cd)pyrene	12.000	0.1	1.2000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **19.0**

All PAH data from SB-5 (1.0-1.5 ft bgs) (PAP-00188365-6)	
Fluoranthene	56
Phenanthrene	49
Athracene	2.9
SUM	107.9

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
6.66	kg PAHs (Benzo(a)pyrene Equivalent)
37.72	kg PAHs (Other)
56.29	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

100.67 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Legacy Vulcan Corporation

600 Doremus Ave	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.840E-4	5.0%	Occasional Noncompliance	New Jersey State Department of Health had issued “pollution abatement orders” to Vulcan in 1969 (PAS-00058707). Vulcan was given notice to install and provide wastewater treatment and disposal facilities, and to cease discharging “industrial waste or polluting matter” into the Passaic River (PAP-00217398).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.414E-4

AP_ABS	2.414E-4

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Legacy Vulcan Corporation

600 Doremus Ave	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.611E-2	5.0%	Occasional Noncompliance	New Jersey State Department of Health had issued “pollution abatement orders” to Vulcan in 1969 (PAS-00058707). Vulcan was given notice to install and provide wastewater treatment and disposal facilities, and to cease discharging “industrial waste or polluting matter” into the Passaic River (PAP-00217398).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.069E-2

AP_ABS	3.069E-2

Allocation Facility Cmass Calculation

National Standard LLC	714-716 Clifton Avenue	Clifton	NJ	07013

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	2.32%	1,020.00	100.00%	-	23.66	1.018817E-2	0.24
Mercury	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	2.32%	0.01	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	2.32%	0.01	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

National Standard LLC	714-716 Clifton Avenue	Clifton	NJ	07013

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0.24	7.534E-8	7.534E-10
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	6.368E-12	3.184E-13
LPAHs	0.01	170,000.00	0	8.990E-12	8.990E-14
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

National Standard LLC	714-716 Clifton Avenue	Clifton	NJ	07013

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	8.200E-5	0.24	262.17	8.200E-5	8.200E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	3.451E-11	0	0	3.451E-11	1.726E-12
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	4.979E-11	0	0	4.979E-11	4.979E-13
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

National Standard LLC	**714-716 Clifton Avenue**	**Clifton**	**NJ**	**07013**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	0.00%	0.00%	Did not connect to PVSC until 1973

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Limited information on COCs
	# hours/per day discharged	Discharge rates to PVSC in 1981
	#days/week discharged	10,000gpd Process Water
	#weeks/yr discharged	3000 gpd Sanitary
4,745,000	calc gal/yr discharge PAP-00196914	
1973	Yr Ops started	
1976	Yr Ops ceased	
3	calc #yrs facility operated	Yantacaw Bypass
Copper (Cu)		
3	#yrs facility discharged	
-	calc mg/L COC discharged	TRI reports to USEPA
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
3	#yrs facility discharged	
	calc mg/L COC discharged	Per TRI report to USEPA 340 kg/yr lead discharged
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,020.00	calc kg COC discharged	
Mercury (Hg)		
3	#yrs facility discharged	
-	calc mg/L COC discharged	TRI reports to USEPA
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
3	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
0.00012	calc mg/L HPAHs	Based on Surface Water sampling
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.006	calc kg COC discharged	
LPAHs		
3	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
0.00012	calc mg/L LPAHs	Based on Surface Water sampling
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.006	calc kg COC discharged	
PCBs		
4	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	TRI reports to USEPA
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
0	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
4	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
3	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
4	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
4	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
3	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
1,020.00	kg Lead	
-	kg Mercury	
0.0065	kg HPAHs	
0.0065	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	Discharge to Weasel Brook
	# weeks/yr discharged	7500 gpd non contact cooling water
3,650,000	# gals/yr directly discharged PAP-001969114	2500 gpd air compressor water
4.08	ft; 30yr average annual precipitation per Rutgers information	Credit for NJPDES Permit for 1985-1987
	acres	
43,560	ft2 per acre	
1938	Yr Ops started	
1987	Yr Ops ceased	
49	calc #yrs facility operated	
Copper (Cu)		
49	#yrs facility discharged	
	calc mg/kg	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
49	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
49	#yrs facility discharged	
-	calc mg/L COC discharged	TRI Reports to USEPA
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
49	#yrs facility discharged	
0.00012	calc mg/L COC discharged	Based on Surface Water sampling
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0812	calc kg COC discharged	
LPAHs		
49	#yrs facility discharged	
0.00012	calc mg/L COC discharged	Based on Surface Water sampling
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.0812	calc kg COC discharged	
PCBs		
40	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
49	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
42	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

National Standard LLC

714-716 Clifton Avenue	**Clifton**	**NJ**	**07013**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.538E-10	5.0%	Occasional Noncompliance	On August 14, 1972 PVSC inspectors collected samples of discharges from site outfalls, and analysis showed the samples “were polluting.” On August 16, 1972, PVSC directed that they cease polluting at once. National Standard addressed the issue right away (PAS-00034750-52). NJDEP issued an Administrative Order and Notice of Civil Administrative Penalty Assessment to National Standard in August 1987 due to improper hazardous waste storage and management (PAS-00004222-28). According to a Disruption and Closure Permit Application, dated June 1, 1989, lead dross (scum from the surface of the molten lead) and soils with elemental lead associated with operations at the site also were placed in onsite landfill; however, investigations, including borings and test pits, did not reveal lead dross in the landfill (PAP-00197231). It was estimated that a total of 170,000 cubic yards of miscellaneous debris was present within the landfilled areas (PAP-00197232).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.408E-10

AP_ABS	6.408E-10

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

National Standard LLC

714-716 Clifton Avenue	**Clifton**	**NJ**	**07013**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.200E-7	5.0%	Occasional Noncompliance	On August 14, 1972 PVSC inspectors collected samples of discharges from site outfalls, and analysis showed the samples “were polluting.” On August 16, 1972, PVSC directed that they cease polluting at once. National Standard addressed the issue right away (PAS-00034750-52). NJDEP issued an Administrative Order and Notice of Civil Administrative Penalty Assessment to National Standard in August 1987 due to improper hazardous waste storage and management (PAS-00004222-28). According to a Disruption and Closure Permit Application, dated June 1, 1989, lead dross (scum from the surface of the molten lead) and soils with elemental lead associated with operations at the site also were placed in onsite landfill; however, investigations, including borings and test pits, did not reveal lead dross in the landfill (PAP-00197231). It was estimated that a total of 170,000 cubic yards of miscellaneous debris was present within the landfilled areas (PAP-00197232).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.970E-7

AP_ABS	6.970E-7

Allocation Facility Cmass Calculation

Neu Holdings (Eden Wood Corporation)	1 Ackerman Avenue	Clifton	NJ	07011

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	2.54%	4,378.17	100.00%	-	111.3	1.018817E-2	1.13
Lead	100.00%	-	100.00%	-	2.54%	46.09	100.00%	-	1.17	1.018817E-2	0.01
Mercury	100.00%	-	100.00%	-	2.54%	1.17	100.00%	-	0.03	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	2.54%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	2.54%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	2.54%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.54%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.54%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.54%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Neu Holdings (Eden Wood Corporation)	1 Ackerman Avenue	Clifton	NJ	07011

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	1.13	5.400E-7	3.726E-7
Lead	0.01	3,200,000.00	0.01	3.730E-9	3.730E-11
Mercury	0.95	42,000.00	0	7.240E-9	6.878E-9
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Neu Holdings (Eden Wood Corporation)	1 Ackerman Avenue	Clifton	NJ	07011

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	4.018E-4	1.13	842.75	4.018E-4	2.773E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	4.060E-6	0.01	12.98	4.060E-6	4.060E-8
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.905E-6	0	0.29	6.905E-6	6.560E-6
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Neu Holdings (Eden Wood Corporation)	**1 Ackerman Avenue**	**Clifton**	**NJ**	**07011**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No data on discharge flowrates or COCs
	# hours/per day discharged	Using Schiffenhaus, McCarter Highway to estimate.
	#days/week discharged	Similar Facility/Operation and time periods
	#weeks/yr discharged	
5,500,000	calc gal/yr discharge	
1933	Yr Ops started	
1987	Yr Ops ceased	
54	calc #yrs facility operated	
Copper (Cu)		
54	#yrs facility discharged	From Schiffenhaus, McCarter Highway
3.89	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,378.17	calc kg COC discharged	
Lead (Pb)		
54	#yrs facility discharged	From Schiffenhaus, McCarter Highway
0.0410	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
46.09	calc kg COC discharged	
Mercury (Hg)		
54	#yrs facility discharged	
0.00104	calc mg/L COC discharged	From Schiffenhaus, McCarter Highway
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.17	calc kg COC discharged	
HPAHs		
54	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
54	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
45	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
54	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
42	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
4,378.17	kg Copper	
46.09	kg Lead	
1.17	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Neu Holdings (Eden Wood Corporation)

1 Ackerman Avenue	**Clifton**	**NJ**	**07011**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.795E-7	10.0%	Periodic Noncompliacne	In 1947, PVSC stream contamination reports documented four incidents of discharge (paper pulp, oily discharge, paperboard) from Clifton Paper Board Company into the Passaic (PAS-00113923, 925, 927, 929). In March and December 1956, Clifton Paper Board received violations for oil and water discharges from a pipe (PAS-00113935; PAS-00113937). The violations were eliminated on the next day in March and on the same day in December. Sewage discharged in 1977 (PAS-00113563). In September 1976, PVSC notified WPBC that they had two of five outlets (002 and 004) were above values that PVSC did not consider acceptable for discharge limits into the Passaic River for suspended solids, turbidity, and pH (PAS-00113566). The Herald News, dated June 1982, noted that the Clifton Mill had been partially gutted by fire in April 1980 and had never reopened (PAS-00113961). There were stained soils in the drum storage area (PAS-00113605).	0.0%	0% Cooperation with conduct of allocation and requests for related information	4.174E-7

AP_ABS	4.174E-7

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Neu Holdings (Eden Wood Corporation)

1 Ackerman Avenue	**Clifton**	**NJ**	**07011**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.839E-4	10.0%	Periodic Noncompliacne	In 1947, PVSC stream contamination reports documented four incidents of discharge (paper pulp, oily discharge, paperboard) from Clifton Paper Board Company into the Passaic (PAS-00113923, 925, 927, 929). In March and December 1956, Clifton Paper Board received violations for oil and water discharges from a pipe (PAS-00113935; PAS-00113937). The violations were eliminated on the next day in March and on the same day in December. Sewage discharged in 1977 (PAS-00113563). In September 1976, PVSC notified WPBC that they had two of five outlets (002 and 004) were above values that PVSC did not consider acceptable for discharge limits into the Passaic River for suspended solids, turbidity, and pH (PAS-00113566). The Herald News, dated June 1982, noted that the Clifton Mill had been partially gutted by fire in April 1980 and had never reopened (PAS-00113961). There were stained soils in the drum storage area (PAS-00113605).	0.0%	0% Cooperation with conduct of allocation and requests for related information	3.123E-4

AP_ABS	3.123E-4

Allocator's Determinations Regarding Legal Defenses Raised by Allocation Parties

NEU HOLDINGS

Neu Holdings argues that it has no responsibility for cleanup of the Passaic River or OU2 because all liabilities associated with the operations of the Clifton Mill were discharged as a result of WPBC's bankruptcy. WPBC filed for protection under Chapter 11 of the U.S. Bankruptcy Code, 11 U.S.C.§§101 et seq. (the "Bankruptcy Code"), in the United States Bankruptcy Court for the District of New Jersey (the "Bankruptcy Court") on February 8, 1980. The proceedings were designated *In re Whippany Paper Board Co. Inc.*, Case No. 80-00426 (the "Chapter 11 Proceedings"). FDR at 2. The Clifton Mill ceased operations in April of 1980. *Id*.

The Bankruptcy Court established March 11, 1981 as the last day by which parties holding claims against WPBC could file a proof of claim in order to participate in any distribution from WPBC's bankruptcy estate. EPA had actual knowledge of WPBC's Chapter 11 Proceedings well before that date but elected not to file a proof of claim. On March 31, 1981 (the "Confirmation Date"), the Bankruptcy Court entered an order pursuant to 11 U.S.C. §1129 confirming the Chapter 11 Plan for WPBC. FDR 2. Pursuant to Section 9.1 of the Chapter 11 Plan and Bankruptcy Code Section 1141(d), the confirmation of the Chapter 11 Plan discharged WPBC from any and all "debts" that "arose before the date of such confirmation." PAP-00102386; 11 U.S.C. §1141(d)(1)(A).

EPA has suggested that the bankruptcy discharge does not affect its CERCLA claim because the bankruptcy discharge occurred before EPA initiated a response action for the Passaic River. Section 101 of the Bankruptcy Code defines the terms "debt" and "claim" to have "the broadest possible definition[s] . . . [so] that all legal obligations of [a bankruptcy] debtor, *no matter how remote or contingent*, will be able to be dealt with in [a] bankruptcy case" (emphasis added). As a result of these broad definitions, Courts have recognized that a Chapter 11 debtor's discharge extends to any actual or alleged CERCLA liabilities arising from or relating to the debtor's "pre-confirmation" release of hazardous substances. This is true even if such releases do not become the subject of any investigation or response costs until years (or even decades) after the debtor's Chapter 11 plan has been confirmed. For instance, the Second Circuit held that pre- bankruptcy hazardous substance releases are subject to discharge even if such costs relate to CERCLA sites of which EPA is unaware at the time of the bankruptcy proceeding.

The relationship between environmental regulating agencies and those subject to regulation provides sufficient "contemplation" of contingencies to bring most ultimately maturing payment obligations based on [pre-bankruptcy] conduct within the definition of "claims." True, EPA does not yet know the full extent of the …costs that it may one day incur and seek to impose upon [the debtor], and it does not yet even know the location of all the sites at which such wastes may yet be found. But the location of these sites, the determination of their coverage by CERCLA, and the incurring of response costs by EPA are all steps that may fairly be viewed, in the regulatory context, as rendering EPA's claim "contingent," rather than as placing it outside the [Bankruptcy] Code's definition of "claim."

U.S. v. The LTV Corporation (In re Chateaugay Corporation), 944 F. 2d 997, 1005 (2nd Cir. 1991); *see also State of New Jersey Department of Environmental Protection v. The IT Litigation Trust (In re IT Group, Inc., Co.)*, 339 B.R. 338, 343-4 (D. Del. 2006) (post-confirmation environmental remediation order issued by the New Jersey Department of Environmental Protection against successor to Chapter 11 debtor was held to have been discharged as a result of the confirmation of the debtor's Chapter 11 plan).

WPBC ceased all operation of the Clifton Mill in April of 1980, when a fire partially gutted the facility. WPBC never resumed operation of the Clifton Mill prior to selling the Mill to Ponte, an unrelated third-party, on October 1, 1987. FDR 3. Thus, even if WPBC's Clifton Mill operations resulted in the release of COCs into the Passaic River (which, as discussed herein, it did not), any such release would have occurred prior to the March 31, 1981 Confirmation Date. Neu Holdings posits that as a result, any CERCLA liability for any COC released prior to the March 31, 1981 Confirmation Date from the WPBC Clifton Mill was discharged in bankruptcy. Having forgone its right to file a proof of claim and participate in the distributions from WPBC's Chapter 11 bankruptcy estate, EPA is now precluded as a matter of federal bankruptcy law from seeking to recover under CERCLA against Neu Holdings, the successor to NPN/WPBC. *See* 11 U.S.C. §524(a)(2) (providing that a bankruptcy discharge operates as a statutory injunction against any act to collect or recover a discharged debt as a personal liability of the debtor). The bankruptcy discharge is a complete defense to liability and presents a significant litigation risk to EPA should the Agency proceed with a civil case. *See United States v. Davis*, 261 F.3d 1, 26 (1st Cir. 2001) ("party specific discounts may reflect the chances of the United States success in litigation against a given PRP" and it "is appropriate to factor into the equation any reasonable discounts for litigation risks, time savings, and the like that may be justified"); *see also United States v. Fort James Operating Co*., 313 F. Supp. 2d 902, 909 (E.D. Wis. 2004) ("plaintiffs present a number of good reasons for not attempting to obtain top dollar through litigation, including the risks of litigation").

According to Neu Holdings, "Respondent denies that WPBC released COCs from its operation of the Clifton Plant to the Passaic River and OU 2. Even if it did, WPBC's liability for any such releases was discharged as a matter of law in bankruptcy on March 31, 1981. On February 8, 1980, WPBC commenced a voluntary proceeding under Chapter 11 of the United States Bankruptcy Code, 11 U.S.C. §§101 et seq. (the "Bankruptcy Code") in the United States Bankruptcy Court for the District of New Jersey (the "Bankruptcy Court"), said proceedings having been designated In re Whippany Paper Board Co. Inc., Case No. 80-00426". Neu Holdings state that USEPA was aware at the time of WPBC's bankruptcy proceedings and had an opportunity to participate in the same (PAP-00374507).

On March 31, 1981, the Bankruptcy Court entered an Order confirming WPBC's reorganization plan. Per the plan of reorganization and the bankruptcy code, the confirmation of the reorganization plan discharged WPBC from any and all "debts that arose before the date of such confirmation." (PAP-00102386)

"USEPA has suggested that the bankruptcy discharge does not pose a barrier to USEPA's claim because the bankruptcy discharge occurred long before EPA initiated a response action at the Diamond Alkali Site. However, the Bankruptcy Code Section 101(5) defines a "claim" as

including a right to payment that at the time of a debtor's bankruptcy remains "unmatured" and/or "contingent," and it is well-established that a potential liability may qualify as a "claim" for bankruptcy discharge purposes even if it has not yet fully accrued into a cognizable cause of action under applicable non-bankruptcy law. Collier on Bankruptcy, 101.05 at 101-39 (16th Ed. 2017) (As defined in the Bankruptcy Code, the term "'[c]laim' . . . include[s] a cause or action or right to payment that has not yet accrued or become cognizable."). In the environmental context, a Chapter 11 bankruptcy debtor may be discharged from any and all potential liabilities related to a pre-confirmation release or threatened release of hazardous substances even if such release does not become the subject of any investigation and/or resulting response costs until several years (or even decades) after the debtor's Chapter 11 plan has been confirmed.

In this case, WPBC ceased operating the Clifton Plant in April of 1980, before the March 31, 1981 confirmation of its Chapter 11 Plan and never resumed operation of the Clifton Plant before selling it to V. Ponte & Sons on October 1, 1987 (PAS-00113953).

Accordingly, even if WPBC's operation of the Clifton Plant resulted in the release of COCs into the Passaic River (of which there is no evidence), the liability of WPBC for any such release was discharged upon the court's confirmation of its Chapter 11 Plan.

According to the Neu Holdings evidence shows that the Clifton Plant operations during the period of WPBC's ownership and operation did not include COCs and that the Clifton Plant property was not a conduit for discharging COCs into the River. As such, the former Clifton Plant, which is located nearly nine miles from OU2, did not discharge COCs that could have had any material impact to the Passaic River or OU2. Especially considering that Neu Holdings' wholly owned subsidiary contributed approximately $1.8 million toward lower Passaic River investigation and a removal action for which it had no responsibility at all, Neu Holdings should bear no further liability for the Diamond Alkali Site or OU2.

ALLOCATOR'S DETERMINATION – Neu Holdings has noted several arguments why it should not be held responsible for contamination of OU2 caused by the actions of its predecessor. Neu Holdings has posited a legal argument based on the fact that it acquired the entity at issue after it was discharged in bankruptcy, which it argues provides a complete defense to CERCLA liability. The Allocator leaves legal defenses for consideration during future settlement discussions with EPA, at which time Neu Holdings and EPA can discuss the efficacy of its bankruptcy defense and the litigation risk posed thereby. In addition, Neu Holdings has posited several additional equitable arguments. However, there is insufficient available information to determine whether the situation raised overrides the CERCLA doctrine that a legal corporate successor by merger cannot avoid liability for its predecessors acts or omissions on equitable grounds. Therefore, the Allocator likewise leaves this matter for consideration during future settlement discussions with EPA.

Allocation Facility Cmass Calculation

Newark Group, Inc.	17 Blanchard Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	344.97	0.00%	2,271.05	100.00%	101.9	446.89	1.018817E-2	4.55
Lead	100.00%	-	100.00%	97.40	0.00%	641.24	100.00%	28.8	126.18	1.018817E-2	1.29
Mercury	100.00%	-	100.00%	2.03	0.00%	13.36	100.00%	0.6	2.63	1.018817E-2	0.03
HPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Newark Group, Inc.	17 Blanchard Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	4.55	2.168E-6	1.496E-6
Lead	0.01	3,200,000.00	1.29	4.017E-7	4.017E-9
Mercury	0.95	42,000.00	0.03	6.377E-7	6.058E-7
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Newark Group, Inc.	17 Blanchard Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.614E-3	4.55	3,383.93	1.614E-3	1.113E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	4.373E-4	1.29	1,397.92	4.373E-4	4.373E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.082E-4	0.03	25.52	6.082E-4	5.777E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Newark Group, Inc.	**17 Blanchard Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Facility in operation from 1912-2003
24	# hours/per day discharged	Discharge to PVSC started in 1926 (through 2003)
6-7	#days/week discharged	Flowrate data:
52	#weeks/yr discharged	1978 Sewer Connection Application - 127527500 gallons PAS-00103669
52,800,195	calc gal/yr discharge	1975 Waste Effluent Survey - 317,000 gpd PAP-00114423; PAP-00112870through PAP-00114638
		1975 Industrial Wastewater Questionnaire - 563,000 gpd PAS-00000441
1926	Yr Ops started	1980 PVSC Heavy Metal Source Determination Study 356000 gpd PAS-00103655
2003	Yr Ops ceased	2003 PVSC Discharge Monitoring Data - 1/03 2688600; 2/03 2042450; 3/03 1655300; 4/03 1788900
77	calc #yrs facility operated	5/03 2678700; 6/03 4422300 (PAP-00114572)
Copper (Cu)		Copper Data: PAP-00114476 thru PAP-00114640
77	#yrs facility discharged	1975 Waste Effluent Survey - Cu=.20 mg/l
0.17	calc mg/L COC discharged	1978 Ind Waste Questionnaire - Cu=.20 mg/l
3.785	L per gallon (Merck Index)	1980 PVSC Heavy Metals Source Determination Study Cu=.316 mg/l
0.000001	kg per mg (Merck Index)	1974-2002 Wastewater Analytical Results - Cu = .042-.64 mg/l
2,616.02	calc kg COC discharged	1994 PVSC Discharge Reports - Cu = .06-1.7 mg/l
Lead (Pb)		Lead Data:PAP-00114476 thru PAP-00114640
77	#yrs facility discharged	1975 Waste Effluent Survey - Pb = .2-1.0 mg/l
0.048	calc mg/L COC discharged	1978 Ind Waste Questionnaire - Pb = 1 mg/l
3.785	L per gallon (Merck Index)	1980 PVSC Heavy Metals Source Determination Study Pb = .2999 mg/l
0.000001	kg per mg (Merck Index)	1974-2002 Wastewater Analytical Results - Pb = .004-.942 mg/l
738.64	calc kg COC discharged	1994 PVSC Discharge Reports - Pb = .005-.016 mg/l
Mercury (Hg)		Mercury Data:PAP-00114476 thru PAP-00114640
77	#yrs facility discharged	1980 PVSC Heavy Metals Source Determination Study Pb = .0016 mg/l
0.0010	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
15.39	calc kg COC discharged	
HPAHs		
77	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
77	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
77	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
58	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
2,616.02	kg Copper	
738.64	kg Lead	
15.39	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	From 1912-1926 assume discharge direct to Morris Canal
	# days/week discharged	Same flow as assumed to PVSC tab
	# weeks/yr discharged	
52,800,195	# gals/yr directly discharged	PAP-00112870through PAP-00114638
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1924	Yr Ops started	
1926	Yr Ops ceased	
3	calc #yrs facility operated	
Copper (Cu)		Copper Data: PAP-00114476 thru PAP-00114640
3	#yrs facility discharged	
0.17	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
101.92	calc kg COC discharged	
Lead (Pb)		Lead Data: PAP-00114476 thru PAP-00114640
3	#yrs facility discharged	
0.048	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
28.78	calc kg COC discharged	
Mercury (Hg)		Mercury Data: PAP-00114476 thru PAP-00114640
3	#yrs facility discharged	
0.0010	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.60	calc kg COC discharged	
HPAHs		
3	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
3	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
3	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
3	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
3	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
3	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
3	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
3	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
3	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
101.92	kg Copper	
28.78	kg Lead	
0.60	kg Mercury	
	kg HPAHs	
	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Newark Group, Inc.

17 Blanchard Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.106E-6	0.0%	Historically Compliant or No Evidence	A 1970 Stream Contamination Report reported that on April 6, 1970, as a result of negligence, a violation occurred at Newark Boxboard when approximately 500 gal of paper pulp overflowed into a driveway and then into the Blanchard Street storm sewer (PAS-00035386). (non-COC)	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.685E-6

AP_ABS	1.685E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Newark Group, Inc.

17 Blanchard Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.695E-3	0.0%	Historically Compliant or No Evidence	A 1970 Stream Contamination Report reported that on April 6, 1970, as a result of negligence, a violation occurred at Newark Boxboard when approximately 500 gal of paper pulp overflowed into a driveway and then into the Blanchard Street storm sewer (PAS-00035386). (non-COC)	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.356E-3

AP_ABS	1.356E-3

Allocation Facility Cmass Calculation

Newark Morning Ledger Co.	1 Star Ledger Plaza	Newark	NJ	07102

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	10.03%	208.57	100.00%	-	20.92	1.018817E-2	0.21
Lead	100.00%	-	100.00%	-	10.03%	105.59	100.00%	-	10.59	1.018817E-2	0.11
Mercury	100.00%	-	100.00%	-	10.03%	68.07	100.00%	-	6.83	1.018817E-2	0.07
HPAHs	100.00%	-	100.00%	-	10.03%	785.40	100.00%	-	78.76	1.018817E-2	0.8
LPAHs	100.00%	-	100.00%	-	10.03%	523.60	100.00%	-	52.51	1.018817E-2	0.53
PCBs	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	10.03%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Newark Morning Ledger Co.	1 Star Ledger Plaza	Newark	NJ	07102

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.21	1.015E-7	7.001E-8
Lead	0.01	3,200,000.00	0.11	3.371E-8	3.371E-10
Mercury	0.95	42,000.00	0.07	1.656E-6	1.573E-6
HPAHs	0.05	240,000.00	0.8	3.343E-6	1.672E-7
LPAHs	0.01	170,000.00	0.53	3.147E-6	3.147E-8
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Newark Morning Ledger Co.	1 Star Ledger Plaza	Newark	NJ	07102

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	7.552E-5	0.21	158.37	7.552E-5	5.211E-5
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	3.669E-5	0.11	117.31	3.669E-5	3.669E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.579E-3	0.07	66.25	1.579E-3	1.500E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.812E-5	0.8	3.55	1.812E-5	9.060E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.743E-5	0.53	2.43	1.743E-5	1.743E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Newark Morning Ledger Co.	**1 Star Ledger Plaza**	**Newark**	**NJ**	**07102**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	City Dock	CSO	0.11%	61.80%	
2	City Dock	Bypass	9.96%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No direct discharges to Passaic River. All discharges to PVSC (PVSC Permit) PAP-00000640
24	# hours/per day discharged	Flows:
7	#days/week discharged	1972 = 26506876 gallons
52	#weeks/yr discharged	1978 = 18391824 gallons
26,602,987	calc gal/yr discharge	1986 = 33851114 gallons
		1990 = 33717380 gallons
1966	Yr Ops started	1991 = 20547740 gallons
1992	Yr Ops ceased	PAS-00077049-109
26	calc #yrs facility operated	PAS-00077311-475
Copper (Cu)		
26	#yrs facility discharged	Heavy Metal Source Determination (PAP-00212775) CU=.133 mg/l
0.08	calc mg/L COC discharged	1971 Permit Discharge Cu=.048mg/l and .058 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
208.57	calc kg COC discharged	
Lead (Pb)		
26	#yrs facility discharged	Heavy Metal Source Determination (PAP-00212775) Pb = .061 mg/l
0.040	calc mg/L COC discharged	1971 Permit Discharge Pb = .030 mg/l and .030 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
105.59	calc kg COC discharged	
Mercury (Hg)		
26	#yrs facility discharged	Heavy Metal Source Determination (PAP-00212775) Hg = .003 mg/l
0.0260	calc mg/L COC discharged	1971 Permit Discharge Hg = .028 mg/l and .047 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
68.07	calc kg COC discharged	
HPAHs		
26	#yrs facility discharged	1971 Permit Discharge Emulsified oils = 6 mg/l and 4 mg/l
5.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as HPAHs	
0.30	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
785.40	calc kg COC discharged	
LPAHs		
26	#yrs facility discharged	1971 Permit Discharge Emulsified oils = 6 mg/l and 4 mg/l
5.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as LPAHs	
0.20	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
523.60	calc kg COC discharged	
PCBs		
12	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
7	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
22	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
26	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
27	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
20	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
10	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
208.57	kg Copper	
105.59	kg Lead	
68.07	kg Mercury	
785.40	kg HPAHs	
523.60	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Newark Morning Ledger Co.

1 Star Ledger Plaza	**Newark**	**NJ**	**07102**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.842E-6	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.842E-6

AP_ABS	1.842E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Newark Morning Ledger Co.

1 Star Ledger Plaza	**Newark**	**NJ**	**07102**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.554E-3	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.554E-3

AP_ABS	1.554E-3

Allocation Facility Cmass Calculation

Nokia-Lucent Technologies	100 Central Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	2,428.02	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	4,774.53	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	5.91	100.00%	-	0.00%	-	100.00%	-	5.91	1.018817E-2	0.06
HPAHs	100.00%	12.8	100.00%	-	0.00%	6,707.63	100.00%	-	12.8	1.018817E-2	0.13
LPAHs	100.00%	26.09	100.00%	-	0.00%	4,471.75	100.00%	-	26.09	1.018817E-2	0.27
PCBs	100.00%	11,010.36	100.00%	-	0.00%	-	100.00%	-	11,010.36	1.018817E-2	112.18
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Nokia-Lucent Technologies	100 Central Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0.06	1.434E-6	1.362E-6
HPAHs	0.05	240,000.00	0.13	5.434E-7	2.717E-8
LPAHs	0.01	170,000.00	0.27	1.564E-6	1.564E-8
PCBs	12.87	26,000.00	112.18	4.314E-3	5.553E-2
DDx	1.37	27,000.00	0	3.773E-10	5.170E-10
Dieldrin	0.13	390.00	0	5.225E-11	6.792E-12
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Nokia-Lucent Technologies	100 Central Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.367E-3	0.06	57.36	1.367E-3	1.299E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.945E-6	0.13	0.58	2.945E-6	1.472E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	8.660E-6	0.27	1.21	8.660E-6	8.660E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	5.487E-1	112.18	14,153.83	5.487E-1	7.062E+0
DDx	1.37	27,000.00	2,516.93	26,974.36	3.973E-7	0	0.01	3.973E-7	5.443E-7
Dieldrin	0.13	390.00	1.27	389.99	1.580E-6	0	0	1.580E-6	2.054E-7
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Nokia-Lucent Technologies	**100 Central Avenue**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
710,000	gal discharged per day PAS00080507, PAS00073226, PAP00127263, PAS00080267	From 1925-1984 Wastewater was discharged to municipal treatment plant in S. Kearny and discharged to the Hackensack River
	# hours/per day discharged	1978 NPDES Permit Application
5	#days/week discharged	1982 Compliance Monitoring Report, PAS-00080368
52	#weeks/yr discharged	1982 Discharge Reports
184,600,000	calc gal/yr discharge	
1974	Yr Ops started	
1984	Yr Ops ceased	
10	calc #yrs facility operated	FDR pages 2-5, Allocation Figure 12
Copper (Cu)		
10	#yrs facility discharged	
0.35	calc mg/L COC discharged PAP00127737, PAS00080267, PAP00127263	1978 NPDES Permit Application
3.785	L per gallon (Merck Index)	1981 Wastewater Treatment Plant Survey & Discharge Reports
0.000001	kg per mg (Merck Index)	1982 Compliance Monitoring Reports
2,428.02	calc kg COC discharged	
Lead (Pb)		
10	#yrs facility discharged	
0.683	calc mg/L COC discharged PAP00127737, PAS00080267	1978 NPDES Permit Application
3.785	L per gallon (Merck Index)	1981 Wastewater Treatment Plant Survey & Discharge Reports
0.000001	kg per mg (Merck Index)	
4,774.53	calc kg COC discharged	
Mercury (Hg)		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
10	#yrs facility discharged	
16.0	calc mg/L O&G PAP00127737, PAS00080267	1978 NPDES Permit Application
10%	% O&G that is considered PAHs	1981 Wastewater Treatment Plant Survey & Discharge Reports
60%	% COC in O&G considered as HPAHs	
0.96	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
6,707.63	calc kg COC discharged	
LPAHs		
10	#yrs facility discharged	
16.0	calc mg/L O&G PAP00127737, PAS00080267	1978 NPDES Permit Application
10%	% O&G that is considered PAHs	1981 Wastewater Treatment Plant Survey & Discharge Reports
40%	% COC in O&G considered as LPAHs	
1	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,471.75	calc kg COC discharged	
PCBs		
4	#yrs facility discharged within PCBs Timeline	
-	calc mg/kg	
0.0075%	assumed %mg of material in conveyance carried away via 1L discharge flow through the conveyance	
	calc gal/yr discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-1	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
11	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
11	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
11	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
2	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
2,428.02	kg Copper	
4,774.53	kg Lead	
-	kg Mercury	
6,707.63	kg HPAHs	
4,471.75	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
107,388	# gallons discharged per day (PAP000126621, PAS00073226, PAS00080319, PAS00080368)	PAP-00126844 thru PAP-00127139
	# hours/day discharged	Direct Discharges to Passaic River
5	# days/week discharged	1974 NPDES Permit, PAS-00080368
52	# weeks/yr discharged	1978 NPDES Permit
27,920,880	# gals/yr directly discharged	1980 Selected Substance Report
		1981 Wastewater Treatment Plant Survey and Discharge Reports
4.08	ft; 30yr average annual precipitation per Rutgers information	CREDITS:
	acres	NJPDES Discharge limits: Copper .167#/day= 670.5 kg and Lead .042 #/day = 168.63
43,560	ft2 per acre	Oil and Grease 8.3#/day=3.76 kg/day over 11 years = 15096.4 kg
		1974-1984
1974	Yr Ops started	
1984	Yr Ops ceased	
10	calc #yrs facility operated	FDR page 2-5, Allocation Figure 12
Copper (Cu)		
10	#yrs facility discharged	1974 NPDES Permit
0.1244	calc mg/L COC discharged PAP000126621, PAS00073226, PAS00080319, PAS00080368, PAP00127363	PAP-00126844 thru PAP-00127139
3.785	L per gallon (Merck Index)	1980 Selected Substance Report
0.000001	kg per mg (Merck Index)	1981 Wastewater Treatment Plant Survey and Discharge Reports
131.47	calc kg COC discharged	1982 Compliance Monitoring Reports
Lead (Pb)		
10	#yrs facility discharged	1974 NPDES Permit
0.0372	calc mg/L COC discharged PAP000126621, PAS00073226, PAS00080368	PAP-00126844 thru PAP-00127139
3.785	L per gallon (Merck Index)	1981 Wastewater Treatment Plant Survey and Discharge Reports
0.000001	kg per mg (Merck Index)	
39.31	calc kg COC discharged	
Mercury (Hg)		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
10	#yrs facility discharged	
3.258	calc mg/L O&G PAP000126621, PAS00073226, PAS00080368	PAP-00126844 thru PAP-00127139
10%	% O&G that is considered PAHs	1978 NPDES Permit
60%	% COC in O&G considered as HPAHs	1981 Wastewater Treatment Plant Survey and Discharge Reports
0.20	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
206.58	calc kg COC discharged	
LPAHs		
10	#yrs facility discharged	
3.268	calc mg/L O&G PAP000126621, PAS00073226, PAS00080368	PAP-00126844 thru PAP-00127139
10%	% O&G that is considered PAHs	1978 NPDES Permit
40%	% COC in O&G considered as LPAHs	1981 Wastewater Treatment Plant Survey and Discharge Reports
0.13	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
138.15	calc kg COC discharged	
PCBs		
4	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-1	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
11	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
11	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
11	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
2	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
147	ACRES - TOTAL SITE AREA (acres)	FDR, Page 1	
30	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of FDR and PAP-00367726.	
4,046.86	$METERS^2$/ACRE		
121,406	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
12	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1925	Year site operations began	Nokia-Lucent Technologies Inc. (Lucent) operated and owned the facility as Western Electric Company Kearny Works (Kearny Works) from 1925 to 1984 (PAS-00080504).	
1984	Year site processing and storage operations ceased	Sold site to the Union Minerals and Alloys Corporation in May 1984 (PAS-00080509)	
59	NUMBER YEARS DISCHARGE		
716	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill reported as fine to coarse sand with silt and fine gravel (PAP-00367705, pdf 62). Bulk density range for silty sand and gravel 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
1,406,086	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Other metals not listed here (i.e not COCs) were detected in onsite soil	
59	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	351 mg/kg Copper concentration in on-site surface soil sample F6-8-1 (PAP-00367863). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Lead (Pb)			
59	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Lead was found in on-site surface soil sample L4-7-1 (2.5-3) at 4,030 mg/kg. (PAP-00367869). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Mercury (Hg)			
59	YEARS DISCHARGED		
4.20	MG/KG (MAX CONCENTRATION)	Mercury concentration in on-site surface soil sample M8-6-1 (1-1.5) (PAP-00367870).	
0.000001	kg per mg (Merck Index)		
5.91	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
59	YEARS DISCHARGED		
9.1	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
12.80	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
59	YEARS DISCHARGED		
19	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
26.09	KILOGRAMS DISCHARGED		

Site is within Historic Fill Area - used maximum PAH concentrations documented in Fill surface soil sample M6-3-1 (PAP-00367848)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	6.100	1.0	6.1000
Benzo(a)anthracene	7.800	0.1	0.7800
Benzo(b)fluoranthene	7.800	0.1	0.7800
Benzo(k)fluoranthene	3.500	0.01	0.0350
Chrysene	7.600	0.001	0.0076
Dibenz(a,h)anthracene	1.000	1.0	1.0000
Indeno(1,2,3-cd)pyrene	4.000	0.1	0.4000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **9.1**

PCBs	
28	
33000	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
11,010.36	KILOGRAMS DISCHARGED
DDx	
44	YEARS DISCHARGED within DDx Timeline
2.04	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0.0011	KILOGRAMS DISCHARGED
Dieldrin	
20	YEARS DISCHARGED within Dieldrin Timeline
0.0075	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0.000002	KILOGRAMS DISCHARGED
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED
0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	calc kg COC discharged

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
5.91	kg Mercury
12.80	kg PAHs (Benzo(a)pyrene Equivalent)
26.09	kg PAHs (Other)
11010.36	kg PCBs
0.001090	kg DDx
0.000002	kg Dieldrin
0.000000	kg Dioxins/Furans

11055.156230	MASS (KG) DISCHARGED FROM SURFACE SOIL

360 gallons of PCB oils on 1981 inventory. Assumed PCB transformers made from 1956-1981 (i.e., PCBs were used up in 1981), based on employee affidavit that PCB transformers were manufactured for 25 years (FDR, Page 8; PAS-00129817). Site operations ended and the property was sold in 1984; therefore, reduced PCB discharge period from 54 to 28 years (1956-1984). Also, the investigation for cleanup occurred in 1985, see below, documenting that that PCB-contaminated soil was still in place
Maximum surface soil concentration (FDR, Page 9). Surface sample data on PAS-00129817.

PCB mass calculation adjusted to account for area of erosion shown by PAP-00367959, PAP-00367998, PAP-00368003-6
DDT use began in 1940s - assume present between 1940 and 1984. Period of discharge changed.

DDT concentration in on-site surface soil sample F6-8-1 (1-1.5 ft bgs) (PAP-00367888).

Found in one sample 2.5-3 ft bgs at a low concentration (PAP-00367769)

Sample M6-3-1 (PAP-00367848)	
Anthracene	3.7
Acenaphthene	0.98
Acenapthylene	0.11
Fluorene	0.69
Naphthalene	0.072
Phenanthrene	13
1-methylnaphthalene	0
2-methylnaphthalene	0
SUM	18.552

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Nokia-Lucent Technologies

100 Central Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.553E-2	5.0%	Occasional Noncompliance	Violations of (unspecified) effluent limitations identified by EPA in 1977 (PAS-00073276). A response letter from Western Electric Company addressed the exceedances, stating they were not above limits (PAP-00127236). An inspection report noted that there were two instances in 1981 when the NPDES permit levels were not met (parameters not specified) (PAS-00080369). A Compliance Monitoring Report dated October 1, 1982 stated outfall 002 was out of compliance for soluble copper one time in the previous year (PAP-00127263, 65). A memorandum dated November 12, 1979, stated that partially filled drums of hazardous waste had been consolidated at the O.P. yard, but the practice of tipping the drums to pour out the waste was hazardous and would be discontinued in accordance with New Jersey's new spill law (PAS-00080312).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	4.720E-2

AP_ABS	4.720E-2

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Nokia-Lucent Technologies

100 Central Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.063E+0	5.0%	Occasional Noncompliance	Violations of (unspecified) effluent limitations identified by EPA in 1977 (PAS-00073276). A response letter from Western Electric Company addressed the exceedances, stating they were not above limits (PAP-00127236). An inspection report noted that there were two instances in 1981 when the NPDES permit levels were not met (parameters not specified) (PAS-00080369). A Compliance Monitoring Report dated October 1, 1982 stated outfall 002 was out of compliance for soluble copper one time in the previous year (PAP-00127263, 65). A memorandum dated November 12, 1979, stated that partially filled drums of hazardous waste had been consolidated at the O.P. yard, but the practice of tipping the drums to pour out the waste was hazardous and would be discontinued in accordance with New Jersey's new spill law (PAS-00080312).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.004E+0

AP_ABS	6.004E+0

Allocation Facility Cmass Calculation

Occidental Chemical Corp.	**80 & 120 Lister Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	51.58	100.00%	-	0.00%	-	100.00%	-	51.58	1.018817E-2	0.53
Lead	100.00%	162.51	100.00%	-	0.00%	-	100.00%	-	162.51	1.018817E-2	1.66
Mercury	100.00%	2.61	100.00%	-	0.00%	-	100.00%	-	2.61	1.018817E-2	0.03
HPAHs	100.00%	4.15	100.00%	-	0.00%	-	100.00%	181.3	185.41	1.018817E-2	1.89
LPAHs	100.00%	6.74	100.00%	-	0.00%	-	100.00%	51.8	58.55	1.018817E-2	0.6
PCBs	100.00%	0.49	100.00%	-	0.00%	-	100.00%	119.7	120.2	1.018817E-2	1.22
DDx	100.00%	265.61	100.00%	-	0.00%	-	100.00%	1,673.1	1,938.72	1.018817E-2	19.75
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	0.1	0.14	1.018817E-2	0
Dioxins_Furans	100.00%	347.69	100.00%	-	0.00%	2,045.94	100.00%	3,382.0	3,729.71	1.018817E-2	38.

Allocation Facility COC Base Scores - Protocol Calculation

Occidental Chemical Corp.	**80 & 120 Lister Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.53	2.502E-7	1.727E-7
Lead	0.01	3,200,000.00	1.66	5.174E-7	5.174E-9
Mercury	0.95	42,000.00	0.03	6.331E-7	6.015E-7
HPAHs	0.05	240,000.00	1.89	7.871E-6	3.935E-7
LPAHs	0.01	170,000.00	0.6	3.509E-6	3.509E-8
PCBs	12.87	26,000.00	1.22	4.710E-5	6.062E-4
DDx	1.37	27,000.00	19.75	7.316E-4	1.002E-3
Dieldrin	0.13	390.00	0	3.537E-6	4.598E-7
Dioxins_Furans	83.92	38.00	38.	1.000E+0	8.392E+1

Allocation Facility COC Base Scores - Alternative Calulcation

Occidental Chemical Corp.	**80 & 120 Lister Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.862E-4	0.53	390.57	1.862E-4	1.285E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	5.631E-4	1.66	1,800.4	5.631E-4	5.631E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.038E-4	0.03	25.33	6.038E-4	5.736E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	4.266E-5	1.89	8.35	4.266E-5	2.133E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.943E-5	0.6	2.71	1.943E-5	1.943E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	5.990E-3	1.22	154.52	5.990E-3	7.709E-2
DDx	1.37	27,000.00	2,516.93	26,974.36	7.703E-1	19.75	20,777.58	7.703E-1	1.055E+0
Dieldrin	0.13	390.00	1.27	389.99	1.070E-1	0	41.72	1.070E-1	1.391E-2
Dioxins_Furans	83.92	38.00	3,729.82	0.00	1.000E+0	38.	0	1.000E+0	8.392E+1

Facility Bypass Information

Occidental Chemical Corp.	**80 & 120 Lister Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
15,000	gal discharged per day/week/month	Connected to PVSC in 1956, but only the 2,4-D and 2,4,5-T plants connected.
24	# hours/per day discharged	15000gpd from 2,4-D and 2,4,5-T (PAP-00162277)
7	#days/week discharged	
52	#weeks/yr discharged	
5,460,000	calc gal/yr discharge	
1956	Yr Ops started	
1986	Yr Ops ceased	
30	calc #yrs facility operated	
Copper (Cu)		
30	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
30	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
30	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
30	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
30	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
22	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
17	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
31	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
30	#yrs facility discharged	
3.30	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,045.94	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
31	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
30	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
20	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
2,045.94	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	From 1946-1956 all discharges directly to the Passaic River (PAS-00128425-26)
	# days/week discharged	After 1956 15000 gpd went to PVSC (PAP-00162277)
	# weeks/yr discharged	All storm water (as well as groundwater migration) to the Passaic River, with documentation.
10,742,932	# gals/yr directly discharged	Assume storm water flow for 5.6 acres
		30,000 gpd process wastewater (PAS-001284474)
4.08	ft; 30yr average annual precipitation per Rutgers information	
43,560	ft2 per acre	
5.60	acres	
50%	Percent Precip to River	
1946	Yr Ops started	
1986	Yr Ops ceased	
40	calc #yrs facility operated	
Copper (Cu)		
40	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
40	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
40	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		Estimating all COCs based on Soil Data, Groundwater Data, Sump Sampling Data, etc.
40	#yrs facility discharged	February 1985 Sampling Data = 334,000 ug/kg = 334 mg/kg; assume 0.334 mg/l
0.11	calc mg/L COC discharged	May 1985 Soil Sampling Data = 111,500 ug/kg = 111.5 mg/kg; assume 0.1115 mg/l
3.785	L per gallon (Merck Index)	February 1985 GW Sampling Data = .174 mg/l; assume .000174 mg/l
0.000001	kg per mg (Merck Index)	1994 Remedial Design Investigation Sampling Data = .099mg/l; assume .000099 mg/l
181.26	calc kg COC discharged	
LPAHs		Estimating all COCs based on Soil Data, Groundwater Data, Sump Sampling Data, etc.
40	#yrs facility discharged	February 1985 Sampling Data = 83,180 ug/kg= 83.180 mg/kg; assume .083180mg/l
0.03	calc mg/L COC discharged	May 1985 Soil Sampling Data = 42,600 ug/kg=42.6 mg/kg; assume .0426mg/l
3.785	L per gallon (Merck Index)	February 1985 GW Sampling Data = 1.556 mg/l; assume .001556 mg/l
0.000001	kg per mg (Merck Index)	1994 Remedial Design Investigation Sampling Data = .078mg/l; assume .000078 mg/l
51.81	calc kg COC discharged	
PCBs		Estimating all COCs based on Soil Data, Groundwater Data, Sump Sampling Data, etc.
32	#yrs facility discharged within PCBs Timeline	
0.092	calc mg/L COC discharged	Total PCB concentrations in Sumps A5, A9, A10 and A11 (1984 data)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
119.71	calc kg COC discharged	
DDx		Estimating all COCs based on Soil Data, Groundwater Data, Sump Sampling Data, etc.
27	#yrs facility discharged within DDx Timeline	February 1985 Sampling Data = 5569000 ug/kg = 5569 mg/kg; assume 5.556 mg/l
1.52	calc mg/L COC discharged	May 1985 Soil Sampling Data = 504,600 ug/kg = 504.6 mg/kg; assume 0.5046 mg/l
3.785	L per gallon (Merck Index)	February 1985 GW Sampling Data = 35.054 mg/l; assume 0.035054 mg/l
0.000001	kg per mg (Merck Index)	1994 Remedial Design Investigation Sampling Data = .1671mg/l; assume .0001671 mg/l
1,673.11	calc kg COC discharged	
Dieldrin		
37	#yrs facility discharged within Dieldrin Timeline	1983 Soil Data (PAS-00125457-51)
0.00009	calc mg/L COC discharged	Dieldrin = .09mg/kg; assume .00009 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.1354	calc kg COC discharged	
Dioxins/Furans		
25	#yrs facility discharged	25 years (Direct process discharges during dioxin-generating operations)
3.30	calc mg/L COC discharged	Average dioxin concentration measured in sumps, product and process streams. Divide sump (residue) and product material concentrations by 10 to get process wastestream concentration (FDR Pgs 22, 44).
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3,354.61	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		Estimating all COCs based on Soil Data, Groundwater Data, Sump Sampling Data, etc.
41	#yrs facility discharged within 2,4-D Timeline	February 1985 Sampling Data = 85000 ug/kg=85 mg/kg; assume.0085 mg/l
0.0118	calc mg/L COC discharged	May 1985 Soil Sampling Data = 280 ug/kg=0.280 mg/kg; assume .000028mg/l
3.785	L per gallon (Merck Index)	February 1985 GW Sampling Data = 27 mg/l; assume .027 mg/l
0.000001	kg per mg (Merck Index)	
19.7	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		Estimating all COCs based on Soil Data, Groundwater Data, Sump Sampling Data, etc.
40	#yrs facility discharged within 2,4,5-T Timeline	February 1985 Sampling Data = 86,000 ug/kg= 86 mg/kg; assume 0.0086 mg/l
0.005	calc mg/L COC discharged	May 1985 Soil Sampling Data = 400 ug/kg=0.4 mg/kg; assume .00004 mg/l
3.785	L per gallon (Merck Index)	February 1985 GW Sampling Data = 5.600 mg/l; assume 0.0056mg/l
0.000001	kg per mg (Merck Index)	
7.67	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
181.26	kg HPAHs	
51.81	kg LPAHs	
119.71	kg PCBs	
1,673	kg DDx	
0.1354	kg Dieldrin	
3,382.02	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
3.4	ACRES - TOTAL SITE AREA (acres)	PAS-00126895, PAS-001226915, FDR	
2.5	ACRES - AFFECTED AREA	Rough estimate of site area with exposed soil fill determined from review of historical aerial photographs 1995-2020 (Google Earth) and Figure 1 Allocation Facilities map.	
4,046.86	$METERS^2$/ACRE		
10,117	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1946	Year site operations began	Operator from 1946-1969	
1986	Year site processing and storage operations ceased	Owner 80 Lister Ave 1946-1971 and 1986; Lessor 80 Lister Ave 1957-1971, Owner 80 Lister Ave 1986; Owner 120 Lister Ave 1984-1986	
40	NUMBER YEARS DISCHARGE		
40	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,746	KG/M^3 SOIL DENSITY	Fill reported as Organic Silt (PAP-00160669). Bulk density range 1394 KG/M^3 to 2098 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
70,658	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
40	YEARS DISCHARGED		
730	MG/KG (MAX CONCENTRATION)	Maximum detected concentration of Copper in soils from 120 Lister Avenue Site Evaluation - May 1985 (Depth = 0-6 inches) (FDR page 49)	PAP-00160683 and PAS-00127158 indicate this should be 730 rather than 350
0.000001	kg per mg (Merck Index)		
52	KILOGRAMS DISCHARGED		
Lead (Pb)			
40	YEARS DISCHARGED		
2300	MG/KG (AVERAGE CONCENTRATION)	Maximum detected concentration of lead in soils from 120 Lister Avenue Site Evaluation - May 1985 (Depth = 12-24 inches) (FDR page 49)	PAP-00160683 and PAS-00127158 indicate this should be 2300 rather than 880
0.000001	kg per mg (Merck Index)		
163	KILOGRAMS DISCHARGED		
Mercury (Hg)			
40	YEARS DISCHARGED		
37.0	MG/KG (MAX CONCENTRATION)	Maximum detected concentration of mercury in soils from 120 Lister Avenue Site Evaluation - May 1985 (Depth = 0-6 inches) (FDR page 49)	PAS-00127149 and PAP-00160683 indicate this should be 37 rather than 10.3
0.000001	kg per mg (Merck Index)		
3	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
40	YEARS DISCHARGED	
58.7	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Max concentrations from samples 1-2 ft bgs (PAS-00127145-6, PAP-00160683)
0.000001	kg per mg (Merck Index)	
4	KILOGRAMS DISCHARGED	
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table
40	YEARS DISCHARGED	
95.36	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
7	KILOGRAMS DISCHARGED	
PCBs		
40	YEARS DISCHARGED	
6.9	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PCBs were detected in soils; used maximum PCB concentration in soils in 2015 sampling - 6.9 ppm
0.000001	kg per mg (Merck Index)	
0.49	KILOGRAMS DISCHARGED	
DDx		DDx Timeframe 1940-1972 (33 years)
27	YEARS DISCHARGED within DDx Timeline	
5569	MG/KG (MAX CONCENTRATION)	Maximum detected concentration of DDx compounds in soil from 80 Lister Avenue Site Evaluation - February 1985 (Depth = 12-24") (FDR page 48; PAS-00127141-58)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
266	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	None Found in Documentation
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		
40	YEARS DISCHARGED	
50	MG/KG (MAX CONCENTRATION)	Sample 202-0-6 80/120 (0 to 6 inches bgs) (PAP000160413)
0.000001	kg per mg (Merck Index)	
4	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
51.58	kg Copper
162.51	kg Lead
2.61	kg Mercury
4.15	kg PAHs (Benzo(a)pyrene Equivalent)
6.74	kg PAHs (Other)
0.49	kg PCBs
265.61	kg DDx
0.00	kg Dieldrin
3.53	kg Dioxins/Furans

497.23 MASS (KG) DISCHARGED FROM SURFACE SOIL

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	44.000	1.0	44.0000
Benzo(a)anthracene	47.000	0.1	4.7000
Benzo(b)fluoranthene	71.000	0.1	7.1000
Benzo(k)fluoranthene	71.000	0.01	0.7100
Chrysene	120.000	0.001	0.1200
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	21.000	0.1	2.1000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **58.7**

Max concentrations from samples 1-2 ft bgs (PAS-	
Anthracene	1.2
Acenaphthene	0
Acenaphthylene	0.86
Fluorene	0.3
Naphthalene	11
Phenanthrene	61
2-Methylnaphthalene	21
SUM	95.36

Discharge Calcs	Direct Discharge Information	NOTES, COMMENTS, REFERENCES			
1950	YEAR STARTED	2,4, 6 TCP Production time period 1950-1975 - assume production for entire period>			
1975	Ended Production of 2,4, 6 TCP				
25	NUMBER YEARS DISCHARGE				
Dioxins/Furans		Per PAP-00160076 (Paulus, Sokowski and Sartier Engineer Report, 1987) signficant TCP air emissions via exhaust fans. After controls 0.06 #/hr discharged via mist emissions.	assume 24 hr operation for 25 years of production per TCP commerical production time period	.06#/hr*8 hr=0.48#/day*365 days=175.2#/yr=79.3 kg/yr x 25 years = 1984.14 kg	assume 1/10 reaches river directly = 198.4 kg
25	YEARS DISCHARGED	Per PAP-0016076, 5 Rupture disk releases at 1.2# per release	1.2#/release x 5 = 6 # = 2.71 kg		
	MG/KG (CONCENTRATION)				
0.000001	kg per mg (Merck Index)				
201	calc kg COC discharged	Sum of calculated values from D71, D72, E71, E72			

SUMMARY CMASS ESTIMATES:

201.11 kg Dioxins/Furans

201.11 MASS (KG) DISCHARGED BY OVERLAND FLOW

Discharge Calcs	Direct Discharge Information	NOTES, COMMENTS, REFERENCES
1960	YEAR of Explosion	1960 TCP Unit explosion in 5 story building. Entire Building destroyed, with dioxin spread throughout the plant and nearby property. Document PAP-00160016 indicated 1/3# of dioxin released.
Dioxins/Furans		
?	YEARS DISCHARGED	1/3# dioxin released from explosion = .333# = 0.151 kg
	MG/KG (CONCENTRATION)	Building chip samples = .13ug/kg - 6.3 mg/kg dioxane>>> avg = 3.15 mg/kg dioxin
0.000001	kg per mg (Merck Index)	assume 10,000,000 pounds of building materials
142.851	calc kg COC discharged	10,000,000 # = 4,530,000 kg x 3.15 mg/kg = 1426979 mg = 14269.5 kg dioxin assume 1/100th reaches the river = 142.7 kg dioxin

SUMMARY CMASS ESTIMATES:

142.851 kg Dioxins/Furans

142.85 MASS (KG) DISCHARGED BY OVERLAND FLOW

Discharge Calcs	Direct Discharge Information	NOTES, COMMENTS, REFERENCES	
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
13	ACRES - TOTAL SITE AREA (acres)		
7.50	ACRES - AFFECTED AREA	ISRA Investigation Report dated 8/2020 indicated that AOC 26 - Dioxin contamination was from Occidental Site Operations (PAP-00126516). Both reports referenced in the Sherwin Williams FDR.	
4,046.86	METERS^2/ACRE		
		Sherwin Williams report references a DDT Solution overflow from a rail tanker at the Occidental Site that ran down the tracks to the Sherwin Williams Facility. Document PAP-00145018-19 referenced in the Sherwin Williams FDR is a deposition that discusses the overflow but provides no information or data.	
30,351	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
3	METERS^3/YEAR (ERODED SOIL VOLUME)		
1946	Year site operations began	Occidental Facility Operations	
1986	Year site processing and storage operations ceased		
40	NUMBER YEARS DISCHARGE		
121	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,746	KG/M^3 SOIL DENSITY	Fill reported as Organic Silt (PAP-00160669). Bulk density range 1394 KG/M^3 to 2098 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
211,975	KILOGRAMS (TOTAL WT OF SOIL AFFECTED OVER TIME)		
Dioxins/Furans			
40	YEARS DISCHARGED		
0.0235	MG/KG (CONCENTRATION)	Highest concentration of Dioxins was 23.5 ug/kg from the Deed Notice (PAP-00367345)	
0.000001	kg per mg (Merck Index)		
0.199	calc kg COC discharged		

SUMMARY CMASS ESTIMATES:

0.20 kg Dioxins/Furans

0.20 MASS (KG) DISCHARGED BY OVERLAND FLOW

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Occidental Chemical Corp.

80 & 120 Lister Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.392E+1	100.0%	Intentional Action with Knowledge of Risk to HH/E	In the 1984 Aetna litigation, Judge Stanton found that Diamond, was concious that its discharge into the river were illiegal, and that the company as a matter of corporate policy, intentionally and continuously discharged dioxin, DDT, and other hazardous substances from the Lister Plant into the Passaic River during the entire period of its plant operations. Specifically, the trial court found that “Diamond was conscious that its discharges into the (Passaic) (R)iver were illegal. It deliberately concealed them, and over a period of many years employed an alarm system to warn employees to stop the discharges when Passaic Valley inspectors were on the premises.” Also, “Housekeeping at the (Lister Plant) ranged from inadequate to poor throughout the entire period of its operation by (DSCC). . . . Spills of liquid and solid chemical products and wastes were literally continuous during every day of the plant’s operations andome pipes were always leaking.” Although "factory floors at the Newark plant were so badly corroded by acid spills that they had to be replaced nearly every summer...nothnig was done to mitigatethe polluting effect spills and leaks had upon the physical environment." And that OxyChem's "toleration and continuous spiling and leaking" ---was just "the way of life at the Newark Plant" and "its management accepted the spills and leaks as part of the normal routine of operating a chemical manufacturing plant."(PAS-00128426-29 & 49-50)	0.0%	-10% Original CPG member - Provision of funding and participation in PRP Group action to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities; -10% Phase 1 removal actions completed in 2012 benefited all OU2 PRPs by removing subtantially more COCs (except for dioxin) from OU2 than the facility contributed to OU2 20% Failed to participate in conduct of allocation as offered by EPA	1.678E+2

AP_ABS	1.678E+2

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Occidental Chemical Corp.

80 & 120 Lister Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.506E+1	100.0%	Intentional Action with Knowledge of Risk to HH/E	In the 1984 Aetna litigation, Judge Stanton found that Diamond, was concious that its discharge into the river were illiegal, and that the company as a matter of corporate policy, intentionally and continuously discharged dioxin, DDT, and other hazardous substances from the Lister Plant into the Passaic River during the entire period of its plant operations. Specifically, the trial court found that “Diamond was conscious that its discharges into the (Passaic) (R)iver were illegal. It deliberately concealed them, and over a period of many years employed an alarm system to warn employees to stop the discharges when Passaic Valley inspectors were on the premises.” Also, “Housekeeping at the (Lister Plant) ranged from inadequate to poor throughout the entire period of its operation by (DSCC). . . . Spills of liquid and solid chemical products and wastes were literally continuous during every day of the plant’s operations andome pipes were always leaking.” Although "factory floors at the Newark plant were so badly corroded by acid spills that they had to be replaced nearly every summer...nothnig was done to mitigatethe polluting effect spills and leaks had upon the physical environment." And that OxyChem's "toleration and continuous spiling and leaking" ---was just "the way of life at the Newark Plant" and "its management accepted the spills and leaks as part of the normal routine of operating a chemical manufacturing plant."(PAS-00128426-29 & 49-50)	0.0%	-10% Original CPG member - Provision of funding and participation in PRP Group action to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities; -10% Phase 1 removal actions completed in 2012 benefited all OU2 PRPs by removing subtantially more COCs (except for dioxin) from OU2 than the facility contributed to OU2 20% Failed to participate in conduct of allocation as offered by EPA	1.701E+2

AP_ABS	1.701E+2

Allocation Facility Cmass Calculation

Okonite Company	**220 Passaic Ave.**	**Passaic**	**NJ**	**07055**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	398.18	100.00%	-	2.32%	-	100.00%	5,422.8	5,821.01	1.018817E-2	59.31
Lead	100.00%	18,337.17	100.00%	-	2.32%	-	100.00%	8,827.3	27,164.42	1.018817E-2	276.76
Mercury	100.00%	27.24	100.00%	-	2.32%	-	100.00%	-	27.24	1.018817E-2	0.28
HPAHs	100.00%	4.26	100.00%	-	2.32%	-	100.00%	26,939.7	26,944.	1.018817E-2	274.51
LPAHs	100.00%	12.62	100.00%	-	2.32%	-	100.00%	17,959.8	17,972.44	1.018817E-2	183.11
PCBs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Okonite Company	**220 Passaic Ave.**	**Passaic**	**NJ**	**07055**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	59.31	2.824E-5	1.949E-5
Lead	0.01	3,200,000.00	276.76	8.649E-5	8.649E-7
Mercury	0.95	42,000.00	0.28	6.608E-6	6.277E-6
HPAHs	0.05	240,000.00	274.51	1.144E-3	5.719E-5
LPAHs	0.01	170,000.00	183.11	1.077E-3	1.077E-5
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Okonite Company	**220 Passaic Ave.**	**Passaic**	**NJ**	**07055**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	2.102E-2	59.31	44,077.44	2.102E-2	1.450E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	9.413E-2	276.76	300,945.99	9.413E-2	9.413E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.302E-3	0.28	264.4	6.302E-3	5.987E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	6.199E-3	274.51	1,213.29	6.199E-3	3.100E-4
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	5.965E-3	183.11	830.99	5.965E-3	5.965E-5
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Okonite Company	**220 Passaic Ave.**	**Passaic**	**NJ**	**07055**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
24	# hours/day discharged	Direct Discharge was to Weasel Brook
7	# days/week discharged	Permitted PAP-000242145-48
52	# weeks/yr discharged	1988 Permit Application (PAP-002363525-28)
22,812,500	# gals/yr directly discharged	50000 gpd wastewater to Weasel Brook
		12500 gpd cooling water to Weasel Brook
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	Connect to PVSC in 1920s for sanitary only
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1885	Yr Ops started	
1989	Yr Ops ceased	
104	calc #yrs facility operated	
Copper (Cu)		
104	#yrs facility discharged	1977 Priority Pollutant Monitoring Report (PAP-00264228,55)
0.75	calc mg/L COC discharged	Cu = 27 ug/l, 12 ug/l, 15 ug/l
3.785	L per gallon (Merck Index)	1989 Discharge Monitoring Report 0.03 mg/l-0.64mg/l Cu
0.000001	kg per mg (Merck Index)	1988-1989 sampling Cu=1.89 mg/l
6,713.98	calc kg COC discharged	
Lead (Pb)		
104	#yrs facility discharged	1977 Priority Pollutant Monitoring Report (PAP-00264228,55)
0.9830	calc mg/L COC discharged	Pb = 2200 ug/l, 49 ug/l, 700 ug/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
8,827.25	calc kg COC discharged	
Mercury (Hg)		
104	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
104	#yrs facility discharged	Permitted Discharge to Weasel Creek (PAP-000242145-48)
	calc mg/L O&G	pAH 10 mg/l
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
3.0	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
26,939.74	calc kg COC discharged	
LPAHs		
104	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
2	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
17,959.83	calc kg COC discharged	
PCBs		
104	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
104	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
104	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
104	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
104	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
104	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
104	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
5,422.83	kg Copper	
8,827.25	kg Lead	
-	kg Mercury	
26,939.74	kg HPAHs	
17,959.83	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
	4.08 FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
	12.9 ACRES - TOTAL SITE AREA (acres)	FDR p 1	
	2.58 ACRES - AFFECTED AREA	Looks to be around 80% buildings in 1930 and 1977 aerial photos here https://njdep.maps.arcgis.com/apps/webappviewer/index.html	
	4,046.86 METERS^2/ACRE		
	10,441 METERS^2 (AFFECTED AREA)		
	0.0001 METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
	1 METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES	
	1885 Year site operations began	FDR p 1	
	1993 Year Okonite sold the property	Okonite operations ceased in 1989 (FDR p 1)	
	108 NUMBER YEARS DISCHARGE		
	113 METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
	1,859 KG/M^3 SOIL DENSITY	Fill reported as fine, medium, and coarse sands and silt and residue consisting of ash and cinders (PAS-00060192). Bulk density range 1346 KG/M^3 to 2371 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
	209,568 KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)	About 2/3 of the property appears to be on historic fill (FDR p 26) Several AOCs within site are located on regional historic fill (FDR p 3)	
Copper (Cu)		Copper was used in cable manufacturing and stored inside in coil form (FDR p 18)	
	108 YEARS DISCHARGED		
	1900 MG/KG (MAX CONCENTRATION)	Concentration from Area I1. Sample I1-2B was collected from 8-8.5 ft bgs (PAP-00244662)	
	0.000001 kg per mg (Merck Index)		
	398 KILOGRAMS DISCHARGED		
Lead (Pb)		Lead was used in insulating compound manufacturing (FDR p 21)	
	108 YEARS DISCHARGED		
	87500 MG/KG (MAX CONCENTRATION)	Concentrations from Area K. Sample K-9 was collected from 1.5-2 ft bgs (PAP-00244672)	
	0.000001 kg per mg (Merck Index)		
	18,337 KILOGRAMS DISCHARGED		
Mercury (Hg)		Mercury was present only in sealed thermometers and switches (FDR p 24)	
	108 YEARS DISCHARGED		
	130 MG/KG (MAX CONCENTRATION)	Sample K-23, concentration 430 mg/kg is maximum concentration. Was collected from 7-7.5 ft bgs (PAP-00244679). However, the 430 mg/kg result and its field duplicate do not meet NJDEP's April 2014 Site Remediation Program Data Quality Assessemnt and Data Usability Evaluation Technical Guidance. Therefore 130 mg/kg used. Sample from a lower depth is used here because of mercury's high density.	
	0.000001 kg per mg (Merck Index)		
	27 KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)	
108	YEARS DISCHARGED
20.3	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)
0.000001	kg per mg (Merck Index)
4	KILOGRAMS DISCHARGED
PAHs (others detected)	
108	YEARS DISCHARGED
60	MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
13	KILOGRAMS DISCHARGED
PCBs	
108	YEARS DISCHARGED
	MG/KG AVG OF REPORTED CONCENTRATIONS)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
DDx	
108	YEARS DISCHARGED within DDx Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dieldrin	
108	YEARS DISCHARGED within Dieldrin Timeline
	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION
108	YEARS DISCHARGED
	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	calc kg COC discharged

SUMMARY CMASS ESTIMATES:	
398.18	kg Copper
18,337.17	kg Lead
27.24	kg Mercury
4.26	kg PAHs (Benzo(a)pyrene Equivalent)
12.62	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

18779.46 MASS (KG) DISCHARGED FROM SURFACE SOIL

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

Data below the Benzo(a)pyrene Equivalent Table

No storage, disposal, or generation of PCBs by Okonite (FDR p 9)

Max concentrations from Area C, a paved area that was used to store empty drums (PAP-00244650). Sample C-2A was collected from 1.5-2 ft bgs (PAP-00244651)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	16.000	1.0	16.0000
Benzo(a)anthracene	23.000	0.1	2.3000
Benzo(b)fluoranthene	1.500	0.1	0.1500
Benzo(k)fluoranthene	15.000	0.01	0.1500
Chrysene	22.000	0.001	0.0220
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	17.000	0.1	1.7000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **20.3**

Sample C-2A was collected from 1.5-2 ft bgs (PAP-	
Acenaphthylene	0.2
Acenaphthene	5.8
Anthracene	9.4
Naphthalene	1.8
Phenanthrene	43
SUM	60.2

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Okonite Company

220 Passaic Ave.	**Passaic**	**NJ**	**07055**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
9.459E-5	5.0%	Occasional Noncompliance	1973 PVSC Annual Report identified a sample of the boiler blowdown outlet that was found to be polluting, and the company was directed to halt this pollution (PAS-00034781; PAS-00102011). On August 27, 1985 NJDEP issued Okonite an Administrative Order concerning a violation of the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq and regulations promulgated thereunder, specifically N.J.A.C 7:26-7.6(f) 2 for failure to file an annual report (PAS-00102064-5). Area K had an unpaved area of oil-stained soils with water softener resin beads and tar-like material. Also, at an unpaved area beneath the Banbury mixer where oil-stained soils were observed. At the loading oil-stained soils were also found (PAP-00245798-802).	-10.0%	-10% SPG member - Provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory to address environmental or public harm created by own activities	8.986E-5

AP_ABS	8.986E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Okonite Company

220 Passaic Ave.	**Passaic**	**NJ**	**07055**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.180E-2	5.0%	Occasional Noncompliance	1973 PVSC Annual Report identified a sample of the boiler blowdown outlet that was found to be polluting, and the company was directed to halt this pollution (PAS-00034781; PAS-00102011). On August 27, 1985 NJDEP issued Okonite an Administrative Order concerning a violation of the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq and regulations promulgated thereunder, specifically N.J.A.C 7:26-7.6(f) 2 for failure to file an annual report (PAS-00102064-5). Area K had an unpaved area of oil-stained soils with water softener resin beads and tar-like material. Also, at an unpaved area beneath the Banbury mixer where oil-stained soils were observed. At the loading oil-stained soils were also found (PAP-00245798-802).	-10.0%	-10% SPG member - Provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory to address environmental or public harm created by own activities	2.071E-2

AP_ABS	2.071E-2

Allocation Facility Cmass Calculation

Otis Elevator Co.	1000 1st Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	141.76	0.24%	567.03	100.00%	116.7	259.75	1.018817E-2	2.65
Lead	100.00%	-	100.00%	125.15	0.24%	500.60	100.00%	103.0	229.32	1.018817E-2	2.34
Mercury	100.00%	-	100.00%	6.76	0.24%	27.05	100.00%	5.6	12.39	1.018817E-2	0.13
HPAHs	100.00%	-	100.00%	590.75	0.24%	2,363.02	100.00%	486.2	1,082.47	1.018817E-2	11.03
LPAHs	100.00%	-	100.00%	395.26	0.24%	1,581.04	100.00%	325.3	724.26	1.018817E-2	7.38
PCBs	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.24%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Otis Elevator Co.	**1000 1st Street**	**Harrison**	**NJ**	**07029**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	2.65	1.260E-6	8.695E-7
Lead	0.01	3,200,000.00	2.34	7.301E-7	7.301E-9
Mercury	0.95	42,000.00	0.13	3.005E-6	2.855E-6
HPAHs	0.05	240,000.00	11.03	4.595E-5	2.298E-6
LPAHs	0.01	170,000.00	7.38	4.341E-5	4.341E-7
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Otis Elevator Co.	1000 1st Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	9.379E-4	2.65	1,966.86	9.379E-4	6.471E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	7.947E-4	2.34	2,540.56	7.947E-4	7.947E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	2.866E-3	0.13	120.26	2.866E-3	2.723E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.491E-4	11.03	48.74	2.491E-4	1.245E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.404E-4	7.38	33.49	2.404E-4	2.404E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Otis Elevator Co.	**1000 1st Street**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Middlesex Street	CSO	0.51%	46.17%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Discharge to the PVSC starting in 1924
24	# hours/per day discharged	
7	#days/week discharged	1971 - 46440000 gallons
52	#weeks/yr discharged	1974 - 27412720 gallons
27,982,978	calc gal/yr discharge	1976 - 26294900 gallons
		1978 - 11784920 gallons
1924	Yr Ops started	
1980	Yr Ops ceased	
56	calc #yrs facility operated	
Copper (Cu)		
56	#yrs facility discharged	Sampling Data
0.12	calc mg/L COC discharged	1972 = 0.04 mg/l
3.785	L per gallon (Merck Index)	1978 = .199 mg/l
0.000001	kg per mg (Merck Index)	
708.79	calc kg COC discharged	
Lead (Pb)		
56	#yrs facility discharged	Sampling Data
0.11	calc mg/L COC discharged	1972 = .07 mg/l
3.785	L per gallon (Merck Index)	1978 = .141 mg/l
0.000001	kg per mg (Merck Index)	
625.75	calc kg COC discharged	
Mercury (Hg)		
56	#yrs facility discharged	Sampling Data
0.0057	calc mg/L COC discharged	1978 = .0057 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
33.81	calc kg COC discharged	
HPAHs		
56	#yrs facility discharged	Sampling Data
8.30	calc mg/L O&G	1979 8.33 mg/l emulsified oil
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.50	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,953.77	calc kg COC discharged	
LPAHs		
56	#yrs facility discharged	Sampling Data
8.33	calc mg/L O&G	1979 8.33 mg/l emulsified oil
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,976.30	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
31	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
56	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
35	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
36	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
708.79	kg Copper	
625.75	kg Lead	
33.81	kg Mercury	
2,953.77	kg HPAHs	
1,976.30	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1910-1924 all discharges went to Passaic River
	# days/week discharged	1924-1980 connected to PVSC so noncontact cooling water and storm water to River
	# weeks/yr discharged	
18,422,658	# gals/yr directly discharged	1971 - 17610730 gallons
		1974 - 26174000 gallons
4.08	ft; 30yr average annual precipitation per Rutgers information	1976 - 10805900 gallons
	acres	1978 - 19100000 gallons
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1910	Yr Ops started	
1924	Yr Ops ceased	
14	calc #yrs facility operated	
Copper (Cu)		
14	#yrs facility discharged	Sampling Data
0.12	calc mg/L COC discharged	1972 = 0.04 mg/l
3.785	L per gallon (Merck Index)	1978 = .199 mg/l
0.000001	kg per mg (Merck Index)	
116.66	calc kg COC discharged	
Lead (Pb)		
14	#yrs facility discharged	Sampling Data
0.1055	calc mg/L COC discharged	1972 = .07 mg/l
3.785	L per gallon (Merck Index)	1978 = .141 mg/l
0.000001	kg per mg (Merck Index)	
102.99	calc kg COC discharged	
Mercury (Hg)		
14	#yrs facility discharged	Sampling Data
0.01	calc mg/L COC discharged	1978 = .0057 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
5.56	calc kg COC discharged	
HPAHs		
14	#yrs facility discharged	Sampling Data
8.30	calc mg/L O&G	1979 8.33 mg/l emulsified oil
10%	% O&G that is considered PAHs	1972 14.8 mg/l emulsified oil
60%	% PAHs considered as PAHs	
0.50	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
486.16	calc kg COC discharged	
LPAHs		
14	#yrs facility discharged	Sampling Data
8.33	calc mg/L O&G	1979 8.33 mg/l emulsified oil
10%	% O&G that is considered PAHs	1972 14.8 mg/l emulsified oil
40%	% PAHs considered as LPAHs	
0.33	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
325.28	calc kg COC discharged	
PCBs		
-4	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-15	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-25	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
14	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-21	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-20	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-25	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
116.66	kg Copper	
102.99	kg Lead	
5.56	kg Mercury	
486.16	kg HPAHs	
325.28	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Otis Elevator Co.

1000 1st Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
6.464E-6	10.0%	Periodic Noncompliacne	Former employee stated that a fellow employee had occasionally disposed of water-based coolant collected from metal cutting operations into an exterior drain or other such structure, believed to drain to the primary wastewater discharge line that ran from the facility to the Passaic Valley Sewerage Commission (PVSC) sewer system. A review of the annual reports from 1969 through 1976 and the 1977 Draft Report mention Otis in 1969, 1971, and 1972 for two minor violations (PAS-00076592-93). In the 1972 PVSC Annual Report, Otis received a violation for samples taken on December 14, 1971 from the five outlets that were flowing (7, 8, 10, 15, and 16). The discharge from Outlet 7 had been polluting PAP-00319432-323; PAS-00006171-72; PAS-00076763-64). According to a Cease and Desist Order from NJDOH to Otis dated October 3, 1969,, NJDOH found that Otis had been discharging harmful, deleterious and polluting matter from a sewer or drain into the Passaic River (PAS-00076756-58).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.817E-6

AP_ABS	5.817E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Otis Elevator Co.

1000 1st Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.393E-3	10.0%	Periodic Noncompliacne	Former employee stated that a fellow employee had occasionally disposed of water-based coolant collected from metal cutting operations into an exterior drain or other such structure, believed to drain to the primary wastewater discharge line that ran from the facility to the Passaic Valley Sewerage Commission (PVSC) sewer system. A review of the annual reports from 1969 through 1976 and the 1977 Draft Report mention Otis in 1969, 1971, and 1972 for two minor violations (PAS-00076592-93). In the 1972 PVSC Annual Report, Otis received a violation for samples taken on December 14, 1971 from the five outlets that were flowing (7, 8, 10, 15, and 16). The discharge from Outlet 7 had been polluting PAP-00319432-323; PAS-00006171-72; PAS-00076763-64). According to a Cease and Desist Order from NJDOH to Otis dated October 3, 1969,, NJDOH found that Otis had been discharging harmful, deleterious and polluting matter from a sewer or drain into the Passaic River (PAS-00076756-58).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.054E-3

AP_ABS	3.054E-3

Allocation Facility Cmass Calculation

Pabst Brewing Company	**400 Grove Street**	**Newark**	**NJ**	**07111**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	3,662.52	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	4,657.77	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	149.29	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	189,834.09	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	126,556.06	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Pabst Brewing Company	**400 Grove Street**	**Newark**	**NJ**	**07111**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Pabst Brewing Company	**400 Grove Street**	**Newark**	**NJ**	**07111**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Pabst Brewing Company	**400 Grove Street**	**Newark**	**NJ**	**07111**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Beyond PVSC boundaries		0.00%	0.00%	"The western portion of the city (Newark) is served by the Essex and Union County Treatment Plants in Elizabeth, while the remainder is served by the Passaic Valley Sewerage Commission treatment plant in southeastern Newark" (PAP-00701823).

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	PVSC Discharge under permit No. NJ0028088 (PAS-00031712)
24	# hours/per day discharged	Discharge Volumes to Sanitary Sewer PVSC
6-7	#days/week discharged	1974 = 440,507,570 gallons (PAS-00031809)
52	#weeks/yr discharged	1978 = 401,467,017 gallons (PAS-00031828)
500,849,512	calc gal/yr discharge	1982 = 1.44MGD (PAS-00031714); 1983 = 1.3442 MGD (PAP-00406403);1984 = 1.426 MGD (PAP-00016793); 1985 = 1.4594 MGD (PAP-00406602);1972 = 594,568,000 gallons (PAS-0031804)
1964	Yr Ops started	
1985	Yr Ops ceased	
21	calc #yrs facility operated	May 29, 2020 Expert Report by Roux Associates, Inc.
Copper (Cu)		
21	#yrs facility discharged	1978 = .179 mg/l (PAS-00031647/PAS-00031832)
0.092	calc mg/L COC discharged	1984 = .005 mg/l (PAP-00406896)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
3,662.52	calc kg COC discharged	
Lead (Pb)		1978
21	#yrs facility discharged	pb = .117 mg/l (PAS-00031647/PAS00031832)
0.117	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,657.77	calc kg COC discharged	
Mercury (Hg)		1978
21	#yrs facility discharged	Hg = .0063 mg/l and .0012 mg/l (PAS-00031647/PAS-00031832)
0.0038	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
149.29	calc kg COC discharged	
HPAHs		
21	#yrs facility discharged	1978 Oil and Grease = 4.6 mg/l (PAS-00031718)
79.48	calc mg/L O&G	1972 Waste Effluent Survey: 33.2, 230, 340 mg/l and 3.6, 2.4, 0.4 mg/l
10%	% O&G that is considered PAHs	1975 21.6 mg/l
60%	% PAHs considered as HPAHs	
4.77	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
189,834.10	calc kg COC discharged	
LPAHs		
21	#yrs facility discharged	1978 Oil and Grease = 4.6 mg/l (PAS-00031718)
79.48	calc mg/L O&G	1972 Waste Effluent Survey: 33.2, 230, 340 mg/l and 3.6, 2.4, 0.4 mg/l
10%	% O&G that is considered PAHs	1975 21.6 mg/l
40%	% PAHs considered as LPAHs	
3	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
126,556.06	calc kg COC discharged	
PCBs		
14	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
9	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
22	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
21	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
22	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
22	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
12	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
3,662.52	kg Copper	
4,657.77	kg Lead	
149.29	kg Mercury	
189,834.10	kg HPAHs	
126,556.06	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Direct Discharge of Storm water to Maybaum Creek
	# days/week discharged	Storm water Flow Volumes
	# weeks/yr discharged	1971 96790000 gallons (PAS-00031804)
-	# gals/yr directly discharged	1974 49484560 gallons (PAS-00031809)
		1978 106205100 gallons (PAS-00031828)
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1945	Yr Ops started	
1985	Yr Ops ceased	Determined to have no direct connection to the Passaic River, therefore no direct discharge to Passaic River.
40	calc #yrs facility operated	
Copper (Cu)		
40	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
40	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
40	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
40	#yrs facility discharged	1975
21.00	calc mg/L O&G	21 mg/l Emul Oil to Storm Sewer
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1.26	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
40	#yrs facility discharged	1975
21.00	calc mg/L O&G	21 mg/l Emul Oil to Storm Sewer
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.84	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
33	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
28	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
36	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
40	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
40	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Pabst Brewing Company

400 Grove Street	**Newark**	**NJ**	**07111**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	0.0%	Historically Compliant or No Evidence	Pabst and New West Developers, Inc. received Notices of Violation (NOV) on May 5, 2005 (prior to Pabstt ownership) and April 28, 2011, for failure of New West to conduct a remedial investigation and conduct remediation to abate contamination; area subsqueently remedied by Pabst. (PAP-00286348-49; PAP-00286135).	-10.0%	-10% SPG member - Provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	0

AP_ABS	0

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Pabst Brewing Company

400 Grove Street	**Newark**	**NJ**	**07111**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	0.0%	Historically Compliant or No Evidence	Pabst and New West Developers, Inc. received Notices of Violation (NOV) on May 5, 2005 (prior to Pabstt ownership) and April 28, 2011, for failure of New West to conduct a remedial investigation and conduct remediation to abate contamination; area subsqueently remedied by Pabst. (PAP-00286348-49; PAP-00286135).	-10.0%	-10% SPG member - Provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	0

AP_ABS	0

Allocation Facility Cmass Calculation

Passaic Pioneer Properties Co.	35 8th Street	Passaic	NJ	07055

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	2.32%	3.32	100.00%	20.6	20.68	1.018817E-2	0.21
Lead	100.00%	-	100.00%	-	2.32%	1.19	100.00%	7.4	7.44	1.018817E-2	0.08
Mercury	100.00%	-	100.00%	-	2.32%	0.11	100.00%	0.7	0.71	1.018817E-2	0.01
HPAHs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Passaic Pioneer Properties Co.	**35 8th Street**	**Passaic**	**NJ**	**07055**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.21	1.003E-7	6.923E-8
Lead	0.01	3,200,000.00	0.08	2.368E-8	2.368E-10
Mercury	0.95	42,000.00	0.01	1.718E-7	1.632E-7
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Passaic Pioneer Properties Co.	**35 8th Street**	**Passaic**	**NJ**	**07055**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	7.467E-5	0.21	156.6	7.467E-5	5.152E-5
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.577E-5	0.08	82.39	2.577E-5	2.577E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.638E-4	0.01	6.87	1.638E-4	1.557E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Passaic Pioneer Properties Co.	**35 8th Street**	**Passaic**	**NJ**	**07055**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	No information on flows or COCs.
	# hours/per day discharged	PAP-00193888 indicated no process waste directly to Passaic River
	#days/week discharged	2006 PAR (PAP-00193883) - All sanitary and industrial waste to PVSC since 1900
	#weeks/yr discharged	Assume 1MGY
1,000,000	calc gal/yr discharge	
1936	Yr Ops started	
1966	Yr Ops ceased	
30	calc #yrs facility operated	
Copper (Cu)		
30	#yrs facility discharged	Metals data assumed based on 1982 USEPA Document:
0.0292	calc mg/L COC discharged	"Final Development Document for Effluent Limitations Guidelines and Standards for Textile Mills"
3.785	L per gallon (Merck Index)	Used for estimates
0.000001	kg per mg (Merck Index)	
3.32	calc kg COC discharged	
Lead (Pb)		
30	#yrs facility discharged	Metals data assumed based on 1982 USEPA Document:
0.0105	calc mg/L COC discharged	"Final Development Document for Effluent Limitations Guidelines and Standards for Textile Mills"
3.785	L per gallon (Merck Index)	Used for estimates
0.000001	kg per mg (Merck Index)	
1.19	calc kg COC discharged	
Mercury (Hg)		
30	#yrs facility discharged	Metals data assumed based on 1982 USEPA Document:
0.001	calc mg/L COC discharged	"Final Development Document for Effluent Limitations Guidelines and Standards for Textile Mills"
3.785	L per gallon (Merck Index)	Used for estimates
0.000001	kg per mg (Merck Index)	
0.114	calc kg COC discharged	
HPAHs		
30	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
30	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
31	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
27	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
17	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
30	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
21	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
22	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
17	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
3.32	kg Copper	
1.19	kg Lead	
0.11	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Documentation states stormwater discharged to Passaic River
	# days/week discharged	Thread Manufacturing/Dyeing process
	# weeks/yr discharged	Stormwater flow based on acreage and rainfall data
6,214,114	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
9.34	acres	
50%	Percent Precip to River	
1936	Yr Ops started	
1966	Yr Ops ceased	
30	calc #yrs facility operated	
Copper (Cu)		
30	#yrs facility discharged	Metals data assumed based on 1982 USEPA Document:
0.0292	calc mg/L COC discharged	"Final Development Document for Effluent Limitations Guidelines and Standards for Textile Mills"
3.785	L per gallon (Merck Index)	Used for estimates
0.000001	kg per mg (Merck Index)	
20.60	calc kg COC discharged	
Lead (Pb)		
30	#yrs facility discharged	Metals data assumed based on 1982 USEPA Document:
0.0105	calc mg/L COC discharged	"Final Development Document for Effluent Limitations Guidelines and Standards for Textile Mills"
3.785	L per gallon (Merck Index)	Used for estimates
0.000001	kg per mg (Merck Index)	
7.41	calc kg COC discharged	
Mercury (Hg)		
30	#yrs facility discharged	Metals data assumed based on 1982 USEPA Document:
0.001	calc mg/L COC discharged	"Final Development Document for Effluent Limitations Guidelines and Standards for Textile Mills"
3.785	L per gallon (Merck Index)	Used for estimates
0.000001	kg per mg (Merck Index)	
0.71	calc kg COC discharged	
HPAHs		
30	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
30	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
31	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
27	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
17	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
30	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
21	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
22	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
17	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
20.6039	kg Copper	
7.4089	kg Lead	
0.7056	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Passaic Pioneer Properties Co.

35 8th Street	**Passaic**	**NJ**	**07055**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.327E-7	5.0%	Occasional Noncompliance	Documented instances of dye wastes (in 1947, 1948, 1951, 1956, 1971, 1978) and cooling water (1969) being released to the Passaic River by tenants resulted in violations (PAS-00115125; PAS-00115406; PAS-00035373; PAS-00115415-426).	0.0%	0% Cooperation with conduct of allocation and requests for related information	2.443E-7

AP_ABS	2.443E-7

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Passaic Pioneer Properties Co.

35 8th Street	**Passaic**	**NJ**	**07055**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.074E-4	5.0%	Occasional Noncompliance	Documented instances of dye wastes (in 1947, 1948, 1951, 1956, 1971, 1978) and cooling water (1969) being released to the Passaic River by tenants resulted in violations (PAS-00115125; PAS-00115406; PAS-00035373; PAS-00115415-426).	0.0%	0% Cooperation with conduct of allocation and requests for related information	2.178E-4

AP_ABS	2.178E-4

Allocation Facility Cmass Calculation

Pharmacia LLC	Pennsylvania Ave	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	458.16	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	807.23	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	45.85	100.00%	-	0.00%	9.00	100.00%	-	45.85	1.018817E-2	0.47
HPAHs	100.00%	12.09	100.00%	-	0.00%	-	100.00%	-	12.09	1.018817E-2	0.12
LPAHs	100.00%	12.64	100.00%	-	0.00%	-	100.00%	-	12.64	1.018817E-2	0.13
PCBs	100.00%	6,134.35	100.00%	-	0.00%	-	100.00%	-	6,134.35	1.018817E-2	62.5
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Pharmacia LLC	**Pennsylvania Ave**	**Kearny**	**NJ**	**07032**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0.47	1.112E-5	1.057E-5
HPAHs	0.05	240,000.00	0.12	5.132E-7	2.566E-8
LPAHs	0.01	170,000.00	0.13	7.575E-7	7.575E-9
PCBs	12.87	26,000.00	62.5	2.404E-3	3.094E-2
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Pharmacia LLC	**Pennsylvania Ave**	**Kearny**	**NJ**	**07032**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.061E-2	0.47	445.04	1.061E-2	1.008E-2
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.782E-6	0.12	0.54	2.782E-6	1.391E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	4.195E-6	0.13	0.58	4.195E-6	4.195E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	3.057E-1	62.5	7,885.71	3.057E-1	3.934E+0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Pharmacia LLC	**Pennsylvania Ave**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Discharge to Kearny POTW via NJPDES Permit #0022161
24	# hours/per day discharged	
7	#days/week discharged	
52	#weeks/yr discharged	
12,008,500	calc gal/yr discharge	1971 - 1972 Waste Effluent Survey = 19345000 gallons to sewer
		1990 - Pretreatment Inspection Report = 12800 gpd to sewer
1955	Yr Ops started	
1991	Yr Ops ceased	
36	calc #yrs facility operated	
Copper (Cu)		
36	#yrs facility discharged	
0.28	calc mg/L COC discharged	1976 wastewater = 0.2 mg/l
3.785	L per gallon (Merck Index)	May 1978 wastewater = 0.3 mg/l
0.000001	kg per mg (Merck Index)	Dec 1978 wastewater = 0.38 mg/l and 240 ug/l
458.16	calc kg COC discharged	
Lead (Pb)		
36	#yrs facility discharged	
0.49	calc mg/L COC discharged	1976 wastewater = 0.8mg/l
3.785	L per gallon (Merck Index)	May 1978 wastewater = 0.28 mg/l
0.000001	kg per mg (Merck Index)	Dec 1978 wastewater = 400ug/l
807.23	calc kg COC discharged	
Mercury (Hg)		
36	#yrs facility discharged	1976 wastewater = 0.01mg/l
0.0055	calc mg/L COC discharged	May 1978 wastewater = 0.0022 mg/l
3.785	L per gallon (Merck Index)	Dec 1978 wastewater = 43ug/l
0.000001	kg per mg (Merck Index)	
9.00	calc kg COC discharged	
HPAHs		
36	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
36	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
23	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
	calc kg COC discharged	
DDx		
18	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
33	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
36	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
37	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
31	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
21	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
458.16	kg Copper	
807.23	kg Lead	
9.00	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Prior to 1973 storm water was discharged direct to Passaic River
	# days/week discharged	
	# weeks/yr discharged	
17,298,391	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
26.00	acres	
50%	Percent Precip to River	
1955	Yr Ops started	
1973	Yr Ops ceased	
18	calc #yrs facility operated	
Copper (Cu)		
18	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
18	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
18	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
18	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
18	#yrs facility discharged	Per FDR no Discharge
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
19	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
18	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
19	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
18	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
19	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
19	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
19	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University provided.
26	ACRES - TOTAL SITE AREA (acres)	FDR, Page 1	
20	ACRES - AFFECTED AREA	Approximately one-quarter of site was covered by buildings (PAS-00074836).	Settling ponds included in acreage
4,046.86	METERS^2/ACRE		
78,914	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
8	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1954	Year of ownership	FDR, Page 1	
1994	Year sold	FDR, Page 1	
40	NUMBER YEARS DISCHARGE		
316	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Site surface soil consists of fill (fine to coarse sand, some gravel and silt, cinders, and wood (PAP-00035477-81, 489-513). Bulk density range for silty sand and gravel 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
619,631	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Site is located on historic fill (FDR page 8)	
Copper (Cu)			
40	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Copper concentration in surface soil sample APSS-SS-02 at 645 mg/kg (PAS-00073580). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Lead (Pb)			
40	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Lead concentration in surface soil sample APSS-SS-02 at 676 mg/kg (PAS-00073580). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Mercury (Hg)			
40	YEARS DISCHARGED		
74.00	MG/KG (MAX CONCENTRATION)	Mercury concentration in surface soil sample B16-SS-01 (PAS-00073580).	
0.000001	kg per mg (Merck Index)		
45.85	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
40	YEARS DISCHARGED		
19.5	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentration found in surface soil sample B-16 (PAS-00073586).	
0.000001	kg per mg (Merck Index)		
12.09	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
40	YEARS DISCHARGED		
20	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Other PAHs concentrations using maximum concentration found in surface soil sample B-16 (PAS-00073586).	
0.000001	kg per mg (Merck Index)		
12.64	KILOGRAMS DISCHARGED		
PCBs			
22	YEARS DISCHARGED	PCBs were used at the site from 1960 to 1972, and a PCB disposal area was excavated by 1982. PAP-00035449 indicates that there were two areas with PCB contamination. Reduced PCB discharge period to 22 years. However, additional soil containing PCBs was excavated in 1994	
36000	MG/KG (MAX CONCENTRATION)	Maximum total PCB soil concentration in sample B-6 (0-2) (PAS-00073515).	
0.000001	kg per mg (Merck Index)		
6,134.35	KILOGRAMS DISCHARGED	PCB mass calculation adjusted to account for area of erosion shown by PAP-00035449, PAP-00035422, PAP-00035436	
DDx			
0	YEARS DISCHARGED within DDx Timeline	NONE FOUND IN AVAILABLE DOCUMENTATION	
	MG/KG (MAX CONCENTRATION)		
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	14.000	1.0	14.0000
Benzo(a)anthracene	16.000	0.1	1.6000
Benzo(b)fluoranthene	30.000	0.1	3.0000
Benzo(k)fluoranthene	0.000	0.01	0.0000
Chrysene	16.000	0.001	0.0160
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	9.000	0.1	0.9000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **19.5**

Sample B-16 (PAS-00073586)	
Anthracene	8.7
Acenaphthene	4.6
Acenaphthylene	0
Fluorene	3.9
Naphthalene	0
Phenanthrene	3.2
SUM	20.4

Dieldrin		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dioxins/Furans		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
45.85	kg Mercury
12.09	kg PAHs (Benzo(a)pyrene Equivalent)
12.64	kg PAHs (Other)
6,134.35	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

6204.93	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Pharmacia LLC

Pennsylvania Ave	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.095E-2	5.0%	Occasional Noncompliance	According to an Administrative Consent Order between NJDEP and Monsanto, dated July 24, 1989 (1989 ACO), on November 14, 1986, Monsanto submitted to NJDEP a report which stated that in the mid-1960s approximately 2,000 gallons of heat transfer liquid containing PCBs were landfilled on site. NJDEP filed a civil complaint against Monsanto on November 1, 1988 for failure to immediately notify NJDEP of the full nature and extent of discharges of hazardous substances which it caused to occur at the site, including the release of PCBs and petroleum hydrocarbons. PCBs used as non-contact cooling fluid starting in 1960. 2,000 gallons of PCB oil released during a 1967-1968 production upset were disposed on-site in the PCB disposal area/pit. In 1972, during conversion to non-PCB containing fluid, a tank containing 2,000 gallons of PCB oil was also discarded in the PCB disposal area/pit (PAS-00073345). Placement of PCB containing material intended to contain appropriately contaminants onsite & disposal areas voluntarily remediated in coordination with NJDEP by facility in late 1980s (PAP-00717529-30).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.630E-2

AP_ABS	2.630E-2

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Pharmacia LLC

Pennsylvania Ave	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.944E+0	5.0%	Occasional Noncompliance	According to an Administrative Consent Order between NJDEP and Monsanto, dated July 24, 1989 (1989 ACO), on November 14, 1986, Monsanto submitted to NJDEP a report which stated that in the mid-1960s approximately 2,000 gallons of heat transfer liquid containing PCBs were landfilled on site. NJDEP filed a civil complaint against Monsanto on November 1, 1988 for failure to immediately notify NJDEP of the full nature and extent of discharges of hazardous substances which it caused to occur at the site, including the release of PCBs and petroleum hydrocarbons. PCBs used as non-contact cooling fluid starting in 1960. 2,000 gallons of PCB oil released during a 1967-1968 production upset were disposed on-site in the PCB disposal area/pit. In 1972, during conversion to non-PCB containing fluid, a tank containing 2,000 gallons of PCB oil was also discarded in the PCB disposal area/pit (PAS-00073345). Placement of PCB containing material intended to contain appropriately contaminants onsite & disposal areas voluntarily remediated in coordination with NJDEP by facility in late 1980s (PAP-00717529-30).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.353E+0

AP_ABS	3.353E+0

Allocation Facility Cmass Calculation

Pitt Consol Chemical Company	191 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	3,007.29	100.00%	-	0.00%	72.00	100.00%	882.9	3,890.15	1.018817E-2	39.63
Lead	100.00%	22,798.99	100.00%	-	0.00%	131.26	100.00%	132.7	22,931.66	1.018817E-2	233.63
Mercury	100.00%	293.13	100.00%	-	0.00%	0.13	100.00%	-	293.13	1.018817E-2	2.99
HPAHs	100.00%	11,062.83	100.00%	-	0.00%	-	100.00%	41.2	11,104.08	1.018817E-2	113.13
LPAHs	100.00%	24,342.31	100.00%	-	0.00%	497.02	100.00%	27.5	24,369.81	1.018817E-2	248.28
PCBs	100.00%	447.23	100.00%	-	0.00%	-	100.00%	-	447.23	1.018817E-2	4.56
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Pitt Consol Chemical Company	191 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	39.63	1.887E-5	1.302E-5
Lead	0.01	3,200,000.00	233.63	7.301E-5	7.301E-7
Mercury	0.95	42,000.00	2.99	7.111E-5	6.755E-5
HPAHs	0.05	240,000.00	113.13	4.714E-4	2.357E-5
LPAHs	0.01	170,000.00	248.28	1.460E-3	1.460E-5
PCBs	12.87	26,000.00	4.56	1.752E-4	2.255E-3
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Pitt Consol Chemical Company	191 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.405E-2	39.63	29,456.72	1.405E-2	9.692E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	7.946E-2	233.63	254,052.55	7.946E-2	7.946E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.781E-2	2.99	2,845.22	6.781E-2	6.442E-2
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.555E-3	113.13	500.02	2.555E-3	1.277E-4
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	8.089E-3	248.28	1,126.79	8.089E-3	8.089E-5
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.229E-2	4.56	574.91	2.229E-2	2.868E-1
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Pitt Consol Chemical Company	**191 Doremus Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
185,000	gal discharged per day/week/month (PAS-00014145)	It is assumed that from 1981-1986 that discharge went to the PVSC.
24	# hours/per day discharged	Flow assumed to be 185,000 gpd and 67Mgal/yr
7	#days/week discharged	
52	#weeks/yr discharged	
67,340,000	calc gal/yr discharge	
1981	Yr Ops started	
1986	Yr Ops ceased	
5	calc #yrs facility operated	
Copper (Cu)		
5	#yrs facility discharged	
0.0565	calc mg/L COC discharged (PAS-00014145, PAS-00145500)	Copper data: 0.05 mg/l 1981 and 63 ug/l in 1984. 63ug/l=0.063mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
72.00	calc kg COC discharged	
Lead (Pb)		
5	#yrs facility discharged	
0.103	calc mg/L COC discharged (PAS-00145500)	Lead data at 103 ug/l in 1984. 103ug/l=0.103mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
131.26	calc kg COC discharged	
Mercury (Hg)		
5	#yrs facility discharged	
0.0001	calc mg/L COC discharged (PAS-00145500)	Mercury was at <0.1ug/l in 1984. assume 0.1ug/l=0.0001mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.1274	calc kg COC discharged	
HPAHs		
5	#yrs facility discharged	
-	calc mg/L HPAHs (PAS-00045500)	Napthalene data at 390ug/l in 1984, all others at ND. Assume no HPAHs
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
5	#yrs facility discharged	
0.390	calc mg/L LPAHs (PAS-00045500)	Napthalene data at 390ug/l in 1984, all others at ND. 390ug/l=0.390mg/l
3.785	L per gallon (Merck Index)	Napthalene is considered a LMW PAH
0.000001	kg per mg (Merck Index)	
497.02	calc kg COC discharged	
PCBs		
0	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged (PAS-00145500)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
0	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
6	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
5	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
6	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
5	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-5	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
72.00	kg Copper	
131.26	kg Lead	
0.13	kg Mercury	
-	kg HPAHs	
497.02	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
24	# hours/day discharged	
7	# days/week discharged	
52	# weeks/yr discharged	
45,521,582	# gals/yr directly discharged	ranged from 72000 gpd (1975) up to 185000 gpd (1978). Capacity was 500 gpm. Data indicated 67Mgpy;(PAS-00014145, PAS-00052111, PAS00000246,PAS00000568)
4.08	ft; 30yr average annual precipitation per Rutgers information	N/A
	acres	
43,560	ft2 per acre	N/A
1955	Yr Ops started	1972 facility connected to sanitary sewer to the PVSC. Dam built by the City of Newark in 1969 redirected
1969	Yr Ops ceased	discharge in the CSO to the PVSC treatment facility. PAS-00014143
14	calc #yrs facility operated	
Copper (Cu)		
14	#yrs facility discharged	
0.366	calc mg/L COC discharged	1972=1-10ppm (assume 1mg/l); 1978 Killam=0.048mg/l; 1978 WWQ=0.05mg/l (PAS-00014145, PAS-0005211)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
882.86	calc kg COC discharged	
Lead (Pb)		
14	#yrs facility discharged	
0.055	calc mg/L COC discharged	1978=.02mg/l; 1980=<.2mg/l, use .1 mg/l(PAS-0005211, PAS-0000577)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
132.67	calc kg COC discharged	
Mercury (Hg)		
14	#yrs facility discharged	
-	calc mg/L COC discharged	PAS-00052111
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
14	#yrs facility discharged	
0.2850	calc mg/L COC discharged (PAS-00014574)	From waste effluent survey 285 ug/l Oil (assumed to be ug/l as units not provided in background docs)
10%	% O&G that is considered PAHs	Calculation of HMW PAHs from Oil and Grease data.
60%	% PAHs considered as HPAHs	
0.0171	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
41	calc kg COC discharged	
LPAHs		
14	#yrs facility discharged	
0.2850	calc mg/L COC discharged (PAS-00014574)	From waste effluent survey 285 ug/l Oil (assumed to be ug/l as units not provided in background docs)
10%	% O&G that is considered PAHs	Calculation of LMW PAHs from Oil and Grease data.
40%	% PAHs considered as LPAHs	
0.0114	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
27	calc kg COC discharged	
PCBs		
15	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
15	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
15	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
14	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
15	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
15	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
15	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
882.86	kg Copper	
132.67	kg Lead	
-	kg Mercury	
41.25	kg HPAHs	
27.50	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.083333333	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
37	ACRES - TOTAL SITE AREA (acres)	FDR page 1; confirmed with Google Earth	
25	ACRES - AFFECTED AREA	Based on PAP-00009386, it is estimated that approximately 1/3 of the site was occupied by buildings. Therefore, 2/3 of the site was assumed to be exposed soil prior to 1986 (approximately 25 acres).	Since the site closed in 1983, and all production facilities were dismantled in 1986, a two-part estimate - pre-1986 and post-1986 have been calculated. According to PAP-00009411 the site cap was still in the planning phase after 2017. It is assumed that the site wide cap has yet to be implemented. This is the first part of the calculation assuming that 2/3 of the site is exposed soil from 1955 to 1986.
4,046.86	METERS^2/ACRE		
101,172	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
10	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1955	Year site operations began	Pitt-Consol purchased the site in 1955 from Reilly Tar & Chemical, Inc. (FDR page 1)	
1986	Year site was dismantled and decontaminated	Pitt-Consol operated at the site until May 1983 when all manufacturing was discontinued. The site was then dismantled and decontaminated from 1984 to 1986 (FDR page 1)	
31	NUMBER YEARS DISCHARGE		
313.63165	METERS3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1962.5	KG/M3 SOIL DENSITY	Fill includes sand, gravel, rock, cinders, ash, brick, concrete, wood, slag, metal, glass and trash (PAP-00009973). Used "silty sand and gravel" soil type from http://structx.com/Soil_Properties_002.html. Bulk density range 1442 KG/M3 to 2483 KG/M3, so use average. Average is 1962.5 kg/m3	
615,502	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The site is located on regional Historic Fill (FDR page 12)	
Copper (Cu)			
31	YEARS DISCHARGED		
2,770	MG/KG (MAX CONCENTRATION)	Table 2 of the RIR (PAP-00009951, pdf page 91) showed a maximum concentration at location J16-01, depth of 0-2ft in AOC 4.	
0.000001	kg per mg (Merck Index)		
1,705	KILOGRAMS DISCHARGED		
Lead (Pb)			
31	YEARS DISCHARGED		
21,000	MG/KG (MAX CONCENTRATION)	Lead concentration in onsite soils at location TPZ10-E depth of 2.0-3.0 ft in AOC 5 (PAP-00009951, pdf page 163, Table 3)	
0.000001	kg per mg (Merck Index)		
12,926	KILOGRAMS DISCHARGED		
Mercury (Hg)			
31	YEARS DISCHARGED		
270	MG/KG (MAX CONCENTRATION)	Mercury concentration in onsite soils at location F05-01, depth of 0-2 ft in AOC 6 (PAP-00009951, pdf page 181, Table 4)	
0.000001	kg per mg (Merck Index)		
166	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

31 YEARS DISCHARGED
10189.9 MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001 kg per mg (Merck Index)
6,272 KILOGRAMS DISCHARGED

PAHs (others detected)

31 YEARS DISCHARGED
25,880 MG/KG (TOTAL PAH MAX CONCENTRATION)

0.000001 kg per mg (Merck Index)
15,929 KILOGRAMS DISCHARGED

PCBs

31 YEARS DISCHARGED
418 MG/KG (MAX OF REPORTED CONCENTRATIONS)

0.000001 kg per mg (Merck Index)
257 KILOGRAMS DISCHARGED

SUMMARY CMASS ESTIMATES:

1,704.94	kg Copper
12,925.54	kg Lead
166.19	kg Mercury
6,271.90	kg PAHs (Benzo(a)pyrene Equivalent)
15,929.19	kg PAHs (Other)
257.28	kg PCBs

37255.05 MASS (KG) DISCHARGED FROM SURFACE SOIL

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

Data below the Benzo(a)pyrene Equivalent Table

Used maximum surface sample PTC-S-E03-01 (0-2 ft bgs) (PAP-00009951 pdf p 119-120).

The site contained three hot oil heat transfer systems which used PCB-containing oils until 1968 (one heater) and 1972 (two heaters) (FDR page 8).

Total PCB concentration in sample SW16-SC-3C23-S2-6-8-050417, depth 6-8 ft bgs (PAP-00009381, table on pdf page 46, and FDR page 18)

Max concentrations found in PTC-S-E03-01 (0-2 ft bgs). (FDR page 10; Table 3 of PAP-00009951, pdf page 119)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7400.000	1.0	7400.0000
Benzo(a)anthracene	8600.000	0.1	860.0000
Benzo(b)fluoranthene	8700.000	0.1	870.0000
Benzo(k)fluoranthene	4100.000	0.01	41.0000
Chrysene	8900.000	0.001	8.9000
Dibenz(a,h)anthracene	660.000	1.0	660.0000
Indeno(1,2,3-cd)pyrene	3500.000	0.1	350.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **10189.9**

PTC-S-E03-01 (0-2 ft bgs) (PAP-00009951 pdf p 119-120)	
Anthracene	4100
Acenaphthene	2400
Acenaphthylene	0
Fluorene	2700
Naphthalene	1200
Phenanthrene	15000
2-Methylnaphthalene	480
SUM	25880

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.083333333	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
37	ACRES - TOTAL SITE AREA (acres)	FDR page 1; confirmed with Google Earth	
37	ACRES - AFFECTED AREA	Since the site closed in 1983, and all production facilities were dismantled in 1986, a two-part estimate - pre-1986 and post-1986 have been calculated. According to PAP-00009411 the site cap was still in the planning phase after 2017. It is assumed that the site wide cap has yet to be implemented. This is the second part of the calculation assuming that all buildings have been demolished and the site is bare soil from 1986 to present day.	
4,046.86	$METERS^2$/ACRE		
149,734	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
15	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1986	Year site was dismantled and decontaminated	Pitt-Consol purchased the site in 1955 from Reilly Tar & Chemical, Inc. (FDR page 1)	
2002	Pitt-Consol is the current owner of the site (FDR page 1)	Pitt-Consol operated at the site until May 1983 when all manufacturing was discontinued. The site was then dismantled and decontaminated from 1984 to 1986 (FDR page 1) End year of discharge period through 2002. A cover consisting of permeable fabric geomembrane and fill consisting of a layer of crushed stone and gravel, nominally between 2 and 5 ft thick, was placed in 2002 (PAP-00009973).	
16	NUMBER YEARS DISCHARGE		
239.574112	METERS3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1962.5	KG/M3 SOIL DENSITY	Fill includes sand, gravel, rock, cinders, ash, brick, concrete, wood, slag, metal, glass and trash (PAP-00009973). Used "silty sand and gravel" soil type from http://structx.com/Soil_Properties_002.html. Bulk density range 1442 KG/M3 to 2483 KG/M3, so use average. Average is 1962.5 kg/m3	
470,164	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
16	YEARS DISCHARGED		
2,770	MG/KG (MAX CONCENTRATION)	Table 2 of the RIR (PAP-00009951, pdf page 91) showed a maximum concentration at location J16-01, depth of 0-2ft in AOC 4.	
0.000001	kg per mg (Merck Index)		
1,302	KILOGRAMS DISCHARGED		
Lead (Pb)			
16	YEARS DISCHARGED		
21,000	MG/KG (MAX CONCENTRATION)	Lead concentration in onsite soils at location TPZ10-E depth of 2.0-3.0 ft in AOC 5 (PAP-00009951, pdf page 163, Table 3.	
0.000001	kg per mg (Merck Index)		
9,873	KILOGRAMS DISCHARGED		
Mercury (Hg)			
16	YEARS DISCHARGED		
270	MG/KG (MAX CONCENTRATION)	Mercury concentration in onsite soils at location F05-01, depth of 0-2 ft in AOC 6 (PAP-00009951, pdf page 181, Table 4)	
0.000001	kg per mg (Merck Index)		
127	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
16	YEARS DISCHARGED	
10189.9	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
4,791	KILOGRAMS DISCHARGED	
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table
16	YEARS DISCHARGED	
17,894	MG/KG (TOTAL PAH MAX CONCENTRATION)	PAP-0009951 pdf 173-174 sample PTC-S-C05-01(0-2)
0.000001	kg per mg (Merck Index)	
8,413	KILOGRAMS DISCHARGED	
PCBs		The site contained three hot oil heat transfer systems which used PCB-containing oils until 1968 (one heater) and 1972 (two heaters) (FDR page 8).
16	YEARS DISCHARGED	
404	MG/KG (MAX OF REPORTED CONCENTRATIONS)	Total PCB concentration in sample SW16-SC-3-28* depth2-2.5 ft bgs (PAP-00009381, table on pdf page 46)
0.000001	kg per mg (Merck Index)	
190	KILOGRAMS DISCHARGED	

SUMMARY CMASS ESTIMATES:	
1,302.35	kg Copper
9,873.45	kg Lead
126.94	kg Mercury
4,790.93	kg PAHs (Benzo(a)pyrene Equivalent)
8,413.12	kg PAHs (Other)
189.95	kg PCBs

24696.74	MASS (KG) DISCHARGED FROM SURFACE SOIL

Max concentrations found in PTC-S-E03-01 (0-2 ft bgs). (FDR page 10; Table 3 of PAP-00009951, pdf page 119)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7400.000	1.0	7400.0000
Benzo(a)anthracene	8600.000	0.1	860.0000
Benzo(b)fluoranthene	8700.000	0.1	870.0000
Benzo(k)fluoranthene	4100.000	0.01	41.0000
Chrysene	8900.000	0.001	8.9000
Dibenz(a,h)anthracene	660.000	1.0	660.0000
Indeno(1,2,3-cd)pyrene	3500.000	0.1	350.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **10189.9**

PAP-0009951 pdf 173-174 sample PTC-S-C05-01(0-2)	
Anthracene	1400
Acenaphthene	1300
Acenaphthylene	94
Fluorene	1500
Naphthalene	7400
Phenanthrene	4300
2-Methylnaphthalene	1900
SUM	17894

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Pitt Consol Chemical Company

191 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.375E-3	10.0%	Periodic Noncompliacne	An incidence report to the Coast Guard, dated May 12, 1981, is listed on the inspection report and states that an "unknown" red liquid was released into the Passaic River by dumping or illegal discharge from Pitt-Consol on May 11, 1981. (PAS-00051363, PAS-00051497, PAS-00051507). Based on the Summary of Existing Environmental Data, Pitt-Consol Site, dated July 24, 1989, an oily, creosote-like staining was observed in fill on the northern portion of the site and coal-like and tar-like material have been observed in areas of the site, primarily on the western half of the facility in fill material (PAP-00016509-10). The PVSC Annual Report for 1972 stated that industrial waste was discharging to the Passaic River from the Roanoke Ave storm sewer, even though a concrete dam had been built to prevent overflow from the sanitary sewer into the storm sewer. In order to locate the source of the pollution, the Roanoke Avenue storm sewer was cleaned in late 1971. While preparing a visual inspection of the storm sewer, a manhole on the Pitt-Consol property exploded, injuring three men. Inspection of the sewer with a camera in January 1972 found a 10 inch connection discharging polluted water from the Pitt-Consol facility (PAS-00006274-5).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.137E-3

AP_ABS	2.137E-3

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Pitt Consol Chemical Company

191 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.620E-1	10.0%	Periodic Noncompliacne	An incidence report to the Coast Guard, dated May 12, 1981, is listed on the inspection report and states that an "unknown" red liquid was released into the Passaic River by dumping or illegal discharge from Pitt-Consol on May 11, 1981. (PAS-00051363, PAS-00051497, PAS-00051507). Based on the Summary of Existing Environmental Data, Pitt-Consol Site, dated July 24, 1989, an oily, creosote-like staining was observed in fill on the northern portion of the site and coal-like and tar-like material have been observed in areas of the site, primarily on the western half of the facility in fill material (PAP-00016509-10). The PVSC Annual Report for 1972 stated that industrial waste was discharging to the Passaic River from the Roanoke Ave storm sewer, even though a concrete dam had been built to prevent overflow from the sanitary sewer into the storm sewer. In order to locate the source of the pollution, the Roanoke Avenue storm sewer was cleaned in late 1971. While preparing a visual inspection of the storm sewer, a manhole on the Pitt-Consol property exploded, injuring three men. Inspection of the sewer with a camera in January 1972 found a 10 inch connection discharging polluted water from the Pitt-Consol facility (PAS-00006274-5).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.258E-1

AP_ABS	3.258E-1

Allocation Facility Cmass Calculation

PMC, Inc. | **450 Schuyler Avenue** | **Kearny** | **NJ**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	1.21%	15,077.10	100.00%	49,175.3	49,358.02	1.018817E-2	502.87
Lead	100.00%	-	100.00%	-	1.21%	9,231.83	100.00%	40,836.5	40,948.42	1.018817E-2	417.19
Mercury	100.00%	-	100.00%	-	1.21%	79.43	100.00%	289.9	290.85	1.018817E-2	2.96
HPAHs	100.00%	-	100.00%	-	1.21%	750,822.13	100.00%	1,850,387.4	1,859,487.41	1.018817E-2	18,944.78
LPAHs	100.00%	-	100.00%	-	1.21%	500,548.09	100.00%	1,233,591.6	1,239,658.31	1.018817E-2	12,629.85
PCBs	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

PMC, Inc.	450 Schuyler Avenue	Kearny	NJ

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	502.87	2.395E-4	1.652E-4
Lead	0.01	3,200,000.00	417.19	1.304E-4	1.304E-6
Mercury	0.95	42,000.00	2.96	7.055E-5	6.703E-5
HPAHs	0.05	240,000.00	18,944.78	7.894E-2	3.947E-3
LPAHs	0.01	170,000.00	12,629.85	7.429E-2	7.429E-4
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

PMC, Inc.	450 Schuyler Avenue	Kearny	NJ

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.782E-1	502.87	373,745.19	1.782E-1	1.230E-1
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.419E-1	417.19	453,654.51	1.419E-1	1.419E-3
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.729E-2	2.96	2,823.07	6.729E-2	6.392E-2
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	4.278E-1	18,944.78	83,732.88	4.278E-1	2.139E-2
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	4.115E-1	12,629.85	57,318.19	4.115E-1	4.115E-3
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

PMC, Inc.	**450 Schuyler Avenue**	**Kearny**	**NJ**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Ivy	CSO	1.83%	66.23%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day	Prior to 1986 all wastewater discharged to Frank's Creek
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
1,816,904,418	calc gal/yr discharge	
1986	Yr Ops started	
2007	Yr Ops ceased	
21	calc #yrs facility operated	
Copper (Cu)		
21	#yrs facility discharged	1990 PVSC Sewer App
0.1044	calc mg/L COC discharged PAS00014827, PAS00014918, PAS00014974	1994 inspection Reports
3.785	L per gallon (Merck Index)	1995 PVSC Sewer App
0.000001	kg per mg (Merck Index)	
15,077.10	calc kg COC discharged	
Lead (Pb)		
21	#yrs facility discharged	
0.0639	calc mg/L COC discharged PAS00014827, PAS00014918, PAS00014974	1990 PVSC Sewer App
3.785	L per gallon (Merck Index)	1994 inspection Reports
0.000001	kg per mg (Merck Index)	1995 PVSC Sewer App
9,231.83	calc kg COC discharged	
Mercury (Hg)		
21	#yrs facility discharged	
0.00055	calc mg/L COC discharged PAS00014827, PAS00014918, PAS00014974	1990 PVSC Sewer App
3.785	L per gallon (Merck Index)	1994 inspection Reports
0.000001	kg per mg (Merck Index)	1995 PVSC Sewer App
79.43	calc kg COC discharged	
HPAHs		
21	#yrs facility discharged	
86.65	calc mg/L O&G PAS00014827 & PAS00014974	calcs used to convert mg/kg O&G to HPAHs
10%	% O&G that is considered PAHs	1990 PVSC Sewer App
60%	% PAHs considered as HPAHs	1995 PVSC Sewer App
5	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
750,822.15	calc kg COC discharged	
LPAHs		
21	#yrs facility discharged	
86.65	calc mg/L O&G PAS00014827 & PAS00014974	calcs used to convert mg/kg O&G to LPAHs
10%	% O&G that is considered PAHs	1990 PVSC Sewer App
40%	% PAHs considered as LPAHs	1995 PVSC Sewer App
3	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
500,548.10	calc kg COC discharged	
PCBs		
-8	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-13	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
2	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
21	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
22	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
0	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-10	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
15,077.10	kg Copper	
9,231.83	kg Lead	
79.43	kg Mercury	
750,822.15	kg HPAHs	
500,548.10	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Discharge to Frank's Creek which flows to Passaic River
	# days/week discharged	1970 Data
	# weeks/yr discharged	1977 NPDES Permit Application
4,212,758,786	# gals/yr directly discharged PAS00015015, PAS00014827, PAS00015012, PAS00014918, PAS00014974	1990 PVSC Permit Application
		1994 Inspection Reports
4.08	ft; 30yr average annual precipitation per Rutgers information	1995 PVSC Sewer Application
	acres	
43,560	ft2 per acre	
1971	Yr Ops started	
2007	Yr Ops ceased	
36	calc #yrs facility operated	
Copper (Cu)		
36	#yrs facility discharged	1990 PVSC Sewer App
0.0857	calc mg/L COC discharged PAS00014827, PAS00014918, PAS00014974	1994 inspection Reports
3.785	L per gallon (Merck Index)	1995 PVSC Sewer App
0.000001	kg per mg (Merck Index)	1985 Wastewater Sample
49,175.28	calc kg COC discharged	
Lead (Pb)		
36	#yrs facility discharged	1990 PVSC Sewer App
0.0711	calc mg/L COC discharged PAS00014827, PAS00014918, PAS00014974	1994 inspection Reports
3.785	L per gallon (Merck Index)	1995 PVSC Sewer App
0.000001	kg per mg (Merck Index)	1985 Wastewater Sample
40,836.53	calc kg COC discharged	
Mercury (Hg)		
36	#yrs facility discharged	
0.00051	calc mg/L COC discharged PAS00014827, PAS00014918, PAS00014974	1990 PVSC Sewer App
3.785	L per gallon (Merck Index)	1994 inspection Reports
0.000001	kg per mg (Merck Index)	1995 PVSC Sewer App
289.89	calc kg COC discharged	calcs used to convert mg/kg O&G to HPAHs
HPAHs		
36	#yrs facility discharged	
63.10	calc mg/L O&G PAS00014827 & PAS00014974	calcs used to convert mg/kg O&G to HPAHs; remove if not needed
10%	% O&G that is considered PAHs	1990 PVSC Sewer App
60%	% COC in O&G considered as PAHs	1995 PVSC Sewer App
4	calc mg/L HPAHs	1985 Wastewater Sample
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,173,279.52	calc kg COC discharged	
LPAHs		
36	#yrs facility discharged	
63.10	calc mg/L O&G PAS00014827 & PAS00014974	calcs used to convert mg/kg O&G to LPAHs; remove if not needed
10%	% O&G that is considered PAHs	1990 PVSC Sewer App
40%	% COC in O&G considered as PAHs	1995 PVSC Sewer App
3	calc mg/L LPAHs	1985 Wastewater Sample
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,448,853.01	calc kg COC discharged	
PCBs		
7	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
2	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
17	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
36	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
37	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
15	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
5	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
49,175.28	kg Copper	
40,836.53	kg Lead	
289.89	kg Mercury	
1,850,387.36	kg HPAHs	
1,233,591.57	kg LPAHs	
-	kg PCBs	
-	kg DDx	

-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

PMC, Inc.

450 Schuyler Avenue | **Kearny** | **NJ**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.923E-3	10.0%	Periodic Noncompliacne	The PVSC permit request filed in September 1985 was in response to a civil action by the EPA against Kleer Kast for violation of the federal Clean Water Act for discharging contact cooling water to Frank's Creek. On July 1, 1986, the company began discharging contact cooling water to the PVSC system rather than to surface water (PAS-00015237; PAS-00015262; PAS-00015264; PAS-00015296-298; PAS-00015302-303). On March 6, 1990, Kleer Kast reported to PVSC that approximately 50 gallons of Number 6 fuel oil were discharged to the sewer during a 1-hour period. The discharge resulted from a leak in a fuel oil recirculating line. PVSC issued a NOV to Kleer Kast on March 7, 1990 for the discharge (PAS-00015134-136; PAS-00015134-6). During a June 9, 1994 facility inspection, NJDEP documented that an oil-like substance was leaking from the foundation of the loading dock area of Alexandria Plastics, a tenant at the Kleer Kast Site (PAS-00014840; PAS-00015208).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	6.400E-3

AP_ABS	6.400E-3

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

PMC, Inc.

450 Schuyler Avenue | **Kearny** | **NJ**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.138E-1	10.0%	Periodic Noncompliacne	The PVSC permit request filed in September 1985 was in response to a civil action by the EPA against Kleer Kast for violation of the federal Clean Water Act for discharging contact cooling water to Frank's Creek. On July 1, 1986, the company began discharging contact cooling water to the PVSC system rather than to surface water (PAS-00015237; PAS-00015262; PAS-00015264; PAS-00015296-298; PAS-00015302-303). On March 6, 1990, Kleer Kast reported to PVSC that approximately 50 gallons of Number 6 fuel oil were discharged to the sewer during a 1-hour period. The discharge resulted from a leak in a fuel oil recirculating line. PVSC issued a NOV to Kleer Kast on March 7, 1990 for the discharge (PAS-00015134-136; PAS-00015134-6). During a June 9, 1994 facility inspection, NJDEP documented that an oil-like substance was leaking from the foundation of the loading dock area of Alexandria Plastics, a tenant at the Kleer Kast Site (PAS-00014840; PAS-00015208).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	2.780E-1

AP_ABS	2.780E-1

Allocation Facility Cmass Calculation

PPG Industries Inc.	29 Riverside Avenue	Newark	NJ	07104

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	32.69	100.00%	-	0.00%	-	100.00%	-	32.69	1.018817E-2	0.33
Lead	100.00%	283.93	100.00%	-	0.00%	-	100.00%	-	283.93	1.018817E-2	2.89
Mercury	100.00%	0.31	100.00%	-	0.00%	-	100.00%	-	0.31	1.018817E-2	0
HPAHs	100.00%	0.83	100.00%	-	0.00%	-	100.00%	-	0.83	1.018817E-2	0.01
LPAHs	100.00%	5.26	100.00%	-	0.00%	-	100.00%	-	5.26	1.018817E-2	0.05
PCBs	100.00%	0.38	100.00%	-	0.00%	-	100.00%	-	0.38	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

PPG Industries Inc.	29 Riverside Avenue	Newark	NJ	07104

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.33	1.586E-7	1.094E-7
Lead	0.01	3,200,000.00	2.89	9.040E-7	9.040E-9
Mercury	0.95	42,000.00	0	7.520E-8	7.144E-8
HPAHs	0.05	240,000.00	0.01	3.523E-8	1.762E-9
LPAHs	0.01	170,000.00	0.05	3.152E-7	3.152E-9
PCBs	12.87	26,000.00	0	1.489E-7	1.916E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

PPG Industries Inc.	29 Riverside Avenue	Newark	NJ	07104

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.180E-4	0.33	247.53	1.180E-4	8.144E-5
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	9.839E-4	2.89	3,145.57	9.839E-4	9.839E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	7.172E-5	0	3.01	7.172E-5	6.813E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.910E-7	0.01	0.04	1.910E-7	9.548E-9
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.746E-6	0.05	0.24	1.746E-6	1.746E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.894E-5	0	0.49	1.894E-5	2.437E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

PPG Industries Inc.	**29 Riverside Avenue**	**Newark**	**NJ**	**07104**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Limited to no discharge data
	# hours/per day discharged	Operations from 1902-1971
7	#days/week discharged	Connect to PVSC in 1900s through the Delavan Ave Connector (PAS-0044291)
52	#weeks/yr discharged	No information on discharge volumes, flows or water quality
37,500,000	calc gal/yr discharge	Manufacturer of Paint and paint products - using Sherwin Williams to estimate
		Volume reduced by 50% due to statement about liquid wastes potentially being hauled off
1902	Yr Ops started	
1971	Yr Ops ceased	No information on Storm water since on the banks of the Passaic assuming direct to Passaic
69	calc #yrs facility operated	
Copper (Cu)		
69	#yrs facility discharged	Based on Sherwin Williams
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
69	#yrs facility discharged	Based on Sherwin Williams
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
69	#yrs facility discharged	Based on Sherwin Williams
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
69	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
69	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
43	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
32	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
22	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
69	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
26	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
27	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
22	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	No information on Storm water however site is on bank of Passaic so assuming discharge to Passaic
	# weeks/yr discharged	Assuming data from POTW at 25%
-	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
43,560	ft2 per acre	
7.00	acres	
50%	Percent Precip to River	
1902	Yr Ops started	
1971	Yr Ops ceased	
69	calc #yrs facility operated	
Copper (Cu)		
69	#yrs facility discharged	
0.07	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
69	#yrs facility discharged	
0.13	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
69	#yrs facility discharged	
0.0003	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
69	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
69	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
43	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
32	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
22	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
69	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
26	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
27	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
22	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
7	ACRES - TOTAL SITE AREA (acres)		
1.40	ACRES - AFFECTED AREA	80 percent of site is covered with impervious material and buildings (FDR Page 15, PAS-00044334). Affected area reflects the referenced 20% bare/unpaved portion of the total 7 acres.	
4,046.86	METERS^2/ACRE		
5,666	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1902	Year site operations began	FDR page 1, PAP-00037404	
1971	Year site processing and storage operations ceased	FDR page 1, PAP-00037404	
69	NUMBER YEARS DISCHARGE		
39	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill reported as silt, sand, and gravel (PAP-00305946-48). Bulk density range for silty sand and gravel 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
76,739	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Other metals not listed here (i.e. not COCs) were detected in onsite soil	
69	YEARS DISCHARGED		
426	MG/KG (MAX CONCENTRATION)	Copper concentration in on-site surface soil sample B-53 (0-1). (PAP-00305850).	
0.000001	kg per mg (Merck Index)		
32.69	KILOGRAMS DISCHARGED		
Lead (Pb)			
69	YEARS DISCHARGED		
3700	MG/KG (MAX CONCENTRATION)	Lead concentration in on-site surface soil sample B-30 (0-1) (PAP-00305846).	
0.000001	kg per mg (Merck Index)		
283.93	KILOGRAMS DISCHARGED		
Mercury (Hg)			
69	YEARS DISCHARGED		
4.0	MG/KG (MAX CONCENTRATION)	Mercury concentration in on-site fill sample B-38 (PAP-00305848).	
0.000001	kg per mg (Merck Index)		
0.31	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

69 YEARS DISCHARGED

10.8 MG/KG (TOTAL PAH MAX CONCENTRATION)

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations found in surface soil (0-3 ft bgs) sample, B-63(1-3)-101117 (PAP-00305839).
Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	7.300	1.0	7.3000
Benzo(a)anthracene	8.900	0.1	0.8900
Benzo(b)fluoranthene	9.700	0.1	0.9700
Benzo(k)fluoranthene	3.300	0.01	0.0330
Chrysene	8.900	0.001	0.0089
Dibenz(a,h)anthracene	1.200	1.0	1.2000
Indeno(1,2,3-cd)pyrene	4.000	0.1	0.4000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **10.8**

0.000001 kg per mg (Merck Index)

0.83 KILOGRAMS DISCHARGED

PAHs (others detected)

69 YEARS DISCHARGED

68 MG/KG (TOTAL PAH MAX CONCENTRATION)

Other PAHs = Acenaphthene (7.6), Acenaphthylene (0.59 J), Anthracene (10), Fluorene (6.4), Naphthalene (3.9), Phenanthrene (40). Maximum PAH concentrations found in surface soil sample B-53(1-3) - PAP-00305837.

Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

0.000001 kg per mg (Merck Index)

5.26 KILOGRAMS DISCHARGED

PCBs

Documentation says no PCBs used or generated at the site during PPG owner/operator timeframe, and point to Lot 70 post-PPG owner/operator. However, highest PCB concentration found at other end of site (FDR page 4-7)

41 YEARS DISCHARGED

5 MG/KG (MAX CONCENTRATION)

Number of years reflect a 1930 start date for PCBs.
Total PCBs concentration in on-site surface soil sample B-52 (0-1) (PAP-00305864).
Transformers were likely present at the site because most manufacturing operations had transformers containing PCBs during PPG's period of operation. These could have led to releases from leaks, poor storage or disposal with replacement, or spills of PCB oils during refill.
No change to the PCBs concentration because maximum values are used for the purpose of this calculation. A sample id with an alternative maximum value was not suggested.

0.000001 kg per mg (Merck Index)

0.38 KILOGRAMS DISCHARGED

DDx

0 YEARS DISCHARGED within DDx Timeline

NONE FOUND IN AVAILABLE DOCUMENTATION

3.785 L per gallon (Merck Index)

0.000001 kg per mg (Merck Index)

0 KILOGRAMS DISCHARGED

Dieldrin

0 NONE FOUND IN AVAILABLE DOCUMENTATION

MG/KG (MAX CONCENTRATION)

3.785 L per gallon (Merck Index)

0.000001 kg per mg (Merck Index)

0 KILOGRAMS DISCHARGED

Dioxins/Furans

69 YEARS DISCHARGED

0.00045655 MG/KG (MAX CONCENTRATION)

2,3,7,8-TCDD equivalent (calculated in table to the right). Data from on-site soil sample DF-6 (0-0.5). (PAP-00305871).

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	2,3,7,8-TCDD Equivalents
2,3,7,8-TCDD	0.0000208	1.0	0.0000208
1,2,3,7,8-PeCDD	0.0000448	1.0	0.0000448
1,2,3,4,7,8-HxCDD	0.0000422	0.1	0.0000042
1,2,3,6,7,8-HxCDD	0.0001800	0.1	0.0000180
1,2,3,7,8,9-HxCDD	0.0000936	0.1	0.0000094
1,2,3,4,6,7,8-HpCDD	0.0014400	0.01	0.0000144
OCDD	0.0119000	0.0003	0.0000036
2,3,7,8-TCDF	0.0000405	0.1000	0.0000041
1,2,3,7,8-PeCDF	0.0000349	0.0300	0.0000010
2,3,4,7,8-PeCDF	0.0008360	0.3000	0.0002508
1,2,3,4,7,8-HxCDF	0.0001760	0.1000	0.0000176
1,2,3,6,7,8-HxCDF	0.0001860	0.1000	0.0000186
1,2,3,7,8,9-HxCDF	0.0000275	0.1000	0.0000028
2,3,4,6,7,8-HxCDF	0.0004070	0.1000	0.0000407
1,2,3,4,6,7,8-HpCDF	0.0005000	0.0100	0.0000050
1,2,3,4,7,8,9-HpCDF	0.0000599	0.0100	0.0000006
OCDF	0.0008510	0.0003	0.0000003

Total 2,3,7,8-TCDD Equivalents = **0.00045655**

0.000001 kg per mg (Merck Index)

0.0000350352 calc kg COC discharged

SUMMARY CMASS ESTIMATES:

32.69	kg Copper
283.93	kg Lead
0.31	kg Mercury
0.83	kg PAHs (Benzo(a)pyrene Equivalent)
5.26	kg PAHs (Other)
0.38	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

323.40 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

PPG Industries Inc.

29 Riverside Avenue	**Newark**	**NJ**	**07104**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.111E-6	5.0%	Occasional Noncompliance	Indications of direct dumping of containers to river, as reported in an affidavit of a former employee, though he stated that he had no knowledge of the contents of the containers (PAS-00080135; PAS-00080161-62). According to former employees, a fire in the resin building occurred in 1969 but did not result in resin material reaching the river. The resin material was confined to the building (PAS-00044290). According to a PPG employee, a vapor cloud was released from one of the resin reactors in Building 17. Newark City firefighters pumped water from the river into the building and nearby storage tanks to attempt to contain the fire. The building was damaged beyond repair during the fire and was later demolished (PAS-00006303).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.795E-6

AP_ABS	1.795E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

PPG Industries Inc.

29 Riverside Avenue	**Newark**	**NJ**	**07104**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.032E-4	5.0%	Occasional Noncompliance	Indications of direct dumping of containers to river, as reported in an affidavit of a former employee, though he stated that he had no knowledge of the contents of the containers (PAS-00080135; PAS-00080161-62). According to former employees, a fire in the resin building occurred in 1969 but did not result in resin material reaching the river. The resin material was confined to the building (PAS-00044290). According to a PPG employee, a vapor cloud was released from one of the resin reactors in Building 17. Newark City firefighters pumped water from the river into the building and nearby storage tanks to attempt to contain the fire. The building was damaged beyond repair during the fire and was later demolished (PAS-00006303).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.427E-4

AP_ABS	3.427E-4

Allocation Facility Cmass Calculation

PSE&G Corp.	4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	4,994.42	100.00%	190.99	0.00%	833.40	100.00%	-	5,185.41	1.018817E-2	52.83
Lead	100.00%	-	100.00%	17.59	0.00%	76.76	100.00%	551.7	569.32	1.018817E-2	5.8
Mercury	100.00%	39.3	100.00%	-	0.00%	-	100.00%	-	39.3	1.018817E-2	0.4
HPAHs	100.00%	403.57	100.00%	580.50	0.00%	2,533.10	100.00%	255,499.5	256,483.6	1.018817E-2	2,613.1
LPAHs	100.00%	2,719.18	100.00%	387.00	0.00%	1,688.74	100.00%	262,287.1	265,393.31	1.018817E-2	2,703.87
PCBs	100.00%	10.16	100.00%	-	0.00%	-	100.00%	-	10.16	1.018817E-2	0.1
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

PSE&G Corp.	4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	52.83	2.516E-5	1.736E-5
Lead	0.01	3,200,000.00	5.8	1.813E-6	1.813E-8
Mercury	0.95	42,000.00	0.4	9.533E-6	9.057E-6
HPAHs	0.05	240,000.00	2,613.1	1.089E-2	5.444E-4
LPAHs	0.01	170,000.00	2,703.87	1.591E-2	1.591E-4
PCBs	12.87	26,000.00	0.1	3.981E-6	5.124E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

PSE&G Corp.	4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.872E-2	52.83	39,264.57	1.872E-2	1.292E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.973E-3	5.8	6,307.26	1.973E-3	1.973E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	9.092E-3	0.4	381.46	9.092E-3	8.637E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	5.901E-2	2,613.1	11,549.48	5.901E-2	2.951E-3
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	8.809E-2	2,703.87	12,271.01	8.809E-2	8.809E-4
PCBs	12.87	26,000.00	20,066.54	25,795.56	5.063E-4	0.1	13.06	5.063E-4	6.516E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

PSE&G Corp.	**4th Street**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Facility has both NJPDES Permits for discharge directly to the Passiac River and PVSC Sewer Permits
24	# hours/per day discharged	1978 PVSC Permit
7	#days/week discharged	1978 Waste Effluent Survey
52	#weeks/yr discharged	1985/86 PVSC Permit Application
30,178,920	calc gal/yr discharge PAP00132788, PAP00134897, PAP00140305, PAP00140813, PAP00428220, PAP00140810	1990 PVSC Permit Application
		1991 PVSC Permit Application
1902	Yr Ops started	
2020	Yr Ops ceased	
118	calc #yrs facility operated	
Copper (Cu)		
118	#yrs facility discharged PAP00140813, PAP00428220	1983 PSA
0.08	calc mg/L COC discharged	1990 PVSC Sewer Application
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,024.39	calc kg COC discharged	
Lead (Pb)		
118	#yrs facility discharged	
0.01	calc mg/L COC discharged PAP00140813, PAP00428220	1990 PVSC Sewer Application
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
94.35	calc kg COC discharged	
Mercury (Hg)		
118	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
118	#yrs facility discharged	1978 PVSC Permit and Waste Effluent Survey
3.85	calc mg/L O&G PAP00132788, PAP00134897, PAP00140305, PAP00140810	1985/86 PVSC Permit Application
25%	% O&G that is considered PAHs	1991 PVSC Permit Application
60%	% PAHs considered as HPAHs	
1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
7,784.01	calc kg COC discharged	
LPAHs		
118	#yrs facility discharged	1978 PVSC Permit and Waste Effluent Survey
3.85	calc mg/L O&G PAP00132788, PAP00134897, PAP00140305, PAP00140810	1985/86 PVSC Permit Application
25%	% O&G that is considered PAHs	1991 PVSC Permit Application
40%	% PAHs considered as LPAHs	
0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
5,189.34	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
118	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
75	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
1,024.39	kg Copper	
94.35	kg Lead	
-	kg Mercury	
7,784.01	kg HPAHs	
5,189.34	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
24	# hours/day discharged	1978 PVSC Permit and Waste Effluent Survey
7	# days/week discharged	1985/86 PVSC Permit Application
52	# weeks/yr discharged	
176,472,207	# gals/yr directly discharged	PAP-00134898
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1902	Yr Ops started	
2020	Yr Ops ceased	
118	calc #yrs facility operated	
Copper (Cu)		
118	#yrs facility discharged	1980 NPDES Permit
-	calc mg/L COC discharged PAP0014073, PAP00140813, PAP00428220	1990 PVSC Permit Application
3.785	L per gallon (Merck Index)	PAP-00130839
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
118	#yrs facility discharged	
0.0070	calc mg/L COC discharged PAP00140813, PAP00428220	1990 PVSC Permit Application
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
551.72	calc kg COC discharged	
Mercury (Hg)		
118	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
118	#yrs facility discharged	1978 PVSC Permit and Waste Effluent Survey
3.50	calc mg/L COC discharged PAP00132788, PAP00134897, PAP0014073, PAP00140315	1985/86 PVSC Permit Application
3.785	L per gallon (Merck Index)	1980 NPDES Permit
0.000001	kg per mg (Merck Index)	5#/day oil & Grease discharge limit x 60% as HPAH x 41 years = 44895 # = 20362.7 kg Credit
275,862.24	calc kg COC discharged	
LPAHs		
118	#yrs facility discharged	1978 PVSC Permit and Waste Effluent Survey
3.50	calc mg/L COC discharged PAP00132788, PAP00134897, PAP0014073, PAP00140315	1985/86 PVSC Permit Application
3.785	L per gallon (Merck Index)	1980 NPDES Permit
0.000001	kg per mg (Merck Index)	5#/day oil & Grease discharge limit x 40% as LPAH x 41 years = 29930 # = 13575.1 kg Credit
275,862.24	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
118	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
75	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
551.72	kg Lead	
-	kg Mercury	
255,499.54	kg HPAHs	
262,287.14	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION		
32	ACRES - TOTAL SITE AREA (acres)	FDR, PDF PAGE 1	
16	ACRES - AFFECTED AREA *AREA OF POTENTIAL OVERLAND FLOW DISCHARGE TO PASSAIC RIVER	The site is located on historic fill material. Unpaved gravel covered areas in the southwesterly area of the Site periodically flood to depths exceeding 1.5 feet. (PAP-00130585-6).	
4,046.86	METERS^2/ACRE	CONVERSION TO METERS	
64,750	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
6	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED to Passaic.	
1902	Year site operations began	Commencing in 1902 through September 1926, when the Plant commenced commercial operations, the Site was a satellite facility utilized solely for the storage of oil and manufactured gas. (PAP-00356759)	Newark Gas leased its Plant properties and franchises to the United Gas Improvement Company in 1898 which assigned the lease that same year to the Essex and Hudson Gas Company. Public Service Corporation of New Jersey acquired in 1903 the plant, property " and franchises of the Essex and Hudson Gas Company, which included the Site. The Essex and Hudson Gas Company and Newark Gas Company merged with and into PSE&G in 1939. (PAP-
2020	Year site operations ceased	FDR PDF PAGE 1, Operator: 1902 or 1909 to present (PAP-00140468; PAS-00007043-44). Owner: 1884 to present (PAS-00007043-44). On March 4, 2014, PSE&G submitted a Remedial Investigation Timeframe Extension which was approved by NJDEP on March 4, 2014. Therefore, the current applicable timeframe for the completion of a remedial investigation and submission of an RIR for the Site is May 7, 2016. (PAP-00130579)	
118	NUMBER YEARS DISCHARGE		
764	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill reported as silt, clay sand and gravel. Bulk density range 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	The historic fill contains heterogeneous mixtures of predominantly sand and gravel that can occur with cinders and other anthropogenic debris such as brick, wood, concrete, coal fragments. Portions of the historic fill material may also contain tar material and oil material (TM and OM) in areas . The Fill Unit is a continuous water-bearing unit that comprises the shallow aquifer beneath the Site, where the depth to groundwater typically ranges from 1 to 8 feet bsg. (PAP-00130585) historical MGP structures (PAP-00130582)
1,499,825	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
118	YEARS DISCHARGED		
3,330	MG/KG (MAX CONCENTRATION)	PAP-00129400 (0.5 to 1 ft)	
0.000001	kg per mg (Merck Index)		
4,994	KILOGRAMS DISCHARGED		
Lead (Pb)			
118	YEARS DISCHARGED		
0	MG/KG MAX CONCENTRATION)	FDR PDF PAGE 13 MAX CONCENTRATIONS OF 4,890 mg/kg Found in Onsite Soils. **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
118	YEARS DISCHARGED		
26.2	MG/KG (MAX CONCENTRATION)	28.2 MG/KG FROM TABLE 3-2 SAMPLE PES-25 (PAP-00129413)	
0.000001	kg per mg (Merck Index)		
39	KILOGRAMS DISCHARGED		

DISCHARGE CALCULATIONS		DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
PAHs (listed in Benzoic Pyrene Equivalent conversion table)				
118	YEARS DISCHARGED			
269.1	MG/KG (TOTAL PAH MAX CONCENTRATION)			PAP-00128657, 1.5-2 ft sample
0.000001	kg per mg (Merck Index)			
404	KILOGRAMS DISCHARGED			
PAHs (others detected)			Data below the Benzo(a)pyrene Equivalent Table	TEF FOR CHRYSENE LISTED AS 0.01 BY OTHERS
118	YEARS DISCHARGED			
1,813	MG/KG (TOTAL PAH MAX CONCENTRATION)		PAP-00128657, 1.5-2 ft sample	
0.000001	kg per mg (Merck Index)			
2,719	KILOGRAMS DISCHARGED			
PCBs				
90	YEARS DISCHARGED			
8.88	MG/KG (MAX CONCENTRATION)		PAP-00129059 1.5-2 ft post-excavation sample	
0.000001	kg per mg (Merck Index)			
10	KILOGRAMS DISCHARGED			
DDx				
118	YEARS DISCHARGED within DDx Timeline		HISTORIC FILL OU2 COC CONCENTRATION REFERENCE TABLE	
0	MG/KG (MAX CONCENTRATION)		NONE REPORTED in site soil	
0.000001	kg per mg (Merck Index)			
0	KILOGRAMS DISCHARGED			
Dieldrin				
118	YEARS DISCHARGED		NONE REPORTED in site soil	
0	MG/KG (MAX CONCENTRATION)			
0.000001	kg per mg (Merck Index)			
0	KILOGRAMS DISCHARGED			
Dioxins/Furans			Land use at the Site has not changed since the former MGP was decommissioned in 1992 (PAP-00130589).	
118	YEARS DISCHARGED			
0	MG/KG (MAX CONCENTRATION)		2,3,7,8-TCDD was detected at concentrations up to 14,600 pg/g (picogram/gram) (PAP-00128893). However, Dioxins/Furans concentration set as 0 mg/kg based on the conclusion accepted by NJDEP that the 2,3,7,8 TCDD detected was attributed to migration from the Passaic River and was not associated with operations at the Harrison site (PAP-00128997-8)	
0.000001	kg per mg (Merck Index)			
0.00	KILOGRAMS DISCHARGED			

SUMMARY CMASS ESTIMATES:	
4994.42	kg Copper
0.00	kg Lead
39.30	kg Mercury
403.57	kg PAHs (Benzo(a)pyrene Equivalent)
2719.18	kg PAHs (Other)
10.16	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

8166.62	TOTAL MASS (KG) DISCHARGED FROM SURFACE SOIL

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	200.000	1.0	200.0000
Benzo(a)anthracene	240.000	0.1	24.0000
Benzo(b)fluoranthene	160.000	0.1	16.0000
Benzo(k)fluoranthene	52.000	0.01	0.5200
Chrysene	260.000	0.001	0.2600
Dibenz(a,h)anthracene	20.000	1.0	20.0000
Indeno(1,2,3-cd)pyrene	83.000	0.1	8.3000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **269.1**

PAP-00128657, 1.5-2 ft sample	
Anthracene	180
Acenaphthene	120
Acenaphthylene	43
Fluorene	170
Naphthalene	100
Phenanthrene	1000
2-Methylnaphthalene	200
SUM	1813

Allocation Facility Cmass Calculation

PSE&G Corp.	155 Raymond Blvd.	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	5,838.11	100.00%	-	0.00%	-	100.00%	-	5,838.11	1.018817E-2	59.48
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	37.3	100.00%	164.47	0.00%	1,754.37	100.00%	34.1	235.86	1.018817E-2	2.4
LPAHs	100.00%	167.25	100.00%	109.65	0.00%	1,169.58	100.00%	22.7	299.62	1.018817E-2	3.05
PCBs	100.00%	1.97	100.00%	-	0.00%	0.04	100.00%	-	1.97	1.018817E-2	0.02
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

PSE&G Corp.	155 Raymond Blvd.	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	59.48	2.832E-5	1.954E-5
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	2.4	1.001E-5	5.006E-7
LPAHs	0.01	170,000.00	3.05	1.796E-5	1.796E-7
PCBs	12.87	26,000.00	0.02	7.735E-7	9.954E-6
DDx	1.37	27,000.00	0	3.251E-11	4.454E-11
Dieldrin	0.13	390.00	0	4.924E-9	6.401E-10
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

PSE&G Corp.	155 Raymond Blvd.	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	2.108E-2	59.48	44,206.91	2.108E-2	1.454E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	5.427E-5	2.4	10.62	5.427E-5	2.713E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	9.945E-5	3.05	13.85	9.945E-5	9.945E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	9.836E-5	0.02	2.54	9.836E-5	1.266E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	3.423E-8	0	0	3.423E-8	4.689E-8
Dieldrin	0.13	390.00	1.27	389.99	1.489E-4	0	0.06	1.489E-4	1.936E-5
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

PSE&G Corp.	**155 Raymond Blvd.**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Dicharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day	March 1975 Letter states only sanitary wastes went to PVSC
24	# hours/per day discharged	1980 NPDES Permit
7	#days/week discharged	1975 Waste Effluent Survey
52	#weeks/yr discharged	
8,047,000	calc gal/yr discharge	PAP-00130793, PAP-00130819
1915	Yr Ops started	
2020	Yr Ops ceased	
105	calc #yrs facility operated	
Copper (Cu)		
105	#yrs facility discharged	
-	calc mg/L COC discharged	PAP-00130839, intake water contains 1 mg/l Cu
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
105	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
105	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
105	#yrs facility discharged	
10.00	calc mg/L O&G	PAP-00130839
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.6	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,918.85	calc kg COC discharged	
LPAHs		
105	#yrs facility discharged	
10.00	calc mg/L O&G	PAP-00130839
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.40	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,279.23	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
0.000030	calc mg/L COC discharged	PAP-00130879
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.04	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
0.000001	calc mg/L COC discharged	PAP-00130879
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00101	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
0.0000019	calc mg/L COC discharged	PAP-00130879
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.00220	calc kg COC discharged	
Dioxins/Furans		
105	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
75	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
1,918.85	kg HPAHs	
1,279.23	kg LPAHs	
0.0448	kg PCBs	
0.0010	kg DDx	
0.0022	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
24	# hours/day discharged	3 Outfalls permitted to the Passaic River (1985 PAP-00131288-89)
7	# days/week discharged	1975 Waste Effluent Survey
52	# weeks/yr discharged	1980 NJPDES Permit Renewal
234,536	# gals/yr directly discharged PAP00130793, PAP00130820, PAP00353627	
1915	Yr Ops started	
2020	Yr Ops ceased	
105	calc #yrs facility operated	
Copper (Cu)		
105	#yrs facility discharged	
-	calc mg/L COC discharged	PAP-00130839, intake water contains 1 mg/l Cu therefore a credit is
3.785	L per gallon (Merck Index)	applied reducing copper concentration to zero.
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
105	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
105	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
105	#yrs facility discharged	PAP-00130839
10.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.60	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
55.93	calc kg COC discharged	
LPAHs		
105	#yrs facility discharged	
10.00	calc mg/L O&G	PAP-00130839
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.40	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
37.28	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
105	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
75	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
34.09	kg HPAHs	
22.73	kg LPAHs	
-	kg PCBs	
-	kg DDx	

-	kg Dieldrin	
-	kg Dioxins/Furans	

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
61	ACRES - TOTAL SITE AREA (acres)	According to a March 12, 1975 Waste Effluent Survey, the acreage was 61 acres.] (PAP-00130792).	
33	ACRES - AFFECTED AREA *AREA OF POTENTIAL OVERLAND FLOW DISCHARGE TO PASSAIC RIVER	The site is located on historic fill material - GOOGLE MAPS SHOWS SITE INCLUDES 0.5 MILES PASSAIC RIVER SHORELINE.	
4,046.86	METERS^2/ACRE	CONVERSION TO METERS	
133,546	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
13	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED to Passaic.	
1915	Year site operations began	Operator: 1915 to Present (PAP-00131333); Owner: 1915 to Present (PAP-00354146)	
2020	Year site operations ceased		
105	NUMBER YEARS DISCHARGE	PSE&G obtained the site through a series of transactions starting in approximately 1915 (PAP-00354146).	
1,402	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,251	KG/M^3 SOIL DENSITY	Fill reported as silt, clay sand and gravel. Bulk density range 2002 KG/M^3 to 2499 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
3,155,734	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
105	YEARS DISCHARGED		
1,850	MG/KG (MAX CONCENTRATION)	FDR PDF PAGE 10 MAX CONCENTRATIONS OF COC Found in Onsite Soils	
0.000001	kg per mg (Merck Index)	PAP-00139965	
5,838	KILOGRAMS DISCHARGED		
Lead (Pb)			
105	YEARS DISCHARGED		
0	MG/KG MAX CONCENTRATION)	FDR PDF PAGE 10 MAX CONCENTRATIONS OF 1,080 mg/kg Found in Onsite Soils. **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)	PAP-00139965	
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
105	YEARS DISCHARGED		
0.0	MG/KG (MAX CONCENTRATION)	FDR PDF PAGE 10 MAX CONCENTRATIONS OF 3.5 mg/kg Found in Onsite Soils PAP-00139966. **Set to 0 since less than HF.**	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)			Sum of Benzoic Pyrene Equivalent conversion concentrations. https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
105	YEARS DISCHARGED		
11.8	MG/KG (TOTAL PAH MAX CONCENTRATION)		PAP-00132435, sample 1-S Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.
0.000001	kg per mg (Merck Index)		
37	KILOGRAMS DISCHARGED		
PAHs (others detected)			TEF FOR CHRYSENE LISTED AS 0.01 BY OTHERS
105	YEARS DISCHARGED		
53.00	MG/KG (TOTAL PAH MAX CONCENTRATION)	PAP-00132435, sample 1-S Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.	
0.000001	kg per mg (Merck Index)		
167	KILOGRAMS DISCHARGED		
PCBs		FDR PDF PAGE 6 - PCBs were detected in many of the drums of oil that were drained from pieces of electrical equipment (i.e., oil circuit breakers) (PAP-00726563). Sampling of the oil removed from the oil circuit breakers revealed PCB concentrations from 6 ppm to 33,000 ppm. Seven soil samples were also collected below six of the Oil Circuit Breakers. Four of the samples contained PCBs ranging from 170 to 730 µg/kg. The remaining three oil circuit breakers were determined to contain less than 2 ppm PCBs; accordingly no additional soil samples were collected. The interim soil action level for PCBs used by NJDEPE at the time was 1,000 to 5,000 µg/kg. As none of the samples contained PCBs at these concentrations, no further sampling was recommended for this area (PAP-00726575-76).	
90	YEARS DISCHARGED		
0.73	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		
DDx			
105	YEARS DISCHARGED within DDx Timeline		
0	MG/KG (MAX CONCENTRATION)	NONE REPORTED on-site	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dieldrin			
105	YEARS DISCHARGED	NONE REPORTED on-site	
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dioxins/Furans			
105	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Dioxin concentrations from samples taken from dredge materials in 1991 beneath the New Jersey Turnpike bridge ranged from non-detect to 3.2 ppb.(PAS-00013528-39, 47). Dioxin contamination appears to be from use of this area to receive dredge materials from the river. Set to zero.	
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		

Contaminant	MAX CONCN. (mg/kg) SAMPLE 1-S 10.5-11 FT 6/23/1998 (PAP-00132435)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	8.400	1.0	8.4000
Benzo(a)anthracene	9.100	0.1	0.9100
Benzo(b)fluoranthene	7.800	0.1	0.7800
Benzo(b)fluoranthene	7.800	0.1000	0.7800
Benzo(k)fluoranthene	3.000	0.01	0.0300
Chrysene	9.600	0.001	0.0096
Dibenz(a,h)anthracene	0.710	1.0	0.7100
Indeno(1,2,3-cd)pyrene	2.000	0.1	0.2000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

48.410 **Total Benzo(a)pyrene Equivalents =** **11.8**

	ALTERNATE MAX CONCN. (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	5.000	1.0	5.0000
Benzo(a)anthracene	12.000	0.1	1.2000
Benzo(b)fluoranthene		0.1	0.0000
Benzo(k)fluoranthene	5.800	0.01	0.0580
Chrysene	9.800	0.001	0.0098
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	2.400	0.1	0.2400

35.000 **Total Benzo(a)pyrene Equivalents =** **6.5**

SUMMARY CMASS ESTIMATES:

5838.11	kg Copper
0.00	kg Lead
0.00	kg Mercury
37.30	kg PAHs (Benzo(a)pyrene Equivalent)
167.25	kg PAHs (Other)
1.97	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

ye

6,044.64 TOTAL MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

PSE&G Corp.

155 Raymond Blvd. | **Newark** | **NJ** | **07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.018E-5	5.0%	Occasional Noncompliance	PVSC Annual Reports noted discharges of oil from the facility to the Passaic River in 1973 and 1974. In January 1991, PSEG was issued a Notice of Violation by the NJDEP for the January 28, 1991 discharge of kerosene from a leaking underground fill line at its Essex Generating Station at 155 Raymond Blvd. (PAP-00131028-29; PAP-00131033; PAP-00131037). According to the Environmental Documentation of Demolition Phase 3 Report, Essex Generating Station, during the structural demolition of the decommissioned Essex Generating Station concrete surfaces located within two areas of the Essex Generating Station were observed to be oil stained. These areas were the concrete floor in the turbine building; and the two underlying concrete slabs where the oil pots containing percent levels of PCBs were removed from the potential transformer cabinets. The sample collected below potential transformer 1 contained 13,000 ppm of PCBs, and the sample collected below potential transformer 4 contained 60 ppm. A mineral oil leak from a transformer, located hundreds of feet from the Passaic River or Lawyer's Ditch, occurred on September 16-17, 1993. No discharge to the Passaic River occurred. The mineral oil from the transformer and from the spill area was analyzed and shown to contain 10-11 ppm PCBs. It was estimated that 900 gallons of mineral oil were discharged to the gravel/soil beneath the transformer.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.565E-5

4th Street | **Harrison** | **NJ** | **07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS

7.811E-4	10.0%	Periodic Noncompliacne	Numerous violations: in 1969, violations concerning pollutants from the Harrison Gas Plant entering the Passaic River. A sample of the plant's outfall collected by the Department of Health on August 21, 1969, contained 363 ppm of ether soluble matter (usually inferred as oil) (PAP-00140328-29; PAP-00140419-20). PSE&G Harrison Gas Plant paid fines to the Coast Guard regarding oil/kerosene/tar spills to the Passaic River in the 1970s and 1980s and 1994 (see data report). On September 25, 1987, the EPA found PSE&G Harrison in violation of general facility requirements pertaining to PCBs. A penalty of $8,500 was assessed (PAS-00104676-77). Note: The nature of the violation was not described in further detail. A 1988 inspection found several violations concerning documentation and storing PCB waste more than one year after being placed into storage for disposal (PAP-00140392-95; PAP-00140436-37). In November 2004 and April 2010, PSE&G voluntarily reported un-manifested PCB shipment from the Harrison Gas Plant facility. In April 2011, PSE&G and U.S. EPA entered into a Consent Agreement and Final Order due to violating TSCA on three occasions by storing PCB waste and/or shipping PCB waste for disposal without identifying it as PCB on EPA Manifest Form 8700-22 (PAP-00130040-47; PAP-00130049-55). Facility manufactured gas from oil during early days, which generates wastes high in PAHs; manufactured gas plant (MGP) historical practices disposed of wastes on the facility or adjacent property. Former employees who worked at the Harrison Gas Plant prior to 1944 allegedly stated that on-site disposal of tar wastes on the ground occurred at the site (PAS-00013565-66). During testimony, a PSE&G chemist testified in deposition that he observed an area in the north corner of the Harrison Plant where solidified tar, clinkers, and debris had been buried and covered with gravel. As early as the 1940s, he noticed that the solidified tar associated with the buried waste would re-liquefy during the summer months and rise to the surface (PAS-00013567). It was also testified in deposition that some gas plant materials, such as coke, were stored on the ground and that other gas plant materials, such as tar, tarry and oily wastes, condensates, light oils, and spent oxide wastes were present in or on the ground due to leaks, spills, and occasional on-site disposal (PAS-00013571). Floating free product layers were observed in 7 piezometers along the river at thicknesses up to 1.79 feet (PAP-00128600) - this indicates that free phase product could have been discharged directly to the river with groundwater. Lead was also a site waste. A list of wastes generated by the PSE&G Harrison Gas Plant facility for the year 1997 included 6.78 tons of lead waste and 8 tons of lead and PCB waste. These waste streams were both transported off-site and landfilled (PAS-00104679-80).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.030E-4

AP_ABS	7.287E-4

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

PSE&G Corp.

155 Raymond Blvd.	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.583E-2	5.0%	Occasional Noncompliance	PVSC Annual Reports noted discharges of oil from the facility to the Passaic River in 1973 and 1974. In January 1991, PSEG was issued a Notice of Violation by the NJDEP for the January 28, 1991 discharge of kerosene from a leaking underground fill line at its Essex Generating Station at 155 Raymond Blvd. (PAP-00131028-29; PAP-00131033; PAP-00131037). According to the Environmental Documentation of Demolition Phase 3 Report, Essex Generating Station, during the structural demolition of the decommissioned Essex Generating Station concrete surfaces located within two areas of the Essex Generating Station were observed to be oil stained. These areas were the concrete floor in the turbine building; and the two underlying concrete slabs where the oil pots containing percent levels of PCBs were removed from the potential transformer cabinets. The sample collected below potential transformer 1 contained 13,000 ppm of PCBs, and the sample collected below potential transformer 4 contained 60 ppm. A mineral oil leak from a transformer, located hundreds of feet from the Passaic River or Lawyer's Ditch, occurred on September 16-17, 1993. No discharge to the Passaic River occurred. The mineral oil from the transformer and from the spill area was analyzed and shown to contain 10-11 ppm PCBs. It was estimated that 900 gallons of mineral oil were discharged to the gravel/soil beneath the transformer.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.346E-2

4th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS

3.192E-2	10.0%	Periodic Noncompliacne	Numerous violations: in 1969, violations concerning pollutants from the Harrison Gas Plant entering the Passaic River. A sample of the plant's outfall collected by the Department of Health on August 21, 1969, contained 363 ppm of ether soluble matter (usually inferred as oil) (PAP-00140328-29; PAP-00140419-20). PSE&G Harrison Gas Plant paid fines to the Coast Guard regarding oil/kerosene/tar spills to the Passaic River in the 1970s and 1980s and 1994 (see data report). On September 25, 1987, the EPA found PSE&G Harrison in violation of general facility requirements pertaining to PCBs. A penalty of $8,500 was assessed (PAS-00104676-77). Note: The nature of the violation was not described in further detail. A 1988 inspection found several violations concerning documentation and storing PCB waste more than one year after being placed into storage for disposal (PAP-00140392-95; PAP-00140436-37). In November 2004 and April 2010, PSE&G voluntarily reported un-manifested PCB shipment from the Harrison Gas Plant facility. In April 2011, PSE&G and U.S. EPA entered into a Consent Agreement and Final Order due to violating TSCA on three occasions by storing PCB waste and/or shipping PCB waste for disposal without identifying it as PCB on EPA Manifest Form 8700-22 (PAP-00130040-47; PAP-00130049-55). Facility manufactured gas from oil during early days, which generates wastes high in PAHs; manufactured gas plant (MGP) historical practices disposed of wastes on the facility or adjacent property. Former employees who worked at the Harrison Gas Plant prior to 1944 allegedly stated that on-site disposal of tar wastes on the ground occurred at the site (PAS-00013565-66). During testimony, a PSE&G chemist testified in deposition that he observed an area in the north corner of the Harrison Plant where solidified tar, clinkers, and debris had been buried and covered with gravel. As early as the 1940s, he noticed that the solidified tar associated with the buried waste would re-liquefy during the summer months and rise to the surface (PAS-00013567). It was also testified in deposition that some gas plant materials, such as coke, were stored on the ground and that other gas plant materials, such as tar, tarry and oily wastes, condensates, light oils, and spent oxide wastes were present in or on the ground due to leaks, spills, and occasional on-site disposal (PAS-00013571). Floating free product layers were observed in 7 piezometers along the river at thicknesses up to 1.79 feet (PAP-00128600) - this indicates that free phase product could have been discharged directly to the river with groundwater. Lead was also a site waste. A list of wastes generated by the PSE&G Harrison Gas Plant facility for the year 1997 included 6.78 tons of lead waste and 8 tons of lead and PCB waste. These waste streams were both transported off-site and landfilled (PAS-00104679-80).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.873E-2

AP_ABS	4.219E-2

Allocation Facility Cmass Calculation

Purdue Pharma Technologies Inc.	199 Main Street	Lodi	NJ	07644

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	15.25	100.00%	-	2.32%	5,837.08	100.00%	-	150.67	1.018817E-2	1.54
Lead	100.00%	44.67	100.00%	-	2.32%	121.01	100.00%	-	47.48	1.018817E-2	0.48
Mercury	100.00%	0.19	100.00%	-	2.32%	-	100.00%	-	0.19	1.018817E-2	0
HPAHs	100.00%	0.22	100.00%	-	2.32%	746.01	100.00%	-	17.53	1.018817E-2	0.18
LPAHs	100.00%	1.65	100.00%	-	2.32%	497.34	100.00%	-	13.19	1.018817E-2	0.13
PCBs	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Purdue Pharma Technologies Inc.	199 Main Street	Lodi	NJ	07644

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	1.54	7.310E-7	5.044E-7
Lead	0.01	3,200,000.00	0.48	1.512E-7	1.512E-9
Mercury	0.95	42,000.00	0	4.609E-8	4.378E-8
HPAHs	0.05	240,000.00	0.18	7.440E-7	3.720E-8
LPAHs	0.01	170,000.00	0.13	7.904E-7	7.904E-9
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Purdue Pharma Technologies Inc.	**199 Main Street**	**Lodi**	**NJ**	**07644**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	5.440E-4	1.54	1,140.89	5.440E-4	3.754E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.645E-4	0.48	525.99	1.645E-4	1.645E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	4.396E-5	0	1.84	4.396E-5	4.176E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	4.033E-6	0.18	0.79	4.033E-6	2.016E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	4.377E-6	0.13	0.61	4.377E-6	4.377E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Purdue Pharma Technologies Inc.	**199 Main Street**	**Lodi**	**NJ**	**07644**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	
	#days/week discharged	
	#weeks/yr discharged	
15,672,370	calc gal/yr discharge (FDR)	PAP-00373563, PAP-00373580 & PAP-00373590
365	#day per yr operated (FDR) (PAP-00016712, 16715, PAP-00206119)	
1971	Yr Ops started (FDR)	
1995	Yr Ops ceased (FDR)	
24	calc #yrs facility operated	
Copper (Cu)		
24	#yrs facility discharged	
4.10	calc mg/L COC discharged	Based on Goodrich
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
5,837	calc kg COC discharged	
Lead (Pb)		
24	#yrs facility discharged	Based on Purdue sampling data from 1990
0.085	calc mg/L COC discharged; (FDR) PAP00128020	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
121.01	calc kg COC discharged	
Mercury (Hg)		
24	#yrs facility discharged	
-	calc mg/L COC discharged; (FDR)	Mercury only used a laboratory chemical
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
24	#yrs facility discharged	
8.7	calc mg/L O&G (FDR)	Based on Goodrich
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
746	calc kg COC discharged	
LPAHs		
24	#yrs facility discharged	
8.7	calc mg/L O&G (FDR)	Based on Goodrich
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
497	calc kg COC discharged	
PCBs		
7	#yrs facility discharged within PCBs Timeline	
	calc mg/kg	
0.0075%	assumed %mg of material in conveyance carried away via 1L discharge flow through the conveyance	
	calc gal/yr discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
2	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
17	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
24	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
25	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
15	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
5	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
5,837	kg Copper	
121	kg Lead	
-	kg Mercury	
746	kg HPAHs	
497	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	
	# weeks/yr discharged	
-	# gals/yr directly discharged (PAP-00016712, PAP-00206119, PAP-00206137, PAP-00016698)	No direct discharge to Passaic River per FDR. Facility is located on the Saddle River. FDR Page 13, no discharges to Saddle River (PAS-00081939,45). 1996 Preliminary Assessment Report (PAP-00373393), all discharges to PVSC
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
365	#day operated per yr (PAP-00206119, PAP-00433684)	
1983	Yr Ops started	
1994	Yr Ops ceased	
11	calc #yrs facility operated	
Copper (Cu)		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
11	#yrs facility discharged	
0.2	calc mg/L O&G discharged (PAP-00206137)	
10%	% PAHs assumed in O&G	
60%	% COC assumed in PAHs	
0.01	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
11	#yrs facility discharged	
0.2	calc mg/L O&G discharged (PAP-00206137)	
10%	% PAHs assumed in O&G	
40%	% COC assumed in PAHs	
0.01	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
-5	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-10	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
5	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
11	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
12	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
3	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-7	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
1.73	ACRES - TOTAL SITE AREA (acres)	FDR page 1; confirmed with Google Earth	
0.73	ACRES - AFFECTED AREA	The 1966 aerial photograph shows an unpaved area adjacent to the south side of the current facility parking lot, which was later paved and fenced-in for materials storage use. (PAS-00085007)	
4,046.86	$METERS^2$/ACRE		
2,954	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1971	Year site operations began	Operator: 1971 to 1995; Owner: Not Applicable(FDR page 1)	
1995	Year site operations ceased	On April 21, 1995 an industrial accident at the facility resulted in a fire and explosion, destroying a portion of the facility and causing the plant operations to be terminated. (PAS-00084999)	
24	NUMBER YEARS DISCHARGE		
7	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,250	KG/M^3 SOIL DENSITY	Soil reported as mix of clays, silts, sand and gravels (PAP-00127504). Bulk density range 2002 KG/M^3 to 2499 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
15,953	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
24	YEARS DISCHARGED		
956	MG/KG (MAX CONCENTRATION)	Sample TP-7 (PAP-00127745), which is on Purdue property.	
0.000001	kg per mg (Merck Index)		
15	KILOGRAMS DISCHARGED		
Lead (Pb)			
24	YEARS DISCHARGED		
2,800	MG/KG MAX CONCENTRATION)	Lead was detected in soil with maximum concentrations being detected along the industrial sewer line. Max concentration from sample at a depth of 9 feet (PAP-00127745).	
0.000001	kg per mg (Merck Index)		
45	KILOGRAMS DISCHARGED		
Mercury (Hg)			
24	YEARS DISCHARGED		
11.7	MG/KG (MAX CONCENTRATION)	Mercury was detected in soil with maximum concentrations being detected along the industrial sewer line. Max concentration from a sample at a depth of 9.5 feet (PAP-00127745).	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
24	YEARS DISCHARGED		
14.1	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below Benzo(a)pyrene Equivalent Table	
24	YEARS DISCHARGED		
103.6	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		
PCBs			
24	YEARS DISCHARGED		
0.0	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PCBs along shoreline and industrial waste line attributed to Hexcel (see FDR). Set to zero.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
DDx			
0	YEARS DISCHARGED within DDx Timeline	NONE REPORTED	
	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.000000	KILOGRAMS DISCHARGED		

NAPP TP-7B PAH sample results collected from Napp areas. (PAP-00127744)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	11.000	1.0	11.0000
Benzo(a)anthracene	18.000	0.1	1.8000
Benzo(b)fluoranthene	12.000	0.1	1.2000
Benzo(k)fluoranthene	5.300	0.01	0.0530
Chrysene	13.000	0.001	0.0130
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.000	0.1	0.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **14.1**

NAPP TP-7B PAH (PAP-00127744)

Anthracene	3.6
Acenaphthene	0
Acenaphthylene	0
Fluorene	0
Naphthalene	81
Phenanthrene	19
SUM	103.6

Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	NONE REPORTED
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.00	KILOGRAMS DISCHARGED	
Dioxins/Furans		
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0.0000	KILOGRAMS DISCHARGED	

SUMMARY FTMASS ESTIMATES:	
15.25	kg Copper
44.67	kg Lead
0.19	kg Mercury
0.22	kg PAHs (Benzo(a)pyrene)
1.65	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

61.98	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Purdue Pharma Technologies Inc.

199 Main Street	**Lodi**	**NJ**	**07644**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.948E-7	5.0%	Occasional Noncompliance	An explosion and fire at the site on April 21, 1995, resulted in firefighting material runoff that was “very evident” in the Saddle River for its entire two-mile length to its confluence with the Passaic River (PAS-00007951). No evidence that COC involved in discharge.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.056E-7

AP_ABS	5.056E-7

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Purdue Pharma Technologies Inc.

199 Main Street	**Lodi**	**NJ**	**07644**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.190E-4	5.0%	Occasional Noncompliance	An explosion and fire at the site on April 21, 1995, resulted in firefighting material runoff that was “very evident” in the Saddle River for its entire two-mile length to its confluence with the Passaic River (PAS-00007951). No evidence that COC involved in discharge.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.562E-4

AP_ABS	3.562E-4

Allocation Facility Cmass Calculation

Quality Carriers, Inc./Quala Systems	80 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	291.32	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	49.68	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	4.3	100.00%	-	0.00%	722.88	100.00%	-	4.3	1.018817E-2	0.04
LPAHs	100.00%	5.08	100.00%	-	0.00%	481.92	100.00%	-	5.08	1.018817E-2	0.05
PCBs	100.00%	0.39	100.00%	-	0.00%	-	100.00%	-	0.39	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Quality Carriers, Inc./Quala Systems	**80 Doremus Avenue**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.04	1.825E-7	9.127E-9
LPAHs	0.01	170,000.00	0.05	3.044E-7	3.044E-9
PCBs	12.87	26,000.00	0	1.528E-7	1.967E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Quality Carriers, Inc./Quala Systems	80 Doremus Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	9.893E-7	0.04	0.19	9.893E-7	4.947E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.686E-6	0.05	0.23	1.686E-6	1.686E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.944E-5	0	0.5	1.944E-5	2.501E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Quality Carriers, Inc./Quala Systems	**80 Doremus Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Sanitary sewer discharge goes direct to PVSC with no Bypasses
	# hours/per day discharged	Volumes from permit applications (1992, 1997, 2002)
	#days/week discharged	260 days per year prior to 1997, after 1997 312 days per year
	#weeks/yr discharged	
3,225,100	calc gal/yr discharge PAP00328855, 78	
1970	Yr Ops started	
2007	Yr Ops ceased	
37	calc #yrs facility operated	
Copper (Cu)		
37	#yrs facility discharged	
0.645	calc mg/L COC discharged PAP00329025, PAP00328878	PAP-00328564; PAP-00328975; PAP-00329147
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
291.32	calc kg COC discharged	
Lead (Pb)		
37	#yrs facility discharged	
0.11	calc mg/L COC discharged PAP00329025, PAP00328878	PAP-00328564; PAP-00328975; PAP-00329147
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
49.68	calc kg COC discharged	
Mercury (Hg)		
37	#yrs facility discharged	
-	calc mg/L COC discharged PAP00329025, PAP00328878	PAP-00328564; PAP-00328975; PAP-00329147
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
37	#yrs facility discharged	2002 sampling for TOC = 1067 mg/l
1,067.00	calc mg/L O&G	
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
2	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
722.88	calc kg COC discharged	
LPAHs		
37	#yrs facility discharged	2002 sampling for TOC = 1067 mg/l
1,067.00	calc mg/L O&G	
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
1	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
481.92	calc kg COC discharged	
PCBs		
8	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
3	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
18	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
37	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
38	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
16	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
6	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
291.32	kg Copper	
49.68	kg Lead	
-	kg Mercury	
722.88	kg HPAHs	
481.92	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	stormwater discharged to passaic via open ended pipe
	# days/week discharged	
	# weeks/yr discharged	Stormwater only, PAP-00329250, FDR pages 17-18
-	# gals/yr directly discharged	Included in OFT Calculations
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
7.00	acres	
50%	Percent Precip to River	
1970	Yr Ops started	
2007	Yr Ops ceased	
37	calc #yrs facility operated	
Copper (Cu)		
37	#yrs facility discharged	
0.50	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
37	#yrs facility discharged	
0.1125	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
37	#yrs facility discharged	
0.00	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
37	#yrs facility discharged	
266.75	calc mg/L O&G	
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.40	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
37	#yrs facility discharged	
266.75	calc mg/L O&G	
2.5%	% TOC that is considered O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.27	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
8	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
3	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
18	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
37	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
38	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
16	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
6	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
7	ACRES - TOTAL SITE AREA (acres)		
3.5	ACRES - AFFECTED AREA	Much of the southern half of the site is capped with concrete, asphalt, and building structures. The northern half of the site is predominantly lightly vegetated and unvegetated soils with several scattered buildings. (PAS-00084612)	
4,046.86	METERS^2/ACRE		
14,164	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1970	Year site operations began	QCI operated the transportation terminal from 1970 to 2007 and a tank wash from 1970 until 1992; Quala Systems, Inc. (QSI) operated the tank wash from 1993 to 2007 (FDR page 1; PAP-00145606)	
2007	Year site operated tank wash		
37	NUMBER YEARS DISCHARGE		
52	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,965	KG/M^3 SOIL DENSITY	Fill material consisting primarily of silts and fine grained sands (PAS-00084612). Bulk density range 1450 KG/M^3 to 2480 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
102,979	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Site is located on regional Historic Fill (FDR page 16)	
Copper (Cu)			
37	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Fill 3 - south of Fill 2, 2-4 feet bgs (FDR, PAGE 13, 3rd table), detected maximum 520 mg/kg. Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
37	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	AOC 11 - stained soil near red storage area, Figure 6, Pb - 2,060 mg/kg at 0.5 - 1 inch (PAP-00328705). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
1.416401	YEARS DISCHARGED		
0.0	MG/KG (MAX CONCENTRATION)	AOC 11 (Stained Soil near Red Storage Area) POSTEX2 (PAP-00328725). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
37	YEARS DISCHARGED		
41.8	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	Staining near Trailer Staging Area 0 - 0.5 inches bgs FDR pg 11 table (PAS-00084545-61). This area lies in the northern 50% of the property. Environ 2004, Figure 7 (PAP-00328706).	
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		
PAHs (others detected)		Other PAHs (PAS-00084557) Table 9 - Sample ID STAIN 6B-SS01 Phenanthrene - 35.5 ppm Anthracene - 6.95 ppm Acenaphthene - 2.92 ppm Acenaphthylene - 0.676 ppm Naphthalene - 0.804 ppm Fluorene - 2.5 ppm	
37	YEARS DISCHARGED	.	
49	MG/KG (TOTAL PAH MAX CONCENTRATION)	Staining near Trailer Staging Area 0 - 0.5 inches bgs FDR pg 11 table, Pyrene 57.4 mg/kg (PAS-00084545-61). This area lies in the northern 50% of the property. Environ 2004, Figure 7 (PAP-00328706).	
0.000001	kg per mg (Merck Index)		
5	KILOGRAMS DISCHARGED		

PAS-00084557, Table 9, Sample ID STAIN 6B-SS01

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	25.400	1.0	25.4000
Benzo(a)anthracene	29.700	0.1	2.9700
Benzo(b)fluoranthene	27.600	0.1	2.7600
Benzo(k)fluoranthene	11.100	0.01	0.1110
Chrysene	30.500	0.001	0.0305
Dibenz(a,h)anthracene	8.720	1.0	8.7200
Indeno(1,2,3-cd)pyrene	17.600	0.1	1.7600

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **41.8**

PCBs		
37	YEARS DISCHARGED	Table 11 boring E11B, 1.0-1.5 bgs, Arclor -1260 (PAP-00328694 pdf pg 56)
3.74	MG/KG (MAX OF REPORTED CONCENTRATIONS)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
4.30	kg PAHs (Benzo(a)pyrene Equivalent)
5.08	kg PAHs (Other)
0.39	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

9.77	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Quality Carriers, Inc./Quala Systems

80 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.979E-6	5.0%	Occasional Noncompliance	According to the 1998 BCM ISRA PSA, the following summary of PVSC rule violations occurred: Between April 26, 1989 and August 6, 1997 - Multiple violations of discharging corrosive waste July 31, 1990 - pH monitoring equipment was not operating in conformance with its intended use. (No COC involvement)Between January 30, 1991 and May 8, 1995 - Multiple violations of Petroleum Hydrocarbons results exceeding limits. There were numerous areas with staining. The drum storage pad located next to the oil skimmer was filled with approximately three inches of oily liquid waste. The integrity of the pad could not be determined (PAS-00084669).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.682E-6

AP_ABS	1.682E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Quality Carriers, Inc./Quala Systems

80 Doremus Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.502E-4	5.0%	Occasional Noncompliance	According to the 1998 BCM ISRA PSA, the following summary of PVSC rule violations occurred: Between April 26, 1989 and August 6, 1997 - Multiple violations of discharging corrosive waste July 31, 1990 - pH monitoring equipment was not operating in conformance with its intended use. (No COC involvement)Between January 30, 1991 and May 8, 1995 - Multiple violations of Petroleum Hydrocarbons results exceeding limits. There were numerous areas with staining. The drum storage pad located next to the oil skimmer was filled with approximately three inches of oily liquid waste. The integrity of the pad could not be determined (PAS-00084669).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.127E-4

AP_ABS	2.127E-4

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

QUALITY CARRIERS

QCI and QSI state that they received a release from Occidental in the Tierra/Maxus bankruptcy and Occidental is not entitled to recover at least $165 million dollars in response costs from QCI or QSI. Any responsibility for such responses costs must be deducted from any share of the OU-2 response costs attributable to QCI or QSI.

ALLOCATOR'S DETERMINATION – Though I have not had the opportunity to review the underlying settlement document and other potentially relevant facts associated with the release provided by OCC, assuming its validity, it is apparent that there is a high likelihood of success in any action against OCC to enforce the release. Given OCC's lack of participation in the allocations process, however, the Allocator does not believe that it is appropriate to account for the amount of any such release in the assignment of allocated shares. Rather, the Allocator notes the existence of the release and recommends that it be taken into account in determining the appropriate amount of any future settlement with EPA.

Allocation Facility Cmass Calculation

Revere Smelting & Refining Corp.	387 Avenue P	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	79.44	100.00%	-	0.00%	-	100.00%	444.8	524.24	1.018817E-2	5.34
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	92.5	92.5	1.018817E-2	0.94
Mercury	100.00%	0.16	100.00%	-	0.00%	-	100.00%	-	0.16	1.018817E-2	0
HPAHs	100.00%	0.03	100.00%	-	0.00%	-	100.00%	-	0.03	1.018817E-2	0
LPAHs	100.00%	0.08	100.00%	-	0.00%	-	100.00%	-	0.08	1.018817E-2	0
PCBs	100.00%	0.07	100.00%	-	0.00%	-	100.00%	-	0.07	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Revere Smelting & Refining Corp.	**387 Avenue P**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	5.34	2.543E-6	1.755E-6
Lead	0.01	3,200,000.00	0.94	2.945E-7	2.945E-9
Mercury	0.95	42,000.00	0	3.881E-8	3.687E-8
HPAHs	0.05	240,000.00	0	1.274E-9	6.368E-11
LPAHs	0.01	170,000.00	0	4.794E-9	4.794E-11
PCBs	12.87	26,000.00	0	2.743E-8	3.530E-7
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Revere Smelting & Refining Corp.	387 Avenue P	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.893E-3	5.34	3,969.61	1.893E-3	1.306E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	3.205E-4	0.94	1,024.78	3.205E-4	3.205E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	3.702E-5	0	1.55	3.702E-5	3.516E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	6.902E-9	0	0	6.902E-9	3.451E-10
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.655E-8	0	0	2.655E-8	2.655E-10
PCBs	12.87	26,000.00	20,066.54	25,795.56	3.488E-6	0	0.09	3.488E-6	4.490E-5
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Revere Smelting & Refining Corp.	**387 Avenue P**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1971 NJDEP Inspection Report (PAP-00125798-800) states overflow water discharged to the Plum Creek
	# days/week discharged	No connection to the PVSC at this time, so all discharge assumed to Plum Creek (PAP-00126183)
	# weeks/yr discharged	No flow data so assuming rainfall data for flow rates
2,661,291	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
43,560	ft2 per acre	
4.00	acres	
50%	Percent Precip to River	
1970	Yr Ops started	
1972	Yr Ops ceased	
2	calc #yrs facility operated	
Copper (Cu)		
2	#yrs facility discharged	Using Plum Creek Surface Water Sampling and Groundwater Data for COCs
15.80	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
444.80	calc kg COC discharged	(PAP-00728668)
Lead (Pb)		
2	#yrs facility discharged	Using Plum Creek Surface Water Sampling and Groundwater Data for COCs
149.99	calc mg/L COC discharged PAP0012591-3	Also 0.59 mg/l per 1971 wastewater analysis Tierra-A-018437
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
92.50	calc kg COC discharged	Final Revere Expert Witness Report
Mercury (Hg)		
2	#yrs facility discharged	Using Plum Creek Surface Water Sampling and Groundwater Data for COCs
0.00049	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	(PAP-00728668)
HPAHs		
2	#yrs facility discharged	Using Plum Creek Surface Water Sampling and Groundwater Data for COCs
0.0047	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	(PAP-00728668)
LPAHs		
2	#yrs facility discharged	Using Plum Creek Surface Water Sampling and Groundwater Data for COCs
0.0055	calc mg/L COC discharged PAP0012591-3	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	(PAP-00728668)
PCBs		
3	#yrs facility discharged within PCBs Timeline	Using Plum Creek Surface Water Sampling and Groundwater Data for COCs
0.008	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	(PAP-00728668)
DDx		
3	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
3	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
2	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
3	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
3	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
3	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
444.80	kg Copper	
92.50	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	

-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
4	ACRES - TOTAL SITE AREA (acres)	(PAP-00728472)	
3	ACRES - AFFECTED AREA	Estimate of site area with exposed fill determined from review of historical aerial photographs 1995-2020 (Google Earth) and Figure 1 Allocation Facilities map. Approximately 25% paved 1954-1970 . All operations took place on paved ground or inside buildings. (PAP-00728475)	
4,046.86	$METERS^2$/ACRE		
12,141	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1957	Year site operations began	Operator: ~1964-December 1972 (PAS-00008100; PAS-00013085; PAS-0051943) Owner: ~1957- 1970 (PAS-00013085; PAS-00051950; PAP-00125848)	Historical records suggest that smelting operations were conducted at this location as far back as 1941 (PAP-00728475).
1972	Year site operations ceased	The entire period that Revere owned and/operated at the site is used for the purpose of this calculation.	
15	NUMBER YEARS DISCHARGE		
18	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,965	KG/M^3 SOIL DENSITY	Fill reported as silty sand with trace of gravel (FDR). Bulk density range 1450 KG/M^3 to 2480 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
35,784	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
15	YEARS DISCHARGED		
2,220	MG/KG (MAX CONCENTRATION)	Sample SB-05A, at Avenue P Landfill near site (FDR page 9; PAP-00125908) There is evidence that Revere used the Avenue P landfill for illegal dumping (FDR p 4-5, 7-8, 10). Therefore, Avenue P samples used for this calculation.	
0.000001	kg per mg (Merck Index)		
79	KILOGRAMS DISCHARGED		
Lead (Pb)			
15	YEARS DISCHARGED		
0	MG/KG (AVERAGE CONCENTRATION)	Sample SB-05A, at Avenue P Landfill near site (FDR page 9; PAP-00125908). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
15	YEARS DISCHARGED		
4.5	MG/KG (MAX CONCENTRATION)	Sample SB-05A, at Avenue P Landfill near site (FDR page 9; PAP-00125908) There is evidence that Revere used the Avenue P landfill for illegal dumping (FDR p 4-5, 7-8, 10). Therefore, Avenue P samples used for this calculation.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

15 YEARS DISCHARGED

0.9 MG/KG (TOTAL PAH MAX CONCENTRATION)

Sample SB-05A, at Avenue P Landfill near site (PAP-00125905).
There is evidence that Revere used the Avenue P landfill for illegal dumping (FDR p 4-5, 7-8, 10). Therefore, Avenue P samples used for this calculation.

0.000001 kg per mg (Merck Index)

0 KILOGRAMS DISCHARGED

PAHs (others detected)

Data below the Benzo(a)pyrene Equivalent Table

15 YEARS DISCHARGED

2.20 MG/KG (TOTAL PAH MAX CONCENTRATION)

Sample SB-05A, at Avenue P Landfill near site (PAP-00125905).
There is evidence that Revere used the Avenue P landfill for illegal dumping (FDR p 4-5, 7-8, 10). Therefore, Avenue P samples used for this calculation.

0.000001 kg per mg (Merck Index)

0 KILOGRAMS DISCHARGED

PCBs

15 YEARS DISCHARGED

1.91 MG/KG (MAX OF REPORTED CONCENTRATIONS)

Sample SB-05A, at Avenue P Landfill near site (FDR page 9; PAP-00125907)
There is evidence that Revere used the Avenue P landfill for illegal dumping (FDR p 4-5, 7-8, 10). Therefore, Avenue P samples used for this calculation.

0.000001 kg per mg (Merck Index)

0.07 KILOGRAMS DISCHARGED

DDx

0 YEARS DISCHARGED within DDx Timeline

NONE FOUND IN AVAILABLE DOCUMENTATION

MG/KG (MAX CONCENTRATION)

0.000001 kg per mg (Merck Index)

0 KILOGRAMS DISCHARGED

Dieldrin

0 YEARS DISCHARGED within Dieldrin Timeline

NONE FOUND IN AVAILABLE DOCUMENTATION

MG/KG (MAX CONCENTRATION)

0.000001 kg per mg (Merck Index)

0 KILOGRAMS DISCHARGED

Dioxins/Furans

NONE FOUND IN AVAILABLE DOCUMENTATION

0 YEARS DISCHARGED

MG/KG (MAX CONCENTRATION)

0.000001 kg per mg (Merck Index)

0 KILOGRAMS DISCHARGED

SUMMARY CMASS ESTIMATES:

79.44	kg Copper
0.00	kg Lead
0.16	kg Mercury
0.03	kg PAHs (Benzo(a)pyrene Equivalent)
0.08	kg PAHs (Other)
0.07	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

79.78 MASS (KG) DISCHARGED FROM SURFACE SOIL

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.544	1.0	0.5440
Benzo(a)anthracene	0.660	0.1	0.0660
Benzo(b)fluoranthene	0.738	0.1	0.0738
Benzo(k)fluoranthene	0.320	0.01	0.0032
Chrysene	0.688	0.001	0.0007
Dibenz(a,h)anthracene	0.152	1.0	0.1520
Indeno(1,2,3-cd)pyrene	0.341	0.1	0.0341

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.9**

SB-05A, at Avenue P Landfill (PAP-00125905).

Anthracene	0.185
Acenaphthene	0.124
Acenaphthylene	0.103
Fluorene	0.211
Naphthalene	0.75
Phenanthrene	0.83
SUM	2.203

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Revere Smelting & Refining Corp.

387 Avenue P	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.148E-6	0.0%	Historically Compliant or No Evidence	The RIR states that the Avenue P landfill, located just north of Revere Smelting, was used from the 1920s until the 1970s, and it was believed that the surrounding industrial companies and manufacturing plants used the landfill and adjacent areas beyond the property border of the landfill site as an illegal dump to dispose of hazardous materials, manufacturing by-products, solid waste/junk and process wastes (PAP-00125850). A 2008 RIR stated the Avenue P Landfill Site included land upon which the Revere-DE operated from April 1970 to December 31, 1972 as well as additional adjacent properties for a total of eight acres. The Avenue P site was created by filling in salt marshes in the early 1900s (PAP-00125850). In addition, the RIR noted that the highest concentrations of metals were detected in samples collected at the base of the landfill, indicating that the ash and glass layer present at the landfill/marsh interface is a likely source. This debris was likely deposited on site at a time when the area was predominantly marshland (PAP-00125886). Low probability that Revere is source of such contamination.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.718E-6

AP_ABS	1.718E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Revere Smelting & Refining Corp.

387 Avenue P	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.389E-3	0.0%	Historically Compliant or No Evidence	The RIR states that the Avenue P landfill, located just north of Revere Smelting, was used from the 1920s until the 1970s, and it was believed that the surrounding industrial companies and manufacturing plants used the landfill and adjacent areas beyond the property border of the landfill site as an illegal dump to dispose of hazardous materials, manufacturing by-products, solid waste/junk and process wastes (PAP-00125850). A 2008 RIR stated the Avenue P Landfill Site included land upon which the Revere-DE operated from April 1970 to December 31, 1972 as well as additional adjacent properties for a total of eight acres. The Avenue P site was created by filling in salt marshes in the early 1900s (PAP-00125850). In addition, the RIR noted that the highest concentrations of metals were detected in samples collected at the base of the landfill, indicating that the ash and glass layer present at the landfill/marsh interface is a likely source. This debris was likely deposited on site at a time when the area was predominantly marshland (PAP-00125886). Low probability that Revere is source of such contamination.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.111E-3

AP_ABS	1.111E-3

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

REVERE SMELTING

Revere argues that Revere-DE is liable only for the period of its actual ownership/operation of its OU2 related facility. Revere-DE did not indemnify the prior owner and operator of the facility and the seller warranted to Revere-DE that there were "no suits, actions, claims, investigations or inquiries by any governmental body … affecting any of the Corporations or … assets … or the ability to conduct business in the future." Rather the Seller "indemnifies and holds harmless the Buyer." As noted above, Revere-DE cannot be liable for the disposal of chemicals as part of the Avenue P Landfill after Revere-DE ceased operating because Revere-DE: (a) did not own the Avenue P landfill property; (b) Revere-DE did not operate the landfill; (c) did not arrange for the disposal; and (d) did not transport or arrange for transport of chemicals to the Avenue P Landfill. Therefore, Revere-DE is not liable for the COCs in the historic fill and the landfill contaminated soil.

ALLOCATOR'S DETERMINATION - Though Revere Smelting may have a sustainable argument regarding its allegation that it did not accept the CERCLA liability upon purchase of the facility site, there is an insufficient demonstration of applicable case law and facts to support this claim based on available data. Therefore, the Allocator leaves this matter as a topic for settlement discussions between Revere Smelting and EPA.

Secondly, though I have not had the opportunity to review the underlying settlement document and other potentially relevant facts associated with the release provided by OCC to Revere Smelting, assuming its validity, it is apparent that there is a high likelihood of success in any action against OCC to enforce the release. Given OCC's lack of participation in the allocations process, however, the Allocator does not believe that it is appropriate to account for the amount of any such release in the assignment of allocated shares. Rather, the Allocator notes the existence of the release and recommends that it be taken into account in determining the appropriate amount of any future settlement with EPA.

Allocation Facility Cmass Calculation

Roman Asphalt Corporation	14 Ogden Street	Newark	NJ	07104

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	11.71%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	11.71%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	11.71%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	11.71%	-	100.00%	95.2	95.19	1.018817E-2	0.97
LPAHs	100.00%	-	100.00%	-	11.71%	-	100.00%	63.5	63.46	1.018817E-2	0.65
PCBs	100.00%	-	100.00%	-	11.71%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	11.71%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	11.71%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	11.71%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Roman Asphalt Corporation	14 Ogden Street	Newark	NJ	07104

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.97	4.041E-6	2.020E-7
LPAHs	0.01	170,000.00	0.65	3.803E-6	3.803E-8
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Roman Asphalt Corporation	14 Ogden Street	Newark	NJ	07104

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.190E-5	0.97	4.29	2.190E-5	1.095E-6
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.106E-5	0.65	2.93	2.106E-5	2.106E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Roman Asphalt Corporation	**14 Ogden Street**	**Newark**	**NJ**	**07104**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Fourth Avenue	CSO	0.20%	30.89%	
2	Fourth Avenue	Bypass	11.65%	100.00%	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	No information on discharges or permits, etc.
	# days/week discharged	Facility was for Heavy Highway/Street Construction Contractor
	# weeks/yr discharged	Assume equipment storage and maintenance
665,323	# gals/yr directly discharged	1 acre
		Research on Asphalt Plant Discharges used for COCs
4.08	ft; 30yr average annual precipitation per Rutgers information	Storm Sewer connected to the Passaic River
43,560	ft2 per acre	
1.00	acres	
50%	Percent Precip to River	
1964	Yr Ops started	
2006	Yr Ops ceased	
42	calc #yrs facility operated	
Copper (Cu)		
42	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
42	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
42	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
42	#yrs facility discharged	
15.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.90	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
95.19	calc kg COC discharged	
LPAHs		
42	#yrs facility discharged	
15.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.60	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
63.46	calc kg COC discharged	
PCBs		
14	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
9	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
24	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
42	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
43	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
22	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
12	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
95.19	kg HPAHs	
63.46	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Roman Asphalt Corporation

14 Ogden Street	**Newark**	**NJ**	**07104**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.401E-7	10.0%	Periodic Noncompliacne	A NOV was issued to Roman Asphalt on September 18, 1986, due to “hazardous substance discharge” which included reported “pooling oil in facility yard and running off to Rt. 21 drainage system and bank” (PAS-00111340). Another NOV was issued to Roman Asphalt on October 6, 1986, due to “discharge of hazardous substance.” The NOV reported that “oil has run off property onto embankment of State Hwy 21 South”. This pooling oil was apparently used motor oil from oil changes in heavy equipment (PAS-00111343).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	3.121E-7

AP_ABS	3.121E-7

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Roman Asphalt Corporation

14 Ogden Street	**Newark**	**NJ**	**07104**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.306E-6	10.0%	Periodic Noncompliacne	A NOV was issued to Roman Asphalt on September 18, 1986, due to “hazardous substance discharge” which included reported “pooling oil in facility yard and running off to Rt. 21 drainage system and bank” (PAS-00111340). Another NOV was issued to Roman Asphalt on October 6, 1986, due to “discharge of hazardous substance.” The NOV reported that “oil has run off property onto embankment of State Hwy 21 South”. This pooling oil was apparently used motor oil from oil changes in heavy equipment (PAS-00111343).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	1.697E-6

AP_ABS	1.697E-6

Allocation Facility Cmass Calculation

Royce Associates	**17 Carlton Avenue**	**East Rutherford**	**NJ**	**07073**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	2.32%	234.71	100.00%	208.1	213.59	1.018817E-2	2.18
Lead	100.00%	22.73	100.00%	-	2.32%	39.12	100.00%	34.7	58.33	1.018817E-2	0.59
Mercury	100.00%	-	100.00%	-	2.32%	1.30	100.00%	1.3	1.33	1.018817E-2	0.01
HPAHs	100.00%	-	100.00%	-	2.32%	6,258.88	100.00%	5,550.3	5,695.72	1.018817E-2	58.03
LPAHs	100.00%	-	100.00%	-	2.32%	4,172.58	100.00%	3,700.2	3,797.15	1.018817E-2	38.69
PCBs	100.00%	4.16	100.00%	-	2.32%	-	100.00%	-	4.16	1.018817E-2	0.04
DDx	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	2.32%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Royce Associates	**17 Carlton Avenue**	**East Rutherford**	**NJ**	**07073**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	2.18	1.036E-6	7.150E-7
Lead	0.01	3,200,000.00	0.59	1.857E-7	1.857E-9
Mercury	0.95	42,000.00	0.01	3.236E-7	3.075E-7
HPAHs	0.05	240,000.00	58.03	2.418E-4	1.209E-5
LPAHs	0.01	170,000.00	38.69	2.276E-4	2.276E-6
PCBs	12.87	26,000.00	0.04	1.630E-6	2.098E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Royce Associates	17 Carlton Avenue	East Rutherford	NJ	07073

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	7.712E-4	2.18	1,617.33	7.712E-4	5.321E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.021E-4	0.59	646.2	2.021E-4	2.021E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	3.087E-4	0.01	12.95	3.087E-4	2.932E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.310E-3	58.03	256.48	1.310E-3	6.552E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.260E-3	38.69	175.57	1.260E-3	1.260E-5
PCBs	12.87	26,000.00	20,066.54	25,795.56	2.073E-4	0.04	5.35	2.073E-4	2.668E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Royce Associates	**17 Carlton Avenue**	**East Rutherford**	**NJ**	**07073**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Yantacaw	Bypass	2.32%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Very Limited to No data regarding PVSC discharges, only a note that indicates that wastewater was
	# hours/per day discharged	discharged to the PVSC - no monitoring or flow data.
	#days/week discharged	Manufacturer of ingredients for textile and rubber production.
	#weeks/yr discharged	Using Berol Corporation as an example for discharges to PVSC
13,000,000	calc gal/yr discharge	
1929	Yr Ops started	
1982	Yr Ops ceased	
53	calc #yrs facility operated	
Copper (Cu)		
53	#yrs facility discharged	Based on Berol Corporation
0.09	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
234.71	calc kg COC discharged	
Lead (Pb)		
53	#yrs facility discharged	Based on Berol Corporation
0.015	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
39.12	calc kg COC discharged	
Mercury (Hg)		
53	#yrs facility discharged	Based on Berol Corporation
0.0005	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.30	calc kg COC discharged	
HPAHs		
53	#yrs facility discharged	Based on Berol Corporation
40.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
2.40	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
6,258.88	calc kg COC discharged	
LPAHs		
53	#yrs facility discharged	Based on Berol Corporation
40.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
1.60	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,172.58	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
33	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
53	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
37	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
38	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
234.71	kg Copper	
39.12	kg Lead	
1.30	kg Mercury	
6,258.88	kg HPAHs	
4,172.58	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	NPDES Permit #0002682 indicates discharge to a tributary of Passaic River (no name provided)
5	# days/week discharged	indicated 100,000 gpd, assuming 5 days per week operation (260 days)
52	# weeks/yr discharged	
26,000,000	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
1929	Yr Ops started	
1982	Yr Ops ceased	
53	calc #yrs facility operated	
Copper (Cu)		
53	#yrs facility discharged	no information on discharges...stated as non-contact cooling water. Using Berol Corp discharge
0.045	calc mg/L COC discharged	information at 50%.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
235	calc kg COC discharged	
Lead (Pb)		
53	#yrs facility discharged	no information on discharges...stated as non-contact cooling water. Using Berol Corp discharge
0.0075	calc mg/L COC discharged	information at 50%.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
39	calc kg COC discharged	
Mercury (Hg)		
53	#yrs facility discharged	no information on discharges...stated as non-contact cooling water. Using Berol Corp discharge
0.00025	calc mg/L COC discharged	information at 50%.
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.30	calc kg COC discharged	
HPAHs		
53	#yrs facility discharged	no information on discharges...stated as non-contact cooling water. Using Berol Corp discharge
20.00	calc mg/L O&G	information at 50%.
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1.20	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
6,258.88	calc kg COC discharged	
LPAHs		
53	#yrs facility discharged	no information on discharges...stated as non-contact cooling water. Using Berol Corp discharge
20.00	calc mg/L O&G	information at 50%.
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.80	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,172.58	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
33	#yrs facility discharged within Dieldrin Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
53	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
37	#yrs facility discharged within 2,4-D Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
38	#yrs facility discharged within 2,4,5-T Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
208.14	kg Copper	
34.69	kg Lead	
1.30	kg Mercury	
5,550.32	kg HPAHs	
3,700.22	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
5	ACRES - TOTAL SITE AREA (acres)	Acreage noted in the PA Report (PAS-00008137).	
2	ACRES - AFFECTED AREA	Rough estimate of the affected area based on a drawn image of the site on the Royce Global website (https://royceglobal.com/about/). The factory is shown, with the pond and the railroad to the left.	
4,046.86	METERS^2/ACRE		
8,094	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO POND THAT LED TO PASSAIC	
1929	Year site operations began	FDR Page 1.	
1981	Year site processing and storage operations ceased	A 1987 letter noted that the copany discontinued business during Oct 1981, liquidated, and was dissolved (FDR Page 2).	
52	NUMBER YEARS DISCHARGE		
42	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,979	KG/M^3 SOIL DENSITY	Soil type not specified in documents provided. Used https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx to get an idea of the soil type out there. Most is "Urban Land" but nearby soil types are loam/silt loam from 0-30 inches. Used structx.com/Soil_Properties_002.html to identify the density, selected silty clay and the average of the min (1602 kg/m3) and max (2355 kg/mg3).	Silt loam has an approximate bulk density of 1.33 g/cm3 (https://cropwatch.unl.edu/documents/USDA_NRCS_bulk_density_guide.pdf)
83,270	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
PCBs		PCBs were excavated from the transformer area in 1982 (PAS-0008153).	
51	YEARS DISCHARGED	Number of years reflect a 1930 start date for PCBs.	
50	MG/KG (MAX CONCENTRATION)	Eight 55 gallon drums of waste collected from a transformer leaking onto soil. Analysis indicated greater than 50 ppm PCBs (PAS-00102210; FDR Page 2).	
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		
Diesel fuel		Spill in 1983 and was still being remediated in 1984 (PAS-00102173).	
1	YEARS DISCHARGED	Sampling of the pond in March/August of 1984 revealed high levels of benzene, toluene, ethylbenzene and zinc in pond sediments (PAS-00102187).	
	MG/KG (AVERAGE CONCENTRATION)	No data provided.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead		Detected in soil samples in 1984 (PAS-00102183).	
52	YEARS DISCHARGED		
273.0	MG/KG (AVERAGE CONCENTRATION)	Highest concentration from RC-3S collected in 1984 (PAS-00102183). Depth and location details were not provided.	
0.000001	kg per mg (Merck Index)		
23	KILOGRAMS DISCHARGED		

PAHs (oils)		
52	YEARS DISCHARGED	Four 55-gallon drums of compressor oil, oily sludge, soil spill identified in 1982 (FDR Page 2). Also, spills of No. 6 heating oil cause soil contamination (FDR Page 2). Oil was still present in February 1984 sampling (PAS-00102226-8).
	MG/KG (TOTAL PAH MAX CONCENTRATION)	No data provided.
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PAHs (others detected)		Other PAHs = Benzo(g,h,i)perylene, Fluorene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Naphthalene, 2-Methylnaphthalene.
	YEARS DISCHARGED	No data provided.
	MG/KG (TOTAL PAH MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		NOT DETECTED (FDR)
0	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		NOT DETECTED (FDR)
0	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans		NOT DETECTED (FDR)
0	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

SUMMARY FTMASS ESTIMATES:	
0.00	kg Copper
22.73	kg Lead
0.00	kg Mercury
0.00	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
4.16	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

26.90	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Royce Associates

17 Carlton Avenue	**East Rutherford**	**NJ**	**07073**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.637E-5	10.0%	Periodic Noncompliacne	A 1971 PVSC Annual Report notes that Royce Chemical was pumping industrial waste into a storm drain on Carlton Avenue. The material was reportedly diverted to a sanitary line when the Inspector informed them of the violation (PAS-00034516; PAS-00034633). Polluting materials from Royce Chemical were again discharged to the Carlton Hill storm drain and ultimately to the Passaic River in January and February 1973, twice in 1974, and in 1979 (PAS-00034660; PAS-00034762-3; PAS-00034785; PAS-00034904-5; PAS-00008134). Spills of No. 6 heating oil reportedly caused soil contamination at the site. Waste disposal manifests indicate that soils and oily waste were removed from the Royce Chemical facility in May and August 1983 (PAS-00008141).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	4.728E-5

AP_ABS	4.728E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Royce Associates

17 Carlton Avenue	**East Rutherford**	**NJ**	**07073**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.574E-3	10.0%	Periodic Noncompliacne	A 1971 PVSC Annual Report notes that Royce Chemical was pumping industrial waste into a storm drain on Carlton Avenue. The material was reportedly diverted to a sanitary line when the Inspector informed them of the violation (PAS-00034516; PAS-00034633). Polluting materials from Royce Chemical were again discharged to the Carlton Hill storm drain and ultimately to the Passaic River in January and February 1973, twice in 1974, and in 1979 (PAS-00034660; PAS-00034762-3; PAS-00034785; PAS-00034904-5; PAS-00008134). Spills of No. 6 heating oil reportedly caused soil contamination at the site. Waste disposal manifests indicate that soils and oily waste were removed from the Royce Chemical facility in May and August 1983 (PAS-00008141).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	4.646E-3

AP_ABS	4.646E-3

Allocation Facility Cmass Calculation

Safety Kleen Envirosystems Co./McKesson Corp.	600 Doremus Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	368.59	100.00%	-	0.00%	-	100.00%	28.2	396.76	1.018817E-2	4.04
Lead	100.00%	1,316.38	100.00%	-	0.00%	-	100.00%	-	1,316.38	1.018817E-2	13.41
Mercury	100.00%	1.01	100.00%	-	0.00%	-	100.00%	-	1.05	1.018817E-2	0.01
HPAHs	100.00%	1.7	100.00%	-	0.00%	-	100.00%	-	1.7	1.018817E-2	0.02
LPAHs	100.00%	193.75	100.00%	-	0.00%	-	100.00%	-	193.75	1.018817E-2	1.97
PCBs	100.00%	7.06	100.00%	-	0.00%	-	100.00%	-	7.06	1.018817E-2	0.07
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Safety Kleen Envirosystems Co./McKesson Corp.	600 Doremus Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	4.04	1.925E-6	1.328E-6
Lead	0.01	3,200,000.00	13.41	4.191E-6	4.191E-8
Mercury	0.95	42,000.00	0.01	2.548E-7	2.420E-7
HPAHs	0.05	240,000.00	0.02	7.217E-8	3.608E-9
LPAHs	0.01	170,000.00	1.97	1.161E-5	1.161E-7
PCBs	12.87	26,000.00	0.07	2.766E-6	3.560E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Safety Kleen Envirosystems Co./McKesson Corp.	600 Doremus Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.433E-3	4.04	3,004.35	1.433E-3	9.885E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	4.562E-3	13.41	14,583.75	4.562E-3	4.562E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	2.430E-4	0.01	10.19	2.430E-4	2.308E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	3.911E-7	0.02	0.08	3.911E-7	1.956E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	6.431E-5	1.97	8.96	6.431E-5	6.431E-7
PCBs	12.87	26,000.00	20,066.54	25,795.56	3.518E-4	0.07	9.08	3.518E-4	4.528E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Safety Kleen Envirosystems Co./McKesson Corp.	**600 Doremus Ave**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1974-1977 direct discharge to Newark Bay/Passaic River
	# days/week discharged	1972 NPDES Permit = 14.4 MGD discharged initially
	# weeks/yr discharged	0.092 MGD at end of First year FDR, Pages 13-14
33,580,000	# gals/yr directly discharged PAP00187067, PAP00185805	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1974	Yr Ops started	
1977	Yr Ops ceased	
3.17	calc #yrs facility operated	FDR page 13
Copper (Cu)		
3.17	#yrs facility discharged	
0.07	calc mg/L COC discharged	Copper Discharge from 1982 sampling
3.785	L per gallon (Merck Index)	PAP-00185787-88
0.000001	kg per mg (Merck Index)	PAP-00187534
28.17	calc kg COC discharged	
Lead (Pb)		
3	#yrs facility discharged	Lead Discharge from NPDES DMRs
0.2600	calc mg/L COC discharged PAP00189054	PAP- 00185800; PAP-00185815
3.785	L per gallon (Merck Index)	PAP-00188983
0.000001	kg per mg (Merck Index)	PAP-00186123
104.65	calc kg COC discharged	
Mercury (Hg)		
3	#yrs facility discharged	Mercury Discharges from 1982 sampling
0.0001	calc mg/L COC discharged	PAP-00185448
3.785	L per gallon (Merck Index)	PAP-00185787-88
0.000001	kg per mg (Merck Index)	PAP-00187534
0.04	calc kg COC discharged	
HPAHs		
3	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
3	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
4	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-1	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
4	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
3	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
4	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
4	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
2	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
28.17	kg Copper	
-	kg Lead	
0.04	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.083333333	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
8.5	ACRES - TOTAL SITE AREA (acres)	FDR page 1	
4.25	ACRES - AFFECTED AREA	The figure on PAP-00364114 appears to show about half of the total site area was covered by buildings or concrete	
4,046.86	METERS^2/ACRE		
17,199	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1974	Year site operations began		
		Inland purchased certain assets of Vulcan on May 1, 1974; however, Vulcan would continue operation of their former chlor-alkali facilities, as well as their chloromethanes plant at the site until May 1, 1975. (FDR page 1)	
1982	Year site was closed (due to explosion)	On October 10, 1982, an explosion and fire destroyed much of the facility and NJDEP closed the site two days later (FDR page 1)	According to a RCRA Facility Assessment Narrative, the site was being used by nearby industries as a parking lot and storage area for wastes and equipment after closure. (FDR page 5)
1987	Year ownership transferred	Title transfer from Safety-Kleen to McKesson Corporation (FDR page 1)	
13	NUMBER YEARS DISCHARGE		
22	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1962.5	KG/M3 SOIL DENSITY	Fill reported as sand and gravel containing ashes, cinders, slag, brick, and concrete rubble (PAP-00188318; PAP-00364135). Bulk density range 1442 KG/M3 to 2483 KG/M3, so use average. (http://structx.com/Soil_Properties_002.html).	
43,879	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
13	YEARS DISCHARGED		
8,400	MG/KG (MAX CONCENTRATION)	Copper was found at a maximum concentration in surface soil at AEC 3 (SB-21, depth 0-6 inches) and AEC 4 (SB-18, depth 0-6 inches) (PAP-00188368 and PAP-00188372, respectively; Table on FDR page 20).	
0.000001	kg per mg (Merck Index)		
369	KILOGRAMS DISCHARGED		
Lead (Pb)			
13	YEARS DISCHARGED		
30,000	MG/KG (AVERAGE CONCENTRATION)	Maximum concentration found in surface sample at AEC 3 in SB-21, depth of 0-6 inches (FDR page 20; PAP-00188368)	
0.000001	kg per mg (Merck Index)		
1,316	KILOGRAMS DISCHARGED		

Mercury (Hg)

13 YEARS DISCHARGED
23 MG/KG (MAX CONCENTRATION)

Maximum concentration found in surface soil sample at AEC 6 in SB-28, depth of 0-6 inches (FDR page 20; PAP-00188380)

0.000001 kg per mg (Merck Index)
1 KILOGRAMS DISCHARGED

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

13 YEARS DISCHARGED
38.749 MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001 kg per mg (Merck Index)
2 KILOGRAMS DISCHARGED

PAHs (others detected)

Other PAHs = bis (2-ethylhexyl)phthalate, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, hexachlorobenzene, and 2,4-dimethylphenol (PAP-00364271)

13 YEARS DISCHARGED
4416 MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001 kg per mg (Merck Index)
194 KILOGRAMS DISCHARGED

Surface samples with highest concentrations from sample SB-5 or SB-7 at a depth of 0.0-0.5 OR 1.0-1.5 ft bgs. (PAP-00364271)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	27.000	1.0	27.0000
Benzo(a)anthracene	17.000	0.1	1.7000
Benzo(b)fluoranthene	26.000	0.1	2.6000
Benzo(k)fluoranthene	12.000	0.01	0.1200
Chrysene	29.000	0.001	0.0290
Dibenz(a,h)anthracene	6.100	1.0	6.1000
Indeno(1,2,3-cd)pyrene	12.000	0.1	1.2000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **38.7**

PCBs

13 YEARS DISCHARGED
161 MG/KG (MAX OF REPORTED CONCENTRATIONS)

The highest concentration of PCBs was detected in a surface soil sample collected from soil boring SB-24 at a depth of 0 to 0.5 feet bgs at AEC 5 (FDR page 6; PAP-00364274)

According to a Remedial Action Report, dated August 2001, concentrations of PCBs in soils that exceeded 50 ppm were detected in the vicinity of one soil boring (SB-24). The extent of soils containing PCBs greater than 50 ppm was defined to be within a 50-foot by 20-foot rectangular area surrounding the soil boring. Soil that contained 50 ppm or more PCBs was excavated and disposed off-site (FDR Page 6-7)

0.000001 kg per mg (Merck Index)
7 KILOGRAMS DISCHARGED

SUMMARY CMASS ESTIMATES:

368.59	kg Copper
1,316.38	kg Lead
1.01	kg Mercury
1.70	kg PAHs (Benzo(a)pyrene Equivalent)
193.75	kg PAHs (Other)
7.06	kg PCBs

1,888.49 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Safety Kleen Envirosystems Co./McKesson Corp.

600 Doremus Ave	Newark	NJ	07105

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.734E-5	10.0%	Periodic Noncompliacne	At least 11 inspections conducted by NJDEP between January 18, 1980, and May 19, 1982, identified what was described as “leachate of an oil substance is presently entering Newark Bay” and/or “leachate into bay” and/or an “oil like material,” among other similar descriptions. The source of the discharge was documented as being unknown (PAP-00186512-21, 6530-1, 6881, 6908, 6913, 7305, 7310; PAP-00365518-9). dating back to 1979, NJDEP personnel had noted the following deficiencies at the facility: (1) poor, careless housekeeping resulting in extensive spillage; (2) a contaminated stormwater discharge into Newark Bay; (3) open drums in deteriorated condition stored in improper storage areas; (4) an oily material surfacing in the Newark Bay near the facility’s shoreline; and (5) a purple- colored groundwater discharge into Newark Bay (PAP-00185827). According to a Civil Action brought by the State of New Jersey against Inland, dated March 19, 1980, Inland failed to comply with and implement all of NJDEP's requirements of Inland’s Temporary Operating Authority; Inland since or from about October 30, 1979, had failed and continued to fail to comply with the October 30, 1979, Administrative Order; and, Inland's acts since or from about October 30, 1979, had constituted and continued to constitute pollution of the environment or a potential threat of pollution of the environment (PAP-00365511). According to a June 23, 1993, Administrative Consent Order, on October 30, 1979, the facility was issued an Administrative Order by the New Jersey Department of Environmental Protection and Energy (NJDEPE). The order stated that routine inspections conducted by NJDEPE on September 19, October 9, October 16 and October 24 revealed that the facility grounds were contaminated with various chemicals; therefore, the facility was to cease accepting waste and clean up all spills and contaminated soil (PAS-00011254). On October 10, 1982, an explosion and fire destroyed much of the facility. The New Jersey Department of Environmental Protection (NJDEP) closed the site two days later (PAS-00091937).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.360E-5

AP_ABS	3.360E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Safety Kleen Envirosystems Co./McKesson Corp.

600 Doremus Ave	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.794E-3	10.0%	Periodic Noncompliacne	At least 11 inspections conducted by NJDEP between January 18, 1980, and May 19, 1982, identified what was described as “leachate of an oil substance is presently entering Newark Bay” and/or “leachate into bay” and/or an “oil like material,” among other similar descriptions. The source of the discharge was documented as being unknown (PAP-00186512-21, 6530-1, 6881, 6908, 6913, 7305, 7310; PAP-00365518-9). dating back to 1979, NJDEP personnel had noted the following deficiencies at the facility: (1) poor, careless housekeeping resulting in extensive spillage; (2) a contaminated stormwater discharge into Newark Bay; (3) open drums in deteriorated condition stored in improper storage areas; (4) an oily material surfacing in the Newark Bay near the facility’s shoreline; and (5) a purple- colored groundwater discharge into Newark Bay (PAP-00185827). According to a Civil Action brought by the State of New Jersey against Inland, dated March 19, 1980, Inland failed to comply with and implement all of NJDEP's requirements of Inland’s Temporary Operating Authority; Inland since or from about October 30, 1979, had failed and continued to fail to comply with the October 30, 1979, Administrative Order; and, Inland's acts since or from about October 30, 1979, had constituted and continued to constitute pollution of the environment or a potential threat of pollution of the environment (PAP-00365511). According to a June 23, 1993, Administrative Consent Order, on October 30, 1979, the facility was issued an Administrative Order by the New Jersey Department of Environmental Protection and Energy (NJDEPE). The order stated that routine inspections conducted by NJDEPE on September 19, October 9, October 16 and October 24 revealed that the facility grounds were contaminated with various chemicals; therefore, the facility was to cease accepting waste and clean up all spills and contaminated soil (PAS-00011254). On October 10, 1982, an explosion and fire destroyed much of the facility. The New Jersey Department of Environmental Protection (NJDEP) closed the site two days later (PAS-00091937).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	5.214E-3

AP_ABS	5.214E-3

Allocation Facility Cmass Calculation

Schiffenhaus Packaging Corp. (Rock-Tenn Company) | **49 4th Street** | **Newark** | **NJ**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	100.00%	-	100.00%	1,222.0	1,221.95	1.018817E-2	12.45
Lead	100.00%	-	100.00%	-	100.00%	-	100.00%	12.9	12.86	1.018817E-2	0.13
Mercury	100.00%	-	100.00%	-	100.00%	-	100.00%	0.3	0.33	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	49 4th Street	Newark	NJ

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	12.45	5.928E-6	4.091E-6
Lead	0.01	3,200,000.00	0.13	4.096E-8	4.096E-10
Mercury	0.95	42,000.00	0	7.949E-8	7.552E-8
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	49 4th Street	Newark	NJ

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	4.412E-3	12.45	9,252.78	4.412E-3	3.044E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	4.458E-5	0.13	142.51	4.458E-5	4.458E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	7.581E-5	0	3.18	7.581E-5	7.202E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	**49 4th Street**	**Newark**	**NJ**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Passaic River		100.00%	100.00%	Facility operations prior to PVSC (1924)

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	No information available on Sewer Discharges. Assuming similar to McCarter's Hwy since operation was at this location before moving to McCarter's Hwy in 1925
	# days/week discharged	PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corp:
	# weeks/yr discharged	* Wastewater to PVSC from 1909-1924 but most likely bypassed to the Passaic River
5,526,201	# gals/yr directly discharged	PAS00017807, 812, 999
		Flowrates from 1994, 1995 and 2005 data
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1909	Yr Ops started	
1924	Yr Ops ceased	
15	calc #yrs facility operated	
Copper (Cu)		
15	#yrs facility discharged	From 1994, 2005 and 2006 sampling
3.89	calc mg/L COC discharged PAS00017984, 800, 840	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,221.95	calc kg COC discharged	
Lead (Pb)		
15	#yrs facility discharged	From 1994, 2005 and 2006 sampling
0.0410	calc mg/L COC discharged PAS00017984, 800, 840	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
12.86	calc kg COC discharged	
Mercury (Hg)		
15	#yrs facility discharged	
0.00104	calc mg/L COC discharged PAS00017984, 800, 840	From 1994, 2005 and 2006 sampling
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.328	calc kg COC discharged	
HPAHs		
15	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
15	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
-4	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-15	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-25	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
15	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-21	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-20	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-25	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
1,221.95	kg Copper	
12.86	kg Lead	
0.33	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Schiffenhaus Packaging Corp. (Rock-Tenn Company) | **204 Academy Street** | **Newark** | **NJ**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	100.00%	-	100.00%	1,059.0	1,059.03	1.018817E-2	10.79
Lead	100.00%	-	100.00%	-	100.00%	-	100.00%	11.1	11.15	1.018817E-2	0.11
Mercury	100.00%	-	100.00%	-	100.00%	-	100.00%	0.3	0.28	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	100.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	204 Academy Street	Newark	NJ

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	10.79	5.138E-6	3.545E-6
Lead	0.01	3,200,000.00	0.11	3.549E-8	3.549E-10
Mercury	0.95	42,000.00	0	6.889E-8	6.545E-8
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	204 Academy Street	Newark	NJ

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	3.824E-3	10.79	8,019.07	3.824E-3	2.638E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	3.863E-5	0.11	123.51	3.863E-5	3.863E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	6.570E-5	0	2.76	6.570E-5	6.242E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	**204 Academy Street**	**Newark**	**NJ**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Passaic River		100.00%	100.00%	Facility operations prior to PVSC (1924)

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	No information available on Sewer Discharges. Assuming similar to McCarter's Hwy since operation was at this location before moving to 4th Street in 1909
	# days/week discharged	PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corp:
	# weeks/yr discharged	* Wastewater to PVSC from 1909-1924 most likely bypassed to the Passaic River
5,526,201	# gals/yr directly discharged	PAS00017807, 812, 999
		Flowrates from 1994, 1995 and 2005 data
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1895	Yr Ops started	
1908	Yr Ops ceased	
13	calc #yrs facility operated	
Copper (Cu)		
13	#yrs facility discharged	From 1994, 2005 and 2006 sampling
3.89	calc mg/L COC discharged PAS00017984, 800, 840	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,059.02	calc kg COC discharged	
Lead (Pb)		
13	#yrs facility discharged	From 1994, 2005 and 2006 sampling
0.0410	calc mg/L COC discharged PAS00017984, 800, 840	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
11.15	calc kg COC discharged	
Mercury (Hg)		
13	#yrs facility discharged	
0.00104	calc mg/L COC discharged PAS00017984, 800, 840	From 1994, 2005 and 2006 sampling
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.284	calc kg COC discharged	
HPAHs		
13	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
13	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
-20	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-31	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-41	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
13	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-37	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-36	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-41	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
1,059.02	kg Copper	
11.15	kg Lead	
0.28	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Schiffenhaus Packaging Corp. (Rock-Tenn Company) | **2013 McCarter Highway** | **Newark** | **NJ**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.19%	2,606.83	100.00%	4,154.6	4,159.6	1.018817E-2	42.38
Lead	100.00%	-	100.00%	-	0.19%	27.44	100.00%	43.7	43.79	1.018817E-2	0.45
Mercury	100.00%	-	100.00%	-	0.19%	0.70	100.00%	1.1	1.12	1.018817E-2	0.01
HPAHs	100.00%	-	100.00%	-	0.19%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.19%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.19%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.19%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.19%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.19%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	2013 McCarter Highway	Newark	NJ

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	42.38	2.018E-5	1.392E-5
Lead	0.01	3,200,000.00	0.45	1.394E-7	1.394E-9
Mercury	0.95	42,000.00	0.01	2.706E-7	2.571E-7
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	2013 McCarter Highway	Newark	NJ

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.502E-2	42.38	31,496.99	1.502E-2	1.036E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.517E-4	0.45	485.12	1.517E-4	1.517E-6
Mercury	0.95	42,000.00	4,322.53	41,955.96	2.581E-4	0.01	10.83	2.581E-4	2.452E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Schiffenhaus Packaging Corp. (Rock-Tenn Company)	**2013 McCarter Highway**	**Newark**	**NJ**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Delavan	CSO	0.46%	41.36%	No overflows were observed for the Killiam Report. CSO percentages were calculated by the median of all CSOs in the Newark municipality

Dicharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corp:
	# hours/per day discharged	* Wastewater to PVSC from 1924-1975 most likely bypassed to the Passaic River
	#days/week discharged	PAS00017807, 812, 999
	#weeks/yr discharged	Flowrates from 1994, 1995 and 2005 data
5,526,201	calc gal/yr discharge	
1976	Yr Ops started	
2007	Yr Ops ceased	
32	calc #yrs facility operated	
Copper (Cu)		
32	#yrs facility discharged	From 1994, 2005 and 2006 sampling
3.89	calc mg/L COC discharged PAS00017984, 800, 840	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,606.83	calc kg COC discharged	
Lead (Pb)		
32	#yrs facility discharged	From 1994, 2005 and 2006 sampling
0.0410	calc mg/L COC discharged PAS00017984, 800, 840	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
27.44	calc kg COC discharged	
Mercury (Hg)		
32	#yrs facility discharged	
0.00104	calc mg/L COC discharged PAS00017984, 800, 840	From 1994, 2005 and 2006 sampling
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.70	calc kg COC discharged	
HPAHs		
32	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
32	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
2	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-3	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
12	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
32	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
32	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
10	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
0	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
2,606.83	kg Copper	
27.44	kg Lead	
0.70	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	PRP Extraction Form and Evidence Concerning: Schiffenhaus Packaging Corp:
	# days/week discharged	* Wastewater to PVSC from 1924-1975 most likely bypassed to the Passaic River
	# weeks/yr discharged	PAS00017807, 812, 999
5,526,201	# gals/yr directly discharged	Flowrates from 1994, 1995 and 2005 data
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1924	Yr Ops started	
1975	Yr Ops ceased	
51	calc #yrs facility operated	
Copper (Cu)		
51	#yrs facility discharged	From 1994, 2005 and 2006 sampling
3.89	calc mg/L COC discharged PAS00017984, 800, 840	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,154.64	calc kg COC discharged	
Lead (Pb)		
51	#yrs facility discharged	From 1994, 2005 and 2006 sampling
0.0410	calc mg/L COC discharged PAS00017984, 800, 840	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
43.74	calc kg COC discharged	
Mercury (Hg)		
51	#yrs facility discharged	
0.00104	calc mg/L COC discharged PAS00017984, 800, 840	From 1994, 2005 and 2006 sampling
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.114	calc kg COC discharged	
HPAHs		
51	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
51	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
47	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
26	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
51	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
30	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
31	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
4,154.64	kg Copper	
43.74	kg Lead	
1.11	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Schiffenhaus Packaging Corp. (Rock-Tenn Company)

204 Academy Street | Newark | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.611E-6	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	4.333E-6

49 4th Street | Newark | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.166E-6	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	5.000E-6

2013 McCarter Highway | Newark | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.418E-5	10.0%	Periodic Noncompliacne	A NOV was issued by PVSC to Schiffenhaus for a copper exceedance in October 1996. Schiffenhaus subsequently advised in a July 1996 letter that the copper source may be copper phthalocyanine pigments (PAS-00017812; PAS-00017942; PAS-00017954). In May 1995, Schiffenhaus was “out of compliance” with “Local Pretreatment Limitations” for copper (PAS-00017986-87). Reportedly, the facility was over the “threshold limit” for cadmium, chromium, copper, mercury and lead (PAS-00017991). In January 1997, a NOV was issued by PVSC to Schiffenhaus due to the facility's failure to meet compliance milestones established in its Sewer Connection Permit for “local limits” on metals. PVSC advised that Schiffenhaus was determined to be in "significant non-compliance" with PVSC rules and regulations (PAS-00017812; PAS-00017941-42). On October 17, 1997, PVSC filed a complaint in the Superior Court of the State of New Jersey against Schiffenhaus. The complaint alleged that Schiffenhaus violated its PVSC discharge permit by not being in compliance with “local pretreatment limits” established by the permit. Schiffenhaus agreed to pay a fine of $1,000 to settle the PVSC legal action (PAS-00017813; PAS-00017933).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	1.844E-5

AP_ABS	2.777E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Schiffenhaus Packaging Corp. (Rock-Tenn Company)

204 Academy Street | Newark | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.701E-3	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	3.241E-3

49 4th Street | Newark | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.117E-3	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	3.740E-3

2013 McCarter Highway | Newark | NJ

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.061E-2	10.0%	Periodic Noncompliacne	A NOV was issued by PVSC to Schiffenhaus for a copper exceedance in October 1996. Schiffenhaus subsequently advised in a July 1996 letter that the copper source may be copper phthalocyanine pigments (PAS-00017812; PAS-00017942; PAS-00017954). In May 1995, Schiffenhaus was “out of compliance” with “Local Pretreatment Limitations” for copper (PAS-00017986-87). Reportedly, the facility was over the “threshold limit” for cadmium, chromium, copper, mercury and lead (PAS-00017991). In January 1997, a NOV was issued by PVSC to Schiffenhaus due to the facility's failure to meet compliance milestones established in its Sewer Connection Permit for “local limits” on metals. PVSC advised that Schiffenhaus was determined to be in "significant non-compliance" with PVSC rules and regulations (PAS-00017812; PAS-00017941-42). On October 17, 1997, PVSC filed a complaint in the Superior Court of the State of New Jersey against Schiffenhaus. The complaint alleged that Schiffenhaus violated its PVSC discharge permit by not being in compliance with “local pretreatment limits” established by the permit. Schiffenhaus agreed to pay a fine of $1,000 to settle the PVSC legal action (PAS-00017813; PAS-00017933).	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	1.379E-2

AP_ABS	2.077E-2

Allocation Facility Cmass Calculation

Sequa Corporation (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	749.03	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	32,522.45	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	98.61	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	2,331.46	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	1,554.30	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Sequa Corporation (Foundry Street Complex)	**185 Foundry Street**	**Newark**	**NJ**	**07105**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Sequa Corporation (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Sequa Corporation (Foundry Street Complex)	**185 Foundry Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
43,743	gal discharged per day/week/month	All wastewater and stormwater discharged to strip drains in complex connected to industrial sewer
42	# hours/per day discharged	
5	#days/week discharged	
52	#weeks/yr discharged	
11,373,206	calc gal/yr discharge(PAS00111828,PAS00128843,PAP00374662,PAS00000682,PAS00014611,PAP00049170,PAP00120043,PAS00044688,PAS00104294)	
1967	Yr Ops started	
1987	Yr Ops ceased	
20	calc #yrs facility operated (PAS00000242)	
Copper (Cu)		
20	#yrs facility discharged	
0.87	calc mg/L COC discharged (PAP00049166, PAS00000682, PAP00049170, PAS00104294)	1976 Waste Effluent Survey (.16mg/l); 1975 PVSC Ind WWQ, dated 1978 (.16 mg/l); 1979 PVSC Sewer Connection App, dated 1980 (.16mg/l); and 1986 Ind Pretreatment Program Annual Report (3.0mg/l)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
749.03	calc kg COC discharged	
Lead (Pb)		
20	#yrs facility discharged	
37.78	calc mg/L COC discharged (PAP00049166, PAS00000682, PAP00049170, PAS00104294)	1976 Waste Effluent Survey (.1mg/l); 1975 PVSC Ind WWQ, dated 1978 (.1 mg/l); 1979 PVSC Sewer Connection App, dated 1980 (.9mg/l); and 1986 Ind Pretreatment Program Annual Report (150mg/l)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
32,522.45	calc kg COC discharged	
Mercury (Hg)		
20	#yrs facility discharged	
0.1145	calc mg/L COC discharged (PAP00049166, PAS00000682, PAP00049170, PAS00044688, PAS00104294)	1976 Waste Effluent Survey (.06mg/l); 1975 PVSC Ind WWQ, dated 1978 (.06mg/l); 1979 PVSC Sewer Connection App, dated 1980 (.002mg/l); 1985 Permit Application (.0007mg/l); and 1986 Ind Pretreatment Program Annual Report (.45mg/l)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
98.61	calc kg COC discharged	
HPAHs		
20	#yrs facility discharged	
45.13	calc mg/L O&G (PAP00049166, PAP00049170, PAS00044688)	calcs used to convert mg/kg O&G to HPAHs; remove if not needed
10%	% O&G that is considered PAHs	1976 Waste Effluent Survey (6.0 mg/l Oils); 1979 PVSC Sewer Connection Permit, dated 1980 (35 mg/l Oils); and 1985 Permit Application (94.4 mg/l Oils)
60%	% PAHs considered as HPAHs	
2.71	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
2,331.46	calc kg COC discharged	
LPAHs		
20	#yrs facility discharged	
45.13	calc mg/L O&G (PAP00049166, PAP00049170, PAS00044688)	calcs used to convert mg/kg O&G to LPAHs; remove if not needed
10%	% O&G that is considered PAHs	1976 Waste Effluent Survey (6.0 mg/l Oils); 1979 PVSC Sewer Connection Permit, dated 1980 (35 mg/l Oils); and 1985 Permit Application (94.4 mg/l Oils)
40%	% PAHs considered as LPAHs	
1.81	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,554.30	calc kg COC discharged	
PCBs		
11	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
6	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
21	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
20	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
21	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
19	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
9	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
749.03	kg Copper	
32,522.45	kg Lead	
98.61	kg Mercury	
2,331.46	kg HPAHs	
1,554.30	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Sequa Corporation (Foundry Street Complex)

185 Foundry Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	0.0%	Historically Compliant or No Evidence	Soil sampling and remediation took place to remove PCB contaminated soils and groundwater from the site. A total of 1,400 cubic yards of PCB-impacted soils were removed from accessible exterior areas, which were generally excavated to a depth of two feet. A total of 165 cubic yards of PCB-impacted soils were removed from the former Boiler Room floor (PAP- 00124050). No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	0

AP_ABS	0

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Sequa Corporation (Foundry Street Complex)

185 Foundry Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	0.0%	Historically Compliant or No Evidence	Soil sampling and remediation took place to remove PCB contaminated soils and groundwater from the site. A total of 1,400 cubic yards of PCB-impacted soils were removed from accessible exterior areas, which were generally excavated to a depth of two feet. A total of 165 cubic yards of PCB-impacted soils were removed from the former Boiler Room floor (PAP- 00124050). No information on NOVs was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	0

AP_ABS	0

Allocation Facility Cmass Calculation

Seton Company, Inc. (Seton Tanning)	**349 Oraton Street, Newark, NJ 07104** **849 Broadway,Newark, NJ 07104** **62 Verona Ave, Newark, NJ 07104**	**Newark**	**NJ**	**07104**

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	5,700.12	8.23%	25,967.21	100.00%	-	7,836.08	1.018817E-2	79.84
Lead	100.00%	-	100.00%	13,999.24	8.23%	63,774.30	100.00%	-	19,245.05	1.018817E-2	196.07
Mercury	100.00%	-	100.00%	115.99	8.23%	528.40	100.00%	-	159.46	1.018817E-2	1.62
HPAHs	100.00%	-	100.00%	84,067.73	8.23%	382,975.19	100.00%	-	115,569.7	1.018817E-2	1,177.44
LPAHs	100.00%	-	100.00%	56,045.15	8.23%	255,316.78	100.00%	-	77,046.46	1.018817E-2	784.96
PCBs	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Seton Company, Inc. (Seton Tanning)	**349 Oraton Street, Newark, NJ 07104** **849 Broadway,Newark, NJ 07104** **62 Verona Ave, Newark, NJ 07104**	**Newark**	**NJ**	**07104**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	79.84	3.802E-5	2.623E-5
Lead	0.01	3,200,000.00	196.07	6.127E-5	6.127E-7
Mercury	0.95	42,000.00	1.62	3.868E-5	3.675E-5
HPAHs	0.05	240,000.00	1,177.44	4.906E-3	2.453E-4
LPAHs	0.01	170,000.00	784.96	4.617E-3	4.617E-5
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Seton Company, Inc. (Seton Tanning)	**349 Oraton Street, Newark, NJ 07104** **849 Broadway,Newark, NJ 07104** **62 Verona Ave, Newark, NJ 07104**	**Newark**	**NJ**	**07104**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	2.829E-2	79.84	59,335.76	2.829E-2	1.952E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	6.669E-2	196.07	213,209.75	6.669E-2	6.669E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	3.689E-2	1.62	1,547.72	3.689E-2	3.504E-2
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.659E-2	1,177.44	5,204.11	2.659E-2	1.329E-3
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.557E-2	784.96	3,562.4	2.557E-2	2.557E-4
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Seton Company, Inc. (Seton Tanning)	**349 Oraton Street, Newark, NJ 07104** **849 Broadway,Newark, NJ 07104** **62 Verona Ave, Newark, NJ 07104**	**Newark**	**NJ**	**07104**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Verona Ave	CSO	1.27%	21.70%	
2	Verona Ave	Bypass	7.95%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Documentation only shows discharge to PVSC
	# hours/per day discharged	Three contiguous properties at 349 Oraton St, 62 Verona Ave and 849 Broadway
5	#days/week discharged	1975 Waste Effluent Survey - 93100000 gallons wastewater to sanitary (1974)
52	#weeks/yr discharged	1975 waste effluent sample = 661568 gpd
88,441,160	calc gal/yr discharge PAS00102300, 304, 305; PAS 00102292,93	1979 PVSC Sewer Connection App = 810660 + 19392 gpd
1906	Yr Ops started	
2006	Yr Ops ceased	
100	calc #yrs facility operated	
Copper (Cu)		
100	#yrs facility discharged	1975 Waste Effluent Sample
0.946	calc mg/L COC discharged PAS00102292, 93 & PAS00102304,305	1979 PVSC Sewer Connection Application
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
31,667.33	calc kg COC discharged	
Lead (Pb)		
100	#yrs facility discharged	1975 Waste Effluent Sample
2.32	calc mg/L COC discharged PAS00102292, 93 & PAS00102304,305	1979 PVSC Sewer Connection Application
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
77,773.53	calc kg COC discharged	
Mercury (Hg)		
100	#yrs facility discharged	1975 Waste Effluent Sample
0.0193	calc mg/L COC discharged PAS00102292, 93 & PAS00102304,305	1979 PVSC Sewer Connection Application
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
644.39	calc kg COC discharged	
HPAHs		
100	#yrs facility discharged	1975 Waste Effluent Sample
232.53	calc mg/L O&G PAS00102292, 93 & PAS00102304,305	1979 PVSC Sewer Connection Application
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
14	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
467,042.91	calc kg COC discharged	
LPAHs		
100	#yrs facility discharged	1975 Waste Effluent Sample
232.53	calc mg/L O&G PAS00102292, 93 & PAS00102304,305	1979 PVSC Sewer Connection Application
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
9	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
311,361.94	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
100	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
61	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
31,667.33	kg Copper	
77,773.53	kg Lead	
644.39	kg Mercury	
467,042.91	kg HPAHs	
311,361.94	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Seton Company, Inc. (Seton Tanning)

349 Oraton Street, Newark, NJ 07104 **849 Broadway,Newark, NJ 07104** **62 Verona Ave, Newark, NJ 07104**	**Newark**	**NJ**	**07104**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.551E-4	10.0%	Periodic Noncompliacne	In 1956, it was noted that Seton dumped solid industrial waste into the sanitary sewer. In 1978, PVSC documented poor housekeeping and illegal industrial discharges to the combined sanitary and storm sewer system on Verona Avenue. Reportedly, the discharged material contained “high pH liquids as well as animal fats, greases and oils.” Seton representatives indicated that they could not afford the pre-treatment that was required (PAS-00008172). According to the Civil Action Consent Order filed on May 2, 1991, Seton’s wastewater discharge continued to exceed “pretreatment effluent limitations” for chromium, sulfur, and pH (PAS-00102337-338)	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	4.616E-4

AP_ABS	4.616E-4

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Seton Company, Inc. (Seton Tanning)

349 Oraton Street, Newark, NJ 07104 **849 Broadway,Newark, NJ 07104** **62 Verona Ave, Newark, NJ 07104**	**Newark**	**NJ**	**07104**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
5.682E-2	10.0%	Periodic Noncompliacne	In 1956, it was noted that Seton dumped solid industrial waste into the sanitary sewer. In 1978, PVSC documented poor housekeeping and illegal industrial discharges to the combined sanitary and storm sewer system on Verona Avenue. Reportedly, the discharged material contained “high pH liquids as well as animal fats, greases and oils.” Seton representatives indicated that they could not afford the pre-treatment that was required (PAS-00008172). According to the Civil Action Consent Order filed on May 2, 1991, Seton’s wastewater discharge continued to exceed “pretreatment effluent limitations” for chromium, sulfur, and pH (PAS-00102337-338)	20.0%	20% Failed to participate in conduct of allocation as offered by EPA	7.386E-2

AP_ABS	7.386E-2

Allocation Facility Cmass Calculation

Sherwin Williams Co.	60 Lister Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	78.19	100.00%	1,351.31	0.00%	4,406.45	100.00%	1,789.6	3,219.08	1.018817E-2	32.8
Lead	100.00%	3,873.87	100.00%	2,758.20	0.00%	8,994.15	100.00%	3,652.8	10,284.83	1.018817E-2	104.78
Mercury	100.00%	308.17	100.00%	5.21	0.00%	16.99	100.00%	6.9	320.28	1.018817E-2	3.26
HPAHs	100.00%	10.58	100.00%	-	0.00%	-	100.00%	-	10.58	1.018817E-2	0.11
LPAHs	100.00%	1.17	100.00%	-	0.00%	-	100.00%	-	1.17	1.018817E-2	0.01
PCBs	100.00%	0.92	100.00%	-	0.00%	-	100.00%	-	0.92	1.018817E-2	0.01
DDx	100.00%	0.02	100.00%	-	0.00%	-	100.00%	-	0.02	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Sherwin Williams Co.	60 Lister Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	32.8	1.562E-5	1.078E-5
Lead	0.01	3,200,000.00	104.78	3.274E-5	3.274E-7
Mercury	0.95	42,000.00	3.26	7.769E-5	7.381E-5
HPAHs	0.05	240,000.00	0.11	4.491E-7	2.246E-8
LPAHs	0.01	170,000.00	0.01	7.012E-8	7.012E-10
PCBs	12.87	26,000.00	0.01	3.605E-7	4.640E-6
DDx	1.37	27,000.00	0	7.547E-9	1.034E-8
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Sherwin Williams Co.	60 Lister Ave	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.162E-2	32.8	24,375.26	1.162E-2	8.020E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	3.564E-2	104.78	113,942.38	3.564E-2	3.564E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	7.410E-2	3.26	3,108.76	7.410E-2	7.039E-2
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.434E-6	0.11	0.48	2.434E-6	1.217E-7
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	3.883E-7	0.01	0.05	3.883E-7	3.883E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	4.585E-5	0.01	1.18	4.585E-5	5.901E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	7.946E-6	0	0.21	7.946E-6	1.089E-5
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Sherwin Williams Co.	**60 Lister Ave**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Operations from 1901-1999
	# hours/per day discharged	From 1901-1924 wastewater directly discharged to Passaic River
7	#days/week discharged	Volumes from:
52	#weeks/yr discharged	1972 Waste Effluent Survey = 64429000 gallons in 1971
79,268,000	calc gal/yr discharge (PAS00013183, PAS000123267, PAS00052110,11)	Heavy Metals Source Determination Study (1976-1978) = 0.3250 gpd
		1982 Hazardous Waste Investigation = 150000 gpd (avg)
1925	Yr Ops started	
1999	Yr Ops ceased	
74	calc #yrs facility operated	
Copper (Cu)		
74	#yrs facility discharged	1972 Waste Effluent Survey
0.26	calc mg/L COC discharged (PAS00013183, PAS000123267, PAS00052110,11)	Heavy Metals Source Determination Study (1976-1978)
3.785	L per gallon (Merck Index)	1982 Hazardous Waste Investigation
0.000001	kg per mg (Merck Index)	
5,757.76	calc kg COC discharged	
Lead (Pb)		
74	#yrs facility discharged	1972 Waste Effluent Survey
0.53	calc mg/L COC discharged (PAS00013183, PAS000123267, PAS00052110,11)	Heavy Metals Source Determination Study (1976-1978)
3.785	L per gallon (Merck Index)	1982 Hazardous Waste Investigation
0.000001	kg per mg (Merck Index)	
11,752.35	calc kg COC discharged	
Mercury (Hg)		
74	#yrs facility discharged	1972 Waste Effluent Survey
0.0010	calc mg/L COC discharged (PAS00013183, PAS000123267, PAS00052110,11)	Heavy Metals Source Determination Study (1976-1978)
3.785	L per gallon (Merck Index)	1982 Hazardous Waste Investigation
0.000001	kg per mg (Merck Index)	
22.20	calc kg COC discharged	
HPAHs		
74	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
74	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
74	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
54	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
5,757.76	kg Copper	
11,752.35	kg Lead	
22.20	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Operations from 1901-1999
	# days/week discharged	From 1901-1924 wastewater directly discharged to Passaic River
	# weeks/yr discharged	Volumes from:
79,268,000	# gals/yr directly discharged (PAS00013183, PAS000123267, PAS00052110,11)	1972 Waste Effluent Survey = 64429000 gallons in 1971
		Heavy Metals Source Determination Study (1976-1978) = 0.3250 gpd
4.08	ft; 30yr average annual precipitation per Rutgers information	1982 Hazardous Waste Investigation = 150000 gpd (avg)
43,560	ft2 per acre	
13.00	acres	
50%	Percent Precip to River	
1901	Yr Ops started	
1924	Yr Ops ceased	
23	calc #yrs facility operated	
Copper (Cu)		
23	#yrs facility discharged	1972 Waste Effluent Survey
0.26	calc mg/L COC discharged (PAS00013183, PAS000123267,	Heavy Metals Source Determination Study (1976-1978)
3.785	L per gallon (Merck Index)	1982 Hazardous Waste Investigation
0.000001	kg per mg (Merck Index)	
1,789.58	calc kg COC discharged	
Lead (Pb)		
23	#yrs facility discharged	1972 Waste Effluent Survey
0.53	calc mg/L COC discharged (PAS00013183, PAS000123267, PAS00052110,11)	Heavy Metals Source Determination Study (1976-1978)
3.785	L per gallon (Merck Index)	1982 Hazardous Waste Investigation
0.000001	kg per mg (Merck Index)	
3,652.76	calc kg COC discharged	
Mercury (Hg)		
23	#yrs facility discharged	1972 Waste Effluent Survey
0.0010	calc mg/L COC discharged (PAS00013183, PAS000123267, PAS00052110,11)	Heavy Metals Source Determination Study (1976-1978)
3.785	L per gallon (Merck Index)	1982 Hazardous Waste Investigation
0.000001	kg per mg (Merck Index)	
6.90	calc kg COC discharged	
HPAHs		
23	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
23	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
-4	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-15	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-25	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
23	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-21	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-20	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-25	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
1,789.58	kg Copper	
3,652.76	kg Lead	
6.90	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
13	ACRES - TOTAL SITE AREA (acres)	FDR Page 1. 11.04 acres (PAP-00126535) to 13 acres (PAP-00126441). Max value used.	
0.65	ACRES - AFFECTED AREA	Lot appears mostly paved based on Google Earth aerial photos from 1995 and Feb 2017 Final Soil RI (PAP-00126443), which states that 95% of the site is paved. The 2017 Soil RI also states that in the past, the site was entirely covered with impervious surfaces (PAP-00126564). Since operations began in 1901, will assume that some of the lot was not paved, ~5%.	
4,046.86	$METERS^2$/ACRE		
2,630	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	$METERS^3$/YEAR (ERODED SOIL VOLUME)		
1901	Year site operations began	FDR Page 1. Production of paints and varnish.	
1999	Year site processing and storage operations ceased	FDR Page 1. Ceased operations.	
98	NUMBER YEARS DISCHARGE	FDR Page 1	
26	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	0-4 ft of fill beneath concerete is reddish brown silt with some fine to medium sand and gravel (PAP-00126564). Bulk density range for silty sand and gravel is 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
50,590	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
98	YEARS DISCHARGED		
1,530	MG/KG (MAX CONCENTRATION)	Copper concentration at B8-0.0-0.5 from 0-0.5 ft bgs (PAP-00367337). Used max result from shallowest depth.	
0.000001	kg per mg (Merck Index)		
77	KILOGRAMS DISCHARGED		
Lead (Pb)			
98	YEARS DISCHARGED		
75800	MG/KG (AVERAGE CONCENTRATION)	Lead concentration from H4-0.5/1 from 0.5-1 ft (PAP-00367333). Using the max result from shallowest depth.	
0.000001	kg per mg (Merck Index)		
3,835	KILOGRAMS DISCHARGED		
Mercury (Hg)			
98	YEARS DISCHARGED		
6,030.0	MG/KG (MAX CONCENTRATION)	Mercury concentration in AOC19-05-1.5-2 from 1.5-2 ft (PAP-00367332). Due to the density of mercury, the highest concentration is likely in subsurface soil.	
0.000001	kg per mg (Merck Index)		
305	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
98	YEARS DISCHARGED		
206.9	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
10	KILOGRAMS DISCHARGED		
PAHs (others detected)			
98	YEARS DISCHARGED		
23	MG/KG (TOTAL PAH MAX CONCENTRATION)	Naphthalene - 23 mg/kg 0-0.5 ft (PAP-00367328)	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
0-0.5 ft AOC13-03 (PAP-00367324)	Benzo(a)pyrene	140.000	1.0	140.0000
0-0.5 ft (PAP-00367326)	Benzo(a)anthracene	74.000	0.1	7.4000
0-0.5 ft (PAP-00367330)	Benzo(b)fluoranthene	250.000	0.1	25.0000
0-0.5 ft (PAP-00367330)	Benzo(k)fluoranthene	89.000	0.01	0.8900
0-0.5 ft (PAP-00367324)	Chrysene	200.000	0.001	0.2000
24 mg/kg 0-0.5 ft (PAP-00367330)	Dibenz(a,h)anthracene	24.000	1.0	24.0000
0-0.5 ft (PAP-00367330)	Indeno(1,2,3-cd)pyrene	94.000	0.1	9.4000
	DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg			
			Total Benzo(a)pyrene Equivalents =	**206.9**

PCBs			
69	YEARS DISCHARGED	The 2017 Report indicates that PCB contamination is due to an off-site source, possibly a former oil refinery, that was located along the southwestern boundary of the Copco Parcel. The area was capped but the date was not provided (FDR Page 3).	
18	MG/KG (MAX OF REPORTED CONCENTRATIONS)	18 mg/kg was identified in the Copco Parcel (FDR Page 3).	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
DDx		FDR Page 4 - DDT overflowed from a tanker at the adjacent former Diamond Shamrock site and ran onto the Sherwin Williams site (PAP-00145018-19)	FDR 5 - Inseticides may have been stored 1940s-1960s but no other info (PAP-00126497).
98	YEARS DISCHARGED within DDx Timeline		
0.38	MG/KG (MAX CONCENTRATION)	Sum of 4,4-DDD and 4-4-DDE concentrations from sample at 0-0.5 ft (PAP-00367342)	
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dieldrin			
98	YEARS DISCHARGED within Dieldrin Timeline		
0.093	MG/KG (MAX CONCENTRATION)	Dieldrin concentration from sample at 0-0.5 ft (PAP-00367341)	
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	Dioxins were identified onsite but attributed to a different source (FDR page 3) (former manufacturing operations at an adjacent superfund site (PAP-00126551))	
98	YEARS DISCHARGED		
0.023	MG/KG (MAX CONCENTRATION)	Dioxins/furans (TEQ) from sample at 0-0.5 ft (PAP-00367345)	
0.000001	kg per mg (Merck Index)		
0	calc kg COC discharged		

SUMMARY CMASS ESTIMATES:	
77.40	kg Copper
3,834.74	kg Lead
305.06	kg Mercury
10.47	kg PAHs (Benzo(a)pyrene Equivalent)
1.16	kg PAHs (Other)
0.91	kg PCBs
0.02	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

4,229.77	MASS (KG) DISCHARGED FROM SURFACE SOIL

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
13	ACRES - TOTAL SITE AREA (acres)	FDR Page 1. 11.04 acres (PAP-00126535) to 13 acres (PAP-00126441). Max value used.	
0.65	ACRES - AFFECTED AREA	Lot appears mostly paved based on Google Earth aerial photos from 1995 and Feb 2017 Final Soil RI (PAP-00126443), which states that 95% of the site is paved. The 2017 Soil RI also states that in the past, the site was entirely covered with impervious surfaces (PAP-00126564). Since operations began in 1901, will assume that some of the lot was not paved, ~5%.	
4,046.86	$METERS^2$/ACRE		
2,630	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	$METERS^3$/YEAR (ERODED SOIL VOLUME)		
1998	Year site operations began	Release to the Passaic documented March 1998 (FDR Page 10)	
1999	Year site processing and storage operations ceased	Conservatively assume a one year spill period (FDR Page 10)	
1	NUMBER YEARS DISCHARGE		
0	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	0-4 ft of fill beneath concrete is reddish brown silt with some fine to medium sand and gravel (PAP-00126564). Bulk density range for silty sand and gravel is 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
516	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		Specific to the March 1998 release. A leak in an AST with slurry and cracks in the AST pad resulted in a release to the Passaic. No known samples were collected (FDR Page 10, PAP-00126438). Will assume contamination levels from main spreadsheet.	
Copper (Cu)			
1	YEARS DISCHARGED		
1,530	MG/KG (MAX CONCENTRATION)	B8-0.0-0.5 from 0-0.5 ft bgs (PAP-00367337). Used max result from shallowest depth.	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
Lead (Pb)			
1	YEARS DISCHARGED		
75800	MG/KG (AVERAGE CONCENTRATION)	H4-0.5/1 from 0.5-1 ft (PAP-00367333). Using the max result from shallowest depth.	
0.000001	kg per mg (Merck Index)		
39	KILOGRAMS DISCHARGED		
Mercury (Hg)		AOC19-05-1.5-2 from 1.5-2 ft (PAP-00367332). Due to the density of mercury, the highest concentration is likely in subsurface soil.	
1	YEARS DISCHARGED		
6,030.0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
3	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.
1	YEARS DISCHARGED	
206.9	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PAHs (others detected)		
1	YEARS DISCHARGED	
23	MG/KG (TOTAL PAH MAX CONCENTRATION)	Naphthalene - 23 mg/kg 0-0.5 ft (PAP-00367328)
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
PCBs		The 2017 Report indicates that PCB contamination is due to an off-site source, possibly a former oil refinery, that was located along the southwestern boundary of the Copco Parcel. The area was capped but the date was not provided (FDR Page 3).
1	YEARS DISCHARGED	18 mg/kg was identified in the Copco Parcel (FDR Page 3).
18	MG/KG (MAX OF REPORTED CONCENTRATIONS)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
DDx		FDR Page 4 - DDT overflowed from a tanker at the adjacent former Diamond Shamrock site and ran onto the Sherwin Williams site (PAP-00145018-19)
1	YEARS DISCHARGED within DDx Timeline	
0.38	MG/KG (MAX CONCENTRATION)	Sum of 4,4-DDD and 4-4-DDE concentrations from sample at 0-0.5 ft (PAP-00367342)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
1	YEARS DISCHARGED within Dieldrin Timeline	
0.093	MG/KG (MAX CONCENTRATION)	Dieldrin concentration from sample at 0-0.5 ft (PAP-00367341)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	Dioxins were identified onsite but attributed to a different source (FDR page 3) (former manufacturing operations at an adjacent superfund site (PAP-00126551))
1	YEARS DISCHARGED	
0.023	MG/KG (MAX CONCENTRATION)	Dioxins/furans (TEQ) from sample at 0-0.5 ft (PAP-00367345)
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

FDR 5 - Inseticides may have been stored 1940s-1960s but no other info (PAP-00126497).

	Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
0-0.5 ft AOC13-03 (PAP-00367324)	Benzo(a)pyrene	140.000	1.0	140.0000
0-0.5 ft (PAP-00367326)	Benzo(a)anthracene	74.000	0.1	7.4000
0-0.5 ft (PAP-00367330)	Benzo(b)fluoranthene	250.000	0.1	25.0000
0-0.5 ft (PAP-00367330)	Benzo(k)fluoranthene	89.000	0.01	0.8900
0-0.5 ft (PAP-00367324)	Chrysene	200.000	0.001	0.2000
24 mg/kg 0-0.5 ft (PAP-00367330)	Dibenz(a,h)anthracene	24.000	1.0	24.0000
0-0.5 ft (PAP-00367330)	Indeno(1,2,3-cd)pyrene	94.000	0.1	9.4000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 206.9

SUMMARY CMASS ESTIMATES:	
0.79	kg Copper
39.13	kg Lead
3.11	kg Mercury
0.11	kg PAHs (Benzo(a)pyrene Equivalent)
0.01	kg PAHs (Other)
0.01	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

43.16 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Sherwin Williams Co.

60 Lister Ave	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.958E-5	5.0%	Occasional Noncompliance	Spills (emulsion paint and washwater/thinner) identified by former employees resulted in discharges to the Passaic River, but information for the quantity of the discharge or if they contained COCs was not available. NOV was issued by PVSC in 1986 as a result of cleaning causing an accumulation of gray viscous material in the PVSC sand catcher. (No COC involvement) This was due to an accidental in-plant chemical spill, which caused blockages within their waste piping disposal system (PAS-00014642-47). Correspondence from May and June 1987 discusses the continued problem of paint materials discharging from Sherwin Williams and clogging up the PVSC sand catcher located at the entrance of the Sherwin Williams site (PAS-00014638-41).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	7.615E-5

AP_ABS	7.615E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Sherwin Williams Co.

60 Lister Ave	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
7.937E-2	5.0%	Occasional Noncompliance	Spills (emulsion paint and washwater/thinner) identified by former employees resulted in discharges to the Passaic River, but information for the quantity of the discharge or if they contained COCs was not available. NOV was issued by PVSC in 1986 as a result of cleaning causing an accumulation of gray viscous material in the PVSC sand catcher. (No COC involvement) This was due to an accidental in-plant chemical spill, which caused blockages within their waste piping disposal system (PAS-00014642-47). Correspondence from May and June 1987 discusses the continued problem of paint materials discharging from Sherwin Williams and clogging up the PVSC sand catcher located at the entrance of the Sherwin Williams site (PAS-00014638-41).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.746E-2

AP_ABS	6.746E-2

Allocation Facility Cmass Calculation

SpectraServ, Inc.	75 Jacobus Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	58.29	100.00%	-	0.00%	185,704.58	100.00%	9,810.8	9,869.13	1.018817E-2	100.55
Lead	100.00%	-	100.00%	-	0.00%	145,901.45	100.00%	7,910.1	7,910.1	1.018817E-2	80.59
Mercury	100.00%	0.13	100.00%	-	0.00%	12.47	100.00%	-	0.13	1.018817E-2	0
HPAHs	100.00%	1.64	100.00%	-	0.00%	-	100.00%	-	1.64	1.018817E-2	0.02
LPAHs	100.00%	1.79	100.00%	-	0.00%	-	100.00%	-	1.79	1.018817E-2	0.02
PCBs	100.00%	1.2	100.00%	-	0.00%	-	100.00%	-	1.2	1.018817E-2	0.01
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

SpectraServ, Inc.	75 Jacobus Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	100.55	4.788E-5	3.304E-5
Lead	0.01	3,200,000.00	80.59	2.518E-5	2.518E-7
Mercury	0.95	42,000.00	0	3.153E-8	2.996E-8
HPAHs	0.05	240,000.00	0.02	6.962E-8	3.481E-9
LPAHs	0.01	170,000.00	0.02	1.073E-7	1.073E-9
PCBs	12.87	26,000.00	0.01	4.702E-7	6.052E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

SpectraServ, Inc.	75 Jacobus Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	3.563E-2	100.55	74,730.33	3.563E-2	2.459E-2
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.741E-2	80.59	87,633.5	2.741E-2	2.741E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	3.007E-5	0	1.26	3.007E-5	2.857E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	3.773E-7	0.02	0.07	3.773E-7	1.887E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	5.941E-7	0.02	0.08	5.941E-7	5.941E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	5.980E-5	0.01	1.54	5.980E-5	7.696E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

SpectraServ, Inc.	**75 Jacobus Avenue**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Limited data, assuming discharge to PVSC is 365 days per year.
	# hours/per day discharged	1986 USEPA PA Report = 50000-100000gpd
	#days/week discharged	1991 PVSC Sewer Connection Permit = 164250000 gallons/year
	#weeks/yr discharged	2015 permit limits = 0.082 MGD
76,893,333	calc gal/yr discharge PAS00054825, PAP00455914, PAP00206942, PAP00192816	
1962	Yr Ops started	
2020	Yr Ops ceased	
58	calc #yrs facility operated	
Copper (Cu)		
58	#yrs facility discharged	2012-2016 DMRs showed range of .011-79.9mg/l discharged. Assuming average = 39.96 mg/l
11.001	calc mg/L COC discharged PAS00054825, PAP00455914, PAP00206942, PAP00192816	2015 Permit Limit = 1.06mg/l
3.785	L per gallon (Merck Index)	2017 Permit Limit = <.0048mg/l
0.000001	kg per mg (Merck Index)	2020 Permit Limit = 3.98 mg/l
185,704.58	calc kg COC discharged	
Lead (Pb)		
58	#yrs facility discharged	1991 PVSC Sewer Connection Permit = .43 mg/l avg
8.64	calc mg/L COC discharged PAS00054825, PAP00455914, PAP00206942, PAP00192816	2012-2016 DMRs showed range of 5.1-60.46mg/l discharged. Assuming average = 32.78 mg/l
3.785	L per gallon (Merck Index)	2015 Permit Limit - .283 mg/l
0.000001	kg per mg (Merck Index)	2017 Permit Limit = <.21 mg/l
145,901.46	calc kg COC discharged	2020 permit Limit = 1.3 mg/l
Mercury (Hg)		
58	#yrs facility discharged	
0.000739	calc mg/L COC discharged PAP00192816	2015 Permit Limit -<.000739 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
12.47	calc kg COC discharged	
HPAHs		
58	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
58	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
16	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
11	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
26	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
58	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
59	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
24	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
14	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
185,704.58	kg Copper	
145,901.46	kg Lead	
12.47	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Stormwater Directly Discharged to Passaic River.....no data on flow so calcluated based on rainfall data and assuming 50% makes to river
	# days/week discharged	
	# weeks/yr discharged	
4,324,598	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
6.50	acres	
50%	Percent Precip to River	
1962	Yr Ops started	
2020	Yr Ops ceased	
58	calc #yrs facility operated	
Copper (Cu)		
58	#yrs facility discharged	2012-2016 DMRs showed range of .011-79.9mg/l discharged. Assuming average = 39.96 mg/l
11.001	calc mg/L COC discharged PAS00054825, PAP00455914, PAP00206942, PAP00192816	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
10,444.31	calc kg COC discharged	
Lead (Pb)		
58	#yrs facility discharged	1991 PVSC Sewer Connection Permit = .43 mg/l avg
8.64	calc mg/L COC discharged PAS00054825, PAP00455914, PAP00206942, PAP00192816	2012-2016 DMRs showed range of 5.1-60.46mg/l discharged. Assuming average = 32.78 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
8,205.72	calc kg COC discharged	
Mercury (Hg)		
58	#yrs facility discharged	
-	calc mg/L COC discharged PAP00192816	2015 Permit Limit -<.000739 mg/l
3.785	L per gallon (Merck Index)	Credit for NJPDES Permit
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
58	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
58	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
16	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
11	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
26	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
58	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
59	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
24	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
14	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
9,810.84	kg Copper	
7,910.10	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
6.5	ACRES - TOTAL SITE AREA (acres)	FDR page 1	
1	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of historical aerial photographs 1995-2020 (Google Earth)	
4,046.86	METERS^2/ACRE		
2,023	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1962	Year site operations began	FDR page 1	
2020	Year site processing and storage operations ceased	Present (FDR page 1)	
58	NUMBER YEARS DISCHARGE		
12	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Fill reported as fine to coarse sand, with some silt and trace and gravel (PAP-00192948-62). Bulk density range for silty sand and gravel 1442 KG/M^3 to 2483 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
23,038	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)			
58	YEARS DISCHARGED		
2,530	MG/KG (MAX CONCENTRATION)	Copper concentration in on-site surface soil sample S-21 (0-1) (PAS-00054863).	
0.000001	kg per mg (Merck Index)		
58	KILOGRAMS DISCHARGED		
Lead (Pb)			
58	YEARS DISCHARGED		
0	MG/KG (MAX CONCENTRATION)	Lead concentration in on-site surface soil sample S-13 (0-1). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
58	YEARS DISCHARGED		
5.6	MG/KG (MAX CONCENTRATION)	Mercury concentration in on-site surface soil sample SS-1 (0-1) (PAS-00054863).	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
58	YEARS DISCHARGED		
71.3	MG/KG (TOTAL PAH MAX CONCENTRATION)	Sum of Benzo(a)pyrene Equivalent conversion concentrations using maximum concentrations found in surface soil sample S-14 (0-1 ft bgs) (PAS-00054858).	
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
58	YEARS DISCHARGED		
77.6	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		
PCBs			
58	YEARS DISCHARGED		
52	MG/KG (MAX CONCENTRATION)	Total PCBs concentration in on-site surface soil sample S-21 (0-1) (PAS-00054862).	
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
DDx			
0	NONE FOUND IN AVAILABLE DOCUMENTATION		
0	MG/KG (MAX CONCENTRATION)		
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	58.110	1.0	58.1100
Benzo(a)anthracene	36.590	0.1	3.6590
Benzo(b)fluoranthene	55.670	0.1	5.5670
Benzo(k)fluoranthene	0.000	0.01	0.0000
Chrysene	49.400	0.001	0.0494
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	38.650	0.1	3.8650

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **71.3**

Sample S-15 (0-1 ft bgs) (PAS-00054858)	
Anthracene	4.214
Acenaphthene	3.808
Acenaphthylene	0
Fluorene	4.196
Naphthalene	27.36
Phenanthrene	22.14
2-Methylnaphthalene	15.93
SUM	77.648

Dieldrin	
0	NONE FOUND IN AVAILABLE DOCUMENTATION
0	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dioxins/Furans	
69	NONE FOUND IN AVAILABLE DOCUMENTATION
0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	calc kg COC discharged

SUMMARY CMASS ESTIMATES:	
58.29	kg Copper
0.00	kg Lead
0.13	kg Mercury
1.64	kg PAHs (Benzo(a)pyrene Equivalent)
1.79	kg PAHs (Other)
1.20	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

63.04	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

SpectraServ, Inc.

75 Jacobus Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.938E-5	5.0%	Occasional Noncompliance	The facility has received numerous NOVs from PVSC since 1999. The NOVs were for non-COCs (e.g., petroleum hydrocarbons, discharge of sludge to the sanitary sewer, use of water to dilute a discharge, discharge of floatable greases to the sanitary sewer, discharge of solids to the sanitary sewer, improper discharge monitoring).	0.0%	0% Cooperation with conduct of allocation and requests for related information	4.134E-5

AP_ABS	4.134E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

SpectraServ, Inc.

75 Jacobus Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.566E-2	5.0%	Occasional Noncompliance	The facility has received numerous NOVs from PVSC since 1999. The NOVs were for non-COCs (e.g., petroleum hydrocarbons, discharge of sludge to the sanitary sewer, use of water to dilute a discharge, discharge of floatable greases to the sanitary sewer, discharge of solids to the sanitary sewer, improper discharge monitoring).	0.0%	0% Cooperation with conduct of allocation and requests for related information	2.694E-2

AP_ABS	2.694E-2

Allocation Facility Cmass Calculation

Stanley Black & Decker, Inc.	140 Chapel St	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	493.88	100.00%	381.35	0.00%	722.56	100.00%	146.7	1,021.89	1.018817E-2	10.41
Lead	100.00%	7,154.69	100.00%	343.07	0.00%	650.03	100.00%	131.9	7,629.7	1.018817E-2	77.73
Mercury	100.00%	0.38	100.00%	-	0.00%	-	100.00%	-	0.38	1.018817E-2	0
HPAHs	100.00%	0.71	100.00%	2,473.63	0.00%	4,686.88	100.00%	951.3	3,425.67	1.018817E-2	34.9
LPAHs	100.00%	17.27	100.00%	1,649.09	0.00%	3,124.59	100.00%	634.2	2,300.58	1.018817E-2	23.44
PCBs	100.00%	2.19	100.00%	-	0.00%	-	100.00%	-	2.19	1.018817E-2	0.02
DDx	100.00%	0.02	100.00%	-	0.00%	-	100.00%	-	0.02	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Stanley Black & Decker, Inc.	140 Chapel St	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	10.41	4.958E-6	3.421E-6
Lead	0.01	3,200,000.00	77.73	2.429E-5	2.429E-7
Mercury	0.95	42,000.00	0	9.218E-8	8.757E-8
HPAHs	0.05	240,000.00	34.9	1.454E-4	7.271E-6
LPAHs	0.01	170,000.00	23.44	1.379E-4	1.379E-6
PCBs	12.87	26,000.00	0.02	8.582E-7	1.104E-5
DDx	1.37	27,000.00	0	6.868E-9	9.409E-9
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	1.609E-7	1.350E-5

Allocation Facility COC Base Scores - Alternative Calulcation

Stanley Black & Decker, Inc.	140 Chapel St	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	3.690E-3	10.41	7,737.91	3.690E-3	2.546E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.644E-2	77.73	84,527.	2.644E-2	2.644E-4
Mercury	0.95	42,000.00	4,322.53	41,955.96	8.791E-5	0	3.69	8.791E-5	8.352E-5
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	7.882E-4	34.9	154.26	7.882E-4	3.941E-5
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	7.636E-4	23.44	106.37	7.636E-4	7.636E-6
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.091E-4	0.02	2.82	1.091E-4	1.405E-3
DDx	1.37	27,000.00	2,516.93	26,974.36	7.231E-6	0	0.2	7.231E-6	9.907E-6
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	1.609E-7	0	0	1.609E-7	1.350E-5

Facility Bypass Information

Stanley Black & Decker, Inc.	**140 Chapel St**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Prior to 1925 it is presumed that the facility discharged directly to the Passaic River
	# hours/per day discharged	PVSC discharge calculated from 1925-1985 based on available data
	#days/week discharged	1974-1981 discharge volumes
	#weeks/yr discharged	- 43800000, 46566656, 34075888, 17455588 gallons (1974, 1979, 1980 and 1981)
36,920,626	calc gal/yr discharge (PAP00019268, 293, 288, 301)	- 1984 .117 MGD
1925	Yr Ops started	
1985	Yr Ops ceased	
61	calc #yrs facility operated	FDR Page 22
Copper (Cu)		
61	#yrs facility discharged	1980 PVSC Application Data for Metals
0.130	calc mg/L COC discharged PAP00019285	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,103.91	calc kg COC discharged	
Lead (Pb)		
61	#yrs facility discharged	1980 PVSC Application Data for Metals
0.117	calc mg/L COC discharged PAP00019285	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
993.09	calc kg COC discharged	
Mercury (Hg)		
61	#yrs facility discharged	
-	calc mg/L COC discharged PAP00019285	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
61	#yrs facility discharged	1980 PVSC Application Data for Oil and Grease
14.00	calc mg/L O&G PAP00019285	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.8	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
7,160.51	calc kg COC discharged	
LPAHs		
61	#yrs facility discharged	1980 PVSC Application Data for Oil and Grease
14.00	calc mg/L O&G PAP00019285	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.6	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,773.67	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
36	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
61	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
40	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
1,103.91	kg Copper	
993.09	kg Lead	
-	kg Mercury	
7,160.51	kg HPAHs	
4,773.67	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Direct discharge was direct to Passaic River per NJPDES Permits
	# days/week discharged	Prior to 1925 presumed all discharge direct to river
	# weeks/yr discharged	Caculating Stormwater discharge based on rainfall flow and combining with wastewater flow information (assume 34MG per year per POTW-PVSC Calc.)
2,927,420	# gals/yr directly discharged	Volume is stormwater calculated as 2927420 + 34MG/yr
4.08	ft; 30yr average annual precipitation per Rutgers information	Per the assertion that Stanley Black and Decker is not responsible for actions by Atha Tools from the 1800s through 1920s the discharge to surface water Dmass calculation has been modified to be only from 1920-1925 when it is presumed that all discharges were changed to the PVSC
	acres	
43,560	ft2 per acre	
4.40	acres	
50%	Percent Precip to River	
1917	Yr Ops started	
1924	Yr Ops ceased	
8	calc #yrs facility operated	FDR Page 22
Copper (Cu)		
8	#yrs facility discharged	1980 PVSC Application Data for Metals
0.130	calc mg/L COC discharged PAP00019285	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
146.66	calc kg COC discharged	
Lead (Pb)		
8	#yrs facility discharged	1980 PVSC Application Data for Metals
0.1165	calc mg/L COC discharged PAP00019285	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
131.94	calc kg COC discharged	
Mercury (Hg)		
8	#yrs facility discharged	
-	calc mg/L COC discharged PAP00019285	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
8	#yrs facility discharged	1980 PVSC Application Data for Oil and Grease
14.00	calc mg/L O&G PAP00019285	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.8	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
951.33	calc kg COC discharged	
LPAHs		
8	#yrs facility discharged	1980 PVSC Application Data for Oil and Grease
14.00	calc mg/L O&G PAP00019285	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.6	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
634.22	calc kg COC discharged	
PCBs		
-4	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-15	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-25	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-21	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-20	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-25	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
146.66	kg Copper	
131.94	kg Lead	
-	kg Mercury	
951.33	kg HPAHs	
634.22	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

DISCHARGE CALCULATIONS	DIRECT DISCHARGE INFORMATION	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
6.2	ACRES - TOTAL SITE AREA (acres)	FDR, page 1, confirmed with Google Earth	Stanley Black and Decker; formerly known as The Stanley Works (Stanley), 139 and 140 Chapel Street, Newark, New Jersey. The site is comprised of two parcels of land separated by Chapel Street. The Western Parcel is approximately 1.8 acres; the Eastern Parcel approximately 4.4 acres (PAS-00085749).
3.0	ACRES - AFFECTED AREA	3 acres exposed land - western 1.8 acres and eastern 1.2 acres (1995-2020 Google Earth aerial photos)	
4,046.86	METERS^2/ACRE		
12,141	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
1	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1917	Year Stanley purchased the site	Operator: 1875 – 1985; Owner: 1875 – December 1997; acquired the site in 1917 and merged with The Stanley Works in 1920 (FDR page 1)	
1997	Year site operations ceased		
80	NUMBER YEARS DISCHARGE		
97	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
2,250	KG/M^3 SOIL DENSITY	Fill reported as a variety of materials, including coal slag, cinders, green glass slag, crushed bricks, assorted gravel, and brown-black sand and silt (PAP-00016872-75). Bulk density range 2002 KG/M^3 to 2499 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
218,530	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The entirety of the site is located on historic fill material (FDR page 15)	
Copper (Cu)			
80	YEARS DISCHARGED		
2,260	MG/KG (MAX CONCENTRATION)	Well boring 447A-MW05-01 at depth of 0.0-0.5 ft bgs (PAP-00017102)	
0.000001	kg per mg (Merck Index)		
494	KILOGRAMS DISCHARGED		
Lead (Pb)			
80	YEARS DISCHARGED		
32,740	MG/KG MAX CONCENTRATION)	Well boring 447A-MW05-01 at depth of 0.0-0.5 ft bgs (PAP-00017081-110)	
0.000001	kg per mg (Merck Index)		
7,155	KILOGRAMS DISCHARGED		
Mercury (Hg)			
80	YEARS DISCHARGED		
1.7	MG/KG (MAX CONCENTRATION)	Sample location 447A-0001-02 0001 at depth of 5.7-6.2 ft bgs (PAP-00017081)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
80	YEARS DISCHARGED		
3.3	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
1	KILOGRAMS DISCHARGED		
PAHs (others detected)			
80	YEARS DISCHARGED		
79	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
17	KILOGRAMS DISCHARGED		

PAH CONCENTRATIONS USED HERE ARE FROM SOIL SAMPLE 447A-2101-01 COLLECTED AT DEPTH OF 0.0-0.5 FT. (PAP-00017157). MAX PAH CONCENTRATIONS FOR SHALLOW SURFACE SAMPLES.

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.000	1.0	0.0000
Benzo(a)anthracene	10.000	0.1	1.0000
Benzo(b)fluoranthene	0.000	0.1	0.0000
Benzo(k)fluoranthene	0.000	0.01	0.0000
Chrysene (OTHERS APPLY TEF = 0.01)	11.000	0.001	0.0110
Dibenz(a,h)anthracene	1.600	1.0	1.6000
Indeno(1,2,3-cd)pyrene	6.400	0.1	0.6400

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **3.3**

PCBs		PCBs were used in a transformer (and possibly other electrical equipment) at the site (PAP-00018252, 257, 328, 332). Transformers were likely present at the site because most manufacturing operations had transformers containing PCBs during the period of operation. These could have led to releases from leaks, poor storage or disposal with replacement, or spills of PCB oils during refill.	Stanley generated and shipped 9.86 tons of undrained electrical transformers containing PCBs in 1993 (PAP-00018238).
67	YEARS DISCHARGED	Max concentration of PCBs (PAP-00017115-55). Number of years changed to reflect a 1930 start date for PCBs.	
10	MG/KG (MAX OF REPORTED CONCENTRATIONS)		
0.000001	kg per mg (Merck Index)		
2	KILOGRAMS DISCHARGED		
DDx			
57	YEARS DISCHARGED within DDx Timeline		
0.117	MG/KG (MAX CONCENTRATION)	SOIL SAMPLE 447A-MW01-01 COLLECTED FROM DEPTH OF 0.0-1.0 FT CONTAINS ONLY DETECTABLE RESULTS FOR DDx (4,4-DDE AND 4,4'-DDT) SUM = 0.117 mg/kg (PAP-00017131). Number of years reflect a 1940 start date for DDx.	
0.000001	kg per mg (Merck Index)		
0.018217	KILOGRAMS DISCHARGED		
Dieldrin			
0	YEARS DISCHARGED within Dieldrin Timeline	NONE REPORTED	
0	MG/KG (MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0.00	KILOGRAMS DISCHARGED		
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION		
57	YEARS DISCHARGED		
0.0027	MG/KG (MAX CONCENTRATION)	DIOXIN Octa-CDD DETECTED IN SOIL SAMPLE 447A-0302-01 AT 0.0027 MG/KG. Number of years reflect a 1940 start date for dioxin.	
0.000001	kg per mg (Merck Index)		
0.0006	KILOGRAMS DISCHARGED		

SUMMARY FTMASS ESTIMATES:	
493.88	kg Copper
7154.69	kg Lead
0.38	kg Mercury
0.71	kg PAHs (Benzo(a)pyrene Equivalent)
17.27	kg PAHs (Other)
2.19	kg PCBs
0.0182	kg DDx
0.0000	kg Dieldrin
0.0006	kg Dioxins/Furans

7669.1241 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Stanley Black & Decker, Inc.

140 Chapel St	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.695E-5	0.0%	Historically Compliant or No Evidence	According to a Request for Information, dated March 30, 2004, Stanley received wastewater treatment system violations associated with its remediation system initiated on December 15, 1998 (PAS-00085670). Violations were for TSS, TOC, TPH in effluent samples collected in 1999 and 2001. There were numerous areas with stained soil. (PAP-00018703, PAP-00018761, PAP-00018779-80, 82, PAP-00018807-09, 12, PAP-00018831, 33).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.956E-5

AP_ABS	2.956E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Stanley Black & Decker, Inc.

140 Chapel St	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.369E-3	0.0%	Historically Compliant or No Evidence	According to a Request for Information, dated March 30, 2004, Stanley received wastewater treatment system violations associated with its remediation system initiated on December 15, 1998 (PAS-00085670). Violations were for TSS, TOC, TPH in effluent samples collected in 1999 and 2001. There were numerous areas with stained soil. (PAP-00018703, PAP-00018761, PAP-00018779-80, 82, PAP-00018807-09, 12, PAP-00018831, 33).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.495E-3

AP_ABS	3.495E-3

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

STANLEY BLACK & DECKER

Stanley Black & Decker note that OCC is currently implementing the Remedial Design for OU2 ("RD"), which is projected by EPA to cost approximately $165 million. OCC released 41 parties, including Stanley, from OCC's claim for these RD costs. Accordingly, any allocation of OU2 costs that includes OCC and Stanley (and the other parties to the release) must reflect OCC's release of this liability.

ALLOCATOR'S DETERMINATION – Though I have not had the opportunity to review the underlying settlement document and other potentially relevant facts associated with the release provided by OCC, assuming its validity, it is apparent that there is a high likelihood of success in any action against OCC to enforce the release. Given OCC's lack of participation in the allocations process, however, the Allocator does not believe that it is appropriate to account for the amount of any such release in the assignment of allocated shares. Rather, the Allocator notes the existence of the release and recommends that it be taken into account in determining the appropriate amount of any future settlement with EPA.

Allocation Facility Cmass Calculation

STWB Inc.	120 Lister Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	0.00%	202.52	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

STWB Inc.	120 Lister Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

STWB Inc.	120 Lister Avenue	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

STWB Inc.	**120 Lister Avenue**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Manufactuer of organic/inorganic pigments
	# hours/per day discharged	Phthalo dyes
	#days/week discharged	Transoxide use
	#weeks/yr discharged	Wastewater very limited COCs
1,000,000	calc gal/yr discharge	No information on permits, but assumes all went to sewer system.
		No Flowdate
1957	Yr Ops started	Assuming 1,000,000 gallons per year
1986	Yr Ops ceased	
29	calc #yrs facility operated	
Copper (Cu)		
29	#yrs facility discharged	Use and storage of water soluble copper.
1.85	calc mg/L COC discharged	trace amounts in wastewater discharge. Assuming to be 2mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
202.52	calc kg COC discharged	
Lead (Pb)		
29	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
29	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
29	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
29	#yrs facility discharged	
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
21	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
16	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
30	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
29	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
30	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
29	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
19	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
202.52	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Assume stormwater direct to Passaic River until 1971
	# days/week discharged	
	# weeks/yr discharged	
1,729,839	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
2.60	acres	
50%	Percent Precip to River	
1957	Yr Ops started	
1971	Yr Ops ceased	
14	calc #yrs facility operated	
Copper (Cu)		
14	#yrs facility discharged	Historically stored 1000-43242 lbs of copper sulfate onsite. Took average amount of 22,121 lbs
-	calc mg/L COC discharged	assume that 1% gets into stormwater discharge direct to Passaic River
3.785	L per gallon (Merck Index)	221.25 pounds in 1729839 gallons of stormwater per year = 15.37 mg/l
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
14	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
14	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
14	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
14	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
15	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
15	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
15	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
14	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
15	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
15	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
15	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

STWB Inc.	192 and 194 Bloomfield Avenue	Bloomfield	NJ	07003

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	12.41%	278.98	100.00%	-	34.62	1.018817E-2	0.35
Lead	100.00%	-	100.00%	-	12.41%	6.05	100.00%	-	0.75	1.018817E-2	0.01
Mercury	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	12.41%	39.47	100.00%	0.2	5.06	1.018817E-2	0.05
LPAHs	100.00%	-	100.00%	-	12.41%	26.31	100.00%	0.1	3.37	1.018817E-2	0.03
PCBs	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

STWB Inc.	192 and 194 Bloomfield Avenue	Bloomfield	NJ	07003

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.35	1.680E-7	1.159E-7
Lead	0.01	3,200,000.00	0.01	2.390E-9	2.390E-11
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0.05	2.147E-7	1.074E-8
LPAHs	0.01	170,000.00	0.03	2.021E-7	2.021E-9
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

STWB Inc.	192 and 194 Bloomfield Avenue	Bloomfield	NJ	07003

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.250E-4	0.35	262.16	1.250E-4	8.625E-5
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	2.601E-6	0.01	8.32	2.601E-6	2.601E-8
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.164E-6	0.05	0.23	1.164E-6	5.818E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.119E-6	0.03	0.16	1.119E-6	1.119E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

STWB Inc.	**192 and 194 Bloomfield Avenue**	**Bloomfield**	**NJ**	**07003**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Union Outlet	Bypass	12.41%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Limited to no information sewer discharges
	# hours/per day discharged	Cleaning Produces and Disinfectant formulation and mixing
	#days/week discharged	Estimating based on Canning Gumm
	#weeks/yr discharged	Wastewater discharged to PVSC from 1931-1965, prior direct to Second River
1,175,000	calc gal/yr discharge	
1931	Yr Ops started	
1965	Yr Ops ceased	
34	calc #yrs facility operated	
Copper (Cu)		
34	#yrs facility discharged	Based on Goodrich
1.85	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
278.98	calc kg COC discharged	
Lead (Pb)		
34	#yrs facility discharged	Based on Goodrich
0.04	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
6.05	calc kg COC discharged	
Mercury (Hg)		
34	#yrs facility discharged	Based on Goodrich
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
34	#yrs facility discharged	Based on Canning Gumm
4.35	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.26	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
39.47	calc kg COC discharged	
LPAHs		
34	#yrs facility discharged	Based on Goodrich
4.35	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.17	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
26.31	calc kg COC discharged	
PCBs		
35	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
26	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
16	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
34	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
20	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
21	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
16	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
278.98	kg Copper	
6.05	kg Lead	
-	kg Mercury	
39.47	kg HPAHs	
26.31	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	Limited to no information sewer discharges
	# days/week discharged	Cleaning Produces and Disinfectant formulation and mixing
	# weeks/yr discharged	Estimating based on Canning Gumm
1,175,000	# gals/yr directly discharged	Wastewater discharged to PVSC from 1931-1965, prior direct to Second River
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1925	Yr Ops started	
1931	Yr Ops ceased	
6	calc #yrs facility operated	
Copper (Cu)		
6	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
6	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
6	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
6	#yrs facility discharged	
0.1	calc mg/L O&G discharged	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.01	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.16	calc kg COC discharged	
LPAHs		
6	#yrs facility discharged	
0.1	calc mg/L O&G discharged	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.00	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.11	calc kg COC discharged	
PCBs		
3	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-8	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
-18	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
6	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
-14	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
-13	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-18	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
0.16	kg HPAHs	
0.11	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

STWB Inc.

120 Lister Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	5.0%	Occasional Noncompliance	PVSC inspection in 1971 noted poor housekeeping at the site and green fluorecein dye discharged into a catch basin within the site area, which reached the Lockwood Street storm sewer and the Passaic River (PAS-00002739). In February 1972, PVSC issued a notice of violation indicating that the sewer department took out a sample from the sewer line and found “chemical in the line.” (PAS-00002741). Note: The specific “chemical in the line” was not identified. On April 27, 1976, a $750 fine was imposed on TCI for violations of the Spill Prevention, Control, and Countermeasure (SPCC) regulations under Section 311 of the Federal Water Pollution Control Act (PAS-00002727). Note: No additional information was provided. No indication that COC involved	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	0

192 and 194 Bloomfield Avenue	**Bloomfield**	**NJ**	**07003**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.287E-7	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.029E-7

AP_ABS	1.029E-7

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

STWB Inc.

120 Lister Avenue	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	5.0%	Occasional Noncompliance	PVSC inspection in 1971 noted poor housekeeping at the site and green fluorecein dye discharged into a catch basin within the site area, which reached the Lockwood Street storm sewer and the Passaic River (PAS-00002739). In February 1972, PVSC issued a notice of violation indicating that the sewer department took out a sample from the sewer line and found “chemical in the line.” (PAS-00002741). Note: The specific “chemical in the line” was not identified. On April 27, 1976, a $750 fine was imposed on TCI for violations of the Spill Prevention, Control, and Countermeasure (SPCC) regulations under Section 311 of the Federal Water Pollution Control Act (PAS-00002727). Note: No additional information was provided. No indication that COC involved	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	0

192 and 194 Bloomfield Avenue	**Bloomfield**	**NJ**	**07003**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
8.635E-5	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	6.908E-5

AP_ABS	6.908E-5

Allocation Facility Cmass Calculation

Sun Chemical Corporation (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	0.34	100.00%	-	0.00%	2,829.40	100.00%	-	0.34	1.018817E-2	0
Lead	100.00%	0.28	100.00%	-	0.00%	499.93	100.00%	-	0.28	1.018817E-2	0
Mercury	100.00%	0.01	100.00%	-	0.00%	1,296.67	100.00%	-	0.01	1.018817E-2	0
HPAHs	100.00%	0.06	100.00%	-	0.00%	54.83	100.00%	-	0.06	1.018817E-2	0
LPAHs	100.00%	0.05	100.00%	-	0.00%	143.59	100.00%	-	0.05	1.018817E-2	0
PCBs	100.00%	0.4	100.00%	-	0.00%	-	100.00%	-	0.4	1.018817E-2	0
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Sun Chemical Corporation (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	1.650E-9	1.138E-9
Lead	0.01	3,200,000.00	0	8.915E-10	8.915E-12
Mercury	0.95	42,000.00	0	2.426E-9	2.304E-9
HPAHs	0.05	240,000.00	0	2.547E-9	1.274E-10
LPAHs	0.01	170,000.00	0	2.997E-9	2.997E-11
PCBs	12.87	26,000.00	0	1.567E-7	2.017E-6
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Sun Chemical Corporation (Foundry Street Complex)	185 Foundry Street	Newark	NJ	07105

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.228E-6	0	2.57	1.228E-6	8.471E-7
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	9.703E-7	0	3.1	9.703E-7	9.703E-9
Mercury	0.95	42,000.00	4,322.53	41,955.96	2.313E-6	0	0.1	2.313E-6	2.198E-6
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	1.380E-8	0	0	1.380E-8	6.902E-10
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	1.660E-8	0	0	1.660E-8	1.660E-10
PCBs	12.87	26,000.00	20,066.54	25,795.56	1.993E-5	0	0.51	1.993E-5	2.565E-4
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Sun Chemical Corporation (Foundry Street Complex)	**185 Foundry Street**	**Newark**	**NJ**	**07105**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	PVSC Permit No. 20200038 - discharge of process wastewater, sanitary and storm water
24	# hours/per day discharged	PVSC Permit No. 204-010-42 - discharge of manufacturing residuals treated onsite and discharged
5	#days/week discharged	- limited information on 204-010-42
	#weeks/yr discharged	Main storm sewer to PVSC POTW
20,287,112	calc gal/yr discharge PAP00124262, PAP00123478, PAP00049181	Volume data from:
		- Permit Discharge Limits (2001-2006)
1986	Yr Ops started	- 1986-87 Industrial Pretreatment Program Annual Report
2003	Yr Ops ceased	- 1990 Document
17	calc #yrs facility operated	- Permit application Files and Permits from 1979-1996
Copper (Cu)		
17	#yrs facility discharged	Data from:
2.17	calc mg/L COC discharged PAP00124262, PAP00049181	1990 Permit Sampling Results = 2.75 mg/l
3.785	L per gallon (Merck Index)	1979 & 1990 Sampling Reults = .16 mg/l and 2.74 mg/l
0.000001	kg per mg (Merck Index)	2001-2006 Discharge Limits = 3.02 mg/l
2,829.40	calc kg COC discharged	
Lead (Pb)		
17	#yrs facility discharged	Data from:
0.383	calc mg/L COC discharged PAP00124262, PAP00049181	1988, 1990 & 1992 Permit Sampling Results = .084-.219mg/l, ND, 1.246mg/l
3.785	L per gallon (Merck Index)	1979-1996 Sampling Reults = .9, .084, .188, .219, <.05, .0683 mg/l
0.000001	kg per mg (Merck Index)	2001-2006 Discharge Limits = .54 mg/l
499.93	calc kg COC discharged	
Mercury (Hg)		
17	#yrs facility discharged	1979, 1990 Sampling Results = .16, 2.74 mg/l
0.9933	calc mg/L COC discharged PAP00124262, PAP00049181	2001-2006 Discharge Limits = .080 mg/l
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,296.67	calc kg COC discharged	
HPAHs		
17	#yrs facility discharged	HPAHs from 2001-2006 discharge limits:
	calc mg/L O&G PAP00124262	- Flouranthene 6.75 g/day
10%	% O&G that is considered PAHs	- Pyrene 6.14 g/day
60%	% COC in O&G considered as PAHs	
0.042	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
54.83	calc kg COC discharged	
LPAHs		
17	#yrs facility discharged	LPAHs from 2001-2006 discharge limits
	calc mg/L O&G PAP00124262	- Acenaphthene = 6.8 g/day
10%	% O&G that is considered PAHs	- Anthracene = 6.83 g/day
40%	% COC in O&G considered as PAHs	- Flourene = 6.83 g/day
0.110	calc mg/L LPAHs	- Naphthalene = 6.83 g/day
3.785	L per gallon (Merck Index)	- Phenanthrene = 6.83 g/day
0.000001	kg per mg (Merck Index)	
143.59	calc kg COC discharged	
PCBs		
-8	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
-13	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
2	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
17	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
18	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
0	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
-10	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
2,829.40	kg Copper	
499.93	kg Lead	
1,296.67	kg Mercury	
54.83	kg HPAHs	
143.59	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

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Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.083333333	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University
0.4	ACRES - TOTAL SITE AREA (acres)	FDR page 1	
0.08	ACRES - AFFECTED AREA	From the facility map on PAS-00044655, it appears there were buildings and other sturctures. Only part of the site was shown as unpaved. For this calculation a conservative estimate of 20% of the total site area was assumed to be unpaved.	
4,046.86	$METERS^2$/ACRE		
324	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
0.03	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO PASSAIC RIVER	
1986	Year site operations began	Sequa Corporation changed its name to Sun Chemical Corporation, December 31, 1986 (FDR Page 1)	
1993	Year of site-wide soil remeditation (PAP-00120463)	Operations ended on December 31, 2003 but equipment cleaning and dismantling activities were still being conducted as part of the cessation of operations. The 1992-1993 site-wide remediation included removal of the top two feet of soil from accessible areas of the site and placement of a concrete/asphalt cap over the entire site (PAP-00120487)	
7	NUMBER YEARS DISCHARGE		
0	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1962.5	KG/M3 SOIL DENSITY	Fill reported as 0.504.5 feet of glass, bricks, cement, with brown-black silty/sandy clay and some gravel (PAS-00044960 through PAS-00044964) soil boring logs. Bulk density range 1442 KG/M3 to 2483 KG/M3, so use average. (http://structx.com/Soil_Properties_002.html)	
445	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		The facility site is not located on regional Historic Fill (FDR page 8)	
Copper (Cu)			
7	YEARS DISCHARGED		
762	MG/KG (MAX CONCENTRATION)	Copper was found at a maximum concentration in boring number B-6 (depth of 18-24 inches) in 1988 (PAS-00044905 and FDR page 9)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)			
7	YEARS DISCHARGED		
633	MG/KG (AVERAGE CONCENTRATION)	Lead was found at a maximum concentration in boring number B-6 (depth of 18-24 inches) in 1988 (PAS-00044905)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)			
7	YEARS DISCHARGED		
28	MG/KG (MAX CONCENTRATION)	Mercury was found at a maximum concentration in boring number B-2 (depth of 0-6 inches) in 1988 (PAS-00044905)	
0.000001	kg per mg (Merck Index)		
0.01	KILOGRAMS DISCHARGED		

PAHs (listed in Benzo(a)pyrene Equivalent conversion table)

7 YEARS DISCHARGED
134.12 MG/KG (TOTAL PAH MAX CONCENTRATION)

0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

PAHs (others detected)

7 YEARS DISCHARGED
116 MG/KG (TOTAL PAH MAX CONCENTRATION)
0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

PCBs

7 YEARS DISCHARGED
910 MG/KG (MAX OF REPORTED CONCENTRATIONS)

0.000001 kg per mg (Merck Index)
0 KILOGRAMS DISCHARGED

Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.

Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

Data below the Benzo(a)pyrene Equivalent Table

Sample B-12/1 depth 0-6 inches. (PAP-00381910-12)
Historic fill was not a consideration for PAH concentrations for the purpose of this calculation.

The highest concentration of PCBs was found in sample 3-107 (depth 0-6 inches) (PAS-00045069)
Historic fill was not a consideration for PCB concentrations for the purpose of this calculation.

During January 1993, the area with PAH contamination was excavated down to two feet to the perimeter of the site and covered with clean fill (FDR page 16)

Maximum concentrations listed in review of past and present areas of concern (table from PAP-00381912; table on FDR page 8 and PAS-00045320). Sample collected from New Tank Area in front of Press Room. Sample B-12/1 depth of 0-6 inches

Table (PAP-00381912) indicates that Benzo(b)fluoranthene and Benzo(k)fluoranthene were coeluted

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	74.000	1.0	74.0000
Benzo(a)anthracene	110.000	0.1	11.0000
Benzo(b)fluoranthene	240.000	0.1	24.0000
Benzo(k)fluoranthene	240.000	0.01	2.4000
Chrysene	120.000	0.001	0.1200
Dibenz(a,h)anthracene	17.000	1.0	17.0000
Indeno(1,2,3-cd)pyrene	56.000	0.1	5.6000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **134.1**

B-12/1 depth 0-6 inches. (PAP-00381910-12)	
Anthracene	12
Acenaphthene	0
Acenaphthylene	20
Fluorene	0
Naphthalene	47
Phenanthrene	37
2-Methylnaphthalene	0
SUM	116

SUMMARY CMASS ESTIMATES:

0.34 kg Copper
0.28 kg Lead
0.01 kg Mercury
0.06 kg PAHs (Benzo(a)pyrene Equivalent)
0.05 kg PAHs (Other)
0.40 kg PCBs

1.15 MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Sun Chemical Corporation (Foundry Street Complex)

185 Foundry Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.516E-6	5.0%	Occasional Noncompliance	A May 11, 1992 Memorandum documented a lead violation for Sun Chemical Corporation for a sample collected on April 21, 1992 (PAP-00374626; PAS-00111661; PAS-00128931). A 1987 survey found the ground, building surfaces and drums stored near the plant were stained purple, and it was stated that it was believed these stains were from pigments manufactured by Sun Chemical Company (PAP-00031574). In 1990, it was reported that the driveway located between Arkansas Chemical and Sun Chemical Corporation was stained with a magenta colored substance, which also existed on Sun Chemical Corporation's site. A strip like drain running down the center of the driveway contained standing water with a noticeable sheen on it (PAP-00031576-77). According to a February 13, 1991 Memorandum, on November 26, 1990, a RCRA investigation was conducted at Sun Chemical Corporation to investigate “alleged dumping and sloppy housekeeping practices” at the site. The site tour confirmed the discoloration of the surrounding areas as reported in incident No. 90-10-24-1208 (PAS-00044985; PAS-00111388).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.288E-6

AP_ABS	1.288E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Sun Chemical Corporation (Foundry Street Complex)

185 Foundry Street	**Newark**	**NJ**	**07105**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.947E-4	5.0%	Occasional Noncompliance	A May 11, 1992 Memorandum documented a lead violation for Sun Chemical Corporation for a sample collected on April 21, 1992 (PAP-00374626; PAS-00111661; PAS-00128931). A 1987 survey found the ground, building surfaces and drums stored near the plant were stained purple, and it was stated that it was believed these stains were from pigments manufactured by Sun Chemical Company (PAP-00031574). In 1990, it was reported that the driveway located between Arkansas Chemical and Sun Chemical Corporation was stained with a magenta colored substance, which also existed on Sun Chemical Corporation's site. A strip like drain running down the center of the driveway contained standing water with a noticeable sheen on it (PAP-00031576-77). According to a February 13, 1991 Memorandum, on November 26, 1990, a RCRA investigation was conducted at Sun Chemical Corporation to investigate “alleged dumping and sloppy housekeeping practices” at the site. The site tour confirmed the discoloration of the surrounding areas as reported in incident No. 90-10-24-1208 (PAS-00044985; PAS-00111388).	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.655E-4

AP_ABS	1.655E-4

Allocation Facility Cmass Calculation

Tate & Lyle Ingredients Americas LLC	100 3rd Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	1.21%	6.24	100.00%	31.7	31.8	1.018817E-2	0.32
Lead	100.00%	-	100.00%	-	1.21%	772.14	100.00%	3.2	12.53	1.018817E-2	0.13
Mercury	100.00%	-	100.00%	-	1.21%	-	100.00%	0.8	0.85	1.018817E-2	0.01
HPAHs	100.00%	-	100.00%	-	1.21%	26.06	100.00%	-	0.32	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	1.21%	17.37	100.00%	-	0.21	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Tate & Lyle Ingredients Americas LLC	100 3rd Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0.32	1.543E-7	1.064E-7
Lead	0.01	3,200,000.00	0.13	3.990E-8	3.990E-10
Mercury	0.95	42,000.00	0.01	2.052E-7	1.949E-7
HPAHs	0.05	240,000.00	0	1.341E-8	6.704E-10
LPAHs	0.01	170,000.00	0	1.262E-8	1.262E-10
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Tate & Lyle Ingredients Americas LLC	100 3rd Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	1.148E-4	0.32	240.78	1.148E-4	7.922E-5
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	4.342E-5	0.13	138.82	4.342E-5	4.342E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	1.957E-4	0.01	8.21	1.957E-4	1.859E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	7.267E-8	0	0.01	7.267E-8	3.633E-9
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	6.989E-8	0	0.01	6.989E-8	6.989E-10
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Tate & Lyle Ingredients Americas LLC	**100 3rd Avenue**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Ivy	CSO	1.83%	66.23%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	1971 Waste Effluent Survey = 500000 gallon to sanitary
	# hours/per day discharged	1974 Waste Effluent Survey = 500000 gallon to sanitary
	#days/week discharged	1977 permit 2500 gpd to PVSC
	#weeks/yr discharged	
637,500	calc gal/yr discharge PAS00108802, 65 (PAP-00724090)	
1968	Yr Ops started	
1978	Yr Ops ceased	
10	calc #yrs facility operated	
Copper (Cu)		
10	#yrs facility discharged	1972 sampling data
0.26	calc mg/L COC discharged PAS00108864-68	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
6.24	calc kg COC discharged	
Lead (Pb)		
10	#yrs facility discharged	
32.00	calc mg/L COC discharged PAS00108864-68	1972 sampling data
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
772.14	calc kg COC discharged	
Mercury (Hg)		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
10	#yrs facility discharged	
18.00	calc mg/L O&G PAS00108864-68	1972 sampling data
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
1	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
26.06	calc kg COC discharged	
LPAHs		
10	#yrs facility discharged	
18.00	calc mg/L O&G PAS00108864-68	1972 sampling data
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
1	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
17.37	calc kg COC discharged	
PCBs		
10	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
5	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
11	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
11	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
11	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
8	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
6.24	kg Copper	
772.14	kg Lead	
-	kg Mercury	
26.06	kg HPAHs	
17.37	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	1971 Waste Effluent Survey = 11075000
	# days/week discharged	1974 Waste Effluent Survey = 44800000
	# weeks/yr discharged	
27,937,500	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
	acres	
50%	Percent Precip to River	
1968	Yr Ops started	
1978	Yr Ops ceased	
10	calc #yrs facility operated	
Copper (Cu)		
10	#yrs facility discharged	
0.10	calc mg/L COC discharged PAS00108802	1971 Waste Effluent Survey
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
105.74	calc kg COC discharged	
Lead (Pb)		
10	#yrs facility discharged	
0.0100	calc mg/L COC discharged PAS00108802	1971 Waste Effluent Survey
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
10.57	calc kg COC discharged	
Mercury (Hg)		
10	#yrs facility discharged	
0.00080	calc mg/L COC discharged PAS00108802	1971 Waste Effluent Survey
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.85	calc kg COC discharged	
HPAHs		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
10	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
5	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
11	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
10	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
11	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
11	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
8	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
31.72	kg Copper	
3.17	kg Lead	
0.85	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	

-	kg Dioxins/Furans	

Allocation Facility Cmass Calculation

Tate & Lyle Ingredients Americas LLC	320 Schuyler Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
LPAHs	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
PCBs	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	1.21%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Tate & Lyle Ingredients Americas LLC	**320 Schuyler Avenue**	**Kearny**	**NJ**	**07032**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	0	0	0
LPAHs	0.01	170,000.00	0	0	0
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Tate & Lyle Ingredients Americas LLC	320 Schuyler Avenue	Kearny	NJ	07032

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	0	0	0	0	0
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	0	0	0	0	0
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Tate & Lyle Ingredients Americas LLC	**320 Schuyler Avenue**	**Kearny**	**NJ**	**07032**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Ivy	CSO	1.83%	66.23%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
2,000	gal discharged per day	Administrative/Sales Office Building from 1968-1976
	# hours/per day discharged	No manufacturing performed.
6	#days/week discharged	Only discharge is sanitary to the PVSC
52	#weeks/yr discharged	No evidence or expectation of any COC discharges from facility
624,000	calc gal/yr discharge	
1968	Yr Ops started	
1976	Yr Ops ceased	
8	calc #yrs facility operated	
Copper (Cu)		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
8	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
LPAHs		
8	#yrs facility discharged	
-	calc mg/L O&G	
10%	% O&G that is considered PAHs	
50%	% COC in O&G considered as PAHs	
-	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
PCBs		
9	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
5	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
9	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
8	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
9	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
9	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
8	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
-	kg HPAHs	
-	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Tate & Lyle Ingredients Americas LLC

100 3rd Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.026E-7	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.421E-7

320 Schuyler Avenue	**Kearny**	**NJ**	**07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	0

AP_ABS	2.421E-7

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Tate & Lyle Ingredients Americas LLC

100 3rd Avenue | **Kearny** | **NJ** | **07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.656E-4	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.125E-4

320 Schuyler Avenue | **Kearny** | **NJ** | **07032**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
0	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	0

AP_ABS	2.125E-4

Allocation Facility Cmass Calculation

Teval/Guyon	900 and 1000 4th Street	Harrison	NJ	07029

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	170.86	100.00%	-	0.00%	1,399.39	100.00%	-	170.86	1.018817E-2	1.74
Lead	100.00%	1,467.3	100.00%	-	0.00%	19,900.57	100.00%	-	1,467.3	1.018817E-2	14.95
Mercury	100.00%	4.03	100.00%	-	0.00%	0.04	100.00%	-	4.03	1.018817E-2	0.04
HPAHs	100.00%	-	100.00%	-	0.00%	0.08	100.00%	1.2	1.21	1.018817E-2	0.01
LPAHs	100.00%	-	100.00%	-	0.00%	0.10	100.00%	0.8	0.81	1.018817E-2	0.01
PCBs	100.00%	19.77	100.00%	-	0.00%	-	100.00%	-	19.77	1.018817E-2	0.2
DDx	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	0.00%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Teval/Guyon	**900 and 1000 4th Street**	**Harrison**	**NJ**	**07029**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	1.74	8.289E-7	5.720E-7
Lead	0.01	3,200,000.00	14.95	4.672E-6	4.672E-8
Mercury	0.95	42,000.00	0.04	9.776E-7	9.287E-7
HPAHs	0.05	240,000.00	0.01	5.147E-8	2.573E-9
LPAHs	0.01	170,000.00	0.01	4.844E-8	4.844E-10
PCBs	12.87	26,000.00	0.2	7.747E-6	9.970E-5
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Teval/Guyon	**900 and 1000 4th Street**	**Harrison**	**NJ**	**07029**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	6.169E-4	1.74	1,293.77	6.169E-4	4.257E-4
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	5.085E-3	14.95	16,255.75	5.085E-3	5.085E-5
Mercury	0.95	42,000.00	4,322.53	41,955.96	9.323E-4	0.04	39.12	9.323E-4	8.857E-4
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.789E-7	0.01	0.05	2.789E-7	1.395E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.683E-7	0.01	0.04	2.683E-7	2.683E-9
PCBs	12.87	26,000.00	20,066.54	25,795.56	9.852E-4	0.2	25.41	9.852E-4	1.268E-2
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Teval/Guyon	**900 and 1000 4th Street**	**Harrison**	**NJ**	**07029**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Newark Bay	Bypass	0.00%	0.00%	Did not discharge waste into the Passaic river

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Cutting, Welding and Shaping of Piping
	# hours/per day discharged	Office Space
	#days/week discharged	No other information provided
	#weeks/yr discharged	Estimating based on Revere Smelting Operations
2,600,000	calc gal/yr discharge	
1947	Yr Ops started	
1992	Yr Ops ceased	
45	calc #yrs facility operated	
Copper (Cu)		
45	#yrs facility discharged	Based on Revere Smelting at 20% due to operational differences
3.16	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1,399.39	calc kg COC discharged	
Lead (Pb)		
45	#yrs facility discharged	Based on Revere Smelting at 20% due to operational differences
44.94	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
19,900.57	calc kg COC discharged	
Mercury (Hg)		
45	#yrs facility discharged	Based on Revere Smelting at 20% due to operational differences
0.000098	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.043	calc kg COC discharged	
HPAHs		
45	#yrs facility discharged	Based on Revere Smelting at 20% due to operational differences
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
0.0009	calc mg/L HPAHs	
0.757	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.08	calc kg COC discharged	
LPAHs		
45	#yrs facility discharged	Based on Revere Smelting at 20% due to operational differences
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
0.0011	calc mg/L LPAHs	
0.757	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.10	calc kg COC discharged	
PCBs		
31	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
26	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
38	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
45	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
46	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
39	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
1,399.39	kg Copper	
19,900.57	kg Lead	
0.04	kg Mercury	
0.08	kg HPAHs	
0.10	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	COMMENTS/NOTES
	# hours/day discharged	
	# days/week discharged	Stormwater Discharge direct to Passaic River from 1969-1971 PAS00076889
	# weeks/yr discharged	Oily Discharge
22,620,973	# gals/yr directly discharged	
4.08	ft; 30yr average annual precipitation per Rutgers information	
	acres	
43,560	ft2 per acre	
34.00	acres	
50%	Percent Precip to River	
1969	Yr Ops started	
1971	Yr Ops ceased	
2	calc #yrs facility operated	
Copper (Cu)		
2	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
2	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
2	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
2	#yrs facility discharged	
0.12	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
0.0071	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
1.21	calc kg COC discharged	
LPAHs		
2	#yrs facility discharged	
0.12	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
0.0047	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0.81	calc kg COC discharged	
PCBs		
3	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
3	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
3	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
2	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
3	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
3	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
3	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for Direct Discharge:		
-	kg Copper	
-	kg Lead	
-	kg Mercury	
1.21	kg HPAHs	
0.81	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
35.651	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
8.91	ACRES - AFFECTED AREA	Looks to be around 75% buildings in 1977 aerial photos here https://njdep.maps.arcgis.com/apps/webappviewer/index.html	
4,046.86	METERS^2/ACRE		
36,069	METERS^2 (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
4	METERS^3/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED TO DITCHES	
1947	Year Teval operations began	FDR p 1	
2006	Year Teval sold the property	Teval operations ceased in 1992 (FDR p 1)	
59	NUMBER YEARS DISCHARGE		
213	METERS^3 (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,859	KG/M^3 SOIL DENSITY	Reported as historic fill on site, so use soil composition as other historic fill sites. Bulk density range 1346 KG/M^3 to 2371 KG/M^3, so use average. (http://structx.com/Soil_Properties_002.html)	
395,498	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
		This site is located on regional historic fill (FDR p 163)	
Copper (Cu)		Copper used to make pipes on site (FDR p 3)	
59	YEARS DISCHARGED		
432	MG/KG (MAX CONCENTRATION)	Max concentration at sample S-202 (depth unknown) (PAS-00000980)	
0.000001	kg per mg (Merck Index)		
171	KILOGRAMS DISCHARGED		
Lead (Pb)		Lead paint, primer, and primer paint stored on site (FDR p 6)	
59	YEARS DISCHARGED		
3710	MG/KG (MAX CONCENTRATION)	Max concentration at sample S-202 (depth unknown) (PAS-00000980)	
0.000001	kg per mg (Merck Index)		
1,467	KILOGRAMS DISCHARGED		
Mercury (Hg)		Mercury released and detected in soil (FDR 8)	
59	YEARS DISCHARGED		
10.2	MG/KG (MAX CONCENTRATION)	Max concentration at sample S-203 (depth unknown) (PAS-00000981)	
0.000001	kg per mg (Merck Index)		
4	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)			
59	YEARS DISCHARGED		
0.0	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)	No soil data available for PAHs	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)			
59	YEARS DISCHARGED		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

Contaminant	Concentration (mg/kg)	Toxic Equivalency	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.00	1.0	0.0000
Benzo(a)anthracene	0.00	0.1	0.0000
Benzo(b)fluoranthene	0.00	0.1	0.0000
Benzo(k)fluoranthene	0.00	0.01	0.0000
Chrysene	0.00	0.001	0.0000
Dibenz(a,h)anthracene	0.00	1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.00	0.1	0.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.0**

PCBs		
59	YEARS DISCHARGED	
50	MG/KG	
0.000001	kg per mg (Merck Index)	
20	KILOGRAMS DISCHARGED	
DDx		
59	YEARS DISCHARGED within DDx Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dieldrin		
59	YEARS DISCHARGED within Dieldrin Timeline	
	MG/KG (MAX CONCENTRATION)	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
0	KILOGRAMS DISCHARGED	
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION	
59	YEARS DISCHARGED	
	MG/KG (MAX CONCENTRATION)	
0.000001	kg per mg (Merck Index)	
0	calc kg COC discharged	

PCB transformers on site (FDR p 8)

No data tables or posting figures available (PAP-00190169) but the RI found PCBs at concentrations exceeding the 50 mg/kg standard in several samples (800 fill samples and 400 deeper soil samples) (PAP-00190180-181)

SUMMARY CMASS ESTIMATES:	
170.86	kg Copper
1,467.30	kg Lead
4.03	kg Mercury
0.00	kg PAHs (Benzo(a)pyrene Equivalent)
0.00	kg PAHs (Other)
19.77	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

1661.96	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Teval/Guyon

900 and 1000 4th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.013E-4	0.0%	Historically Compliant or No Evidence	Sandblasting waste was stored on the ground just north of Building G-16. Periodically, it would be scooped up and put in a dumpster and then trucked offsite to a disposal facility in Pennsylvania (PAP-00190195). There were several areas with stained soil. No information on NOVs was identified in the available file material.	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.013E-4

AP_ABS	1.013E-4

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Teval/Guyon

900 and 1000 4th Street	**Harrison**	**NJ**	**07029**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
1.404E-2	0.0%	Historically Compliant or No Evidence	Sandblasting waste was stored on the ground just north of Building G-16. Periodically, it would be scooped up and put in a dumpster and then trucked offsite to a disposal facility in Pennsylvania (PAP-00190195). There were several areas with stained soil. No information on NOVs was identified in the available file material.	0.0%	0% Cooperation with conduct of allocation and requests for related information	1.404E-2

AP_ABS	1.404E-2

Allocation Facility Cmass Calculation

Textron Inc.	681 Main Street	Belleville	NJ	07109

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Lead	100.00%	-	100.00%	-	12.41%	38.10	100.00%	-	4.73	1.018817E-2	0.05
Mercury	100.00%	-	100.00%	-	12.41%	76.20	100.00%	-	9.46	1.018817E-2	0.1
HPAHs	100.00%	0.01	100.00%	-	12.41%	19.81	100.00%	-	2.47	1.018817E-2	0.03
LPAHs	100.00%	-	100.00%	-	12.41%	81.27	100.00%	-	10.09	1.018817E-2	0.1
PCBs	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	12.41%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Textron Inc.	**681 Main Street**	**Belleville**	**NJ**	**07109**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	0	0	0
Lead	0.01	3,200,000.00	0.05	1.505E-8	1.505E-10
Mercury	0.95	42,000.00	0.1	2.294E-6	2.179E-6
HPAHs	0.05	240,000.00	0.03	1.048E-7	5.238E-9
LPAHs	0.01	170,000.00	0.1	6.045E-7	6.045E-9
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Textron Inc.	**681 Main Street**	**Belleville**	**NJ**	**07109**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	0	0	0	0	0
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	1.639E-5	0.05	52.39	1.639E-5	1.639E-7
Mercury	0.95	42,000.00	4,322.53	41,955.96	2.188E-3	0.1	91.79	2.188E-3	2.078E-3
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	5.678E-7	0.03	0.11	5.678E-7	2.839E-8
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	3.348E-6	0.1	0.47	3.348E-6	3.348E-8
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Textron Inc.	**681 Main Street**	**Belleville**	**NJ**	**07109**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Union Outlet	Bypass	12.41%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	Artifical Leather and Plastics Manufacturing
	# hours/per day discharged	Discharged to sanitary sewer after 1926 - PVSC
	#days/week discharged	Estimation based on BASF Corporation - manufacturer of plasticizers
	#weeks/yr discharged	assumed flow volumes to be 50% of BASF
16,777,800	calc gal/yr discharge	PAS-00054098
1956	Yr Ops started	
1962	Yr Ops ceased	
6	calc #yrs facility operated	FDR page 1
Copper (Cu)		
6	#yrs facility discharged	
	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Lead (Pb)		
6	#yrs facility discharged	Based on BASF Corporation
0.10	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
38.10	calc kg COC discharged	
Mercury (Hg)		
6	#yrs facility discharged	Based on BASF Corporation
0.2000	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
76.20	calc kg COC discharged	
HPAHs		
6	#yrs facility discharged	Based on BASF Corporation
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% COC in O&G considered as PAHs	
0.0520	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
19.81	calc kg COC discharged	
LPAHs		
6	#yrs facility discharged	Based on BASF Corporation
	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% COC in O&G considered as PAHs	
0.2133	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
81.27	calc kg COC discharged	
PCBs		
7	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
7	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
7	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
6	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
7	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
7	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
7	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
-	kg Copper	
38.10	kg Lead	
76.20	kg Mercury	
19.81	kg HPAHs	
81.27	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Discharge Calcs	Direct Discharge Information	ASSUMPTIONS, REFERENCES	COMMENTS/NOTES
4.08	FEET/YEAR AVERAGE PRECIPITATION	Long term average annual precipitation includes floods and hurricane events occurring over time.	Data from Rutgers University.
15	ACRES - TOTAL SITE AREA (acres)	FDR p 1	
4	ACRES - AFFECTED AREA	Rough estimate of site area with exposed fill determined from review of PAP-00445807. Estimating that 75% of the site had buildings	Aerial photos 1977 to 2020 show that lot has been paved since 1977 (Google Earth Pro and https://njdep.maps.arcgis.com/apps/webappviewer/index.html).
4,046.86	$METERS^2$/ACRE		
15,176	$METERS^2$ (AFFECTED AREA)		
0.0001	METERS/YEAR (ERODED SOIL THICKNESS)	For this estimate, used a surface soil erosion rate of 0.1 mm/year, or 0.004 inches/year.	
2	$METERS^3$/YEAR (ERODED SOIL VOLUME)	VOLUME/YEAR DISCHARGED	
1956	Year site operations began	Textron purchased the assets of Federal Leather Co (which had been operating on site since 1919) excluding any obligations or liabilities (FDR p 1)	
1962	Year site processing and storage operations ceased	Textron sold the assests to Air Reduction Co (FDR p 1)	Cumberland Chemical Co owned from 1962 to 1966. Belleville Industrial Center owned and operated at the site starting 1968. Helion Industries was tenant from 1975 to 2001 (FDR p 1)
6	NUMBER YEARS DISCHARGE		
9	$METERS^3$ (TOTAL SOIL VOLUME DISCHARGED OVER TIME)		
1,963	KG/M^3 SOIL DENSITY	Surface soil is fill consisting of medium to coarse sand, with medium gravel (PAS-00102979). Density of silty sand and gravel ranges from 1442 to 2483 kg/m^3, so the average is used. (http://structx.com/Soil_Properties_002.html)	
17,869	KILOGRAMS (TOTAL SOIL DISCHARGED OVER TIME)		
Copper (Cu)		Site is located on regional Historic Fill (FDR p 5)	
6	YEARS DISCHARGED	No info regarding storage or use of copper on site (FDR p 1-2)	
0	MG/KG (MAX CONCENTRATION)	990 mg/kg Max concentration from Sample 18 (0.5-1 ft bgs) (PAS-00102988, 3002). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Lead (Pb)		No info regarding storage or use of lead on site (FDR p 1-2)	
6	YEARS DISCHARGED		
0	MG/KG (AVERAGE CONCENTRATION)	280 mg/kg Max concentration from Sample 18 (0.5-1 ft bgs) (PAS-00102002). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
Mercury (Hg)		No info regarding storage or use of mercury on site (FDR p 1-2)	
6	YEARS DISCHARGED		
0.0	MG/KG (MAX CONCENTRATION)	0.46 mg/kg Max concentration from Sample 18 (0.5-1 ft bgs) (PAS-00103002). Set to 0 since less than HF.	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (listed in Benzo(a)pyrene Equivalent conversion table)		Total concentration of PAH compounds for Benzo(a)pyrene Equivalent https://floridadep.gov/waste/petroleum-restoration/documents/benzo-pyrene-equivalents-conversion-table-one-sample.	
6	YEARS DISCHARGED	No info regarding storage or use of PAHs on site (FDR p 1-2)	
0.049	MG/KG (TOTAL PAH AVERAGE CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PAHs (others detected)		Data below the Benzo(a)pyrene Equivalent Table	
6	YEARS DISCHARGED		
0.088	MG/KG (TOTAL PAH MAX CONCENTRATION)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
PCBs			
6	YEARS DISCHARGED		
0	MG/KG (MAX OF REPORTED CONCENTRATIONS)	PCB concentration (0 mg/kg) based on sample 11B, ND at MDL (PAS-00102997)	
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		
DDx			
0	YEARS DISCHARGED within DDx Timeline		
0.941	MG/KG (MAX CONCENTRATION)	Sum of DDD, DDE, and DDT results from Sample 18 (PAS-00103002)	
3.785	L per gallon (Merck Index)		
0.000001	kg per mg (Merck Index)		
0	KILOGRAMS DISCHARGED		

PAH value based on sample 11B (PAS-00102995-6)

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.039	1.0	0.0390
Benzo(a)anthracene	0.044	0.1	0.0044
Benzo(b)fluoranthene	0.053	0.1	0.0053
Benzo(k)fluoranthene	0.000	0.01	0.0000
Chrysene	0.041	0.001	0.0000
Dibenz(a,h)anthracene	0.000	1.0	0.0000
Indeno(1,2,3-cd)pyrene	0.000	0.1	0.0000

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = **0.049**

PAH values changed to sample 11B (PAS-00102995-6)	
Anthracene	0
Acenaphthene	0
Acenapthylene	0
Fluorene	0
Naphthalene	0
Phenanthrene	0.088
1-methylnaphthalene	0
2-methylnaphthalene	0
SUM	0.088

Dieldrin	
0	YEARS DISCHARGED within Dieldrin Timeline
0	MG/KG (MAX CONCENTRATION)
3.785	L per gallon (Merck Index)
0.000001	kg per mg (Merck Index)
0	KILOGRAMS DISCHARGED
Dioxins/Furans	NONE FOUND IN AVAILABLE DOCUMENTATION
0	YEARS DISCHARGED
0	MG/KG (MAX CONCENTRATION)
0.000001	kg per mg (Merck Index)
0	calc kg COC discharged

SUMMARY CMASS ESTIMATES:	
0.00	kg Copper
0.00	kg Lead
0.00	kg Mercury
0.0009	kg PAHs (Benzo(a)pyrene Equivalent)
0.0016	kg PAHs (Other)
0.00	kg PCBs
0.00	kg DDx
0.00	kg Dieldrin
0.00	kg Dioxins/Furans

0.00	MASS (KG) DISCHARGED FROM SURFACE SOIL

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Textron Inc.

681 Main Street	**Belleville**	**NJ**	**07109**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.191E-6	0.0%	Historically Compliant or No Evidence	Captain Vicari of the Belleville Fire Department stated that he was aware of a number of fires at the facility during the 1960s. Captain Vicari also stated that methyl ethyl ketone was dumped by employees who used the substance to wash parts. Spills and fires were also noted in the 1980s. It was stated that violation notices were issued to the facility by the Fire Department (PAS-00103080). Unable to determine if fires and spills cited occurred during Texaco period of ownership which ended in 1962.	-10.0%	-10% CPG member - Participation in PRP Group action to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.972E-6

AP_ABS	1.972E-6

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Textron Inc.

681 Main Street	**Belleville**	**NJ**	**07109**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
2.079E-3	0.0%	Historically Compliant or No Evidence	Captain Vicari of the Belleville Fire Department stated that he was aware of a number of fires at the facility during the 1960s. Captain Vicari also stated that methyl ethyl ketone was dumped by employees who used the substance to wash parts. Spills and fires were also noted in the 1980s. It was stated that violation notices were issued to the facility by the Fire Department (PAS-00103080). Unable to determine if fires and spills cited occurred during Texaco period of ownership which ended in 1962.	-10.0%	-10% CPG member - Participation in PRP Group action to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	1.871E-3

AP_ABS	1.871E-3

Allocator's Determinations Regarding
Legal Defenses Raised by Allocation Parties

TEXTRON

Textron states that it received a release from Occidental Chemical Corporation ("Occidental") in the Tierra/Maxus bankruptcy and Occidental is not entitled to recover at least $165 million dollars in response costs from Textron. Any responsibility for such responses costs must be deducted from any share of the OU-2 response costs attributable to Textron.

ALLOCATOR'S DETERMINATION – Though I have not had the opportunity to review the underlying settlement document and other potentially relevant facts associated with the release provided by OCC, assuming its validity, it is apparent that there is a high likelihood of success in any action against OCC to enforce the release. Given OCC's lack of participation in the allocations process, however, the Allocator does not believe that it is appropriate to account for the amount of any such release in the assignment of allocated shares. Rather, the Allocator notes the existence of the release and recommends that it be taken into account in determining the appropriate amount of any future settlement with EPA.

Allocation Facility Cmass Calculation

Tiffany and Company	820 Highland Avenue	Newark	NJ	07104

Constituent Of Concern (COC)	Overland, Fate & Transport C%	Dmass Overland, Fate & Transport	PrePVSC C%	Dmass PrePVSC	PVSC C%	Dmass PVSC	Direct Discharge C%	Dmass Direct Discharge	COC Total Pathway Cmass	COC A%	COC Historic CMass
Copper	100.00%	-	100.00%	1,420.06	8.23%	3,260.87	100.00%	-	1,688.28	1.018817E-2	17.2
Lead	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Mercury	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
HPAHs	100.00%	-	100.00%	8,520.34	8.23%	19,565.23	100.00%	-	10,129.7	1.018817E-2	103.2
LPAHs	100.00%	-	100.00%	5,680.23	8.23%	13,043.49	100.00%	-	6,753.13	1.018817E-2	68.8
PCBs	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
DDx	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Dieldrin	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0
Dioxins_Furans	100.00%	-	100.00%	-	8.23%	-	100.00%	-	0	1.018817E-2	0

Allocation Facility COC Base Scores - Protocol Calculation

Tiffany and Company	**820 Highland Avenue**	**Newark**	**NJ**	**07104**

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	COC Historic CMass	COC Relative Contribution	COC Base Score
Copper	0.69	2,100,000.00	17.2	8.191E-6	5.652E-6
Lead	0.01	3,200,000.00	0	0	0
Mercury	0.95	42,000.00	0	0	0
HPAHs	0.05	240,000.00	103.2	4.300E-4	2.150E-5
LPAHs	0.01	170,000.00	68.8	4.047E-4	4.047E-6
PCBs	12.87	26,000.00	0	0	0
DDx	1.37	27,000.00	0	0	0
Dieldrin	0.13	390.00	0	0	0
Dioxins_Furans	83.92	38.00	0	0	0

Allocation Facility COC Base Scores - Alternative Calulcation

Tiffany and Company	820 Highland Avenue	Newark	NJ	07104

Constituent Of Concern (COC)	Relative Risk Number (RRN)	Total Mass (Tmass)	Total Cmass (TCmass)	Total OS COC ACmass	COC %	COC Historic CMass	Facility OS COC Cmass	COC Relative Responsibility	COC Base Score
Copper	0.69	2,100,000.00	276,960.25	2,097,178.28	6.096E-3	17.2	12,783.89	6.096E-3	4.206E-3
Lead	0.01	3,200,000.00	288,577.67	3,197,059.92	0	0	0	0	0
Mercury	0.95	42,000.00	4,322.53	41,955.96	0	0	0	0	0
HPAHs	0.05	240,000.00	4,346,388.50	195,718.24	2.331E-3	103.2	456.14	2.331E-3	1.165E-4
LPAHs	0.01	170,000.00	3,012,835.14	139,304.72	2.241E-3	68.8	312.25	2.241E-3	2.241E-5
PCBs	12.87	26,000.00	20,066.54	25,795.56	0	0	0	0	0
DDx	1.37	27,000.00	2,516.93	26,974.36	0	0	0	0	0
Dieldrin	0.13	390.00	1.27	389.99	0	0	0	0	0
Dioxins_Furans	83.92	38.00	3,729.82	0.00	0	0	0	0	0

Facility Bypass Information

Tiffany and Company	**820 Highland Avenue**	**Newark**	**NJ**	**07104**

Item	Bypass Name	Bypass Type	Time %	Flow %	Bypass Notes
1	Verona Ave	CSO	1.27%	21.70%	
2	Verona Ave	Bypass	7.95%	100.00%	

Discharge Calcs	POTW Discharge Information	COMMENTS/NOTES
	gal discharged per day/week/month	
	# hours/per day discharged	Sterling Silver Products and Personal Paper Products
5	#days/week discharged	Limited use or production of COCs
52	#weeks/yr discharged	Permit limits for oil and grease
13,895,564	calc gal/yr discharge PAS00109140, PAS00048935, PAS00048880	Copper dies with trace amounts of copper in wastewater
		1972 Waste Effluent Survey for 1971 = 8042496 gallons process water to sanitary sewer
1897	Yr Ops started	1983 Discharge information 4/1-6/31 = 2566203 gallons; 7/1-9/30 1255895 gallons
1986	Yr Ops ceased	1984 100,000 gallons per day to PVSC
89	calc #yrs facility operated	Discharges to PVSC, including overflows from stormwater storage cistern
Copper (Cu)		
89	#yrs facility discharged	
1.00	calc mg/L COC discharged	No discharge data but reference to copper in small quantities in wastewater discharge to PVSC (1mg/l)
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
4,680.93	calc kg COC discharged	
Lead (Pb)		
89	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Mercury (Hg)		
89	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
HPAHs		
89	#yrs facility discharged	No discharge data but 1981-86 permit has limit of 100mg/l oil and grease
100.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
60%	% PAHs considered as HPAHs	
6	calc mg/L HPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
28,085.58	calc kg COC discharged	
LPAHs		
89	#yrs facility discharged	No discharge data but 1981-86 permit has limit of 100mg/l oil and grease
100.00	calc mg/L O&G	
10%	% O&G that is considered PAHs	
40%	% PAHs considered as LPAHs	
4	calc mg/L LPAHs	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
18,723.72	calc kg COC discharged	
PCBs		
49	#yrs facility discharged within PCBs Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
DDx		
33	#yrs facility discharged within DDx Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dieldrin		
37	#yrs facility discharged within Dieldrin Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxins/Furans		
89	#yrs facility discharged	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4-D		
41	#yrs facility discharged within 2,4-D Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,5-T		
41	#yrs facility discharged within 2,4,5-T Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Dioxin/Furan Precursor - 2,4,6-TCP		
26	#yrs facility discharged within 2,4,6-TCP Timeline	
-	calc mg/L COC discharged	
3.785	L per gallon (Merck Index)	
0.000001	kg per mg (Merck Index)	
-	calc kg COC discharged	
Summary DMassCOC for POTW:		
4,680.93	kg Copper	
-	kg Lead	
-	kg Mercury	
28,085.58	kg HPAHs	
18,723.72	kg LPAHs	
-	kg PCBs	
-	kg DDx	
-	kg Dieldrin	
-	kg Dioxins/Furans	

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Protocol Calculation

Tiffany and Company

820 Highland Avenue	**Newark**	**NJ**	**07104**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
3.120E-5	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	2.496E-5

AP_ABS	2.496E-5

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

Facility Base Scores, Culpability Factor, Cooperation Factor and Adjusted Base Scores - Allocation Calculation

Tiffany and Company

820 Highland Avenue	**Newark**	**NJ**	**07104**

Facility BS	CUF	CUF_Category	CUF_NOTES	COF	COF_NOTES	Facillty Adjusted BS
4.345E-3	0.0%	Historically Compliant or No Evidence	No information on violations or sloppy practices was identified in the available file material.	-20.0%	-20% CPG/SPG member - Continuous provision of funding and participation in PRP Group(s) actions to cooperate with governmental/regulatory entities to address environmental or public harm created by own activities	3.476E-3

AP_ABS	3.476E-3

ATTACHMENT M

HISTORY OF SEWER COLLECTION AND TREATMENT IN THE PASSAIC VALLEY

HISTORY OF SEWER COLLECTION AND TREATMENT IN THE PASSAIC VALLEY

One of the primary pathways for the release of COCs to the Passaic River and OU2 was via connection with the local sewer systems that collected wastes from residential and industrial properties in the Passaic River Valley – the Passaic Valley Sewer Commission (PVSC) and its predecessor sewer collection systems. The great majority of Allocation Parties discharged COCs to the Passaic River via sanitary or stormwater sewer connections.

Encompassing approximately 155 square miles, including 48 municipalities in parts of Bergen, Essex, Hudson, Passaic and Union Counties, the PVSC services approximately 1.4 million residents, more than 5,000 commercial entities and 200 significant users (FEMA - *Environmental Assessment Passaic Valley Sewerage Authority Floodwall and On-Site Power System Construction Newark, Essex County, New Jersey, 4086-DR-NJ PW4701, June 2015*). The PVSC owns, operates and maintains a 22-mile long Main Intercepting Sewer that traverses Paterson, Clifton, Passaic, Nutley, Belleville, and Newark along its route to the Wastewater Treatment Plant, or Publicly Owned Treatment Works (POTW) in Newark, which is located along Wilson and Doremus Avenues adjacent to Newark Bay. Along this Main Intercepting Sewer, or "Trunk Line", there are 11 Branch Interceptor Sewers (18 total miles), as well as several Lateral and Local Sewer Connections (approximately 2,000 total miles) that receive flow from local municipalities' collection systems. In serving the wastewater needs of its residents, businesses, and industries, the PVSC sewer system processes approximately 330 million gallons per day, about a quarter of all the waste generated in all of New Jersey.

The PVSC is one of the oldest and largest regional sewerage commissions in the country, established in 1902, but sewer construction and operation in this part of the country goes back even further. As early as 1854, Newark's first sewer was completed, carrying waste under Broad Street running east under Park Place and Rector Street before emptying into the Passaic River (PAP-00701819). Even though hundreds of miles of sewer and interceptor lines were in place by the turn of the century, accommodating almost all of Newark's homes and business, all waste still flowed into the Passaic River, untreated (PAP-00701823).

Diverting waste away from the immediate vicinity of a residence or business to the river on the other side of town solved one problem, but it created another—a polluted Passaic River. In 1895, the boards of health of the lower Passaic River Valley described the condition of the river as causing "nauseating odors, increased sickness, and economic losses" (PAP-00701823). In the late 1890s, a state investigatory commission, organized to study different sewage disposal options, recommended that a trunk sewer be built along the Passaic River to intercept and carry sewage into Newark Bay. To oversee the ambitious engineering endeavor, the PVSC was established in 1902 and construction of the new Trunk Line began in 1912. By 1924, the Trunk Line was finally complete, linking 22 municipalities along the Passaic River draining 80 square miles from Patterson to Newark Bay, where raw sewage was treated at a pumping station before plunging into the Newark shaft to an outfall in Newark Bay and eventual diffusion into New York Bay. The 280-foot concrete-lined shaft was the nation's first deep shaft outfall pressure tunnel (PAP-00701823).

Given the sheer size, scope, complexity, and engineering challenges of the PVSC Sewer System, its infrastructure and operation has undergone many changes and modifications over the past century, as one would expect. Lines have been added and replaced, treatment systems have been upgraded and expanded, and much more all in the effort to accommodate the volume of wastewater and stormwater while minimizing pollution, within the limitations of physics and engineering. One such addition came in the form of Combined Sewer Overflows, or CSOs. To accommodate larger waste volumes during wet weather overflow events, CSOs were constructed at various locations along the Interceptor Sewer lines, mostly the Trunk Line, but along the Branch Interceptors as well. During dry weather events, the sewer lines (Sanitary, Stormwater, and Combined) eventually all lead to their respective Interceptor sewers, which then carries contained sewerage to the POTW to be treated.

However, in wet weather events, water volume in the PVSC collection system can exceed the POTW's capacity to effectively process and treat it. In such events, the excess wastewater and stormwater is diverted via regulator chambers and then released via bypass valve directly to the Passaic River, via CSOs. The regulator chambers are usually located where sewage districts, or Collection Areas, join the trunk sewer line (PAP-00342195). Collection Areas are sections of the municipalities that are defined by their shared flow to one particular CSO. For example, the Verona Avenue Collection Area on the west side of the Passaic River (river mile 8) covers an area of over 387 acres in northwest Newark. In dry weather events, all discharge from this area makes its way to the Trunk Line (at river mile 8), with eventual flow to the POTW at Newark Bay. But in wet weather events, when the water volumes exceed the capacity of the POTW, the Verona Avenue Bypass may be employed to divert excess wastewater and stormwater into the Passaic River, untreated.

This same operation applies to all of the Collection Areas and CSOs in the PVSC sewer system. In addition to the official CSO Collection areas, there is also the Yantacaw Bypass and the Union River Outlet collection systems. In wet weather events, if the POTW at Newark Bay has exceeded its capacity to handle the water volume, any wastewater and stormwater contents of the Trunk Line north of Yantacaw Bypass (River Mile 11) in Clifton gets released into the Passaic River at the Yantacaw Bypass. Similarly in wet weather events, if the POTW at Newark Bay has exceeded its capacity to handle the water volume, the municipalities of Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange and Little Falls that have sewer discharge below Yantacaw Bypass and above Union Outlet (river mile 8) have their combined wastewater and stormwater released into the Passaic River via bypass at the Union River Outlet.

The PVSC system is large and complex and can look very different at any given time and place. In general, the PVSC Sewer System operates with the Interceptor Sewers (Main and Branch) carrying discharge to the POTW for treatment, except in wet weather events when the POTW is beyond its capacity to process the water volume received. In those cases, the CSOs and Bypasses are employed to divert the untreated discharge from their respective Collection Areas into the Passaic River. Attachment M provides maps indicating the general layout of the PVSC collection system, the location of Allocation Party facilities, and the location of primary CSOs and Bypasses.

ATTACHMENT N

CSO VALVE WORKSHEETS

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

NPDES	CSO Municipality	CSO Name	CSO Percentage Overflow Time	Percentage CSO Flow in Overflow	CSO Overflow Time Percentage x CSO Volume	CSO Observation Start Date	CSO Obervation End Date	Comments
015/H-006	Harrison	Bergen Street	0.33%	64.09%	0.211%	7/6/1975	9/12/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
008/E-001	East Newark	Central Avenue	0.37%	61.94%	0.231%	4/24/1975	6/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
038/N-011	Newark	City Dock	0.11%	61.80%	0.068%	1/1/1975	7/20/1975	High tides cause tide gates to remain closed on some days, preventing overflow to river.
033/N-006	Newark	Clay Street	0.90%	41.36%	0.373%	9/13/1974	9/21/1975	
029/N-002	Newark	Delavan Avenue	0.00%	NA	NA	7/12/1975	9/27/1975	No overflows observed by Killam during short observation period. Killam notes that height of brick dam at CSO inhibits overflow.
023/K-007	Kearny	Ivy Street	1.83%	66.23%	1.212%	1/1/1975	6/16/1975	
022/K-006	Kearny	Johnston Avenue	0.78%	80.50%	0.631%	1/1/1975	6/16/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river.
014/H-005	Harrison	Middlesex Street	0.51%	46.17%	0.238%	4/24/1975	7/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
020/K-004	Kearny	Nairn Avenue	0.22%	19.85%	0.044%	6/5/1975	8/7/1975	Short observation period.
040/N-013	Newark	Polk Street	0.10%	69.05%	0.068%	2/23/1975	8/7/1975	High tides cause tide gates to remain closed on some days, preventing overflow to river.
016/H-007	Harrison	Worthington Ave	NA	NA	NA	5/12/1975	5/21/1975	No metering done at this
004	Clifton	Yantacaw Pump	NA	NA	NA			Inactive -- no metering performed.
003	Clifton	Yantacaw Street	NA	NA	NA			Inactive -- no metering performed.

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Municipality	CSO Name	Area Covered		Source	
Harrison	Bergen Street	0.113	72	LPRSA0196705	PAP-00211877
East Newark	Central Avenue	0.041	26	LPRSA0196785	PAP-00211900
Newark	City Dock	0.594	380	LPRSA0196837	PAP-00211916
Newark	Clay Street	2.538	1,621	LPRSA0196890	PAP-00211931
Newark	Delavan Avenue	0.137	88	LPRSA0196952	PAP-00211953
Newark	Fourth Avenue	0.352	225	LPRSA0197116	PAP-00211995
Kearny	Ivy Street	0.949	607	LPRSA0196062	PAP-00211299
Kearny	Johnston Avenue	0.323	207	LPRSA0196129	PAP-00211367
Harrison	Middlesex Street	0.097	62	LPRSA0196229	PAP-00211468
Kearny	Nairn Avenue	0.275	176	LPRSA0196252	PAP-00211534
Newark	Polk Street	0.311	199	LPRSA0196539	PAP-00211773
Newark	Verona Avenue	0.573	367	LPRSA0195826	PAP-00212451
Wallington	Wallington Pump Station	3.944	2,524	LPRSA0195850	PAS-00120922
Rutherford	Woodward Avenue	0.322	206	LPRSA0195894	PAS-00120922
Harrison	Worthington Avenue	0.277	177	LPRSA0195919	PAS-00212274
Clifton	Yantacaw Pump Station	2.123	1,359	LPRSA0195942	PAS-00120922
Clifton	Yantacaw Street	7.969	5,100	LPRSA0195963	PAS-00120922

Bergen Street (Harrison) CSO Overflows

Harrison

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(7/6/1975-9/12/1975)								
7/9/75	7/9/75	1.28	LPRSA0196199	10.1	0.5	0.54	0.04	0.77
7/13/75	7/13/75	0.83	LPRSA0196199	4.2	0.1	0.15	0.03	0.30
7/20/75	7/21/75	1.67	LPRSA0196199	7.5	0.5	0.52	0.06	0.83
8/6/75	8/7/75	0.88	LPRSA0196199	7.0	0.3	0.26	0.03	0.42
9/12/75	9/12/75	0.70	LPRSA0196199	10.0	0.3	0.29	0.02	0.42
Total		5.36				1.75	0.19	2.74
Average dry weather flow (MGD):			LPRSA0196196	**0.83**				
Combined flow to produce an overflow (MGD):			LPRSA0196196	**4.40**				
Total Observation Period:								
7/6/1975	9/12/1975	**1632.00**	LPRSA0196199	LPRSA0196199				
Overflow percentage of total time=				**0.33%**				
Percentage CSO Overflow/Total Flow =				**64.09%**				

Note: At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Kearny/Harrison/East Newark Area, prepared for PVSC, 1976.

PAP-00211435
PAP-00211438

Central Avenue (East Newark) CSO Overflows

East Newark

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(4/24/1975-6/6/1975)								
5/2/75	5/2/75	0.28	LPRSA0195992	1.3	Negligible	0.02	0.00	0.08
5/6/75	5/6/75	0.32	LPRSA0195992	6.1	0.1	0.08	0.00	0.16
5/16/75	5/16/75	1.50	LPRSA0195992	3.3	0.2	0.21	0.01	0.56
6/1/75	6/1/75	1.75	LPRSA0195992	15.9	1.2	1.16	0.01	1.57
Total		3.85				1.46	0.02	2.36
Average dry weather flow (MGD):			LPRSA0195989	**0.14**				
Combined flow to produce an overflow (MGD):			LPRSA0195989	**5.60**				
Total Observation Period:								
4/24/1975	6/6/1975	**1032.00**	LPRSA0195992	LPRSA0195992				

Overflow percentage of total time= **0.37%**
Percentage CSO Overflow/Total Flow = **61.94%**

Note: At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Kearny/Harrison/East Newark Area, prepared for PVSC, 1976.

PAP-00211243
PAP-00211246

City Dock (Newark) CSO Overflows

Newark

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(1/1/1975-7/20/1975)								
3/12/75	3/12/75	0.50	LPRSA0197075	36.9	0.8	0.8	0.20	1.24
3/30/75	3/30/75	1.25	LPRSA0197075	4.8	0.3	0.3	0.51	1.43
5/12/75	5/13/75	1.83	LPRSA0197075	23.3	1.8	1.8	0.75	3.51
5/16/75	5/16/75	1.00	LPRSA0197075	81.6	3.4	3.4	0.41	4.35
6/1/75	6/1/75	0.67	LPRSA0197075	65.9	1.8	1.8	0.27	2.47
Total		5.25				8.04	2.14	13.00

Note: High tides cause tide gates to remain closed on some days, preventing overflow to river.

Average dry weather flow (MGD):	LPRSA0197072	**9.78**	
Combined flow to produce an overflow (MGD):	LPRSA0197072	**22.70**	

Total Observation Period:

1/1/1975	7/20/1975	4800.00	LPRSA0197075	LPRSA0197076

Overflow percentage of total time= **0.11%**
Percentage CSO Overflow/Total Flow = **61.80%**

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

PAP-00211977
PAP-00211977 12-31-1974 to 7-21-1975
PAP-00211982

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1h. Documented PVSC Bypasses at City Dock (Newark)

Allocation Report			
	Time of bypasses	Time observed	% of Total Time
1950-1962	8695:55:00	87155:30:00	9.98%
1974-1975	0:00:00	0:00:00	0:00:00%
Total	8695:55:00	87155:30:00	9.98%

Koch report 1950-1962 (PAP-PAP-00488452 - PAP-00488454)					
Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	AlterEcho Bates Number (throw-out logs)	Comments
10/4/1950 22:00	10/5/1950 11:30	13:30:00	LPRSA0188654	PAP-00456399	
10/10/1950 2:30	10/10/1950 13:00	10:30:00	LPRSA0188652	PAP-00456397	
10/12/1950 13:30	10/13/1950 11:00	21:30:00	LPRSA0188650	PAP-00456395	
10/23/1950 13:30	10/24/1950 9:00	19:30:00	LPRSA0188648	PAP-00456393	
11/20/1950 18:00	11/21/1950 9:00	15:00:00	LPRSA0188646	PAP-00456391	
11/25/1950 9:00	11/25/1950 13:00	4:00:00	LPRSA0188643	PAP-00456388	
12/4/1950 12:30	12/5/1950 9:30	21:00:00	LPRSA0188641	PAP-00456386	
12/7/1950 16:00	12/8/1950 11:30	19:30:00	LPRSA0188637	PAP-00456382	
12/15/1950 22:30	12/16/1950 14:30	16:00:00	LPRSA0188639	PAP-00456384	
12/29/1950 12:30	12/30/1950 11:30	23:00:00	LPRSA0188635	PAP-00456380	
1/7/1951 17:00	1/8/1951 9:00	16:00:00	LPRSA0188633	PAP-00456378	
1/11/1951 17:30	1/12/1951 8:30	15:00:00	LPRSA0188619	PAP-00456364	
1/14/1951 18:00	1/15/1951 12:00	18:00:00	LPRSA0188631	PAP-00456376	
1/23/1951 2:00	1/24/1951 14:00	36:00:00	LPRSA0188621	PAP-00456366	
1/25/1951 16:00	1/26/1951 10:00	18:00:00	LPRSA0188623	PAP-00456368	
1/28/1951 17:00	1/30/1951 10:00	41:00:00	LPRSA0188625	PAP-00456370	
1/31/1951 16:00	2/2/1951 10:00	42:00:00	LPRSA0188628	PAP-00456373	
2/10/1951 5:30	2/10/1951 14:30	9:00:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/11/1951 18:00	2/15/1951 14:30	92:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/17/1951 4:00	2/18/1951 11:30	31:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/19/1951 17:00	2/20/1951 14:30	21:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/23/1951 8:30	2/23/1951 10:00	1:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
	2/25/1951 10:00		LPRSA0188596	PAP-00456064; PAP-00456341	
3/1/1951 13:00	3/2/1951 10:00	21:00:00	LPRSA0188604	PAP-00456349	
3/3/1951 15:00	3/5/1951 10:30	43:30:00	LPRSA0188606	PAP-00456351	
3/13/1951 16:30	3/15/1951 9:30	41:00:00	LPRSA0188609	PAP-00456354	
3/16/1951 16:00	3/19/1951 9:30	65:30:00	LPRSA0188612	PAP-00456357	
3/19/1951 17:00	3/21/1951 9:00	40:00:00	LPRSA0188616	PAP-00456361	

Diamond Alkali-Lower Passaic River Allocation

3/22/1951 0:00	12/31/1951 23:59				data missing
2/17/1952 3:30	2/19/1952 11:00	55:30:00	LPRSA0189755	PAP-00456150	
2/20/1952 18:00	2/22/1952 10:30	40:30:00	LPRSA0189754	PAP-00456149	
2/29/1952 21:00	3/7/1952 10:30	157:30:00	LPRSA0189753	PAP-00456148	
3/11/1952 5:00	3/18/1952 10:30	173:30:00	LPRSA0189752	PAP-00456147	
3/19/1952 10:30	3/21/1952 11:00	48:30:00	LPRSA0189751	PAP-00456146	
3/22/1952 17:00	3/26/1952 11:00	90:00:00	LPRSA0189750	PAP-00456145	
4/5/1952 8:00	4/7/1952 11:00	51:00:00	LPRSA0189749	PAP-00456144	
4/14/1952 4:00	4/17/1952 11:00	79:00:00	LPRSA0189748	PAP-00456143	
4/23/1952 16:30	4/24/1952 11:30	19:00:00	LPRSA0189747	PAP-00456142	
4/25/1952 11:00	5/9/1952 16:30	341:30:00	LPRSA0189744	PAP-00456139, 141	
5/11/1952 22:00	5/14/1952 14:30	64:30:00	LPRSA0189743	PAP-00456138	
5/18/1952 8:45	5/23/1952 15:30	126:45:00	LPRSA0189741	PAP-00456136	
5/25/1952 10:15	5/27/1952 13:30	51:15:00	LPRSA0189740	PAP-00456135	
5/29/1952 16:15	6/14/1952 10:30	378:15:00	LPRSA0189736	PAP-00456131	
6/17/1952 18:15	6/18/1952 14:30	20:15:00	LPRSA0189735	PAP-00456130	
6/19/1952 14:15	6/20/1952 9:00	18:45:00	LPRSA0189734	PAP-00456129	
6/27/1952 16:40	6/28/1952 9:30	16:50:00	LPRSA0189729	PAP-00456124	
6/29/1952 2:00	6/30/1952 10:50	32:50:00	LPRSA0189728	PAP-00456123	
7/8/1952 17:00	7/10/1952 16:15	47:15:00	LPRSA0189730	PAP-00456125	
7/21/1952 17:15	7/22/1952 13:30	20:15:00	LPRSA0189726	PAP-00456121	
7/31/1952 17:25	8/1/1952 10:25	17:00:00	LPRSA0189724	PAP-00456119	
8/2/1952 17:00	8/3/1952 10:15	17:15:00	LPRSA0189725	PAP-00456120	
8/6/1952 16:00	8/11/1952 10:00	114:00:00	LPRSA0189715	PAP-00456110, 113	
8/12/1952 18:00			LPRSA0189721	PAP-00456116	data missing
8/15/1952 17:45	8/17/1952 9:45	40:00:00	LPRSA0189714	PAP-00456109	
8/21/1952 17:15	8/22/1952 13:30	20:15:00	LPRSA0189713	PAP-00456108	
8/30/1952 10:45	9/2/1952 9:45	71:00:00	LPRSA0189712	PAP-00456107	
9/2/1952 17:45	9/4/1952 9:30	39:45:00	LPRSA0189711	PAP-00456106	
9/15/1952 17:15	9/17/1952 17:45	48:30:00	LPRSA0189709	PAP-00456104	
9/18/1952 13:45	9/20/1952 9:45	44:00:00	LPRSA0189710	PAP-00456105	
9/23/1952 11:15	9/24/1952 10:00	22:45:00	LPRSA0189708	PAP-00456103	
10/2/1952 19:45	10/3/1952 14:15	18:30:00	LPRSA0189707	PAP-00456102	
10/28/1952 18:15	10/29/1952 9:45	15:30:00	LPRSA0189706	PAP-00456101	
11/3/1952 14:45	11/4/1952 9:45	19:00:00	LPRSA0189703	PAP-00456098	
11/10/1952 17:15	11/11/1952 9:45	16:30:00	LPRSA0189704	PAP-00456099	
11/14/1952 14:15	12/1/1952 14:15	408:00:00	LPRSA0189701	PAP-00456096	
12/2/1952 14:45	12/8/1952 9:30	138:45:00	LPRSA0189702	PAP-00456097	
12/9/1952 8:45	1/18/1953 15:15	966:30:00	LPRSA0189655	PAP-00456556	
1/21/1953 15:45	1/22/1953 13:30	21:45:00	LPRSA0189656	PAP-00456557	
1/24/1953 10:45	1/25/1953 10:30	23:45:00	LPRSA0189657	PAP-00456558	
2/11/1953 18:00	2/13/1953 11:00	41:00:00	LPRSA0189658	PAP-00456559	
2/15/1953 11:45	2/16/1953 14:30	26:45:00	LPRSA0189659	PAP-00456560	
2/25/1953 9:45	3/11/1953 10:00	336:15:00	LPRSA0189661	PAP-00456562	
	3/14/1953 13:15		LPRSA0189670	PAP-00456161	data missing
3/17/1953 15:15	4/28/1953 13:30	1006:15:00	LPRSA0189670	PAP-00456161	
4/29/1953 9:30	4/29/1953 15:30	6:00:00	LPRSA0189670	PAP-00456161	

Diamond Alkali-Lower Passaic River Allocation

4/30/1953 17:45	5/8/1953 16:00	190:15:00	LPRSA0189670	PAP-00456161	
5/8/1953 11:30			LPRSA0189670	PAP-00456161	data missing
6/13/1953 18:00	6/15/1953 11:15	41:15:00	LPRSA0189674	PAP-00456563	
6/22/1953 11:00	7/2/1953 15:00	244:00:00	LPRSA0189677	PAP-00456566	
7/6/1953 21:00	7/7/1953 9:30	12:30:00	LPRSA0189681	PAP-00456570	
7/20/1953 22:00	7/21/1953 9:35	11:35:00	LPRSA0189682	PAP-00456571	
7/21/1953 16:45	7/22/1953 9:15	16:30:00	LPRSA0189683	PAP-00456572	
7/23/1953 9:25	7/24/1953 13:30	28:05:00	LPRSA0189684	PAP-00456573	
8/14/1953 14:15	8/15/1953 9:30	19:15:00	LPRSA0189686	PAP-00456575	
10/6/1953 19:30	10/7/1953 10:30	15:00:00	LPRSA0189689	PAP-00456578	
10/20/1953 9:15	10/29/1953 17:30	224:15:00	LPRSA0189690	PAP-00456579	
11/7/1953 8:15	11/8/1953 11:45	27:30:00	LPRSA0189695	PAP-00456584	
11/16/1953 10:45			LPRSA0189653	PAP-00456554	data missing
11/23/1953 11:00	11/23/1953 15:15	4:15:00	LPRSA0189698	PAP-00456587	
11/25/1953 13:15	11/26/1953 10:00	20:45:00	LPRSA0189652	PAP-00456553	
11/30/1953 11:00	12/5/1953 8:45	117:45:00	LPRSA0189651	PAP-00456552	
12/6/1953 10:30	12/8/1953 10:00	47:30:00	LPRSA0189650	PAP-00456551	
12/9/1953 17:30	12/11/1953 10:00	40:30:00	LPRSA0189649	PAP-00456550	
12/14/1953 7:15	12/15/1953 13:45	30:30:00	LPRSA0189647	PAP-00456548	
1/15/1954 14:00	1/18/1954 10:45	68:45:00	LPRSA0189592	PAP-00456493	
1/20/1954 15:00	1/22/1954 13:30	46:30:00	LPRSA0189591	PAP-00456492	
1/25/1954 4:00	2/2/1954 14:00	202:00:00	LPRSA0189590	PAP-00456491	
2/3/1954 14:30	2/4/1954 10:30	20:00:00	LPRSA0189589	PAP-00456490	
2/15/1954 15:00	2/19/1954 14:15	95:15:00	LPRSA0189587	PAP-00456488	
2/21/1954 18:15	2/22/1954 9:45	15:30:00	LPRSA0189586	PAP-00456487	
2/23/1954 13:00	2/27/1954 9:45	92:45:00	LPRSA0189621	PAP-00456522	
3/1/1954 12:00	3/5/1954 14:45	98:45:00	LPRSA0189619	PAP-00456520	
3/13/1954 16:00	3/15/1954 10:30	42:30:00	LPRSA0189618	PAP-00456519	
3/19/1954 17:30	3/20/1954 13:40	20:10:00	LPRSA0189617	PAP-00456518	
3/25/1954 11:00	3/26/1954 10:45	23:45:00	LPRSA0189616	PAP-00456517	
4/8/1954 14:45	4/9/1954 10:30	19:45:00	LPRSA0189613	PAP-00456514	
4/13/1954 13:30	4/13/1954 15:00	1:30:00	LPRSA0189623	PAP-00456524	
4/16/1954 13:50	4/18/1954 10:50	45:00:00	LPRSA0189632	PAP-00456533	
4/19/1954 16:45	4/21/1954 15:30	46:45:00	LPRSA0189615	PAP-00456516	
4/23/1954 14:30	4/25/1954 10:30	44:00:00	LPRSA0189614	PAP-00456515	
4/28/1954 16:15	4/29/1954 10:30	18:15:00	LPRSA0189612	PAP-00456513	
5/3/1954 11:45	5/26/1954 9:45	550:00:00	LPRSA0189631	PAP-00456532	
6/1/1954 12:45	6/3/1954 16:30	51:45:00	LPRSA0189630	PAP-00456531	
7/2/1954 10:00	7/2/1954 17:00	7:00:00	LPRSA0189626	PAP-00456527	
7/4/1954 13:15	7/4/1954 14:30	1:15:00	LPRSA0189625	PAP-00456526	
9/10/1954 14:45	9/12/1954 10:30	43:45:00	LPRSA0189606	PAP-00456507	
5/16/1957 0:00	8/25/1957 23:59				data missing
9/18/1957 0:00	12/19/1957 23:59				data missing
9/12/1960 12:20	9/13/1960 9:30	21:10:00	LPRSA0189397	PAP-00456240	
1/1/1963 0:00	12/31/1974 23:59				data missing
Subtotal 1950-1962 Koch Report		**8676:55:00**			

Diamond Alkali-Lower Passaic River Allocation

Subtotal 1950-1962 Throw out Logs		**8695:55:00**			

Koch report (1974-1975) PAP-00488455					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**		
1/1/1975	1/1/1975	0:00:00	LPRSA0197075	PAP-00456754	
7/20/1975	7/20/1975	0:00:00	LPRSA0197076	PAP-00456755	
7/21/1975	12/31/2004				data missing
Subtotal 1974-1975 Koch Report		**0:00:00**			

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

Clay Street (Newark) CSO Overflows

Newark

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(9/13/1974-9/21/1975)								
9/13/74	9/14/74	2.00	LPRSA0196840	26.7	2.2	2.2	2.27	8.31
1/1/75	1/1/75	1.97	LPRSA0196840	7.7	0.6	0.6	2.23	6.62
1/18/75	1/18/75	2.25	LPRSA0196840	82.2	7.7	7.7	2.55	14.55
1/19/75	1/20/75	4.25	LPRSA0196840	10.8	1.9	1.9	4.82	14.84
1/25/75	1/25/75	6.50	LPRSA0196840	18.1	4.9	4.9	7.37	24.67
1/29/75	1/29/75	2.00	LPRSA0196840	40.0	3.3	3.3	2.27	9.42
2/23/75	2/23/75	2.62	LPRSA0196840	58.0	6.3	6.3	2.97	14.30
2/24/75	2/24/75	3.75	LPRSA0196840	74.2	11.6	11.6	4.25	23.00
3/12/75	3/12/75	5.50	LPRSA0196840	46.1	10.6	10.6	6.23	27.29
3/30/75	3/30/75	3.25	LPRSA0196840	37.0	4.9	5.0	3.68	14.90
4/3/75	4/3/75	1.25	LPRSA0196840	106.7	5.6	5.6	1.42	9.36
4/24/75	4/25/75	9.00	LPRSA0196840	25.2	9.4	9.5	10.20	36.83
4/25/75	4/26/75	6.13	LPRSA0196840	13.9	3.6	3.6	6.95	22.20
5/2/75	5/2/75	1.50	LPRSA0196840	41.2	2.6	2.6	1.70	7.14
5/4/75	5/5/75	12.30	LPRSA0196840	26.1	13.4	13.4	13.94	50.79
5/6/75	5/6/75	1.70	LPRSA0196840	50.4	3.6	3.6	1.93	8.74
5/12/75	5/13/75	3.88	LPRSA0196841	44.0	7.1	7.1	4.40	18.92
5/13/75	5/13/75	3.50	LPRSA0196841	156.4	22.8	22.8	3.97	33.45
5/25/75	5/25/75	1.62	LPRSA0196841	33.5	2.3	2.3	1.84	7.19
5/30/75	5/30/75	2.20	LPRSA0196841	18.4	1.7	1.7	2.49	8.38
6/1/75	6/1/75	3.62	LPRSA0196841	312.6	47.2	47.2	4.10	58.16
Total		80.79				173.31	91.56	419.05

Average dry weather flow (MGD):	LPRSA0196837	**27.20**
Combined flow to produce an overflow (MGD):	LPRSA0196837	**73.00**

Total Observation Period:

9/13/1974	9/21/1975	**8952.00**	LPRSA0196840	LPRSA0196841

Overflow percentage of total time= **0.90%**

Percentage CSO Overflow/Total Flow = **41.36%**

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

PAP-00211907
PAP-00211916
PAP-00449588

Delavan Avenue (Newark) CSO Overflows

Newark

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)
(7/12/1975-9/27/1975)						
No overflows observed during observation period.						
Total		0.00	LPRSA0196683	-	-	-
Average dry weather flow (MGD):			LPRSA0196680	**0.20**		
Total Observation Period:						
7/12/1975	9/27/1975	**1848.00**	LPRSA0196683			
Overflow percentage of total time=		**0.00%**				

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

PAP-00211850
PAP-00211856
PAP-00449588

Fourth Avenue (Newark) CSO Overflows

Newark

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(1/1/1975-7/21/1975)								
2/24/75	2/24/75	1.25	LPRSA0196788	7.8	0.4	0.4	0.08	1.27
4/24/75	4/24/75	0.62	LPRSA0196788	6.2	0.2	0.2	0.04	0.59
5/2/75	5/2/75	0.30	LPRSA0196788	5.0	0.2	0.1	0.02	0.27
5/6/75	5/6/75	0.25	LPRSA0196788	8.0	0.1	0.1	0.02	0.26
5/12/75	5/13/75	1.50	LPRSA0196788	7.7	0.5	0.5	0.10	1.51
5/13/75	5/13/75	2.12	LPRSA0196788	13.2	1.2	1.2	0.14	2.62
5/16/75	5/16/75	1.37	LPRSA0196788	2.6	0.2	0.1	0.09	1.09
5/25/75	5/25/75	*	LPRSA0196788	*	*			
6/5/75	6/6/75	1.08	LPRSA0196789	4.7	0.2	0.2	0.07	0.95
7/20/75	7/21/75	1.12	LPRSA0196789	5.0	0.2	0.2	0.07	1.00
Total		9.61				2.95	0.64	9.56

* Illegible

Average dry weather flow (MGD):	LPRSA0196785	**1.60**
Combined flow to produce an overflow (MGD):	LPRSA0196785	**16.50**

Total Observation Period:

1/1/1975	7/21/1975	**4824.00**	LPRSA0196788	LPRSA0196789

Overflow percentage of total time= **0.20%**

Percentage CSO Overflow/Total Flow = **30.89%**

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

PAP-00211900
PAP-00449588

Ivy Street (Kearny) CSO Overflows

Kearny

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(1/1/1975-6/16/1975)								
1/1/75	1/1/75	1.00	LPRSA0196404	1.6	0.1	0.07	0.13	0.61
1/6/75	1/7/75	1.12	LPRSA0196404	2.3	0.1	0.11	0.14	0.71
1/9/75	1/9/75	6.75	LPRSA0196404	18.7	5.3	5.26	0.84	8.92
1/13/75	1/13/75	7.00	LPRSA0196404	20.7	6.0	6.04	0.88	9.83
1/18/75	1/18/75	5.50	LPRSA0196404	34.9	8.0	8.00	0.69	10.98
1/19/75	1/20/75	3.47	LPRSA0196404	2.2	0.3	0.32	0.43	2.20
1/25/75	1/25/75	5.50	LPRSA0196404	4.6	1.1	1.05	0.69	4.03
1/29/75	1/29/75	6.00	LPRSA0196404	5.4	1.3	1.35	0.75	4.60
2/23/75	2/23/75	2.75	LPRSA0196404	17.3	2.0	1.98	0.34	3.47
2/24/75	2/24/75	5.50	LPRSA0196404	26.3	6.0	6.03	0.69	9.01
5/12/75	5/13/75	1.88	LPRSA0196404	34.3	2.7	2.69	0.24	3.71
5/13/75	5/13/75	2.03	LPRSA0196404	44.3	3.8	3.75	0.25	4.85
5/16/75	5/16/75	2.83	LPRSA0196404	14.8	1.8	1.75	0.35	3.28
5/21/75	5/21/75	0.25	LPRSA0196404	1.5	Negligible	0.02	0.03	0.15
5/25/75	5/25/75	0.50	LPRSA0196404	1.0	Negligible	0.02	0.06	0.29
6/1/75	6/1/75	3.72	LPRSA0196405	147.0	22.8	22.79	0.47	24.80
6/5/75	6/5/75	0.25	LPRSA0196405	1.0	Negligible	0.01	0.03	0.15
6/5/75	6/6/75	4.08	LPRSA0196405	44.7	7.6	7.60	0.51	9.81
6/6/75	6/6/75	1.63	LPRSA0196405	26.2	1.8	1.78	0.20	2.66
6/12/75	6/13/75	9.92	LPRSA0196405	12.6	5.2	5.21	1.24	10.58
6/16/75	6/16/75	1.25	LPRSA0196405	32.5	1.7	1.69	0.16	2.37
Total		72.93				77.49	9.12	116.99

Average dry weather flow (MGD):	LPRSA0196401	**3.00**
Combined flow to produce an overflow (MGD):	LPRSA0196403	**13.00**

Total Observation Period:

1/1/75	6/16/1975	**3984.00**	LPRSA0196404	LPRSA0196405

	PAP-00211645
Overflow percentage of total time=	**1.83%** PAP-00211647
Percentage CSO Overflow/Total Flow =	**66.23%** PAP-00211648-9

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Kearny/Harrison/East Newark Area, prepared for PVSC, 1976.

Johnston Avenue (Kearny) CSO Overflows

Kearny

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(1/1/1975-6/16/1975)								
1/18/75	1/18/75	3.50	LPRSA0196369	8.5	1.2	1.24	0.09	2.30
1/29/75	1/29/75	1.92	LPRSA0196369	14.4	1.2	1.15	0.05	1.74
2/23/75	2/23/75	1.25	LPRSA0196369	20.5	1.1	1.07	0.03	1.45
2/24/75	2/24/75	0.62	LPRSA0196369	27.9	0.7	0.72	0.02	0.91
3/12/75	3/12/75	3.50	LPRSA0196369	7.1	1.0	1.04	0.09	2.10
3/14/75	3/14/75	0.67	LPRSA0196369	19.7	0.6	0.55	0.02	0.75
3/19/75	3/20/75	4.27	LPRSA0196369	41.6	7.4	7.40	0.11	8.70
3/30/75	3/30/75	1.77	LPRSA0196369	13.3	1.0	0.98	0.05	1.52
4/3/75	4/3/75	3.55	LPRSA0196369	41.8	6.2	6.18	0.09	7.26
4/24/75	4/25/75	0.50	LPRSA0196369	9.6	0.2	0.20	0.01	0.35
5/2/75	5/2/75	0.92	LPRSA0196369	12.5	0.5	0.48	0.02	0.76
5/4/75	5/5/75	4.25	LPRSA0196369	76.3	13.5	13.51	0.11	14.80
5/13/75	5/13/75	1.78	LPRSA0196369	32.5	2.4	2.41	0.05	2.95
5/16/75	5/16/75	2.72	LPRSA0196369	20.0	2.3	2.27	0.07	3.09
Total		31.22				39.20	0.82	48.69

Average dry weather flow (MGD):	LPRSA0196366	**0.63**
Combined flow to produce an overflow (MGD):	LPRSA0196366	**7.30**

Total Observation Period:

1/1/75	6/16/1975	**3984.00**	LPRSA0196369	LPRSA0196370

Overflow percentage of total time= 0.78%
Percentage CSO Overflow/Total Flow = 80.50%

Note: At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Kearny/Harrison/East Newark Area, prepared for PVSC, 1976.

PAP-00211610
PAP-00211613-4

Middlesex Street (Harrison) CSO Overflows

Harrison

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(4/24/1975-7/6/1975)								
4/24/75	4/25/75	1.00	LPRSA0196163	1.4	0.1	0.06	0.03	0.21
5/2/75	5/2/75	0.27	LPRSA0196163	0.1	Negligible	0.00	0.01	0.04
5/16/75	5/16/75	3.95	LPRSA0196163	1.1	0.2	0.18	0.12	0.77
6/1/75	6/1/75	1.80	LPRSA0196163	6.6	0.5	0.50	0.05	0.77
6/5/75	6/6/75	2.00	LPRSA0196163	5.1	0.40	0.43	0.06	0.73
Total		9.02				1.16	0.27	2.51
Average dry weather flow (MGD):			LPRSA0196160	**0.72**				
Combined flow to produce an overflow (MGD):			LPRSA0196160	**3.60**				
Total Observation Period:								
4/24/75	7/6/1975	**1752.00**	LPRSA0196163	LPRSA0196163				

Overflow percentage of total time= **0.51%**
Percentage CSO Overflow/Total Flow = **46.17%**

Note: At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Kearny/Harrison/East Newark Area, prepared for PVSC, 1976.

PAP-00211398

Nairn Avenue (Kearny) CSO Overflows

Kearny

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(6/5/1975-8/7/1975)								
6/5/75	6/5/75	1.63	LPRSA0196283	0.6	Negligible	0.04	0.04	0.26
7/6/75	7/6/75	1.00	LPRSA0196283	0.8	Negligible	0.03	0.02	0.17
8/6/75	8/7/75	0.75	LPRSA0196283	1.2	Negligible	0.04	0.02	0.14
Total		3.38				0.11	0.08	0.56
Average dry weather flow (MGD):			LPRSA0196280	**0.54**				
Combined flow to produce an overflow (MGD):			LPRSA0196280	**3.20**				
Total Observation Period:								
6/5/75	8/7/1975	**1512.00**	LPRSA0196283	LPRSA0196283				

Overflow percentage of total time= **0.22%**
Percentage CSO Overflow/Total Flow = **19.85%**

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Kearny/Harrison/East Newark Area, prepared for PVSC, 1976.

PAP-00211562
PAP-00211565

Polk Street (Newark) CSO Overflows

Newark

ADR CONFIDENTIAL - NOT BINDING OR TO BE DEEMED AN ADMISSION FOR ANY OTHER PURPOSE OR PROCEEDING

CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(2/23/1975-8/7/1975)								
3/12/75	3/12/75	3.25	LPRSA0197152	25.6	3.5	3.5	0.22	4.89
4/24/75	4/25/75	0.67	LPRSA0197152	12.9	0.4	0.4	0.05	0.65
Total		3.92				3.83	0.27	5.54

Note: High tides cause tide gates to remain closed on some days, preventing overflow to river.

Average dry weather flow (MGD):	LPRSA0197149	**1.63**
Combined flow to produce an overflow (MGD):	LPRSA0197149	**10.50**

Total Observation Period:

2/23/1975	8/7/1975	**3960.00**	LPRSA0197152	LPRSA0197152

Overflow percentage of total time= **0.10%**
Percentage CSO Overflow/Total Flow = **69.05%**

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

PAP-00212015
PAP-00212019

PAP-00212015

Verona Avenue (Newark) CSO Overflows

Newark

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CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers	Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(1/1/1975-6/29/1975)								
1/6/75	1/7/75	3.20	LPRSA0196644	3.6	0.5	0.5	0.21	3.01
1/9/75	1/9/75	4.00	LPRSA0196644	6.7	1.1	1.1	0.27	4.28
1/29/75	1/29/75	5.90	LPRSA0196644	4.2	1.0	1.0	0.39	5.70
3/12/75	3/12/75	7.25	LPRSA0196644	7.3	2.2	2.2	0.48	7.94
3/14/75	3/14/75	3.25	LPRSA0196644	1.2	0.2	0.2	0.22	2.74
3/19/75	3/20/75	6.38	LPRSA0196644	7.9	2.1	2.1	0.42	7.15
3/30/75	3/30/75	2.62	LPRSA0196644	3.6	0.4	0.4	0.17	2.47
4/3/75	4/3/75	5.50	LPRSA0196644	5.6	1.3	1.3	0.36	5.64
4/24/75	4/24/75	2.62	LPRSA0196644	4.7	0.5	0.5	0.17	2.59
4/24/75	4/25/75	2.37	LPRSA0196644	2.4	0.2	0.2	0.16	2.11
4/25/75	4/26/75	1.00	LPRSA0196644	0.7	0.0	0.0	0.07	0.82
5/2/75	5/2/75	1.37	LPRSA0196644	2.7	0.2	0.2	0.09	1.24
5/4/75	5/5/75	4.42	LPRSA0196644	1.5	0.3	0.3	0.29	3.78
5/6/75	5/6/75	0.75	LPRSA0196644	3.9	0.1	0.1	0.05	0.72
5/16/75	5/16/75	3.25	LPRSA0196644	2.9	0.4	0.4	0.22	2.97
6/28/75	6/28/75	0.66	LPRSA0196645	53.3	1.5	1.5	0.04	1.99
Total		54.54				11.96	3.61	55.14

Average dry weather flow (MGD):	LPRSA0196641	**1.59**
Combined flow to produce an overflow (MGD):	LPRSA0196641	**19.00**

Total Observation Period:

1/1/1975	6/29/1975	**4296.00**	LPRSA0196644	LPRSA0196645

Overflow percentage of total time= **1.27%**

Percentage CSO Overflow/Total Flow = **21.70%**

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

PAP-00211826
PAP-00211820

NPDES	CSO Municipality	CSO Name	Area Covered square miles	Area Covered acres	CSO Percentage Overflow Time	Percentage CSO Flow in Overflow	CSO Overflow Time Percentage x CSO Volume Percentage	CSO Observation Start Date	CSO Obervation End Date	Comments
011/H-002	Harrison	Cleveland Avenue	0.017	11	0.21%	34.80%	0.073%	2/5/1975	6/16/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
015/H-006	Harrison	Bergen Street	0.113	72	0.33%	64.09%	0.211%	7/6/1975	9/12/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
010/H-001	Harrison	New (Hamilton) Street	0.05	32	0.45%	74.58%	0.337%	5/12/1975	7/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
014/H-005	Harrison	Middlesex Street	0.097	62	0.51%	46.17%	0.238%	4/24/1975	7/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
013/H-004	Harrison	Dey Street	0.009	6	0.60%	50.64%	0.306%	6/5/1975	7/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
012/H-003	Harrison	Harrison Avenue	0.105	67	1.13%	62.02%	0.702%	4/24/1975	6/6/1975	Short observation period.
016/H-007	Harrison	Worthington Avenue	0.277	177	NA	NA	NA	5/12/1975	5/21/1975	No metering done at this location.
	Total of Harrison CSOs		0.668	427	3.24%	332.31%				
	Worthington Avenue median				0.48%	56.33%	0.27216093382032900%	median		

Worthington Avenue (Harrison) CSO Overflows

Harrison

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CSO Overflow Start	CSO Overflow End	Duration (hours)	Source Bates Numbers		Average Overflow Rate (MGD)	Cited Overflow Volume (MG)	Calculated Overflow Volume (MG)	Dry Weather Volume (MG)	Total Volume (in system + overflow) (MG)
(5/12/1975-5/21/1975)									
This CSO was not metered for overflows.									
Total		NA							
Average dry weather flow (MGD):			LPRSA0196229		**2.00**				
Combined flow to produce an overflow (MGD):			LPRSA0196229		**5.90**				
Total Observation Period:									
5/12/1975	5/21/1975	216.00	LPRSA0196199	LPRSA0196199					
Overflow percentage of total time=			**NA**						
Percentage CSO Overflow/Total Flow =			**NA**						

Note: No metering done at this location.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Kearny/Harrison/East Newark Area, prepared for PVSC, 1976.

PAP-00211468
PAP-00211471

Yantacaw CSO
Bypass % Calculation

NPDES	CSO Municipality	CSO Name	CSO Percentage Overflow Time	Percentage CSO Flow in Overflow	CSO Overflow Time Percentage x CSO Volume Percentage	CSO Observation Start Date	CSO Obervation End Date	Comments
028/N-001	Newark	Verona Avenue	1.27%	21.70%	0.28%	1/1/1975	6/29/1975	
030/N-003	Newark	Herbert Place	1.40%	39.56%	0.55%	1/1/1975	6/29/1975	
032/N-005	Newark	Fourth Avenue	0.20%	30.89%	0.06%	1/1/1975	7/21/1975	One overflow observation is illegible.
033/N-006	Newark	Clay Street	0.90%	41.36%	0.37%	9/13/1974	9/21/1975	
033/N-006C	Newark	Passaic Street	0.14%	46.55%	0.06%	7/6/1975	10/18/1975	Short observation period. Killam notes that during observation period, high tides caused tide gates to remain closed on some days, preventing overflow to river.
036/N-009	Newark	Rector Street	0.46%	40.16%	0.18%	1/25/1975	8/7/1975	
037/N-010	Newark	Saybrook Place	0.46%	50.20%	0.23%	1/8/1975	6/29/1975	High tides cause tide gates to remain closed on some days, preventing overflow to river.
038/N-011	Newark	City Dock	0.11%	61.80%	0.07%	1/1/1975	7/20/1975	High tides cause tide gates to remain closed on some days, preventing overflow to river.
039/N-012	Newark	Jackson Street	0.05%	54.58%	0.03%	5/1/1975	9/24/1975	High tides cause tide gates to remain closed on some days, preventing overflow to river. Short observation period.
040/N-013	Newark	Polk Street	0.10%	69.05%	0.07%	2/23/1975	8/7/1975	High tides cause tide gates to remain closed on some days, preventing overflow to river.
041/N-014	Newark	Freeman Street	0.47%	32.87%	0.15%	2/23/1975	4/26/1975	Short observation period.
008/E-001	East Newark	Central Avenue	0.37%	61.94%	0.23%	4/24/1975	6/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
010/H-001	Harrison	New (Hamilton) Street	0.45%	74.58%	0.34%	5/12/1975	7/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
011/H-002	Harrison	Cleveland Avenue	0.21%	34.80%	0.07%	2/5/1975	6/16/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
012/H-003	Harrison	Harrison Avenue	1.13%	62.02%	0.70%	4/24/1975	6/6/1975	Short observation period.

Yantacaw CSO
Bypass % Calculation

013/H-004	Harrison	Dey Street	0.60%	50.64%	0.31%	6/5/1975	7/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
014/H-005	Harrison	Middlesex Street	0.51%	46.17%	0.24%	4/24/1975	7/6/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
015/H-006	Harrison	Bergen Street	0.33%	64.09%	0.21%	7/6/1975	9/12/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
019/K-003	Kearny	Bergen Avenue (West)	3.45%	28.68%	0.99%	4/24/1975	5/7/1975	Short observation period.
020/K-004	Kearny	Nairn Avenue	0.22%	19.85%	0.04%	6/5/1975	8/7/1975	Short observation period.
021/K-005	Kearny	Marshall Street	0.39%	56.08%	0.22%	2/5/1975	4/3/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river. Short observation period.
022/K-006	Kearny	Johnston Avenue	0.78%	80.50%	0.63%	1/1/1975	6/16/1975	At times, tidal levels caused tide gates to remain closed during part of rainfall, resulting in reduced overflow to river.
023/K-007	Kearny	Ivy Street	1.83%	66.23%	1.21%	1/1/1975	6/16/1975	
024/K-008	Kearny	Bergen Avenue (East)	1.40%	63.04%	0.89%	1/6/1975	7/21/1975	
025/K-009	Kearny	Tappan Street	0.50%	28.10%	0.14%	2/23/1975	9/24/1975	
026/K-010	Kearny	Dukes St	0.15%	61.02%	0.09%	5/1/1975	10/24/1975	
017/K-001	Kearny	Stewart Avenue	0.35%	48.49%	0.17%	8/6/1975	10/24/1975	Short observation period.
018/K-002	Kearny	Washington Avenue	0.22%	31.33%	0.07%	6/5/1975	9/27/1975	Short observation period.
	Yantacaw	**Median**	**0.45%**	**49.35%**	0.22%			

Note: All of the CSOs with no data have been removed

ATTACHMENT O

MAY 2020 KOCH REPORT

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

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PREPARED SUBJECT TO REQUIREMENTS OF AND FOR USE ONLY IN EPA ALLOCATION
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CONTRIBUTIONS OF CONTAMINANTS OF CONCERN (COCS) TO THE PASSAIC RIVER

Prepared by

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May 22, 2020

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1. PURPOSE

At the request of counsel for the Lower Passaic River Study Area ("LPRSA") Small Parties Group ("SPG"), I was asked to evaluate, based upon available resources, the relative contributions of the main sources of Contaminants of Concern ("COCs") to the LPRSA (the "Site"). In particular, this report evaluates the collective contributions of parties not participating in an allocation proceeding relative to the collective contributions of the Participating Allocation Parties ("PAPs"). This report does not attempt to identify or otherwise assess the existence of orphan shares relating to contamination in the LPRSA, as a solvency review has not been conducted.

2. QUALIFICATIONS

As a Principal and Co-Founder of Axlor Consulting LLC, I work on solutions to economic, environmental, insurance, and product liability issues that arise in litigation, negotiation, business, and regulatory matters. I have been an environmental and business consultant for over 35 years, during which time I have worked on many projects involving contaminated sediment sites and conceptual site models. My experience includes modeling historic industrial processes and the development of mass balances on behalf of private parties and government agencies for litigation and management purposes. I have been retained numerous times regarding complex allocation issues involving evaluation of historic contamination sources to rivers, harbors, groundwater, and land. I have co-authored articles on allocation and have lectured on allocation issues in the context of environmental litigation risk analysis and as a component of the ASTM International best practice standard that addresses environmental allocation issues,[1] for which I have served as technical contact since the standard was first approved in 2001.

[1] ASTM Standard E2137-17, "Standard Guide for Estimating Monetary Costs and Liabilities for Environmental Matters."

I hold a B.S. degree in chemical engineering; a B.S. degree in humanities and engineering (in the Science, Technology & Society Program with a focus on environmental studies); and an M.S. degree in management science (with concentrations in applied economics, corporate strategy, and management of technological innovation) from the Massachusetts Institute of Technology. As part of this education and related research, I studied industrial processes and mass balances; modeled flows of contaminants in air and water; studied environmental science, law and regulations; and developed complex quantitative analyses for decision-making.

Additional information regarding my experience, including examples of mass balance and allocation projects, is contained in my resume, attached in Exhibit 1.

3. METHODOLOGY AND DOCUMENTS CONSIDERED

To develop this report, I reviewed the large collection of Site-related documents listed in Appendix A. I have conducted extensive research to identify the historical sources of COCs to the LPRSA, including review of:

- Numerous historical documents related to industrial development in the Passaic River ("River") area;
- LPRSA investigations conducted for the EPA and other parties;
- Numerous documents related to operations and discharges of the Passaic Valley Sewerage Commission ("PVSC") and local municipalities; and
- Scientific studies related to sources of specific COCs to the Passaic River watershed, including studies of sources of heavy metals (copper, lead and mercury) to the PVSC;

studies conducted by the New York Academy of Sciences related to PCBs, dioxins,[2] mercury, and PAHs; dioxin fingerprinting studies; and studies of copper and lead mass flows.

With the available documents, I estimated the number of parties that likely contributed COCs to the LPRSA and, to the extent feasible, quantified the order of magnitude of these COC contributions. I also researched the contributions of the PAPs relative to the main sources of COCs to the LPRSA. The documents I relied upon for this report, which are typical of those normally relied upon by allocation experts examining the history of pollutant discharges at a site, are cited in the footnotes.

This report is based on the documentation reviewed to date. I will continue to review information as it is made available to me, and may update my opinions accordingly. The opinions offered herein are offered to a reasonable degree of professional certainty.

4. EXECUTIVE SUMMARY

4.1 Background

The current allocation proceeding is being conducted to evaluate the relative contributions by the PAPs of COCs in Operable Unit 2 ("OU-2"), defined as the lower 8.3-mile portion of the 17-

[2] The NYAS study used the term "dioxins" as shorthand for the suite of 210 polychlorinated dibenzo-p-dioxin and polychlorinated dibenzofuran compounds (PCDDs/PCDFs), including 2,3,7,8-TCDD and "dioxin-like compounds" such as coplanar PCBs, polychlorinated naphthalenes, and brominated and chlorinated/brominated dioxins. Of these, the compound 2,3,7,8-TCDD is the most toxic. The report also used "dioxins" to refer to data sets where fewer than the 210 compounds were measured. This report follows the NYAS convention and uses "dioxins" to mean 2,3,7,8-TCDD, TCDD toxic equivalents ("TEQ"), or PCDDs/PCDFs, unless otherwise noted. Source: G.R. Munoz and M.A. Panero, New York Academy of Sciences, Pollution Prevention and Management Strategies for Dioxins in the New York/New Jersey Harbor, August 2006, pp.33-34.

mile LPRSA.[3] Due to the nature of historical contaminant transport into and within the entire LPRSA, discharges of COCs into any portion of the LPRSA are all potential contributors of COCs in in the LPRSA, including OU-2. Therefore, when conducting an equitable allocation for the OU-2 COCs, it is important to consider all historical discharge sources to the LPRSA. As my evaluation shows, many of the sources of such discharges are not included in this allocation.

The COCs identified in EPA's 2016 Record of Decision ("ROD") for OU-2 of the LPRSA are:[4]

- Dioxins and furans
- Polychlorinated biphenyls ("PCBs")
- Mercury
- Dichlorodiphenyltrichloroethane ("DDT")
- Copper
- Dieldrin
- Polycyclic aromatic hydrocarbons ("PAHs")
- Lead

EPA has recognized that there are numerous sources of these COCs, including industrial point sources as well as regional sources such as the Upper Passaic River, Newark Bay, tributaries, and municipal and PVSC and other municipal sewer overflows.[5] As discussed in Section 5 below, EPA's Remedial Investigation indicates that the largest ongoing source of contamination in OU-2 sediments is, by far, the resuspension of legacy (*i.e.*, historical) contamination in sediments. Thus, in performing an allocation for OU-2, it is critical to have as complete a picture as possible of all of the historical sources of contamination to OU-2. This report shows that COCs in OU-2

[3] U.S. Environmental Protection Agency, Region II, Record of Decision: Lower 8.3 Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, March 3, 2016, Decision Summary, p. 1.

[4] U.S. Environmental Protection Agency, Region II, Record of Decision: Lower 8.3 Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, March 3, 2016, Decision Summary, pp. 14-16.

[5] U.S. Environmental Protection Agency, Region II, Record of Decision: Lower 8.3 Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, March 3, 2016, Decision Summary, pp. 16-19.

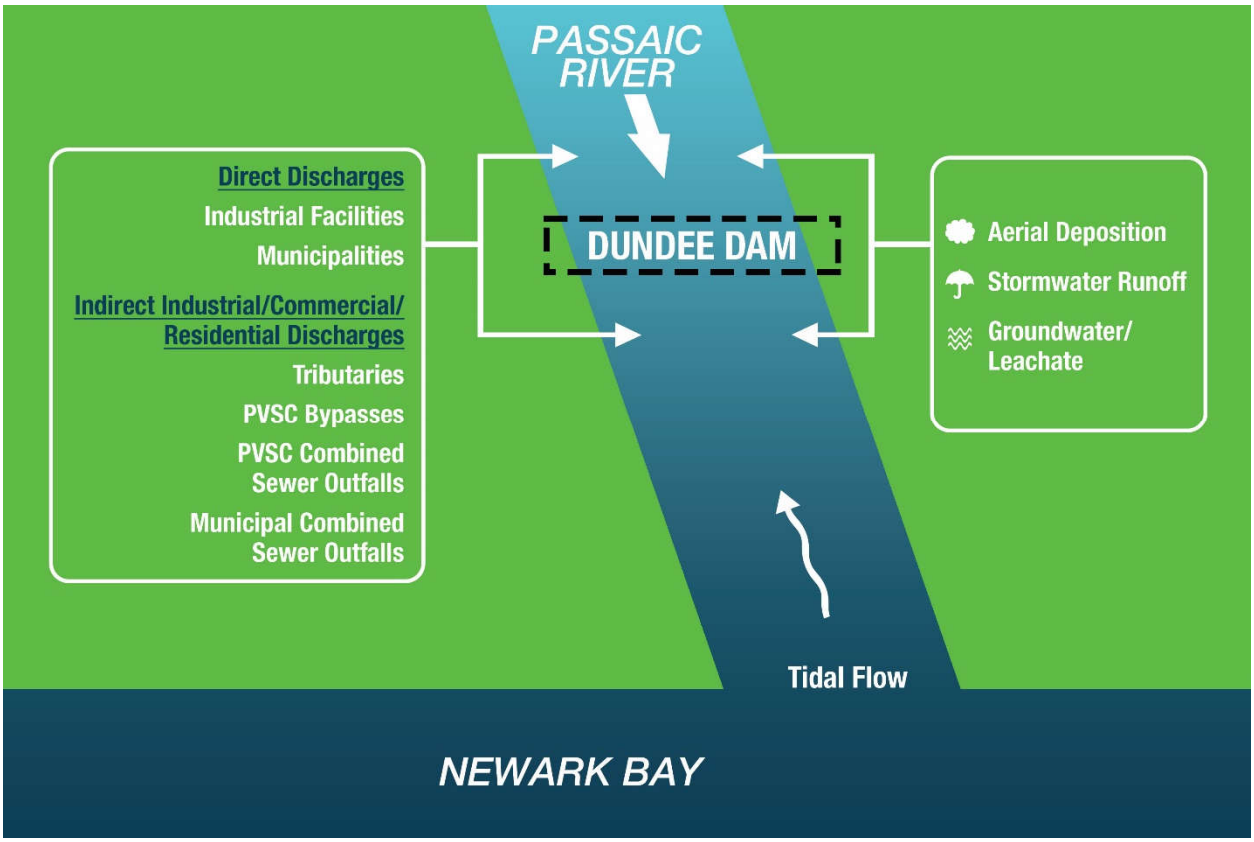
came from sources far outnumbering the allocation participants and from well beyond the areas considered for the allocation.

As illustrated in Figure 1, historically, COCs from industrial, commercial, and residential sources to the LPRSA were:

- Discharged directly to the Passaic River and its tributaries;
- Transported to the Passaic River via individual municipal and Passaic Valley Sewerage Commission ("PVSC") direct discharges, bypasses and combined sewer overflows ("CSOs");
- Transported over Dundee Dam from the Upper Passaic River and its tributaries;
- Transported from Newark Bay via twice-daily tidal flows; and
- Discharged through aerial deposition, groundwater/leachate flow, and stormwater runoff.

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Figure 1. Sources of COCs to the LPRSA



Municipal sewerage systems, and particularly the PVSC, were also significant historical contributors of COCs from both above and below Dundee Dam. While the PVSC interceptor system conveyed much of the wastewater from its collection area to the PVSC treatment plant at Newark Bay and discharged most of the treated effluent in New York Harbor,[6] discharges of untreated sewage into the Passaic River via the PVSC and municipal bypasses and combined sewer overflows alone could account for a material portion of the mass of certain COCs currently found in the OU-2 sediments. The PVSC and municipalities are not participating parties in the

[6] Affidavit of Seymour A. Lubetkin, January 6, 1994 [846680004-846680005]; Memo from R. C Smith to PVSC, February 17, 1947, p. 2 [LPRSA0198629].

allocation, despite the fact that they were, at a minimum, arrangers and transporters of COCs to the LPRSA.

4.2 Conclusions

My investigation of industrial sources as well as residential and commercial sources of COCs to the LPRSA concludes that the PAPs account for only a small percentage of the historical industrial dischargers into the PVSC, municipal, and river systems that were sources of COCs in the LPRSA. Specifically:

1. Of the approximately 11,800 historical industrial dischargers to the Passaic River that were identified through industrial directories both above and below Dundee Dam, ***98.6 percent*** **are not participating in this allocation effort.**

2. While the predominant discharger of dioxin and DDT, the Diamond Alkali facility, is included in the allocation, **the majority of sources of other COCs are not included in the allocation.**

3. Based on historical PVSC research regarding heavy metals, **parties not participating in this allocation comprise *81.5 percent* of the dischargers of heavy metals** to the PVSC sewage system in the late 1970s.

4. Given research showing that **over *450* likely PCB users in the PVSC service area are not included in this allocation**, PCB-related parties are significantly underrepresented in the allocation.

5. Other historical sources also contributed to COCs in the LPRSA. In addition to industrial discharges, residential and commercial discharges contributed COCs. COCs

from numerous tributaries discharged to the Passaic River, both above and below Dundee Dam. Tidal flow also brought contaminants upstream into the LPRSA from Newark Bay. Atmospheric deposition and groundwater/leachate flow also contributed COCs to the LPRSA.

Ultimately, based on my investigation, it is clear that the vast majority of the sources of COCs to OU-2 of the LPRSA (other than dioxins and DDT, for which the Diamond Alkali facility is the predominant source) are not included in the current allocation.

5. BACKGROUND: COCS IN THE LPRSA

According to the 2016 ROD issued by EPA for the lower 8.3 miles of the Lower Passaic River, the eight COCs that currently pose the highest potential risk to human health and/or the environment are:[7]

- Dioxins and furans
- Polychlorinated biphenyls ("PCBs")
- Mercury
- Dichlorodiphenyltrichloroethane ("DDT")
- Copper
- Dieldrin (HEOD or 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4α,5,6,7,8,8α -octahydro-1,4-endo,exo-5,8-dimethanonaphthalene)
- Polycyclic aromatic hydrocarbons ("PAHs")
- Lead

[7] U.S. Environmental Protection Agency, Region II, Record of Decision: Lower 8.3 Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, March 3, 2016, pp. 14-16.

EPA has estimated the mass of several COCs in OU-2 sediments, as shown in Table 1 below (prior to Tierra Phase 2 Removal).[8]

Table 1. Estimated Mass of COCs in Lower 8.3 Miles of LPRSA*

COC	Estimated Total Mass in OU-2 (kg)	Estimated Total Mass in OU-2 (lb)
2,3,7,8-TCDD	38	84
Total 4,4'-DDx	27,000	59,525
Total PCBs	26,000	57,320
Mercury	42,000	92,594
Copper	2,100,000	4,629,708
Lead	3,200,000	7,054,792
Dieldrin	390	860
Total PAHs	410,000	903,895

* This table does not reflect the relative risk of each COC, which is not addressed in this report.

EPA's 2014 Remedial Investigation for OU-2 concludes that resuspension of sediments in the LPRSA through scouring and tidal activity is the primary current (*i.e.,* ongoing) source of COCs to the water and surface sediments, as shown in Table 2.[9] For example, Table 2 shows that the resuspension of legacy contamination accounts for 97 percent of the 2,3,7,8-TCDD and 81 percent of the PCBs in OU-2 sediments.

[8] While interim activities removed some masses of COCs, for allocation purposes it is important to look at the total mass in the LPRSA driving the cleanup. Source: EPA, Additional Contaminant Inventory Analysis for Lower Eight Miles of the Lower Passaic River, April 2019, Table 1.

[9] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. ES-8 to ES 10 and pp. 6-1 to 6-7.

Table 2. Remedial Investigation Estimates of Current COC Sources to LPRSA (%)

Contaminant of Concern (COC)	Upper Passaic River (above Dundee Dam)	Newark Bay	Tributaries	CSOs and SWOs	LPRSA Resuspension of Historical/Legacy Contamination
Solids	32%	14%	6%	1%	48%
2,3,7,8-TCDD	0%	3%	0%	0%	97%
Total TCDD	3%	5%	0%	0%	92%
DDE	10%	8%	3%	1%	78%
Total PCBs	11%	6%	1%	0%	81%
Mercury	11%	14%	0%	0%	75%
Copper	14%	12%	1%	1%	72%
Lead	19%	7%	2%	2%	71%
Chlordane*	32%	3%	11%	3%	52%
PAHs:					
Benzo(a)pyrene	53%	7%	5%	1%	33%
Fluoranthene	47%	5%	6%	2%	40%

*May have similar sourcing to dieldrin.

In addition, while the Remedial Investigation identifies additional sources of COCs in its Conceptual Site Model ("CSM"), the investigation concluded that the following additional sources are not current significant contributors of most COCs to the LPRSA: [10]

- Upper Passaic River (above Dundee Dam)
- Newark Bay (tidal flow)
- Tributaries (e.g., Saddle River, Third River, Second River)
- CSOs and stormwater outfalls ("SWOs") from municipalities and the PVSC
- Industrial sources to the main stem of the Passaic River

[10] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. 6-1 to 6-7.

- Atmospheric deposition
- Groundwater and leachate flow[11]

However, according to the Remedial Investigation's CSM, the Upper Passaic River and Newark Bay combined currently contribute between 15-26 percent of each of Total PCBs, DDE (as an analog for DDx), copper, lead, and mercury; 53 percent of benzo(a) pyrene and 47 percent of fluorathene (PAHs); and insignificant dioxins.[12] In addition, as shown in Table 2, the Upper Passaic River currently accounts for 32 percent, and Newark Bay accounts for 14 percent of the solids flow into the LPRSA. Since each of the COCs tends to bind to fine solids, it is important to note the contribution of solids flowing into the LPRSA from these areas. Limiting the model to only current sources of COCs to the sediments allowed for significant simplification of the CSM to one current source: resuspension of the existing sediments. However, historically, the contributions of COCs from above Dundee Dam and from Newark Bay, as well as from indirect sources, were likely contributing a greater mass of COCs to the LPRSA than currently, given higher historical discharges of industrial effluent and emissions from sources that would not have incorporated or been limited by current environmental regulatory controls (such as required industrial wastewater pre-treatment, or the DDT and PCB bans in the 1970s).

Further, the cessation of historical dredging in the LPRSA increased the accumulation of contamination in LPRSA sediments. As noted in the 2016 ROD for OU-2, after the cessation of broad navigational dredging in 1950, "[t]he coincidence of chemical disposal in the river and the filling-in of the navigation channel created ideal conditions for the accumulation of contaminated

[11] This report does not evaluate the contributions of groundwater and leachate flow from individual facilities, some of which may have significant flows.

[12] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 6-5.

sediments in the Lower Passaic River."[13] This effect, combined with a salt wedge driven by tidal action moving upstream into the LPRSA from Newark Bay, inhibited the movement of suspended solids out of the River and trapped them behind the salt wedge.[14] Since the COCs were hydrophobic, they tended to bind to organic material in the fine silt particles, and were then deposited as sediments.[15]

Consideration of the historical sources of the legacy contamination identified in the surface and deeper sediments is necessary to accurately characterize the relative responsibility of the PAPs for their contributions of COCs to the LPRSA. Research and evaluation beyond the limited information provided in the Remedial Investigation and its Conceptual Site Model shows that the PAPs (other than the Diamond Alkali facility) represent only a very small fraction of the overall profile of contributors to COCs in LPRSA sediments. For DDT and dioxin, the Diamond Alkali facility was the predominant contributor to the LPRSA sediments, as discussed in Appendix B.

6. HISTORICAL SOURCES OF COCS TO THE LPRSA

Because the LPRSA acted as a sink for contaminants from a multitude of sources, including those from above Dundee Dam and from Newark Bay,[16] it is important to evaluate all such sources of COCs over a broad timespan. For example, looking at dated sediment cores to examine historical

[13] U.S. Environmental Protection Agency, Region II, Record of Decision: Lower 8.3 Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, March 3, 2016, Decision Summary, p. 17.

[14] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 6-1.

[15] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 6-3.

[16] See, for example, U.S. Environmental Protection Agency, Region II, Record of Decision: Lower 8.3 Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, March 3, 2016, Decision Summary, pp. 16-19; R.J. Chant, D. Fugate, and E. Garvey, "The Shaping of An Estuarin Superfund Site: Roles of Evolving Dynamics and Geomorphology," *Estuaries and Coasts*, September 10, 2010.

contributions from above Dundee Dam to the LPRSA, one contractor working for EPA determined:

> Dated cores collected above head-of-tide on the Upper Passaic do not provide as extensive a historical record. Nonetheless, the core data are sufficient to suggest that the majority of historical loads of cadmium, lead, mercury, and Total PCB to the Lower Passaic originated in the Upper Passaic River above the Dundee [D]am. Historical loads of copper were more evenly split between Upper Passaic and Lower Passaic sources. Dated sediment cores from the Upper and Lower Passaic River further indicate that relatively little of the Total DDT and much less than 1 percent of the 2,3,7,8-TCDD contamination in the Lower Passaic River originated above the Dundee Dam historically.[17]

This finding supports the conclusion that while a majority of the mass of several COCs (including PCBs) in the LPRSA sediments originated from sources above Dundee Dam, the contaminant mass of TCDD and DDT, which is largely related to the Diamond Alkali facility as discussed in Appendix B, had relatively little input from above the Dundee Dam. For copper, on the other hand, the reported historical loads were more evenly split between Upper Passaic and Lower Passaic sources.

The sections below evaluate all of the historical sources of COCs in the LPRSA more broadly by examining municipal and industrial development around the Passaic River above and below Dundee Dam, the tributaries to the Passaic River, the discharges through municipal and PVSC bypasses and CSOs, atmospheric deposition, and tidal flow into the LPRSA from Newark Bay.[18]

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[17] E.A. Garvey, A.M. Accardi-Dey, J. Atmadja, S. Gbondo-Tugbawa, S. McDonald, and E. Zamek, Malcolm Pirnie, Inc.,"The Interplay of Dredging and Discharges: A Conceptual Model of Contamination in the Lower Passaic River," presented at the 18th World Dredging Congress 2007, Lake Buena Vista, Florida, May 30, 2007, p. 850.

[18] Since there is limited information available providing measurements of historical sources of COCs, information is also presented on current measurements for the various sources of COCs. While current measurements may be indicative of likely historical sources, the reader is advised to keep the distinction of current versus historical measurements in mind, as this distinction is relevant to allocation considerations.

6.1 Municipal and Industrial Development

The first European colony on the Passaic River was established in 1666 in Newark, with settlements soon expanding throughout the area. By 1671, Newark had a mill in operation to grind corn, powered by the First River. In 1719, copper was found on a tract in Arlington/North Arlington, and a mine was established which operated until the mid-1800s. Iron was also discovered, leading to the establishment of at least five forges on the Whippany River and its tributaries during the late 1600s to early 1700s. The first sawmill was built on the Passaic River in approximately 1727. Various types of mills, such as sawmills, gristmills, paper mills, and flour mills, were erected to use the water power of the Passaic River and its tributaries, with some operating until the early 1900s.[19]

Industrial development in Paterson was fueled by targeted investments in the area. In 1791, Treasury Secretary Alexander Hamilton joined with others to form the Society for Establishing Useful Manufactures ("S.U.M.") to promote industrial development through tax advantages, navigation construction projects, power development, and financing in the State of New Jersey. Paterson was selected as the site for this project, with Great Falls to provide power. Operations were established to produce cotton yarn; spun flax, hemp and wool; woven stockings; and cotton fabrics, cotton wick, and ginned cotton. After financial problems shuttered these operations in 1797, a paper mill was built in 1804, with some of the other mill sites leased to other manufacturers. With the advent of the War of 1812, manufacturing in Paterson increased, with eleven cotton mills and other mills such as a rolling mill, nail factory and wire factory in operation by 1814. Following the enaction of tariffs on foreign goods in 1816, Paterson saw strong

[19] N.F. Brydon, *The Passaic River: Past, Present, Future,* New Brunswick, NJ: Rutgers University Press, 1974, pp. 48-53, 66-69, 127-132, and 152 [MAXUS1394116-1394118, 1394124-1394125, 1394154-1394157, and 1394167].

industrial growth in a variety of industries such as the cotton, locomotive engine, iron products, silk, flax spinning, woolens, dyeing, printing, paper, and chemical industries.[20]

In Passaic, construction of Dundee Dam by Dundee Manufacturing Company in 1845 led to the erection of woolen mills, paper mills, print works, cotton bleaching/printing works, and steam engine casting works along the canal next to the dam by the 1870s. By the end of the 1800s, ten thousand workers were employed in the area around Passaic in the production of cotton prints, woolen goods, rubber-insulated wire, artificial leather, chemicals, stove polish, boxes, and other materials. Further down the Passaic River, mills were also located along the Third River (woolen mills, board milling, paper mills) and Second River (copper factory, print mill, brass rolling mills, chemical factory). By 1894, the Geological Survey identified the following mills along the Passaic River and its major tributaries: 12 grist/flour mills, 15 sawmills, 27 fabric/fiber mills, 3 paper mills, 11 rolling mills/forges/iron works, and 11 miscellaneous mills.[21]

Industrial development in the Passaic River watershed was extensive and occurred over a long period of time. In the Natural Resource Damage Assessment Plan for the Diamond Alkali Superfund Site, the U.S. Department of Interior and National Oceanic and Atmospheric Administration state, "By [1922], nearly 1,000 industrial firms are located in Newark; primary industries include clothing and jewelry manufacturers, printing and publishing, foundry products, and leather goods."[22] New Jersey industrial directories from the early 1920s, 1950s, and 1970s catalogue the extensive industrial development of thousands of facilities in Newark, Paterson,

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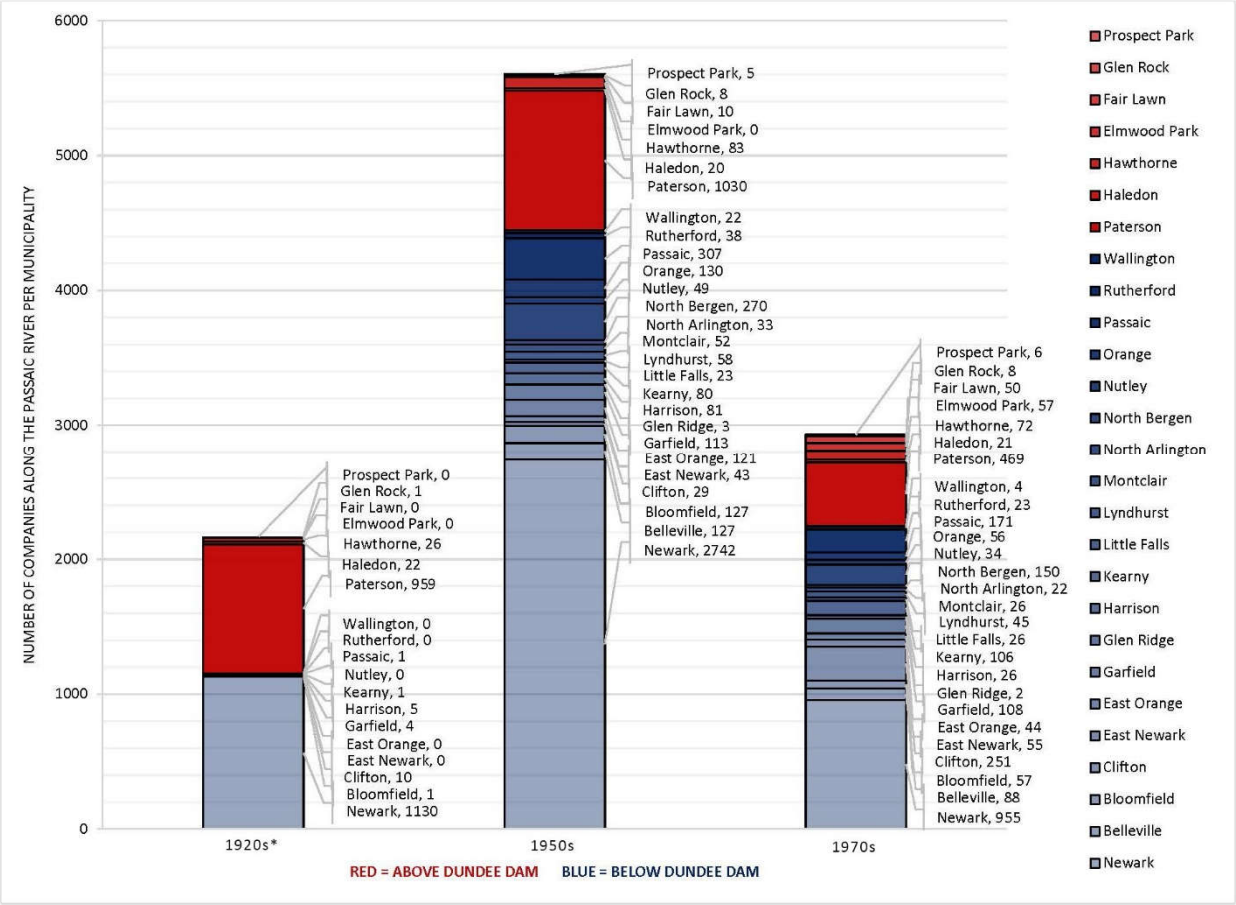
[20] N.F. Brydon, *The Passaic River: Past, Present, Future,* New Brunswick, NJ: Rutgers University Press, 1974, pp. 135-143 [MAXUS1394158-1394162].

[21] N.F. Brydon, *The Passaic River: Past, Present, Future,* New Brunswick, NJ: Rutgers University Press, 1974, pp. 143-152 [MAXUS1394162-1394167].

[22] U.S. Department of the Interior/U.S. Fish and Wildlife Service and U.S. Department of Commerce/National Oceanic and Atmospheric Administration, Final Natural Resource Damage Assessment Plan for the Diamond Alkali Superfund Site, January 2020, Exhibit 1-2, pp. 12-13, referencing data from the Merchants Association of Newark, 1922.

and the other municipalities that discharged their sewers directly to the Passaic River before eventually connecting to the PVSC, as shown below in Figure 2.[23] (As described further in Sections 6.3 and 6.4, connection to the PVSC did not eliminate municipal discharges to the River.)

Figure 2. Number of Industrial Facilities in PVSC Municipalities



* 1920s data is partial data from available directories and is therefore low.

[23] New Jersey Industrial Directories: Belleville, 1952/53, 1974; Bloomfield, 1952/53, 1974; Clifton, 1954/55, 1970; East Newark, 1952/53, 1974; East Orange, 1954/55, 1973; Elmwood Park, 1975, Fair Lawn, 1946, 1975; Garfield, 1956/57, 1973; Glen Ridge, 1952/53, 1973; Glen Rock, 1952/53, 1975; Haledon, 1954/55, 1973; Harrison, 1952/53, 1974; Hawthorne, 1956/57, 1974; Kearny, 1952/53, 1974; Little Falls, 1952/53, 1973; Lyndhurst, 1952/53, 1973; Montclair, 1952/53, 1973; Newark, 1920, 1923, 1952/53, 1974; North Arlington, 1952/53, 1974; North Bergen, 1952/53, 1974; Nutley, 1952/53, 1974; Orange, 1952/53, 1974; Passaic, 1952/53, 1974; Paterson, 1954/55, 1975; Prospect Park, 1946, 1975; Rutherford, 1952/53, 1973; Wallington, 1954/55, 1973.

6.2 Tributaries

As described in the Remedial Investigation, the Passaic River is 80 miles long, fed by a 935-square mile watershed that includes numerous tributaries to the River, and emptying into Newark Bay.[24] The River begins north of Millington in Wendham, New Jersey, flowing northeast to Great Piece meadows north of Caldwell, turning east to Great Falls just above Paterson, then turning south to flow over Dundee Dam and on to Newark Bay. The Passaic River watershed drains land from the eight New Jersey counties of Bergen, Essex, Hudson, Morris, Passaic, Somerset, Sussex and Union, as well as the two New York counties of Rockland and Orange.[25] The PVSC identified 60 tributaries to the Passaic River between Great Falls in Paterson and the mouth of Newark Bay.[26] A map of the Passaic River basin and major tributaries is shown in Figure 3 below.[27]

In the Remedial Investigation, EPA notes that tributaries are currently small sources for COCs in recently-deposited sediments of the LPRSA (see Table 2).[28] However, according to EPA's findings, tributaries still contribute 6 percent of the solids flow into the LPRSA. While historical measurements for these inputs are not available, historically, it is likely that the tributaries carried greater quantities of COC mass to the LPRSA along with the solids flow than they did after imposition of pretreatment and discharge regulations.

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[24] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 1-2.

[25] N.F. Brydon, *The Passaic River: Past, Present, Future,* New Brunswick, NJ: Rutgers University Press, 1974, pp. 3-12 [MAXUS1394093-1394098]; The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, p. 4 [MAXUS006610].

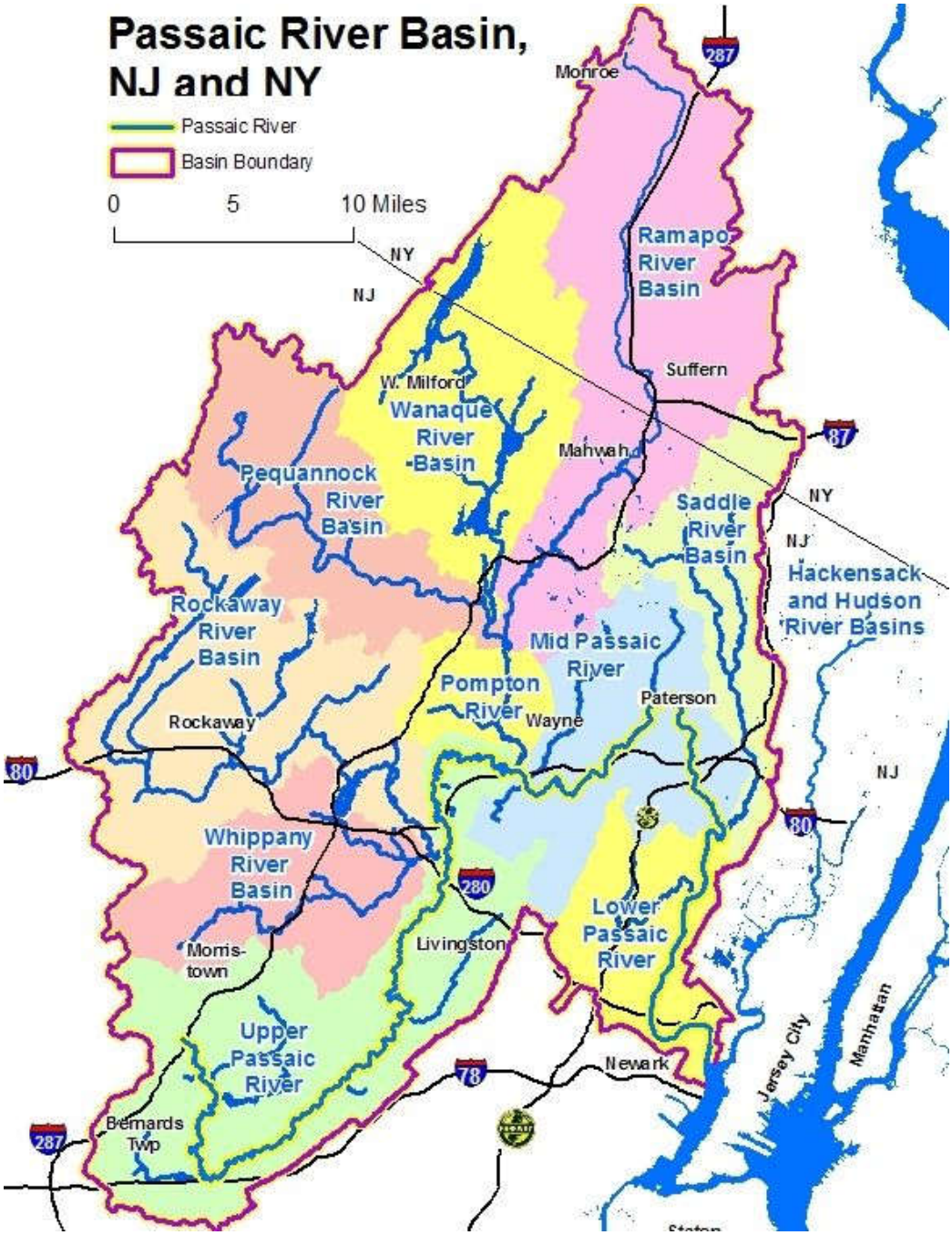
[26] PVSC, Annual Report of the PVSC, 1978, pp. 48-50 [MAXUS0814036-0814038].

[27] M. Mattheiss and K. Waters, Passaic River Environmental Plan (PREP), 2017, retrieved from http://www.wrc.udel.edu/wp-content/uploads/2017/07/PREP-Passaic-R.-NJ-Presentation-2017.pdf.

[28] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. ES-9 to ES-10.

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Figure 3. Passaic River Basin and Major Tributaries



6.3 PVSC Discharges of COCs to the Passaic River

The PVSC was created by the New Jersey Legislature in 1902 with the purpose of relieving and preventing pollution in the Passaic River and its tributaries from Great Falls in Paterson to Newark Bay.[29] In August 1924, the PVSC initiated operations, collecting untreated sewage with a trunk line constructed along the Passaic River. This trunk line and its branch lines intercepted municipal sewer systems that previously discharged directly to the River. The interceptor system carried wastewater to the PVSC treatment plant at Newark Bay for treatment and discharge of treated effluent to New York Harbor.[30] Municipalities joined the PVSC over time (see Figure 4 for map),[31] and as the municipalities grew, the flow through the PVSC system increased from 86.2 million gallons per day ("MGD") in 1924, to 201 MGD in 1950, and to approximately 250 MGD by 1976.[32]

[29] PVSC, "Laws/Policies: Enabling Legislation," http://www.nj.gov/pvsc/home/public/laws/ as accessed on November 23, 2015.

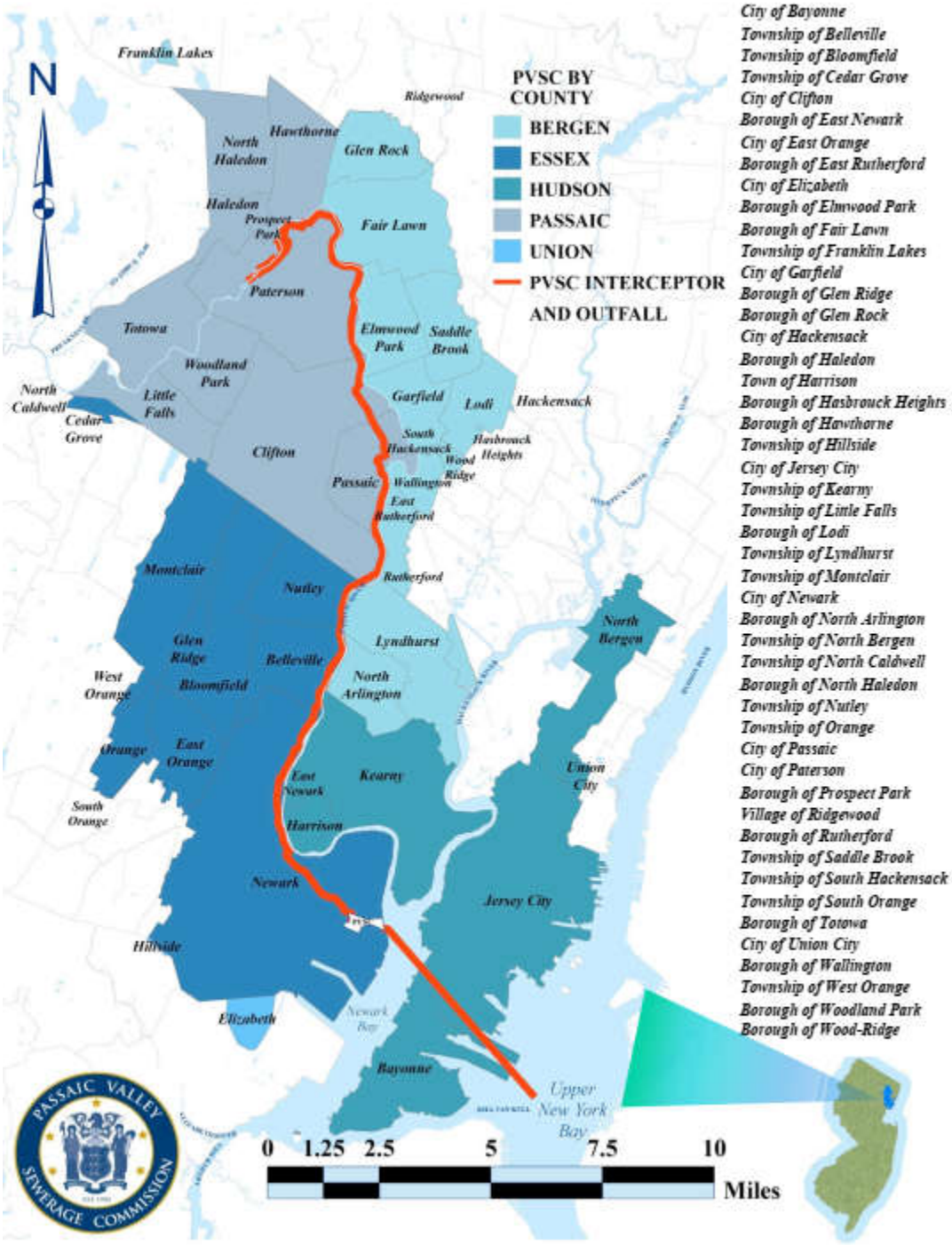
[30] Affidavit of Seymour A. Lubetkin, January 6, 1994 [846680004-846680005]; Memo from R. C Smith to PVSC, February 17, 1947, p. 2 [LPRSA0198629].

[31] PVSC, 2013 Annual Report, retrieved from https://www.state.nj.us/pvsc/home/forms/pdf/2013PVSCAnnual Report.pdf.

[32] PVSC, Exhibit 2: Chart Showing Ave. Daily Sewage Flow - 1924 to 1931, October 11, 1932 [LPRSA0192818]; PVSC, Average Daily Sewage Flow [LPRSA0192046]; PVSC Annual Reports, 1971 -1976 [LPRSA0005524; 5773; 5908; 6065; 6156; 6322].

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Figure 4. Municipalities in the PVSC System



Some municipalities had combined sewer systems, in which stormwater runoff was collected in the same sewers as sanitary waste. As of 1973, a PVSC consultant reported that the municipalities of Paterson, Newark, East Newark, Harrison, Kearny, and Orange used mainly combined sewer systems.[33] The PVSC owned and operated many CSOs in these systems, which automatically discharged untreated waste to the Passaic River during periods of rain and occasionally during dry weather periods. For certain CSOs, the PVSC manually controlled overflow chamber valves. The PVSC also manually controlled additional separate sanitary/industrial sewer outlets. For decades, PVSC staff manually opened and closed these bypasses through chains linked to regulator valves or flaps, or through gates operated by hoists to control flow entering the interceptor and treatment plant during both wet and dry weather. This allowed the PVSC to "bypass" the treatment system and discharge untreated waste directly to the River.[34] In the mid-1980s, the PVSC installed remote controls to allow control of the bypass gates from a central control facility.[35]

As described in detail in Exhibit 2, there is extensive documentation regarding the PVSC's discharges of untreated waste to the Passaic River. The PVSC kept "throw-out" logs to track manual bypasses to the River during rainfall and repair/maintenance events. Bypass times have also been reported more recently in NPDES reports to the NJDEP.[36] A 1976 report by Killam Associates for the PVSC, *Report Upon Overflow Analysis to Passaic Valley Sewerage Commissioners: Passaic River Overflows* ("1976 Killam report"), measured flows to the Passaic River from bypasses and 73 CSOs owned and operated by the PVSC.[37] This information, combined

[33] C. Manganaro, Report on Proposed Sewerage Facilities, Vol.1, May 1973 (revised October 1973) [LPRSA0010098].

[34] Affidavit of Seymour A. Lubetkin, January 6, 1994 [846680004-846680005].

[35] Hatch Mott MacDonald, CSO Long Term Control Plan, Cost & Performance Analysis Report, Volume 1, prepared for the PVSC, March 2007, p. 21 [MAXUS1398968].

[36] PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015, Table 1.

[37] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis to Passaic Valley Sewerage Commissioners: Passaic River Overflows.

with total suspended solids ("TSS") data, provides a basis to estimate the PVSC's sewage and solids discharges[38] to the Passaic River for 1924-2016, as summarized in Table 3. (See Exhibit 2 for detailed discussion of estimation methodology.)

Table 3. Summary of Estimated PVSC Flows to the Passaic River (1924-2016)*

	Untreated Sewage Volume	Solids Mass
PVSC Bypasses	617.1 billion gallons	1.155 billion lb (577,636 tons)
PVSC CSOs	569.9 billion gallons	0.587 billion lb (293,499 tons)
Total	1.187 trillion gallons	1.742 billion lb (871,135 tons)

* For Bypasses: Start date is August 2, 1924 and end date is September 30, 2016; For CSOs, start date is October 1, 1924 and end date is September 30, 2016.

Historical information measuring COCs in the PVSC sewage during the early decades of the PVSC operation is sparse. However, studies of influent concentrations for the PVSC and similar systems in the 1970s and 1980s make it possible to estimate PVSC COC contributions to the LPRSA as shown in Table 4 (see Exhibit 2 for detailed calculations and data sources).

[38] Solids flow into the river is important because, as discussed earlier, the COCs tend to bind tightly to the solids.

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Table 4. PVSC Bypasses and CSO Contaminants of Concern (lb)

COC	Estimated Bypass Mass (1924-2016)**	Estimated CSO Overflow Mass (1924-2016)**	Total Estimated PVSC Mass (1924-2016)**	EPA Estimated Mass in OU-2 Sediments
PCBs*	57,032	34,781	91,813	57,320
Mercury	242,254	205,152	447,406	92,594
Copper	1,015,838	860,258	1,876,096	4,629,708
Lead	3,804,812	3,222,088	7,026,900	7,054,792
Select PAHs (see Exhibit 2-6)	3,083,750	2,611,460	5,695,210	903,895
Total	**8,203,685**	**6,933,739**	**15,137,424**	

* The period for PCB mass estimation is 1930 (start of commercial use) to 1976 (ban).

** Start date is August 2, 1924; end date is September 30, 2016 (with the exception of Yantacaw and Union Outlet, where the end dates are 1975 due to lack of available detailed documentation after this date).

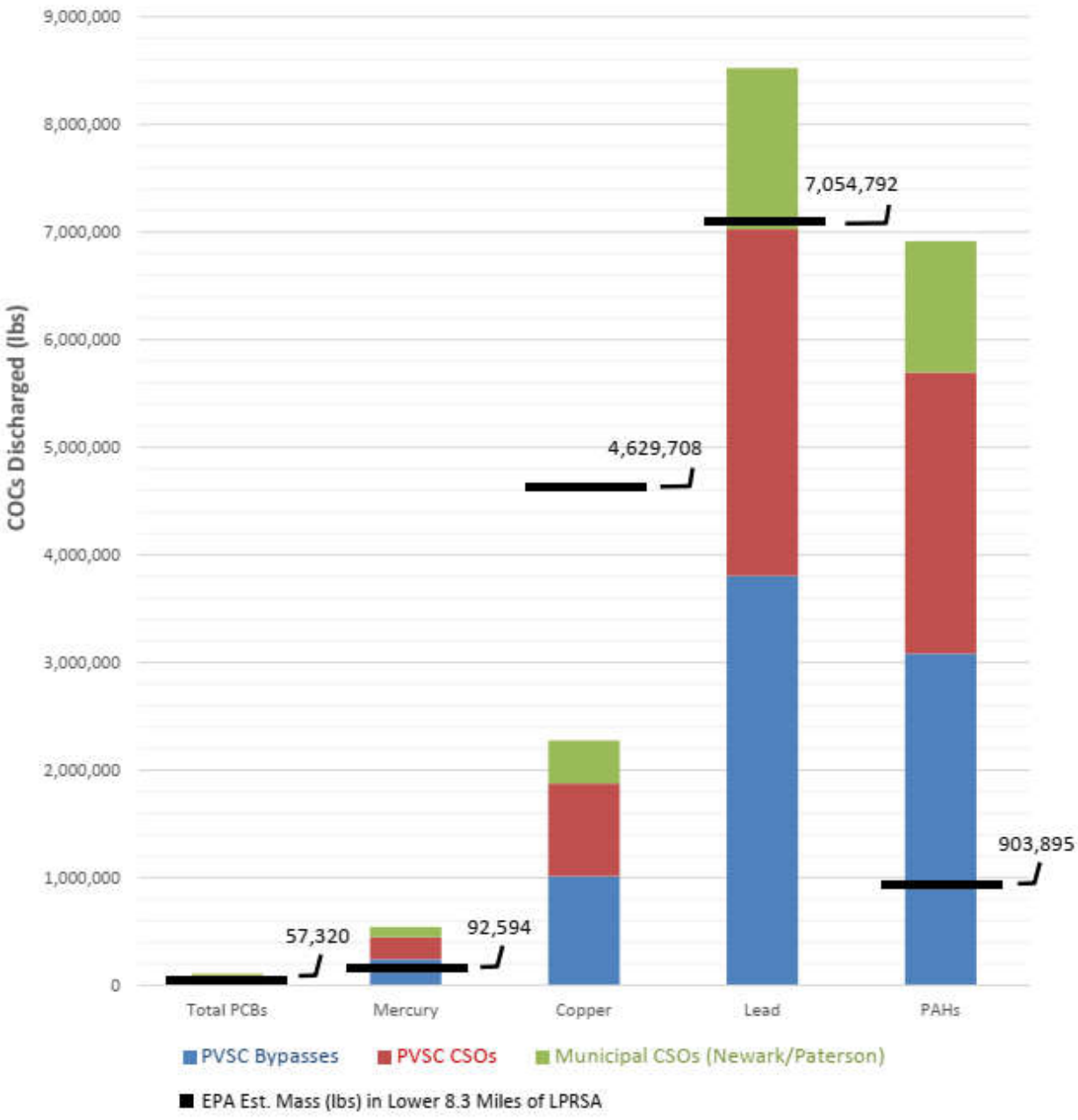
Note: Numbers may not add to totals due to rounding.

As shown in Table 4, the PVSC is estimated to have discharged over 15 million pounds of COCs to the Passaic River during the 1924-2016 time-frame. When comparing these estimates of PVSC-discharged COCs to those estimated by EPA as present in the sediments of the lower eight miles of the River, it is evident that the PVSC discharges alone could account for much of the mass of certain COCs in OU-2 (see Figure 5).

The COC mass values presented in Table 4 are likely conservatively low, as they are based on more recent concentrations that are likely low relative to earlier historical concentrations due to the imposition of industrial waste pretreatment and monitoring requirements in the 1970s. In addition, the available PCB measurements do not cover the period when PCBs were in common use, prior to being phased out by the mid-1970s.

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Figure 5. Estimated PVSC and Municipality (Newark/Paterson) Discharges of COCs (lb) Through Bypasses and CSOs (1924-2016) Relative to EPA Estimates of OU-2 Mass



The PVSC may be the only solvent PRP left for some LPRSA COC discharge streams. For PRPs that initiated operations after 1924 (or after the sewers in their area were joined to the PVSC), discharged waste, but did not discharge directly to the River, either the PVSC or in some cases a municipal-owned system likely served as the sole conduit for their waste to the River. Therefore, for those PRPs that had operations after August 1924 but are now insolvent, the PVSC may be the last remaining viable PRP linked to the discharge of their waste into the Passaic River.

6.4 Non-PVSC Municipal Discharges of COCs to the Passaic River

This section describes the history of municipal discharges of COCs from systems that are not collected by the PVSC. This section further provides estimated COC mass contributions for Paterson (above Dundee Dam) and Newark (below Dundee Dam) to the Passaic River using the same methodology employed above for the PVSC CSOs. COCs contributed by other municipalities, as well as COCs discharged before construction of the PVSC interceptor system in 1924, have not been estimated.

The municipalities in the Passaic River basin designed, constructed, and operated their sewer systems before the PVSC initiated operation of a trunk sewer collection/treatment system in late 1924. After the PVSC started operations, some municipalities continued to operate their own sewer/treatment systems, while others operated their sewer lines until they connected to the PVSC-operated interceptor trunk line and system of bypasses and CSOs. Some municipalities, such as Paterson and Newark, also operated their own CSOs outside of the PVSC system.

Direct discharges continued from multiple municipalities for many decades after completion of the PVSC system. In a 1972 report reviewing Passaic River pollution, The Center for Analysis of Public Issues (“CAPI”) noted that polluted municipal sewer discharges into the Passaic River were identified in West Paterson, Paterson, Prospect Park, Fair Lawn, Garfield, Passaic, Clifton, Nutley,

Belleville, Harrison, and Newark.[39] Citing a 1969 federal survey by the Federal Water Pollution Control Administration and N.J. Department of Health, the CAPI report identified:

- 120 municipal sewage treatment plants discharging treated and untreated waste to the Upper Passaic River above Paterson;
- Significant discharge of treated and untreated waste by Paterson above Dundee Dam; and
- 435 pipes discharging waste into the Lower Passaic River, comprised of 210 municipal outlets and 225 industrial outlets.[40]

While a complete description of all municipal discharges to the Passaic River is beyond the scope of this report, details for select municipal discharges are provided below.

6.4.1 Discharges from Upper Passaic Area Municipalities (above Paterson)

CAPI found that in 1972 there were 120 sewage treatment plants discharging a total of 100 MGD of effluent, plus untreated bypassed sewage during heavy rains, to the Upper Passaic area above Paterson, concluding "State, regional and academic experts all agree that the most important sources of pollution above Little Falls are the municipal treatment plants." [41] This effluent accounted for a significant portion of the Upper Passaic River flow. For example, on October 13, 1970, the sewage effluent accounted for 40 million gallons of the total River flow of 102 million gallons at Little Falls, New Jersey. Also on that day, the PVSC tapped 65 million gallons of the Passaic River flow at Little Falls to use for potable water in Paterson, Passaic, and Clifton, further

[39] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, pp. 27-28 [MAXUS006635-006636].

[40] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, pp. 11-27 [MAXUS006617-006635].

[41] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, pp. 11-12 [MAXUS006617-006618].

complicating the flow of pollution.[42] CAPI also noted significant pollution in the Upper Passaic River area by fertilizer and automobile hydrocarbon runoff as well as oil spills, with some routed to municipal treatment plants (occasionally shutting down the treatment plant for cleanup), and some discharged directly to the River. As an example, 16 oil spills greater than 1,000 gallons were reported in the Upper Passaic area in one year; one spill of 3,000 gallons of oil in Wayne Township entered the municipal sewers, leading to pollution discharge to the Pompton River and eventually shutdown of the Wayne plant for a few days for cleanout.[43] Some Upper Passaic municipalities, such as Livingston Township, were noted as operating their treatment plants inefficiently, allowing "highly polluting effluent" to discharge to the River. In addition, about one-fourth of the Upper Passaic area municipal treatment plants operated in excess of design capacity, leading some to discharge untreated sewage directly to the River.[44]

While CAPI identified inefficient and overloaded municipal treatment plants as contributing to pollution of the Passaic River, it also concluded that pollution prevention was not a high priority for the municipalities:

> Far more serious than the problem of direct factory discharges is the relationship between industrial waste and municipal sewer operations. Most municipalities in the Upper Basin are so anxious to attract new property tax ratables that they readily offer the courted industry cheap access to the local sewer system. They repeatedly overlook the fact that their treatment plants are already overloaded or that industrial wastes might contain traces of phenol or heavy metals that the plants are not designed to handle. They are motivated entirely by what one expert calls "the municipal philosophy that residential and industrial ratables must be obtained and let the devil take the waterways" with the result being "an

[42] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, pp. 6-8 [MAXUS006612-006614].

[43] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, pp. 10-11 [MAXUS006616-006617].

[44] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, pp. 12-13 [MAXUS006618-006619].

> intolerable concentration of industrial waste discharge and severe pollution from obsolete and overloaded municipal waste treatment plants."[45]

6.4.2 Discharges from the City of Paterson CSOs

At the time of an 1897 PVSC investigation of sewage disposal to the Passaic River, Paterson had a combined sewage/stormwater system with 22 CSOs discharging to the Passaic River at an estimated total rate of 17 MGD, with an additional 9 MGD estimated as being directly discharged by Paterson manufacturers and facilities.[46] CAPI concluded in 1972 that "[t]he most notorious perpetrator of municipal bypassing today is the City of Paterson."[47] As reported by CAPI, Paterson officials confirmed that most of its 27 miles of sewer lines were combined sanitary-storm sewers, leading to discharge of untreated waste to the Passaic River during storms. However, in addition to discharge during storms, CAPI found that discharge of untreated sewage to the River also occurred during the PVSC's daily peak discharge hours of 10:30 a.m. to 3:30 p.m., when the main interceptor was overloaded. [48]

The 1976 Killam report identified 23 CSOs owned by Paterson (in addition to the 28 active CSOs owned by the PVSC located in Paterson) that emptied into the Passaic River.[49] The Killam report points out that the Paterson combined sewer system was designed at a size below conventional design standards, accommodating only 0.5 cubic feet per second ("cfs") per acre of drainage, versus normal sizes 2- to 3-times larger (1.0-1.5 cfs per acre of drainage). In addition, while the overall capacity of the Paterson combined sewers is 2,520 MGD, the interceptor sewer in Paterson has a capacity ranging from only 21 MGD at the upper terminus to 82 MGD at the lower

[45] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, p. 15 [MAXUS006621].

[46] Report of the Passaic Valley Sewerage Commission, February 26, 1897, pp. 34-35 [MAXUS006878].

[47] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, p. 24 [MAXUS006632].

[48] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, p. 24 [MAXUS006632].

[49] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for the PVSC, 1976, p. x [LPRSA0195468].

terminus, leading to an inability to accommodate the extra flow from rainfall. As a result, rainfall in Paterson surcharges the available piping and then causes flooding and CSO discharges.[50] Killam noted that the largest Paterson-owned overflow was at 19th Avenue and Vreeland Avenue, with a capability of carrying 120-150 MGD to the Passaic River. This CSO was observed to flow during rainfalls as low as 0.04 inches/hour. Nine other Paterson overflows located in the center of the city also overflowed with low-intensity rainfalls, with an estimated overflow pipeline capacity of 150-200 MGD. Field interviews conducted during the 1976 Killam study indicated that many of the Paterson CSOs frequently discharged to the Passaic River during storms. Overall, the study estimated that the 28 Paterson-owned CSOs resulted in a discharge to the Passaic River equivalent to that discharged by the PVSC CSOs in this area, or 54 MG during the year (1974-1975) measured by Killam.[51] Using the same flow/rainfall relationship and COC concentration data described above for the PVSC CSOs (and described in Exhibit 2) yields the following estimate for COCs discharged by the Paterson-owned CSOs (see Table 5).

[50] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for the PVSC, 1976, pp. 26-28 [LPRSA0195516-0195519].

[51] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for the PVSC, 1976, pp. 36-38 [LPRSA0195526-0195528].

Table 5. Summary of Estimated Paterson-Owned CSO Discharges to the Passaic River[52]

	Paterson-Owned CSO Discharges (1924-2016)*
Sewage volume	4.1 billion gallons
PCBs[53]	247 lb
Mercury[54]	1,476 lb
Copper	6,189 lb
Lead	23,180 lb
Select PAHs[55]	26,008 lb

* Start date is October 1, 1924; end date is September 30, 2016.

6.4.3 Discharges from Cities of Newark and East Orange through Newark CSOs

The sewers in Newark were largely constructed as combined sanitary-storm sewers during the 1830 to 1930 time-frame.[56] At the time of the PVSC's 1897 investigation, the City of Newark had a combined sewage/stormwater system with outlets at Gully Road, Fourth Avenue, Mill Brook (carrying the sewage from the municipality of East Orange), Rector Street/Ballantine's Dock, City Dock, Jackson Street, and Freeman Street, plus five additional "minor" sewers that discharged to the River. Additional sewers were under consideration at the time. In addition, Newark had constructed a South Street intercepting sewer to collect sewage at this location for discharge to Newark Bay. Sewage flow from Newark and East Orange, including the South Street interceptor sewer, was estimated at 34 MGD.[57]

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[52] Note that TCDD discharges via the Paterson system have not been evaluated.

[53] U.S. Environmental Protection Agency, PCBs Removal in Publicly-Owned Treatment Works, July 16, 1977, p. 2.

[54] Elson T. Killam Associates, Inc., Heavy Metals Source Determination, Phase II, April 1980 (Summarizing Phase I work in 1978), prepared for PVSC [LPRSA0009923 and 0009955].

[55] CFM Incorporated, Investigation of Organic Priority Pollutants in the Influent to the PVSC Treatment Plant, May 1986, Tables 2-3 (measurements taken 11/1984-1/1986).

[56] Purcell Associates, Pollution Abatement Plan: Newark, New Jersey, prepared for City of Newark, Department of Public Works, 1975, p. i [MAXUS0800485].

[57] Report of the Passaic Valley Sewerage Commission, February 26, 1897, pp. 37-38 [MAXUS006879-006880].

In 1965/1966, Newark built the South Side Interceptor to collect sanitary waste from the Peddie, Queen, and Waverly districts and convey it to the PVSC treatment plant. Before this time, the untreated waste from these districts was discharged directly to Petty Ditch in the area of Newark Airport. However, after construction of the interceptor, untreated waste could still flow into Newark Bay. For example, when the collected waste exceeded the capacity of the South Side Interceptor, excess flow is diverted to Newark Bay via the Peripheral Ditch, which also conveys flows from Wheeler Ditch, Adams Ditch, the Newark Airport, and the City of Elizabeth. Waste could also be diverted during maintenance and repair activities, such as the repair of a faulty valve at a pumping station during April to October 1969, which led to the discharge of 30 MGD of untreated waste.[58] This flow was later measured by Killam, as discussed below.

In 1972, CAPI found that approximately half of Newark's 500 miles of sewer lines were combined sanitary-storm sewers. With more than 75 percent of the sewer system almost 100 years old and inadequately maintained, breakdowns and blockages were common, leading to discharges of untreated waste to the Passaic River. The study concluded, "When the Newark collection system is overloaded – and it is an antiquated system subject to frequent breakdowns and unable to accommodate even the slightest storm runoff – the excess finds its way into one of the 49 outfall pipes from Newark into the Passaic."[59]

A 1975 study conducted for Newark notes that most of Newark's sewers were built prior to construction of the PVSC system. Once the PVSC system was built, the existing sewer lines near the PVSC trunk line were connected to it. The report states, "Little maintenance is provided for

[58] Purcell Associates, Pollution Abatement Plan: Newark, New Jersey, prepared for City of Newark, Department of Public Works, 1975, p. II-4 [MAXUS0800504]; U.S. Department of the Interior, Federal Water Pollution Control Administration, Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor, November 1969, p. 14.

[59] The Center for Analysis of Public Issues, Pollution Control on the Passaic River, 1972, pp. 25-26 [MAXUS006633-006634].

these facilities and at times they have been known to malfunction and discharge sanitary waste directly into the river even at low flow periods."[60] The report notes numerous Newark outfalls to the Passaic River and Newark Bay were designed to automatically discharge untreated sewage during periods of rainfall and high flow events.[61]

The 1976 Killam report identified at least 14 CSOs owned by Newark (beyond the 15 owned by the PVSC) that emptied into the Passaic River or Newark Bay.[62] The Killam report measured the South Side Interceptor CSO flows (Peddie, Queen, and Waverly districts) at approximately 2,300 MG/yr. Assuming the remaining 11 Newark-owned CSOs had average flow rates similar to PVSC-owned CSO flows, then the average annual flow per CSO is estimated at 103 MG (7,540 MG total measured annual overflow divided by 73 PVSC CSOs).[63] Using this average flow and the same COC concentrations described above for the PVSC CSOs yields an estimated COC discharge estimate for the 14 Newark-owned CSOs, shown in Table 6 below.

[60] Purcell Associates, Pollution Abatement Plan: Newark, New Jersey, prepared for City of Newark, Department of Public Works, 1975, p. II-3 [MAXUS0800503].

[61] Purcell Associates, Pollution Abatement Plan: Newark, New Jersey, prepared for City of Newark, Department of Public Works, 1975 [MAXUS0800479-0800642]; Table II-1 [MAXUS0800.

[62] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for the PVSC, 1976, p. x [LPRSA0195468].

[63] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for the PVSC, 1976, p. x and Table 6, p. 207 [LPRSA0195468 and LPRSA0195697].

Table 6. Summary of Estimated Newark-Owned CSO Discharges to the Passaic River and Newark Bay

	Newark-Owned CSO Discharges (1924-2016)*
Sewage volume	260.2 billion gallons
PCBs[64]	15,711 lb
Mercury[65]	93,836 lb
Copper	393,481 lb
Lead	1,473,780 lb
Select PAHs[66] (see Exhibit 2)	1,194,479 lb

* Start date is October 1, 1924; end date is September 30, 2016.

6.5 Atmospheric Deposition and Groundwater/Leachate Flow

The Remedial Investigation notes that atmospheric deposition and groundwater/leachate are not significant current contributors to COCs in the LPRSA.[67] However, historically, before implementation of emissions controls and phase-out of lead additives in gasoline, and before implementation of groundwater monitoring and discharge permits, such contributions were likely higher.[68] (Appendix B provides additional discussion of available resources on this topic for each COC.)

[64] U.S. Environmental Protection Agency, PCBs Removal in Publicly-Owned Treatment Works, July 16, 1977, p. 2.

[65] Elson T. Killam Associates, Inc., Heavy Metals Source Determination, Phase II, April 1980 (Summarizing Phase I work in 1978), prepared for PVSC [LPRSA0009923 and 0009955].

[66] CFM Incorporated, Investigation of Organic Priority Pollutants in the Influent to the PVSC Treatment Plant, May 1986, Tables 2-3 (measurements taken 11/1984-1/1986).

[67] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 6-4.

[68] This report does not review these contributions for individual sites, some of which may have more significant flows.

6.6 Tidal Flow from Newark Bay

In the Remedial Investigation, EPA notes that tidal flow from Newark Bay currently accounts for 14 percent of recently-deposited sediments (see Table 2).[69] The investigation estimates that tidal flow from Newark Bay accounts for 6 percent of PCBs, 8 percent of DDE (as an analog for DDx), 23 percent of copper, 14 percent of mercury, and 7 percent of lead in recently-deposited surface sediments in the LPRSA. While data are not available to document historical contributions, the data on current contributions indicate that Newark Bay also historically contributed COCs to the LPRSA.

7. COC CONTRIBUTIONS OF NON-PAPS

Understanding the extensive and lengthy industrial development along the Passaic River is critical when examining allocation issues. Although not included in the current allocation effort, the area serviced by the PVSC above Dundee Dam included numerous industrial facilities that would have contributed COCs to the Passaic River. A review of New Jersey industrial directories dating from the late-1800s to 1970s indicates the number of industrial facilities located in the PVSC service area as shown in Section 6.1, Figure 2. In total, Paterson was found to have over 5,000 industrial facilities listed over the 1874 to 2006 time-frame, with the highest number of facilities peaking at just over 1,000 in 1949. Examples of the industrial activities represented by these facilities include textile production, dyeing, metalworking, casting, printing, and the manufacture of equipment, plastics, chemicals, transformers and electrical equipment, locomotives, paints, and adhesives. As noted in Appendix B, these industries are typically associated with releases of contaminants including those identified as COCs for OU-2. **None of these facilities are included in the current allocation effort.**

[69] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. ES-9 to ES-10.

Similarly, industrial directories for Newark identified over 4,000 industrial facilities listed over the 1920 to 1974 time-frame, with the highest number of facilities found in the 1950s at over 2,700 facilities.[70] As seen in Figure 2, other municipalities connected to the PVSC below Dundee Dam showed similar development patterns, peaking at an additional 1,700 facilities in the mid-1950s, and accounting for approximately 1,300 facilities in the mid-1970s. Types of industries again range broadly, including metals smelting and refining, castings, dental laboratories, copper paints and soaps, equipment manufacture, textiles, tanners, dyeing, metalworking, tanning, printing, plastics, electrical and electronic equipment, lacquers and paints, hatters, and adhesives. Overall, approximately 6,800 industrial facilities were identified during this time frame in the area below Dundee Dam. **Of these 6,800 industrial facilities, approximately 97.6 percent are not participating parties in the allocation. Of the approximate 11,800 industrial facilities identified through industrial directories both above and below Dundee Dam, 98.6 percent are not participating in the allocation.**

In the sections below, more detailed information is provided regarding industrial sources of specific COCs, namely heavy metals (copper, mercury, and lead) and PCBs.

7.1 Sources of Metal COCs (Copper, Lead, Mercury)

The 1980 *Heavy Metals Source Determination Study* (Phase II) conducted by Killam Associates for the PVSC (the "Heavy Metals Study") identified 260 heavy metal-contributing facilities to the PVSC system.[71] The study focused on facilities that had been previously identified in the PVSC files as heavy-metal contributors, and excluded some major heavy-metals dischargers such as

[70] See industrial directories cited for Figure 2. Note that the data for the 1920s is partial information, so the figures for this time-frame are low.

[71] Elson T. Killam Associates, Inc., Heavy Metals Source Determination Study, Phase II, prepared for PVSC, April 1980 [LPRSA0009906-0010069].

hospitals.[72] For these facilities, the study measured flows and metal discharges during operating hours in order to identify the sources of heavy metals observed in PVSC treatment plant influent (measured in Phase I of the study).

In the study, the PVSC system was divided into ten sub-areas (numbered 0-9 based on accessible man-holes for measuring sewage concentrations). The number of facilities identified in each sub-area is shown in Table 7 below.[73] Of the 260 industrial facilities in the study, 89 were located in Sub-Area 0 (Newark), followed by 71 facilities located in Sub-Area 8 (Paterson). The specific industries contributing the most metals included metal finishing and electroplating, textile manufacturers, and organic chemical manufacturers.[74]

[72] Elson T. Killam Associates, Inc., Heavy Metals Source Determination Study, Phase II, prepared for PVSC, April 1980, p. 14 [LPRSA0009931].

[73] Elson T. Killam Associates, Inc., Heavy Metals Source Determination Study, Phase II, prepared for PVSC, April 1980, Phase I Summary Table 1: Mass Balance Analysis, Industrial Metals, Entire Service Area, p. 21 [LPRSA0009938].

[74] Elson T. Killam Associates, Inc., Heavy Metals Source Determination Study, Phase II, prepared for PVSC, April 1980, Phase I Summary Table 1: Mass Balance Analysis, Industrial Metals, Entire Service Area, p. 14 [LPRSA0009931].

Table 7. COC Metals Discharges of 260 Facilities by PVSC Sub-Area as Shown in 1980 Phase II Heavy Metals Study

Sub-Area	Number of Facilities (%)
0: Newark (northern portion)	89 (34%)
1: Newark (southern portion)	13 (5%)
2: East Newark, Harrison, Kearny	8 (3%)
3: Belleville, Bloomfield, Orange	9 (3%)
4: Belleville, Clifton, Lyndhurst, Nutley	14 (5%)
5: Nutley	2 (1%)
6: Clifton, Lodi, Passaic, Saddle Brook	29 (11%)
7: East Rutherford, Garfield, Passaic, Wallington	15 (6%)
8: Elmwood Park, Fairlawn, Glen Rock, Haledon, Paterson	71 (27%)
9: Hawthorne	10 (4%)
Total	**260 (100%)**

As shown in Table 7, a substantial portion of the metals-discharging facilities are attributable to industrial facilities located above Dundee Dam in sub-areas 8-9 (e.g., Paterson). In addition, the results of the study show that significant industrial sources of metals were not included in the 260 studied facilities. For example, in sub-area 8 (Paterson), only 30.6% of industrial copper and 13.5% of industrial lead were accounted for by the study.[75]

In addition to the industrial sources, the Heavy Metals Study estimated contributions for domestic and infiltration/inflow sources to the PVSC system as shown in Table 8.

[75] Elson T. Killam Associates, Inc., Heavy Metals Source Determination Study, Phase II, prepared for PVSC, April 1980, Phase I Summary Table 1: Mass Balance Analysis, Industrial Metals, Entire Service Area, p. 83 [LPRSA001000].

Table 8. Estimated Domestic and Infiltration/Inflow Contributions of Metals to the PVSC as Shown in 1978 Phase I Heavy Metals Study[76]

	Domestic Discharge (lb/day)	Infiltration/Inflow (lb/day)	Total Domestic & Infiltration/Inflow (lb/day)
Copper	120.2	30.6	150.8
Lead	69.9	63.5	133.4
Mercury	1.1	0.5	1.6

Of the total flow into the PVSC system, the study estimated domestic and infiltration/inflow contributions to be 15.1 percent for copper, 7.1 percent for lead, and 1.3 percent for mercury.[77]

Of the 260 facilities accounted for in the Heavy Metals Study, 212 facilities (81.5 percent of the total) are not a part of the current allocation effort. One example of a company not participating in the allocation is Troy Chemical in Newark, even though it was found to be responsible for 327.86 lb/day mercury, or 98.25 percent of the total industrial mercury discharge into the PVSC system measured by the study.[78]

In addition to the facilities identified in the Heavy Metals Study, there were numerous facilities involved in metals processing throughout the industrial history of the Passaic River area. An example of a facility that likely contributed contamination to the Passaic River is Schuyler's Copper Mines, which operated in North Arlington, New Jersey from around 1712 to 1865 and

[76] Elson T. Killam Associates, Inc., Heavy Metals Source Determination Study, Phase I, prepared for PVSC, August 15, 1978, Table 55, p. 6 [MAXUS5490327].

[77] Elson T. Killam Associates, Inc., Heavy Metals Source Determination Study, Phase I, prepared for PVSC, August 15, 1978, Table 55, p. 6 [MAXUS5490327].

[78] Elson T. Killam Associates, Inc., Heavy Metals Source Determination, Phase II, prepared for PVSC, April 1980, Phase I Summary Table 1: Mass Balance Analysis, Industrial Metals, Entire Service Area, pp. 59 and 83 [LPRSA0009976 and 001000].

included ore crushing, separation, and washing operations. Copper milling and reduction was attempted at the site in 1900-1901, but was not successful. It is estimated that 42 shafts were installed, accompanied by drain tunnels.[79] To produce steam engines to drain the mines, a foundry and machine shop were established in Belleville on the Second River (tributary to the Passaic). This shop was turned into the Hendricks Copper Rolling Mill to process copper ore from the Schuyler's mines to produce copper bolts and wire. The copper mill operated until 1928.[80] Copper mines also operated in East Orange, Orange, and Glen Ridge. One was located on the Second River (tributary to the Passaic River), one on Wigwam Brook (tributary to Second River), and another on Toney's Brook (a tributary to the Passaic River).

7.2 Sources of PCBs

There are numerous companies that likely contributed PCBs to the LPRSA that are not PAPs. To identify potential contributors of this COC, facility lists were collected from the following information sources:

- PVSC Significant Industrial User list[81]
- PCB sales data[82]
- EDR data identifying PCB contamination/inspections/violations in the Passaic River area[83]

[79] G.F. Black, Newark Mineralogical Society, "The Belleville Copper-Mine," 1922.

[80] H.P. Woodward, New Jersey Department of Conservation and Development, Copper Mines and Mining in New Jersey, 1944.

[81] Letter from W. Hengemihle, FTI, to S. Flanagan, EPA, regarding PVSC Industrial Users List, Lower Passaic River Study Area, February 10, 2017.

[82] Monsanto PCB Sales Summaries.

[83] EDR DataMap Environmental Atlas, Environmental Data Resources Inc., June 18, 2015.

For the facilities listed in these sources, I evaluated information regarding the types of products manufactured to determine which facilities were likely users of PCBs. The results are provided in Exhibit 3, **showing over 450 non-PAP parties that are likely to have used PCBs in the Passaic River area.** Due to the locations of these facilities, they could have discharged waste streams either through the PVSC sewer system (with its bypasses and CSO discharges to the River), to their municipal sewers (with their own CSO discharges to the River), and/or directly to the River or its tributaries. Appendix C provides more detailed examples of potential PCB-discharging facilities that are not a part of this allocation effort.

8. CONCLUSIONS

Based on my review of the extensive information that is available about sources of contamination to the LPRSA, it is clear that the historical sources of COCs to the LPRSA are very broad. These historical sources include thousands of residential, commercial, and industrial sources from both above and below Dundee Dam that:

- Discharged directly to the Passaic River
- Discharged to the extensive network of tributaries to the Passaic River
- Discharged to the Passaic River by PVSC bypasses and CSOs
- Discharged to the Passaic River through municipality direct discharges
- Flowed back up the River via twice daily tidal flows from Newark Bay
- Discharged indirectly through aerial deposition, groundwater/leachate discharge, and stormwater runoff.

Considering only industrial sources, data show that there were thousands of industrial facilities located on the Passaic River. Of these, over 98 percent are not participating in the current allocation effort. When examining historical PVSC research on heavy metals, non-PAPs comprise

81.5 percent of the parties identified as dischargers of heavy metals to the PVSC sewage in the late 1970s. Finally, when examining several sources of likely PCB users in the PVSC service area, over 450 facilities were identified that are non-PAPs.

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EXHIBIT 1
RESUME OF GAYLE SCHLEA KOCH

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GAYLE SCHLEA KOCH — Principal

Ms. Gayle Schlea Koch has over 35 years of consulting experience focused largely on environmental, product liability, technology, and insurance related issues. She has worked broadly in the environmental/mass tort area applying her engineering and business background to address the complex technical and economic issues that arise. She has substantial experience in the estimation of environmental and product liabilities in connection with settlements, insurance claims, penalties, acquisitions and divestitures, bankruptcies, real estate transfers, litigation, and strategic planning.

Ms. Koch has worked extensively in the evaluation of environmental damages, estimation of asbestos and other mass tort liabilities, allocation and recovery of cleanup costs, evaluation of potential insurance recovery, and assessment of the impact of environmental regulations. She has served as an expert on cases involving liability estimation, allocation, cost recovery and NCP (National Contingency Plan) consistency, insurance recovery valuation, disclosure, economic damages, and ability to pay. She has also worked on the evaluation of new technologies and new market opportunities often created by new environmental regulations or changing energy markets.

Examples of projects that are particularly relevant to the mass balance and allocation issues in this matter include:

- Currently working on complex allocation issues with regards to a metal production facility that operated over many decades
- Conducted a litigation risk analysis for multiple PRPs at a complex river system with PCB contamination, looking at possible regulatory action, cost, and allocation scenarios
- Critiqued an allocation prepared for a vast Superfund mining site involving multiple tributaries to a lake system
- Developed an allocation for a Superfund site involving multiple parties/operations over a lengthy period of time, requiring the re-creation of past industrial processes and waste disposal practices, including those from the manufacture of DDT
- Conducted a litigation risk analysis related to cost and allocation scenarios at a harbor site involving PCBs and metals in sediments
- As part of an insurance recovery valuation, researched allocation issues at approximately 350 sites, many with PCB and metals contamination
- Prepared an allocation related to contiguous sites with multiple oil-related activities that changed over time
- Examined allocation and NCP consistency issues as part of a cost recovery matter at a harbor with contaminated sediments
- Critiqued a proposed allocation for a multi-party landfill, examining contaminants of concern versus the composition of various waste streams
- Conducted a litigation risk analysis for an oil tanker company, including allocation, regulatory, and cost recovery issues

Ms. Koch has served as a technical contact for ASTM International (formerly the American Society of Testing and Materials) standards on environmental cost estimation, environmental disclosure, and climate change disclosure. She has participated in meetings with Commissioners of the U.S. Securities and Exchange Commission (SEC) concerning environmental cost estimation and disclosure issues. In addition, Ms. Koch served on the Standards Council of the Sustainability Accounting Standards Board (SASB).

Before co-founding Axlor Consulting, Ms. Koch led the Environmental/Mass Tort practice at The Brattle Group and worked as a consultant with Putnam, Hayes & Bartlett where she focused on environmental and toxic tort liability assessment and insurance issues. Ms. Koch also served as a manager with RCG/Hagler, Bailly & Company, where she focused on the market and economic analysis of industrial process and energy technology markets and on the management of energy and environmental R&D activities. Earlier, Ms. Koch served as a research assistant for the Sloan School of Management at the Massachusetts Institute of Technology and in several positions with E.I. du Pont de Nemours & Company.

EDUCATION

Ms. Koch received a B.S. in Chemical Engineering and a B.S. in Humanities and Engineering (in the Science, Technology and Society Program) from the Massachusetts Institute of Technology, and an M.S. in Management Science (concentrations in applied economics, corporate strategy, and management of technological innovation) from the Sloan School of Management, M.I.T.

PROFESSIONAL ACTIVITIES

- ASTM International, Committee E50 on Environmental Assessment, Risk Management and Corrective Action
- ASTM International (Award of Appreciation, 2010; Distinguished Service Industry Leadership Award, 2017)

PUBLICATIONS AND PRESENTATIONS (LAST 10 YEARS)

"Next Generation ASTM Standards for Environmental Liability Estimation and Disclosure," presented at the ASTM International Workshop, Toronto, Canada, April 5, 2017; presented to the American Bar Association, April 12, 2017.

"Tips for Chemical Engineers from Over 25 Years in Litigation," presented at the 2012 American Institute of Chemical Engineers (AIChE) Spring Meeting, Houston, Texas, April 2, 2012.

“Climate Change: Disclosure Guidelines,” presented at the American Bar Association’s 40th Annual Conference on Environmental Law, Salt Lake City, Utah, March 19, 2011.

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

"Guidelines & Implementation for Climate Change Disclosure," presented at Update on SEC Disclosure and Financial Reporting for Environmental Obligations sponsored by BNA and Sidley Austin LLP, January 20, 2011.

"Climate Change Financial Disclosure: An Update," presented to the National Asian Pacific American Bar Association (NAPABA) Sustainability and Climate Change Committee, October 20, 2010.

"ASTM International's Standard E2178-10: Financial Disclosure Attributed to Climate Change," presented at the American Bar Association Section of Environment, Energy, and Resources Quick Teleconference Series, Recent Developments in Climate Change Disclosure: U.S. and Canadian Perspectives, April 13, 2010.

TESTIMONY (LAST 4 YEARS)

Expert Report in the Matter of ASARCO LLC v. Union Pacific Railroad Company et al., Civil Action No. 2:12-cv-00283-EJL, U.S. District Court for the District of Idaho, June 12, 2015. Deposition taken July 29, 2015. Declaration filed November 9, 2015. Supplemental Expert Report, September 16, 2017. Court testimony, November 14-15, 2017.

Declaration in the Matter of *Vertellus Specialties, Inc., et al*., in the U.S. Bankruptcy Court for the District of Delaware, Case No. 16-11290-, September 2, 2016.

Rebuttal Report in the Matter of *City of Los Angeles v. BAE Systems San Diego Ship Repair Inc.,* U.S. District Court for the Central District of California, Case No. 13-CV-8810, March 8, 2016.

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EXHIBIT 2
PVSC DISCHARGES TO THE PASSAIC RIVER

For Public Disclosure by Consent of the Participating Allocation Parties and EPA (Fall 2022)

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PASSAIC VALLEY SEWER COMMISSION (PVSC)
DISCHARGES TO THE PASSAIC RIVER

Prepared by

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May 22, 2020

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PURPOSE

At the request of counsel on behalf of the Lower Passaic River Study Area ("LPRSA") Small Parties Group ("SPG"), I conducted research on activities of the Passaic Valley Sewer Commission ("PVSC") related to disposal of untreated waste into the Passaic River for the purpose of calculating estimated PVSC volumetric and mass flows of contaminants of concern ("COCs") related to PVSC discharges. These discharges generally fall into three categories: (1) discharge of untreated industrial and domestic waste to the river due to system breakdown, maintenance, and repair activities, (2) PVSC-controlled discharges of untreated waste to the river during high flow events such as rain storms and snow melts, and (3) automatic discharges of untreated waste from combined sewer overflow ("CSO") points. This report is based on the documentation available to date. I will continue to review information as it is made available to me. The opinions offered herein are offered to a reasonable degree of professional certainty.

SUMMARY

Table 2-1 below presents estimated bypass and CSO overflow amounts based on flow and mass information measured by a PVSC contractor in 1974-1975 , contaminant measurements taken during 1977-1986 for the COCs identified in EPA's Record of Decision ("ROD") for the lower portion of the Passaic River,[1] and documented PVSC bypasses of untreated waste to the Passaic River during 1950-1975 and 2005-2014 extrapolated to estimate for bypasses during the 1924-2016 period. Note that because they are based on measurements made after industrial waste pretreatment was starting in the late 1970s and after the phase-out of PCB sales in the mid-1970s, the COC mass estimates presented in Table 2-1 are conservatively low.

[1] U.S. Environmental Protection Agency, Region II, Record of Decision: Lower 8.3 Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, March 3, 2016, pp. 14-16.

Table 2-1. Summary of Estimated PVSC Flows to the Passaic River

	Estimated Bypass Volume and Mass (1924-2016)*	Estimated CSO Automatic Overflows (1924-2016)**	Total (1924-2016)
Sewage volume	617.1 billion gallons	569.9 billion gallons	1.187 trillion gallons
Solids Mass	1.155 billion lb (577,636 tons)	0.587 billion lb (293,499 tons)	1.742 billion lb (871,135 tons)
PCBs	57,032 lb	34,781 lb	91,813 lb
Mercury	242,254 lb	205,152 lb	447,406 lb
Copper	1,015,838 lb	860,258 lb	1,876,096 lb
Lead	3,804,812 lb	3,222,088 lb	7,026,900 lb
PAHs (see Exhibit 2-6 for PAH list)	3,083,750 lb	2,611,460 lb	5,695,210 lb

* Start date is August 2, 1924; end date is September 30, 2016.

** Start date is October 1, 1924; end date is September 30, 2016.

Note: Numbers may not add to totals due to rounding.

PVSC SYSTEM

The PVSC was created by the New Jersey Legislature in 1902 for the purpose of relieving and preventing pollution in the Passaic River and its tributaries between Great Falls in Paterson, New Jersey, and Newark Bay.[2] In August 1924, the PVSC began collecting untreated sewage with a trunk line constructed along the Passaic River. This trunk line intersected municipal lines which previously discharged directly to the river. Collected wastewater was then pumped to the PVSC treatment plant at Newark Bay.[3]

Municipalities joined the PVSC over time as shown in Exhibit 2-1. As more municipalities joined and as their population grew, the flow through the PVSC treatment system expanded from 86.2

[2] PVSC, "Laws/Policies: Enabling Legislation," http://www.nj.gov/pvsc/home/public/laws/ as accessed on November 23, 2015.

[3] Affidavit of Seymour A. Lubetkin, January 6, 1994 [846680004-846680005]; Memo from R. C Smith to PVSC, February 17, 1947, p.2 [LPRSA0198629].

million gallons per day ("MGD") in 1924, to 201 MGD in 1950, and to approximately 250 MGD by 1976.[4]

PVSC CSOs

Some municipalities maintained combined sewer systems, in which stormwater runoff was collected in the same sewers as sanitary waste. As of 1973, a PVSC consultant reported that the municipalities of Paterson, Newark, East Newark, Harrison, Kearny, and Orange used mainly combined sewer systems.[5] These combined systems resulted in combined sewer overflows ("CSOs") of untreated waste to the Passaic River primarily during periods of rain and also occasionally during dry weather periods if the high waste levels overflowed a weir or stop logs in the overflow chambers.

A 1976 report by Killam Associates for the PVSC, *Report Upon Overflow Analysis to Passaic Valley Sewerage Commissioners: Passaic River Overflows* ("1976 Killam report"), measured one year of volumetric flows and total suspended solids ("TSS") flows to the Passaic River from 73 CSOs (located both above and below Dundee Dam) owned and operated by the PVSC.[6] Using the measured CSO flows and accompanying rainfall data, Anchor QEA correlated CSO flows to the Passaic River to rainfall amounts.[7] Anchor QEA applied this correlation to historical rainfall data to derive an estimated PVSC CSO flow of 569.9 billion gallons of untreated sewage into the Passaic River during 1924 to 2016. Applying this estimated flow to TSS data in the 1976 Killam

[4] PVSC, Exhibit 2: Chart Showing Ave. Daily Sewage Flow - 1924 to 1931, October 11, 1932 [LPRSA0192818]; PVSC, Average Daily Sewage Flow [LPRSA0192046]; PVSC Annual Reports, 1971 -1976 [LPRSA0005524; 5773; 5908; 6065; 6156; 6322].

[5] C. Manganaro, Report on Proposed Sewerage Facilities, Vol.1, May 1973 (revised October 1973) [LPRSA0010098].

[6] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis to Passaic Valley Sewerage Commissioners: Passaic River Overflows. Note this report measured outflows during a "water year," defined as October 1-September 30. All Anchor QEA data reflect use of "water years."

[7] Anchor QEA, PVSC CSO overflow and mass discharge estimates, 2017. (See Exhibit 2-8.)

report, Anchor QEA estimated that the CSOs discharged 587 million lb (293,499 tons) of solids mass to the river during this time-frame.

PVSC BYPASSES

While many PVSC CSOs discharged combined overflows to the river automatically as discussed above, some overflow chamber valves and additional separate sanitary/industrial sewer outlets were controlled manually by the PVSC. For decades, PVSC staff manually opened and closed these bypasses through chains linked to regulator valves or flaps, or through gates operated by hoists. This allowed the PVSC to choose to bypass the treatment system and discharge untreated waste directly to the river.[8] In the mid-1980s, the PVSC installed remote controls to allow control of the bypass gates from a central control facility.[9]

Seymour (Sy) Lubetkin, PVSC Assistant Chief Engineer (1950 to 1954) and Chief Engineer (1954 to 1978), who directed PVSC Bypass Crew operations (a 24-hour/7-day per week work crew), stated:

> *The PVSC bypassed waste to the River in the following instances:*
> *a. when it rained and the volume of flow in the system threatened to exceed capacity;*
> *b. when it was necessary to reduce the flow in order to repair sewer lines;*
> *c. when discharges occurred accidentally, as when the flap valves closed because the chain had broken or come unattached; and*
> d. *when a breakdown occurred at the pumping station or treatment plant and it was necessary to limit flow for repairs or to prevent further damage during repairs.*[10]

[8] Affidavit of Seymour A. Lubetkin, January 6, 1994 [846680004-846680005].

[9] Hatch Mott MacDonald, CSO Long Term Control Plan, Cost & Performance Analysis Report, Volume 1, prepared for the PVSC, March 2007, p. 21 [MAXUS1398968].

[10] Affidavit of Seymour A. Lubetkin, January 6, 1994 [846680003-846680007].

According to Mr. Lubetkin, in cases of rain, the Second River Meeting Sewer (Union Outlet) was "easy to bypass because the gates were in the line maintenance yard at Second River owned by the PVSC so they were readily accessible to PVSC personnel."[11] If extensive bypassing was needed, the "last resort" was the Yantacaw Bypass. Bypassing this part of the system, which included all waste from the northern portion of the interceptor, was referred to as "having to throw Yantacaw."[12]

The major bypasses discharged untreated waste from multiple municipalities. For example, when the Yantacaw Bypass was opened, all wastes upstream of the Third River were sent untreated to the Passaic River, including waste from the municipalities of Paterson, Haledon, Prospect Park, Hawthorne, Fair Lawn, Elmwood Park, Garfield, Clifton, Lodi, Passaic, Wallington, and East Rutherford.[13] When the Union Outlet (Second River Bypass) was opened, the entire flow of untreated sanitary, domestic, and industrial waste from Montclair, Orange, Glen Ridge, Bloomfield, and East Orange was discharged directly to the Passaic River.[14] Exhibit 2-2 shows a summary of the PVSC bypasses investigated in this report and the areas served by the sewers connected to each bypass.[15] A total of approximately 39,605 acres was served by the sewers connected to these PVSC bypasses. Exhibit 2-3 provides maps prepared for the PVSC that depict the location of the bypasses along the Passaic River, as well as maps depicting the sewer areas connected to each Newark bypass.[16]

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[11] *Ibid* [846680007].

[12] *Ibid* [846680007].

[13] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for the PVSC, 1976 [LPRSA0195524; 0195578].

[14] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis: Second River Union Outlet, Newark, prepared for the PVSC, 1976 [LPRSA0232948].

[15] Note that there is some documentation of PVSC bypasses in Paterson. Since the available documentation covers only occasional PVSC bypasses in this area, they are not included in this report.

[16] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis to Passaic Valley Sewerage Commissioners: Passaic River Overflows.

While complete documentation regarding PVSC bypasses has not been produced to date, there is extensive documentation regarding the PVSC's discharges to the Passaic River during select time periods. For example, detailed time log documentation was provided by Mr. Lubetkin for much of the period from October 1950 through December 1962. The time logs (referred to as "throw-out logs" because they depicted waste being thrown out of the PVSC system and into the river) identify the dates and times that the PVSC manually opened and closed the bypasses during rainfall and repair/maintenance events. In addition, PVSC contractor Elson T. Killam Associates, Inc. documented bypasses observed during portions of 1974 to 1975, as well as measurements of the volume of bypassed flows and total suspended solids ("TSS") concentrations.[17] The PVSC also summarized its recent annual Newark bypasses to the Passaic River in NPDES reports; to date NJDEP has made available reports for the years 2005-2014.[18]

The documented PVSC bypasses discussed above are summarized in Exhibit 2-4 for each bypass starting in October 1950. This exhibit shows the start and end times for PVSC bypasses to the Passaic River and the calculated total bypass time (in hours and minutes). For the 1974-1975 time-frame, Exhibit 2-4 also summarizes PVSC contractor measurements of bypass times, average bypass flow rates, and average storm TSS values. During the 2005-2014 time-frame, PVSC reports indicate the number of Newark bypasses and the annual elapsed time for each bypass location. Using the measured flow and TSS data from 1974-1975 for each PVSC bypass location shown in Exhibit 2-4, total bypassed volume (in million gallons/hour or "MG/hr") is calculated by summing the total measured overflow volume (elapsed time for each specific bypass event multiplied by the average flow rate for that specific bypass event). This total bypassed volume is then divided by the total bypass time to derive a bypassed volume rate (MG/hr).[19] In addition, for each bypass location in Exhibit 2-4, bypassed mass (in pounds or "lb")

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[17] *Ibid.* Note that in this report, bypasses are indicated as "regulator closed" events, in which the regulator valve allowing waste to be transported to the PVSC Treatment Plant is closed.

[18] PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015, Table 1.

[19] During the 1974-1975 Killam research period, some Newark bypass regulators were inoperable or unused, preventing measurement of bypass flow. In these instances, average measured overflow data are used to calculate flow volumes as noted in Exhibit 2-4. These overflow measurements should be conservatively low compared to the flow that would be experienced when waste was bypassed. Likewise, the Yantacaw Bypass was

is calculated by multiplying average storm TSS measurements[20] by the bypassed volume. The total of bypassed mass is then divided by total bypass time to derive a mass bypass rate (lb/hr) for each location. These calculated bypass volume and mass rates are shown in Exhibit 2-4 for each bypass location.

Table 2-2 below summarizes the documented PVSC bypass times for each bypass location, using the available documentation for the 1950-1962 and 1974-1975 time periods (see Exhibit 2-4 for details). For each bypass location, average annual bypass times were calculated for 1952 to 1962, the period when there are few missing bypass logs. Bypass times for dates with missing documentation during the 1924-1974 period (see highlighted dates in Exhibit 2-4) were then estimated using the 1952-1962 average annual bypass times, adjusted downward during 1924-1950 to account for lower average daily flow rates in the PVSC system as shown in Exhibit 2-5.[21] Bypass times for dates with missing documentation during the 1975-2016 period were estimated using the more recent 2005-2014 average annual bypass times.[22] The resulting total estimated bypass times for 1924-2016 (which include the documented bypasses during this period) are shown in Table 2-2.

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not opened during the Killam study period. However, Killam provided a measurement for the Yantacaw average flow during wet weather, which is used in this analysis. Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for PVSC, 1976, p. 106 [LPRSA0195596].

[20] The TSS measured during storm events was used for this analysis, since the majority of bypasses occurred during storms. Also, it is noted that TSS measurements may not measure all of the mass (such as floating solids or sludge). Therefore, this report may underestimate solids mass releases.

[21] For example, the 1925 average daily flow in the PVSC system was 100.12 MGD versus 201.02 MGD in 1950, resulting in an index adjustment of 100.12/201.02 or 0.498 for 1925 estimates. While it is possible that the 1924-1950 bypass times are similar to the 1952-1962 annual average, the lower system throughput could indicate lower bypass times and in particular, lower bypass volumes. As a conservative estimate, the times and resulting volume estimates have been adjusted downward.

[22] An EPA survey of Superfund allocators indicates that such extrapolation is often used to fill in volumetric data for non-recorded periods where waste production/disposal records are absent. In particular, existing waste production/disposal data combined with years of operation may be used to fill in missing data. In addition, typical manufacturing/production line process discharges and spills may be used to estimate disposal volumes when volumetric data are unavailable. Source: Office of Site Remediation Enforcement, EPA, *Developing Allocations Among Potentially Responsible Parties for the Costs of Superfund Site Cleanups*, October 1994, pp. 4-6.

Table 2-2. Bypass Times (hours)

Bypass	Documented Bypasses (1950-1962, 1974-1975, 2005-2014)	Total Estimated Bypasses (1924-2016)**
Yantacaw*	2,486	9,354
Union Outlet*	14,289	53,940
Verona Avenue	12,401	48,626
Herbert Place	17,804	68,521
4th Avenue	18,053	69,488
Clay Street	19,128	73,007
Rector Street	18,216	70,165
Saybrook Place	17,310	71,465
City Dock	13,075	47,656
Jackson Street	17,936	68,922
Polk Street	18,061	69,410
Freeman Street	18,180	69,874

* Projections for Yantacaw and Union Outlet bypasses are not included after 1975 due to lack of detailed bypass documentation after this date. As described in the text, anecdotal information shows that the PVSC continued to open these bypasses after 1975, making the estimates conservatively low.

** Includes documented bypasses. Start date is August 2, 1924; end date is September 30, 2016, with the exception of Yantacaw and Union Outlet where the end date is 1975 due to lack of available detailed documentation after that date.

There is evidence showing that the PVSC bypassed untreated waste to the Passaic River in time periods extending back to early operations. For example, a PVSC document summarizing flows during November 17-24, 1924 indicates that during the week, the PVSC bypassed 18.12 MGD to the Passaic River at Yantacaw, equal to 47.4% of the total Yantacaw flow for that week.[23] During the week of November 24-December 1, 1924, an additional 14.16 MGD was bypassed at Yantacaw to the Passaic River, equivalent to 46.7% of the Yantacaw flow for that week. The Union Outlet was also bypassed for several days during this week.[24]

[23] PVSC, Table No.4, Flow of Towns in Order of their Interception, Week of Nov. 17-24 [LPRSA0194301].

[24] PVSC, Table IV, Flow of Towns in the order of their Interception, November 24-December 1, 1924 [LPRSA0194291]; Table II, Weekly Record of Venturi Meters, November 26-December 3, 1924 [LPRSA0194288].

Bypasses later in time are also indicated. For example, a PVSC contractor reported that the PVSC bypassed waste to the Passaic River for several months during 1969 while pumps were being repaired.[25] The PVSC also reported that on April 16, 1973, the bypasses were opened at Yantacaw and Newark to allow for inspection of the trunk sewer line, with additional bypassing for inspections on October 14, 1973. Based on this inspection, the PVSC bypassed sewage to the Passaic River for the month of March through April 4, 1974, to allow for internal sewer repairs.[26] In June 1979, equipment repairs and breakdowns let the PVSC to bypass untreated waste to the Passaic River at Union Outlet, Herbert Place, 4th Avenue, Clay Street, Rector Street, Saybrook Place, Freeman Street, Polk Street, and Jackson Street (Newark).[27] Following primary treatment, all PVSC waste was bypassed at a PVSC outlet at Newark Bay (outlet 002) from November 9, 1979 to August 14, 1980.[28] The PVSC also bypassed waste from twenty overflow points to the Passaic River for 21 days in 1980 due to a pipeline break in Paterson. In June 1984, the PVSC bypassed approximately 12 MG of chlorinated, but otherwise untreated sewage to the Passaic River at the Wallington pumping station (including waste from Saddle Brook, Lodi, Garfield, and Wallington) due to equipment work.[29] Bypasses at Yantacaw (Third River), Union Outlet (Second River), and Clay Street (Newark) occurred during June 8-9, 1986 to allow for PVSC inspections of the main interceptor.[30] Bypasses occurred during April 17-18, 1988 at eight locations (including Verona Avenue, Herbert Place, 4th Avenue, Rector Place, and Saybrook Place in Newark as approved by NJDEP) to allow for attempted inspection of the main interceptor; toxic vapors in the sewer

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[25] Charles A. Manganaro, Report on Proposed Sewerage Facilities, Volume 1, May 1973 (Revised October 1973), p. V-10 [LPRSA0233051].

[26] PVSC, Special Report #3 (from March 1974 Report): Crack Repair Under McCarter Highway [LPRSA0006004-0006009].

[27] Letter from E.J. Moller, PVSC to EPA, June 18, 1979.

[28] PVSC memo regarding discharge from PVSC to Newark Bay, July 16, 1980; NJDEP press release, August 22, 1980.

[29] R. Leith, "Effect of Sewage Flow on River Life Being Monitored," *The Record*, June 17, 1984; Letter from D.C. Hofman, NJDEP to R.D. Ricci, PVSC, May 13, 1980.

[30] Letter from J.A. Lawrence, PVSC to A. Schiffman, NJDEP, June 11, 1986. (Note that bypassed waste was disinfected with hypochlorite solution before discharge to the Passaic River.)

prevented workers from completing the inspection.[31] The Herbert Place (Newark) bypass discharged untreated sewage to the Passaic River on January 5, 1989 due to a regulator control malfunction.[32]

As indicated in the detailed bypass logs through 1962, in general the Union Outlet was used first and most frequently, followed by the Newark bypasses.[33] Yantacaw tended to be the last bypass used. As a percentage of total time, on average Union Outlet was bypassed to the Passaic River approximately 12 percent of the time, whereas Yantacaw was bypassed approximately 2 percent of the time. Bypass information for Union Outlet and Yantacaw for the 2005-2014 time-frame has not been made available; during this time the Newark bypasses were used relatively consistently and up to 62 times per year.

Table 2-3 below shows estimated bypass volume and bypass rates using the bypass flow information collected by PVSC's contractor during 1974-1975. The total bypassed volume estimate was calculated by multiplying total bypassed time by average bypass volume flow rate.[34] The estimated volume bypassed by the PVSC during 1924-2016 is approximately 617.1 billion gallons. This volume is similar in magnitude to Anchor QEA's estimated CSO automatic overflow volume of 569.9 billion gallons,[35] for a total PVSC system flow to the Passaic River of 1.187 trillion gallons of sewage.

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[31] Letter from L.T. Cattaneo, NJDEP to S. Lipke, PVSC, April 15, 1988 and letter from S. Lipke, PVSC to B. Zimmer, NJDEP, April 19, 1988.

[32] Letter from P. Habrukowich, PVSC to P. Lynch, NJDEP, January 6, 1988.

[33] While PVSC Chief Engineer Sy Lubetkin indicated in his 1994 affidavit that the Newark bypasses were usually employed first, followed by Union Outlet, the detailed bypass logs produced by Mr. Lubetkin show that Union Outlet was usually opened first, and often in concert with the Newark bypasses. As pointed out by Mr. Lubetkin, the Union Outlet bypass was located in the PVSC line maintenance yard, so it was nearby and easy to access by the bypass crew. Affidavit of Seymour A. Lubetkin, January 6, 1994 [846680003-846680007].

[34] Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976. Note that measured stormy weather flow rates and TSS data are used from this report because a majority of the PVSC's documented bypasses cite stormy weather at the time of the bypass.

[35] Anchor QEA, PVSC CSO overflow and mass discharge estimates, 2017. (See Exhibit 2-8.)

Table 2-3. Bypassed Volume

Bypass	Estimated Bypass Volume Rate (MG/hr)	Estimated Bypassed Volume (MG) (1924-2016)*
Yantacaw*	5.083	47,548
Union Outlet*	1.012	54,608
Verona Avenue	0.292	14,208
Herbert Place	0.387	26,543
4th Avenue	0.275	19,078
Clay Street	2.375	173,360
Rector Street	0.356	24,980
Saybrook Place	0.773	55,215
City Dock	1.771	84,391
Jackson Street	0.692	47,671
Polk Street	0.802	55,673
Freeman Street	0.198	13,829
Total		**617,103**

* Start date is August 2, 1924; end date is September 30, 2016 (with the exception of Yantacaw and Union Outlet, where the end date is 1975 due to lack of available detailed documentation).
Note: Numbers may not add to totals due to rounding.

Table 2-4 below shows the estimated solids mass bypassed by the PVSC to the Passaic River. To estimate pounds of solids mass bypassed, TSS data were applied to the bypass rates discussed above for each bypass (bypass time is multiplied by mass bypass rate). For the 1924-1991 period, estimated solids mass is based on average TSS data measured for stormy weather during 1974-1975 at each bypass. Starting in 1992, these TSS data were reduced by 55 percent to track an equivalent TSS decline observed in the PVSC's influent.[36] As a result, the estimated solids mass bypassed by the PVSC to the Passaic River is 1.155 billion pounds (or 577,636 tons) as shown in Table 2-4. Anchor QEA estimated the total solids mass from automatic CSOs at 0.587 billion

[36] Hazen and Sawyer, *Maximization of the Conveyance of Wastewater: Final Report*, prepared for the PVSC, December 1996, p.2.

pounds (293,499 tons),[37] resulting in a total PVSC disposal of solids to the Passaic River of 1.742 billion pounds (871,135 tons).

Table 2-4. Bypassed Solids Mass (lb)

Bypass	Estimated Bypassed Solids (1924-2016)*
Yantacaw*	178,958,529
Union Outlet*	98,892,427
Verona Avenue	25,679,962
Herbert Place	39,984,396
4th Avenue	30,665,149
Clay Street	336,192,234
Rector Street	30,961,811
Saybrook Place	128,569,673
City Dock	160,207,171
Jackson Street	36,329,289
Polk Street	44,139,691
Freeman Street	44,690,992
Total	**1,155,271,324**

* Start date is August 2, 1924; end date is September 30, 2016 (with the exception of Yantacaw and Union Outlet, where the end date is 1975 due to lack of available detailed documentation after that date).
Note: Numbers may not add to totals due to rounding.

According to the 2016 ROD issued by EPA for the lower 8.3 miles of the Lower Passaic River, the eight COCs that pose the highest potential risk to human health and the environment at the site are:[38]

- Dioxins and furans
- Polychlorinated biphenyls ("PCBs")
- Mercury
- Dichlorodiphenyltrichloroethane ("DDT")
- Copper

[37] Anchor QEA, PVSC CSO overflow and mass discharge estimates, 2017. (See Exhibit 2-8.)

[38] U.S. Environmental Protection Agency, Region II, Record of Decision: Lower 8.3 Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, March 3, 2016, pp. 14-16.

- Dieldrin (HEOD or 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4α,5,6,7,8,8α -octahydro-1,4-endo,exo-5,8-dimethanonaphthalene)
- Polycyclic aromatic hydrocarbons ("PAHs")
- Lead

Historical information measuring COCs in the PVSC sewage during the early decades of PVSC operation is sparse. Available studies indicate the following measurements for COCs:

- 1977 PCBs (due to the lack of PVSC sampling for PCBs during the chemicals' commercial production period of 1929 to 1976,[39] data are for influent measured at a POTW treatment facility in the City of Baltimore that is of comparable size and that treated waste from diverse PCB-using industries similar to those discharging to the PVSC)[40]

[39] Commercial production of PCBs began in the United States in 1929. A PCB ban was implemented in 1977. However, there is evidence that PCBs have been found in the PVSC system at low levels long after their phase-out. For example, PCBs were measured at 300 ng/l in PVSC influent in 1999. Sources: United Nations Environment Programme - Chemicals, *Regionally Based Assessment of Persistent Toxic Substances, North America Regional Report*, December 2002, p.32; HartCrowser, Draft Engineering and Historical Review of PVSC CSOs, Prepared for Tierra Solutions, September 12, 2002, p.7-5, Table 7-2 (based on study by Durell and Lizotta, 1999) [MAXUS2959885].

[40] EPA, *PCBs Removal in Publicly-Owned Treatment Works*, July 16, 1977, pp 1-.2, 7-8, and 59. In this report, EPA studied PCB removal at two publicly-owned treatment works ("POTWs"): a small 3.5 MGD plant in Bloomington, Indiana with one major PCB contributor (a capacitor manufacturer), and a larger, 180 MGD plant in Baltimore, Maryland where "the PCBs in the influent are more generally attributable to diverse industrial and domestic sources typical of a heavily-industrialized urban area." The average influent PCB concentrations were measured at 145 µg/l for the Bloomington facility, and at 15 µg/l for the Baltimore facility. The Baltimore concentration is used in this report due to the similarity in facility size, industrialized location, and industrial contributors (such as electric component and transformer manufacturers common to both areas as well as the common use of PCBs in hydraulic fluids, heat transfer fluids, and recycled paper) as compared to the PVSC system. The study also found a high correlation between PCB removal and TSS removal, noted as an expected result because prior studies show that "PCBs are adsorbed onto suspended solids." Note that the Baltimore POTW covers a similar size industrialized area (140 square miles) as the PVSC (150 square miles). Source: Baltimore City Department of Public Works, "Back River Wastewater Treatment Plant," accessed at http://publicworks.baltimorecity.gov/pw-bureaus/water-wastewater/wastewater/back-river. The Baltimore system also had sewer overflow and CSO overflow issues, leading to a Consent decree with EPA and DOJ in 2002 to address untreated discharges. Source: EPA, *City of Baltimore, Maryland, Sewer Overflows* Settlement, April 26, 2002 Consent Decree, accessed at https://www.epa.gov/enforcement/city-baltimore-maryland-sewer-overflows-settlement

Obtaining samples in a relevant time period is important for mass discharge estimates, as domestic PCB sales generally started around 1930, grew from the mid-1950s, and peaked in 1970, after which they dropped in half and were subsequently phased out later in the 1970s. Sources: EPA, *PCBs in the United States Industrial Use and Environmental Distribution: Task* I, February 25, 1976, pp. 198-207; Versar, Inc., *Polychlorinated Biphenyls 1929-1979: Final Report*, prepared for EPA, May 16, 1979, pp. 1-3.

- 1978 Metals in PVSC influent[41]
- 1984-86 Select PAHs in PVSC influent (see listing of PAHs in Exhibit 2-6)[42]

The sampling results from these studies are summarized in Exhibit 2-6. It is noted that sampling results are not available for each bypass, and that concentrations likely varied by bypass; however, the available sampling provides insights into an order-of-magnitude estimate for the mass of COCs bypassed by the PVSC to the Passaic River. Furthermore, the sample values in Exhibit 2-6 are expected to be low relative to earlier historical concentrations due to the imposition of industrial waste pretreatment requirements in the 1970s. In addition, the available PCB measurements do not cover the period when PCBs were in common use, prior to being phased out by the mid-1970s. Therefore, the bypassed COC estimates discussed below are likely to be low.

Using the measurements for COCs cited above, the mass of COCs bypassed by the PVSC is estimated by multiplying measured concentrations (from Exhibit 2-6) by estimated bypassed volume (summarized in Table 2-3). Starting in 1992, the concentrations are reduced by 55 percent (as discussed above for the mass calculations) to factor in a decline equivalent to the TSS decline observed in the PVSC's influent.[43] As shown in Table 2-5 below (and detailed in Exhibit 2-7), the total mass of COCs bypassed by the PVSC to the Passaic River during 1924-2016 is estimated conservatively low at 8,203,685 pounds (4,102 tons). Applying the same methodology to Anchor QEA's estimated CSO overflow volume yields an estimated 6,933,739 pounds (3,467 tons) of COCs that flowed into the Passaic River from these automatic overflows. Table 2-5 also

[41] PVSC, Heavy Metals Source Determination, Phase II, 1980 (Summarizing Phase I sampling performed in 1978 [LPRSA0009923].

[42] CFM Incorporated, Investigation of Organic Priority Pollutants in the Influent to the PVSC Treatment Plant, May 1986, Tables 2-3 (measurements taken 11/1984-1/1986).

[43] Hazen and Sawyer, *Maximization of the Conveyance of Wastewater: Final Report*, prepared for the PVSC, December 1996, p.2.

compares the estimated total PVSC discharges of COCs to the Passaic River to EPA's mass estimates for the selected COCs as calculated by EPA for the lower eight miles of the LPRSA.[44]

Table 2-5. PVSC Bypasses and CSO Contaminants of Concern (lb)

COC	Estimated Bypass Mass (1924-2016)**	Estimated CSO Overflow Mass (1924-2016)**	Total Estimated PVSC Mass (1924-2016)**	EPA Estimated Mass in OU-2 Sediments
PCBs*	57,032	34,781	91,813	57,320
Mercury	242,254	205,152	447,406	92,594
Copper	1,015,838	860,258	1,876,096	4,629,708
Lead	3,804,812	3,222,088	7,026,900	7,054,792
Select PAHs (see Exhibit 2-6)	3,083,750	2,611,460	5,695,210	903,895
Total	**8,203,685**	**6,933,739**	**15,137,424**	

* The period for PCB mass estimation is 1930-1976.
** Start date is August 2, 1924; end date is September 30, 2016 (with the exception of Yantacaw and Union Outlet, where the end date is 1975 due to lack of available detailed documentation after this date).
Note: Numbers may not add to totals due to rounding.

CONCLUSIONS

As shown in Table 2-5, the PVSC is estimated to have discharged over 15 million pounds of COCs to the Passaic River during the 1924-2016 time-frame. When comparing these estimates of PVSC-discharged COCs to those estimated by EPA as present in the sediments of the lower eight

[44] EPA, Additional Contaminant Inventory Analysis for Lower Eight Miles of the Lower Passaic River, April 2019, Table 1.

miles of the river (prior to Tierra Phase 2 Removal),[45] it is evident that the PVSC discharges alone could account for much of the mass of certain COCs[46] in OU-2.

[45] While interim activities removed some masses of COCs, for allocation purposes it is important to look at the total mass in the LPRSA driving the cleanup. Source: EPA, Additional Contaminant Inventory Analysis for Lower Eight Miles of the Lower Passaic River, April 2019, Table 1.

[46] Mass estimates are calculated for PCBs, mercury, copper, lead, and PAHs based on available historical concentration data.

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EXHIBIT 2-1
TIMELINE FOR MUNICIPALITIES SERVED BY THE PVSC

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Exhibit 2-1. Timeline for Municipalities Served by the PVSC

Year Joined	Municipality
1911	Belleville Clifton East Newark East Rutherford* Garfield Harrison Kearny Lyndhurst Newark North Arlington Nutley Passaic Paterson Rutherford* Wallington
1917	Bloomfield Glen Ridge Prospect Park
1918	East Orange*
1921	Haledon Montclair
1924 (PVSC starts operations)	Orange
1932	Lodi
1942	East Paterson
1943	Elmwood Park Saddle Brook* (portion may have joined in 1960)
1944	Glen Rock Hawthorne
1945	Fair Lawn* (portion may have joined in 1950)
1960	Little Falls
1963	Newark South Side
1971	South Hackensack
1980	North Haledon
1984	West Paterson
1986	Bayonne Jersey City

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Exhibit 2-1 (continued). Timeline for Municipalities Served by the PVSC

Year Joined	Municipality
Unknown	Cedar Grove (portion) Elizabeth (portion) Franklin Lakes (portion) Hackensack (portion) Hasbrouck Heights (portion) Hillside (portion) North Bergen North Caldwell (portion) Ridgewood (portion) South Orange (portion) Totowa Union City (portion) West Orange (portion) Woodland Park Wood-Ridge (portion)

* Possible that only a portion of the municipality joined at this time.

Sources: Undated PVSC presentation to EPA; PVSC 1972 Annual Report; PVSC 2013 Annual Report.

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EXHIBIT 2-2
SEWER AREAS SERVED BY PVSC BYPASSES

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Exhibit 2-2. Sewer Areas Served by PVSC Bypasses

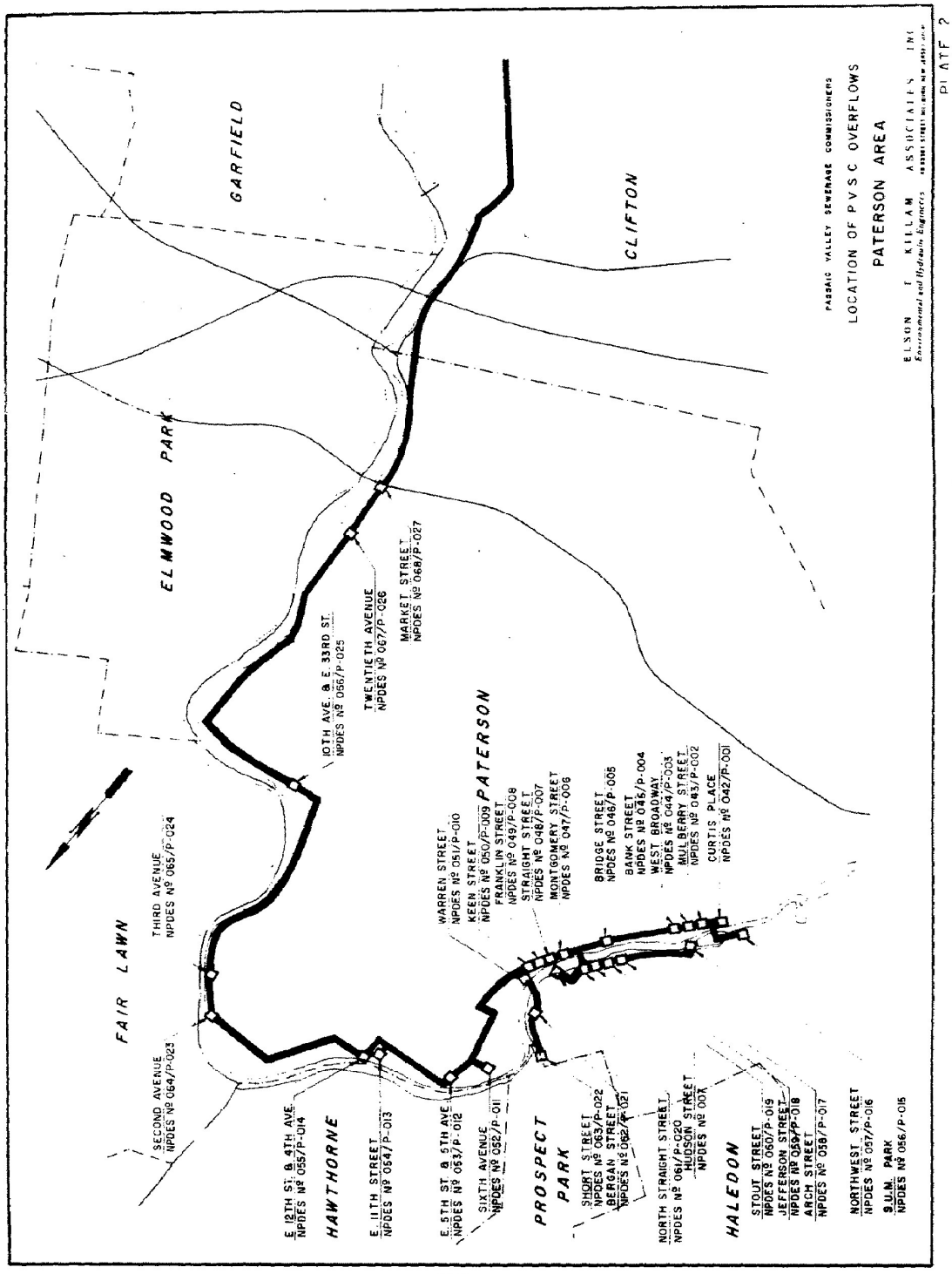
Bypass	Description	Area (Acres)	Source Bates Number
Yantacaw	Entire flow north of Third River (including Paterson, Lodi, Passaic, Clifton, Garfield, Haledon, Prospect Park, Hawthorne, Fair Lawn, Elmwood Park, Wallington and East Rutherford)	24,320	LPRSA0195596
Union Outlet	Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls	10,227	LPRSA0195645
Verona Avenue	Portion of Newark	367	LPRSA0195608
Herbert Place	Portion of Newark	298	LPRSA0195608
4th Avenue	Portion of Newark	225	LPRSA0195608
Clay Street	Portion of Newark; portion of East Orange	2,874	LPRSA0195608
Rector Street	Portion of Newark	177	LPRSA0195608
Saybrook Place	Portion of Newark	306	LPRSA0195608
City Dock	Portion of Newark	380	LPRSA0195608
Jackson Street	Portion of Newark	83	LPRSA0195608
Polk Street	Portion of Newark	199	LPRSA0195608
Freeman Street	Portion of Newark	149	LPRSA0195608
Total		39,605	

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for PVSC, 1976.

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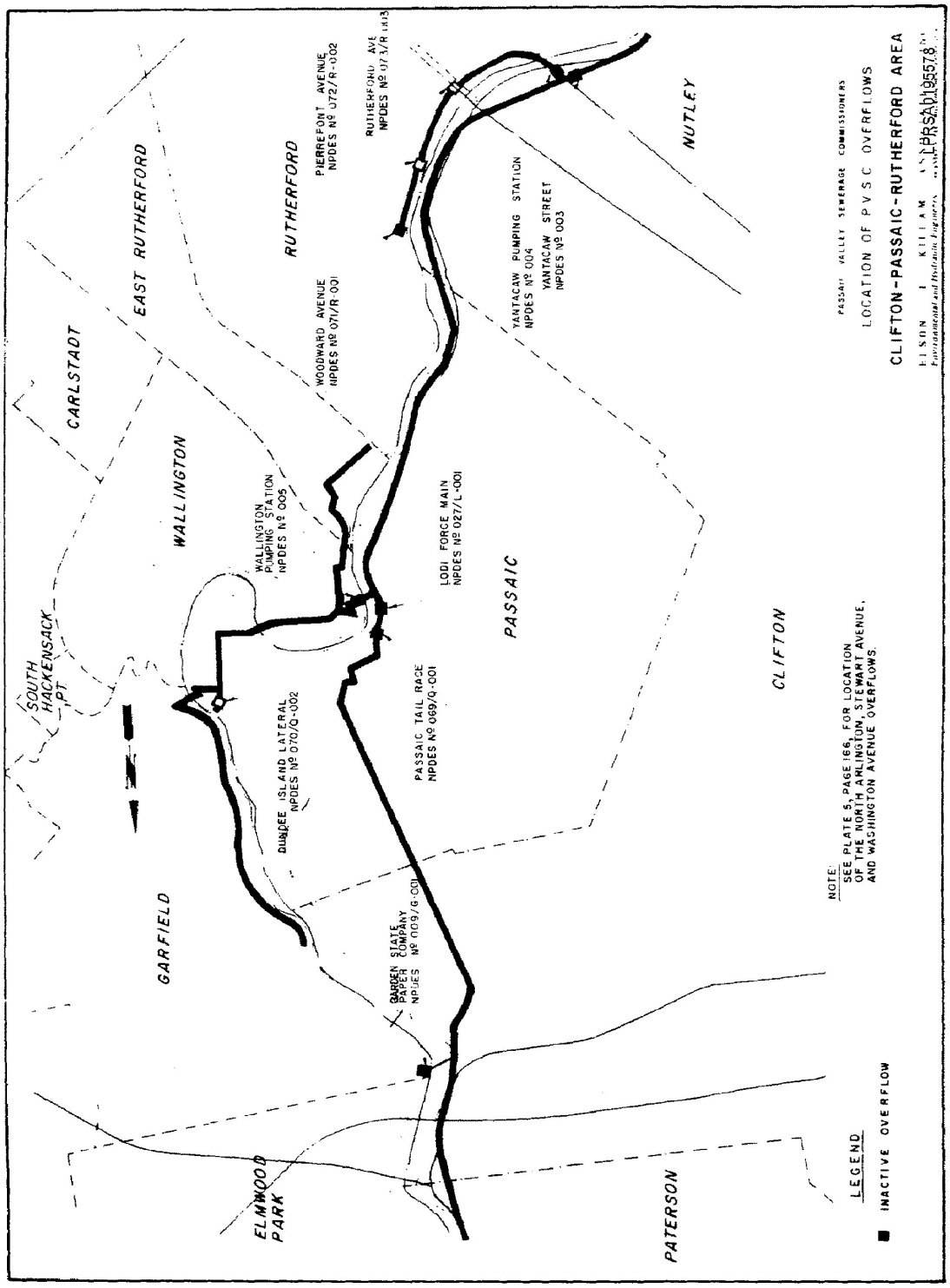
EXHIBIT 2-3
MAPS OF PVSC BYPASSES
(FROM ELSON T. KILLAM ASSOCIATES, INC., REPORT UPON OVERFLOW ANALYSIS, PREPARED FOR PVSC, 1976)

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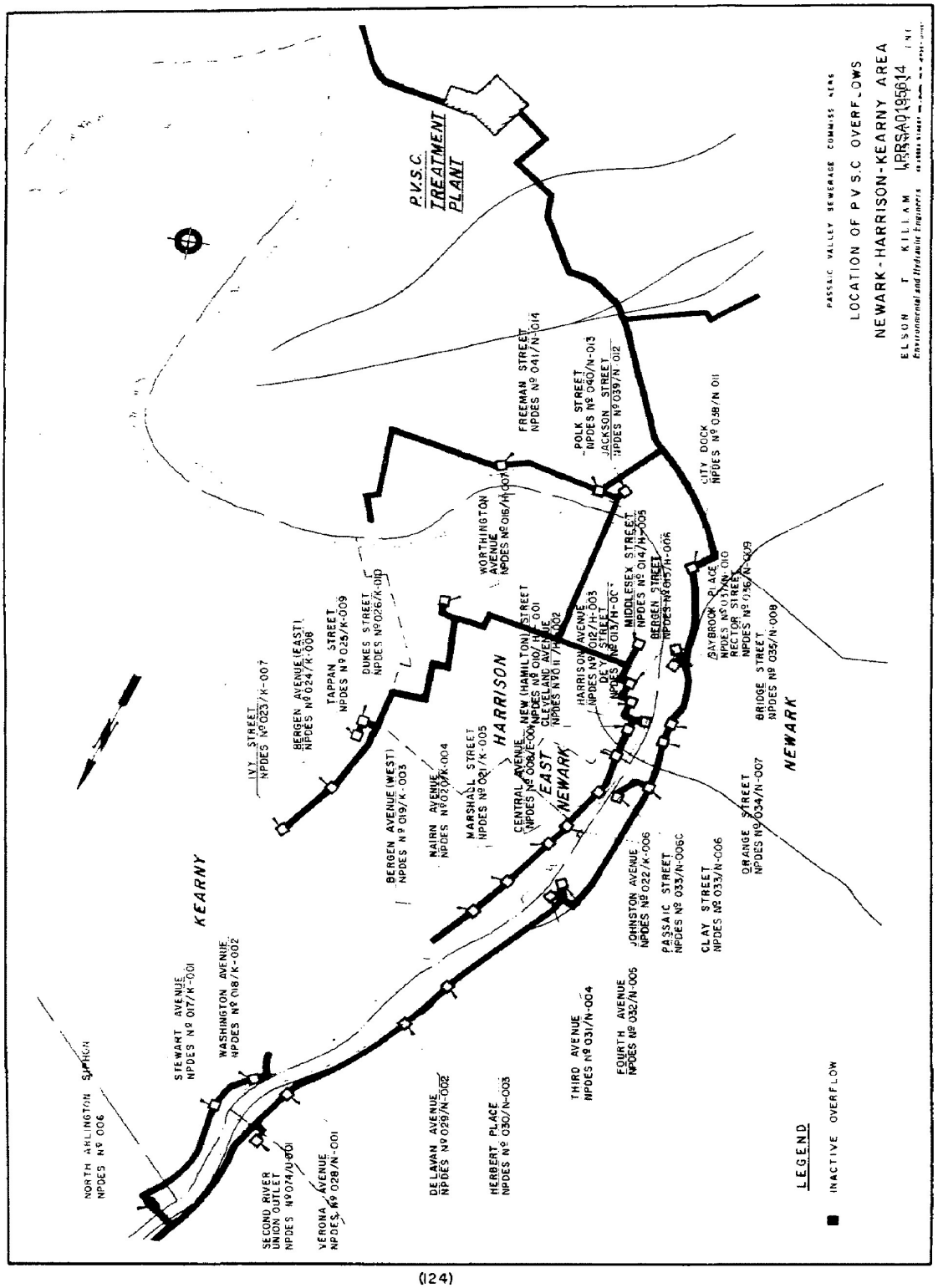
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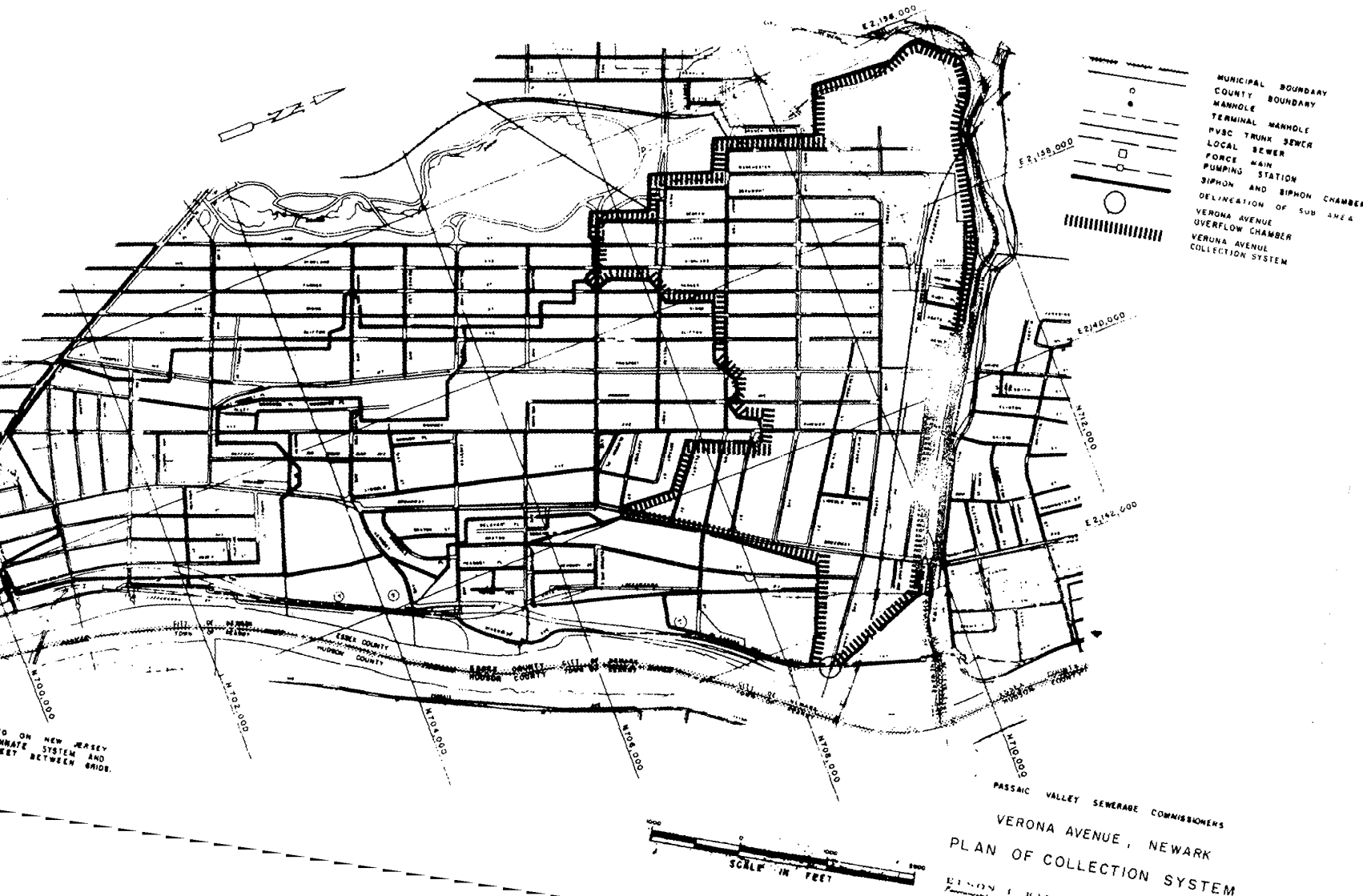
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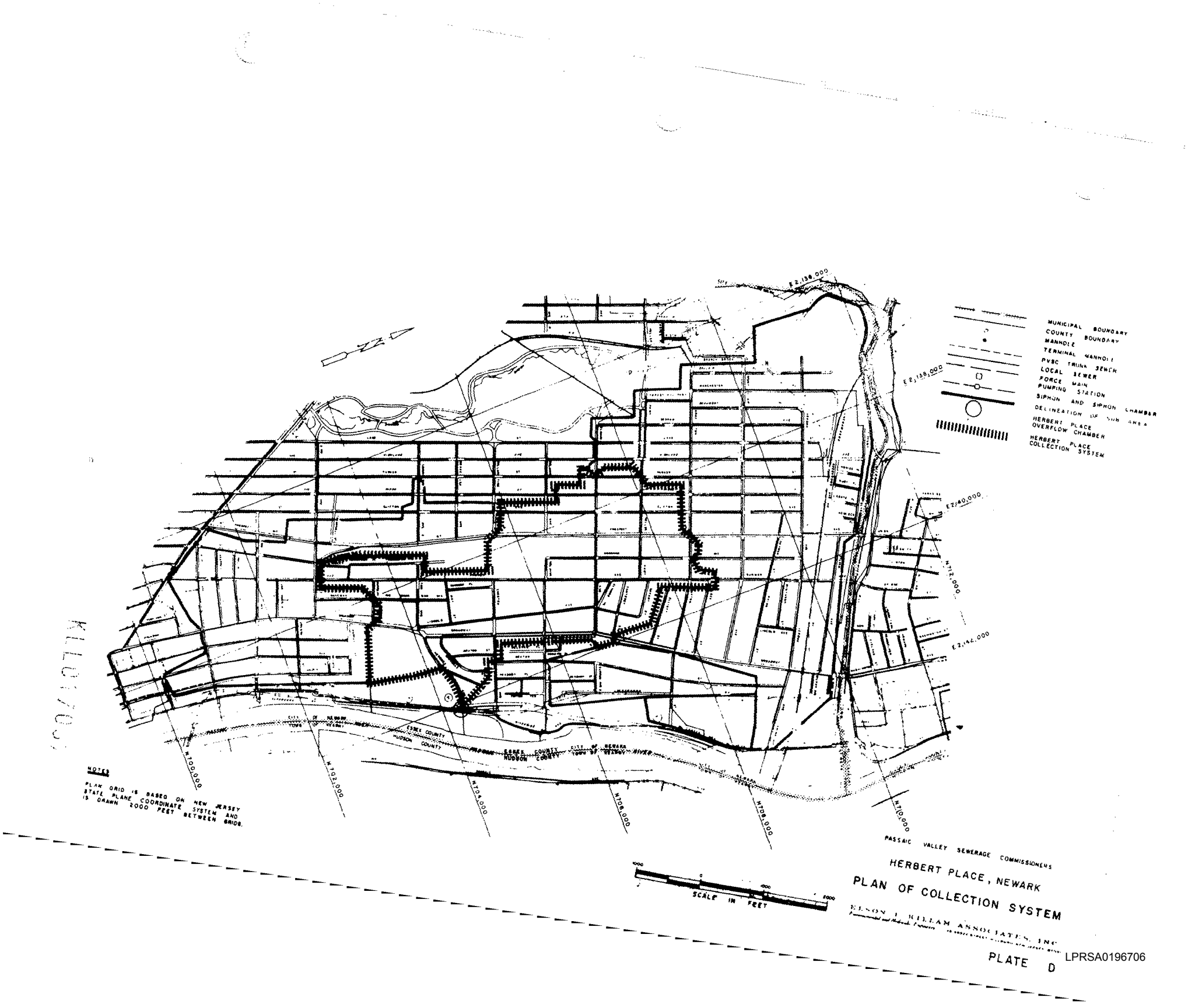
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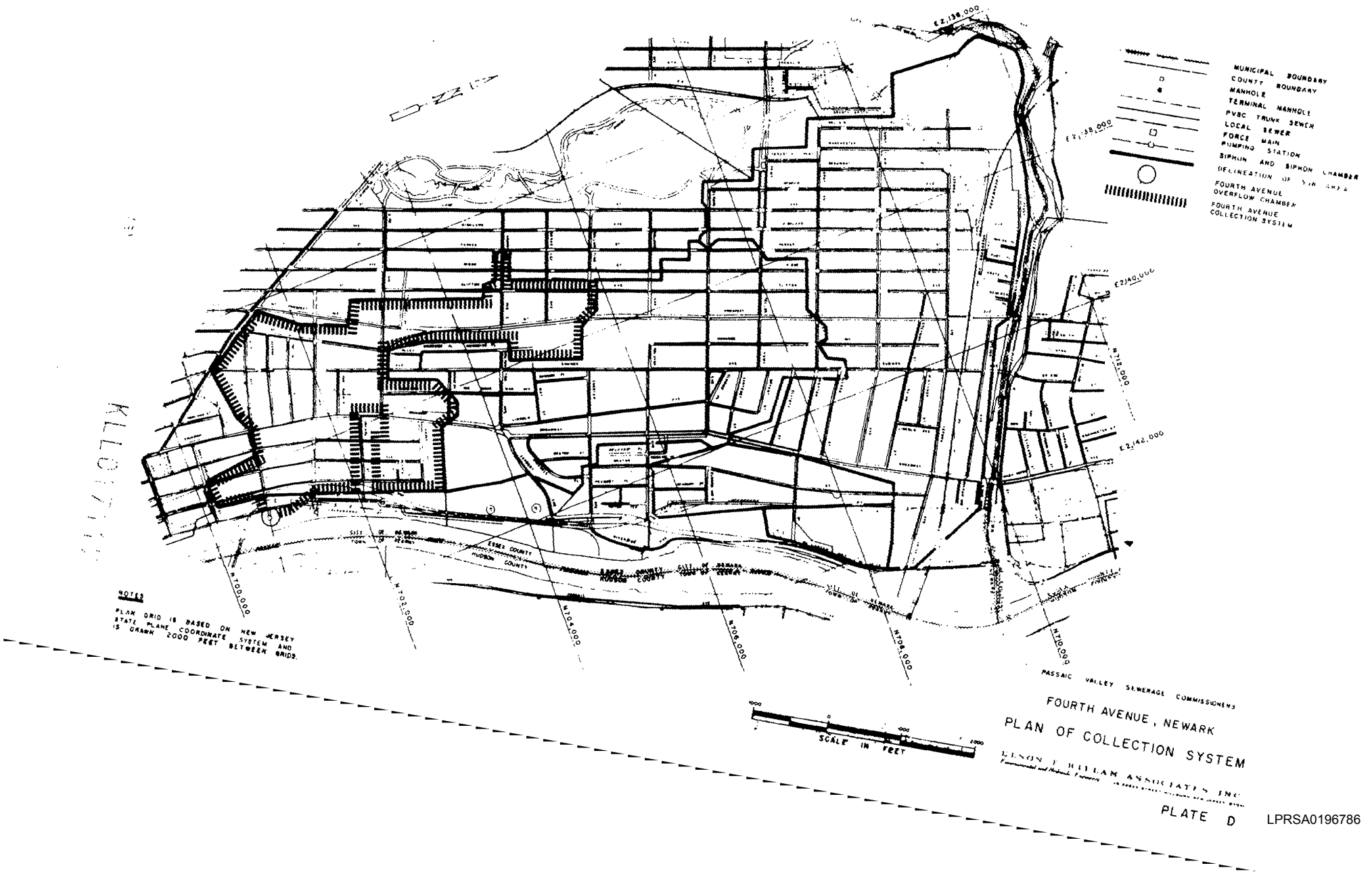
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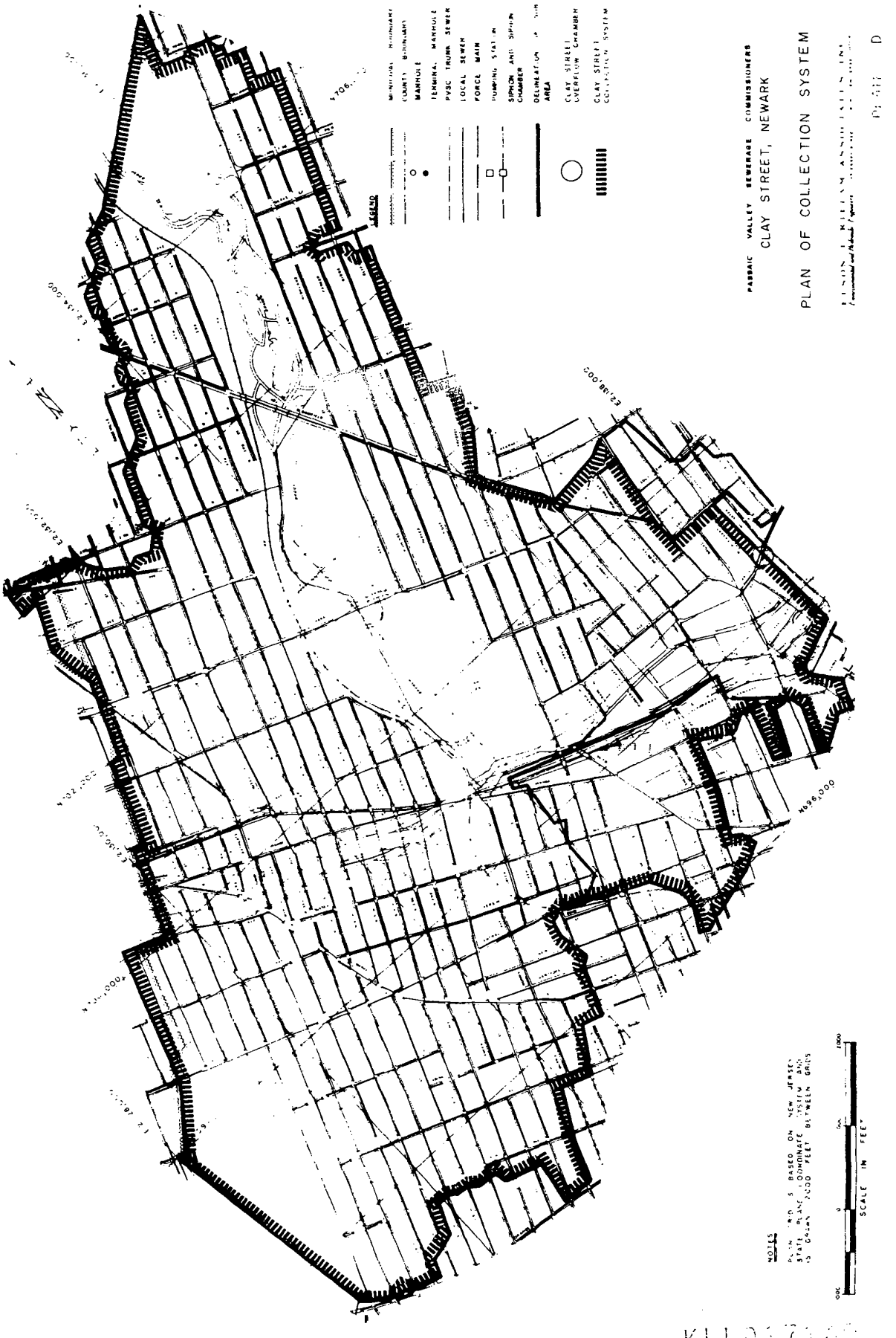


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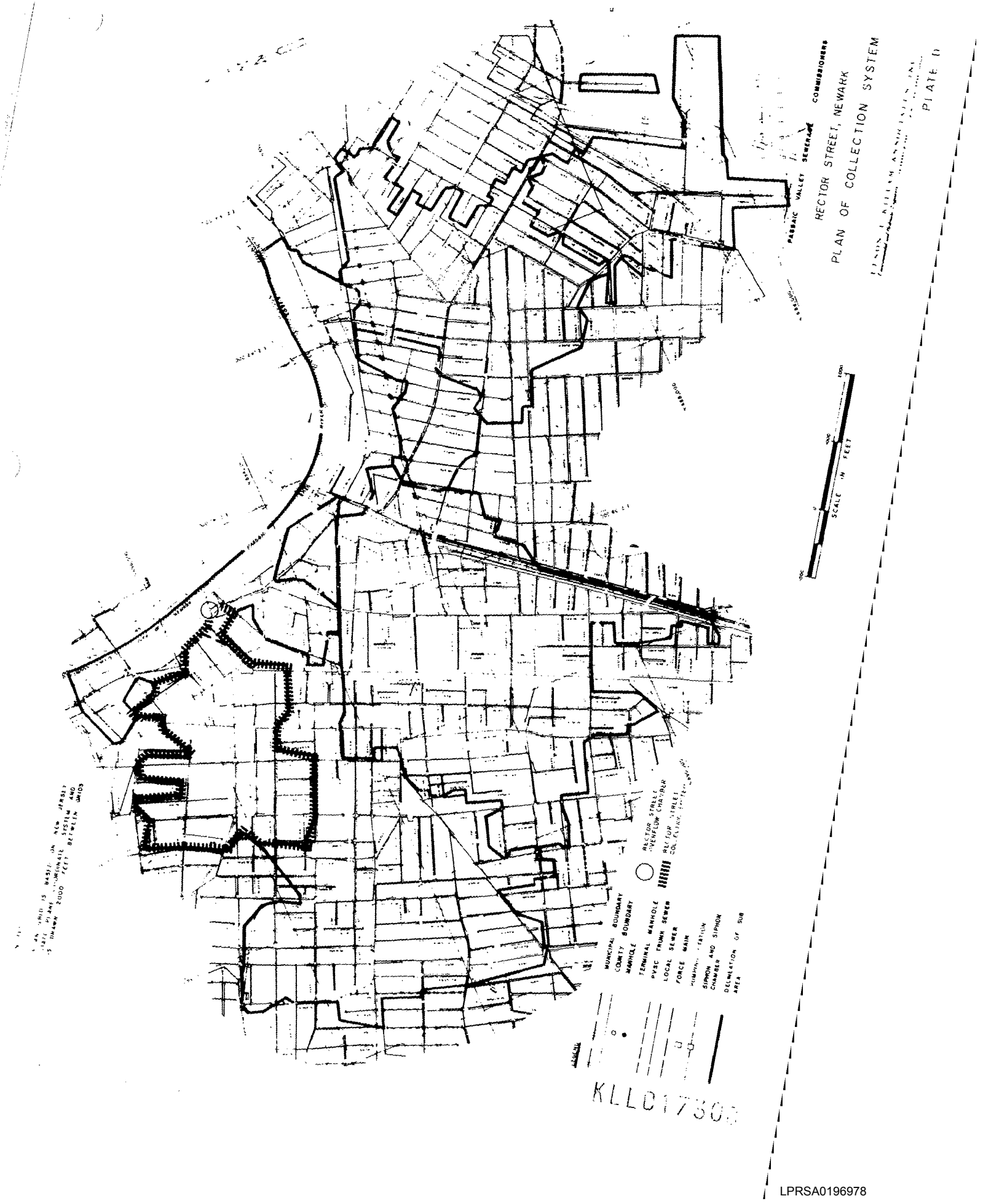
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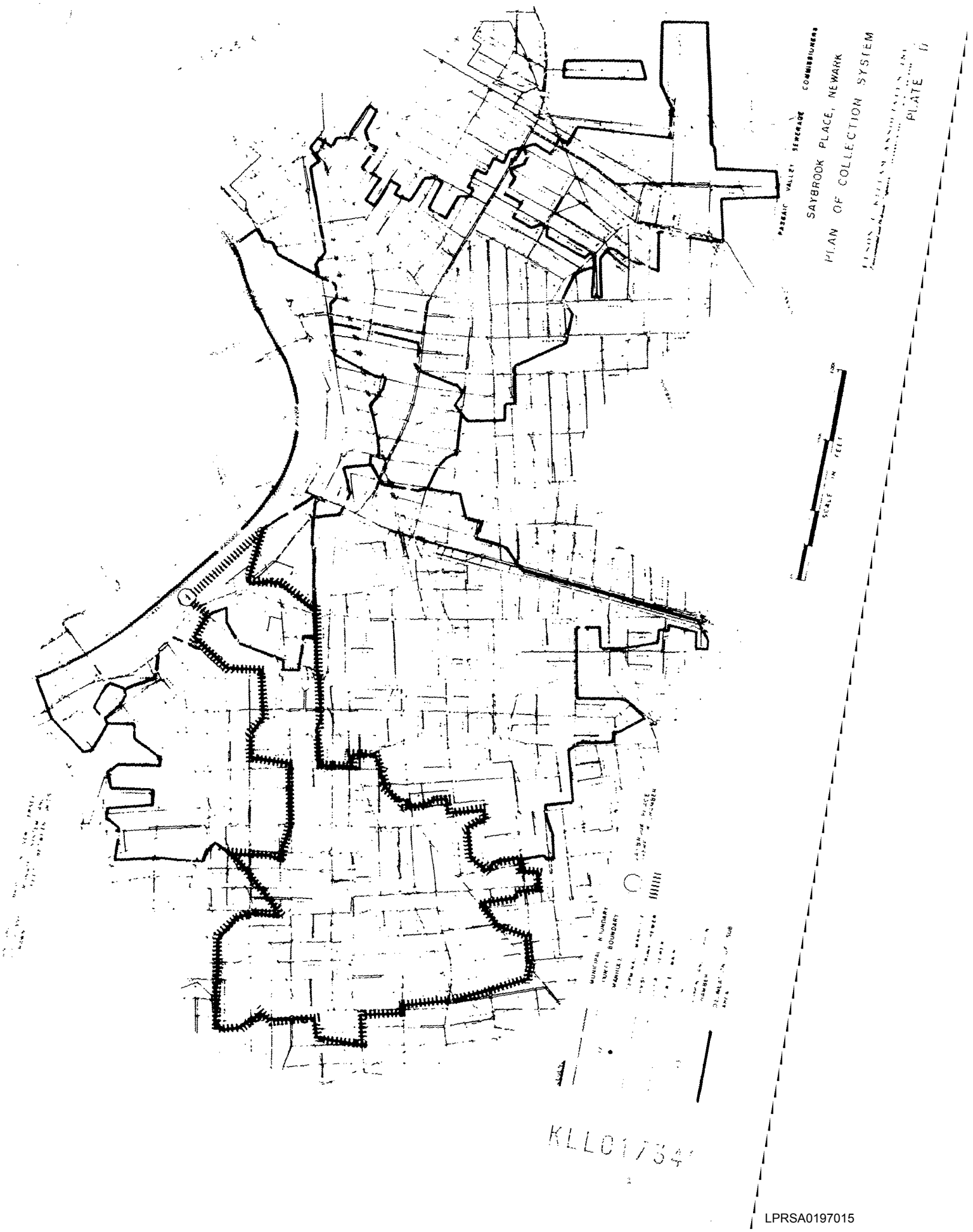


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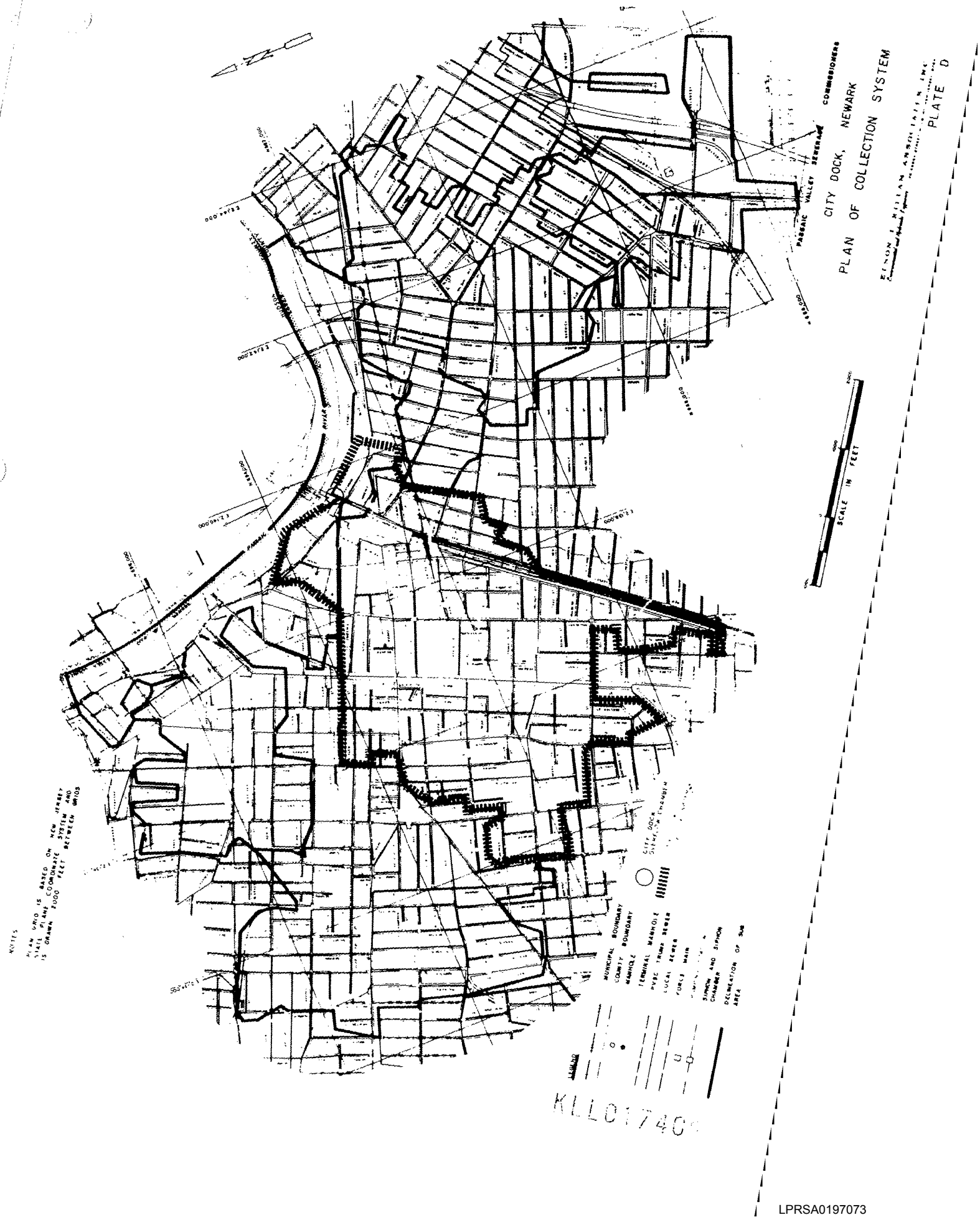
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LPRSA0197015

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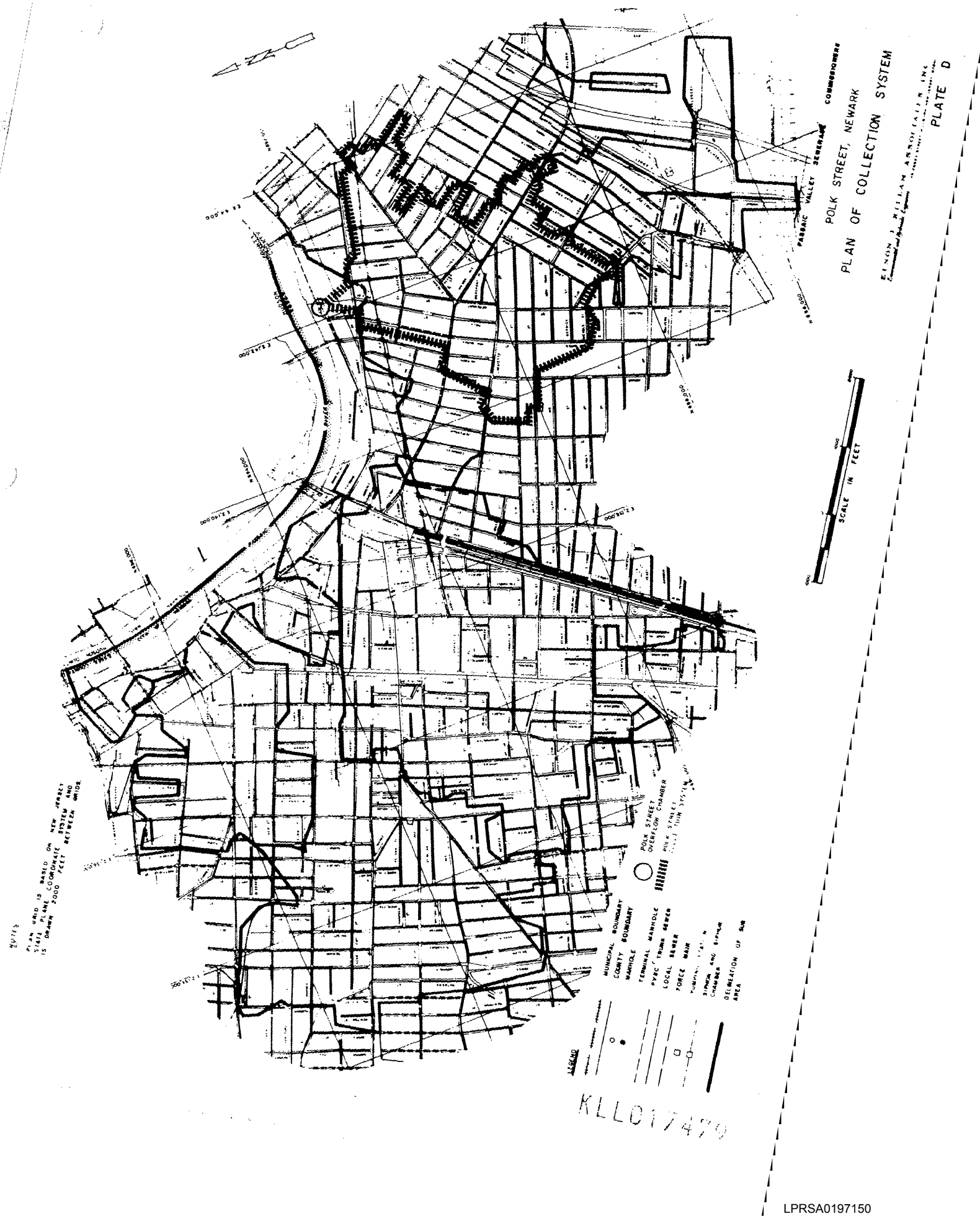
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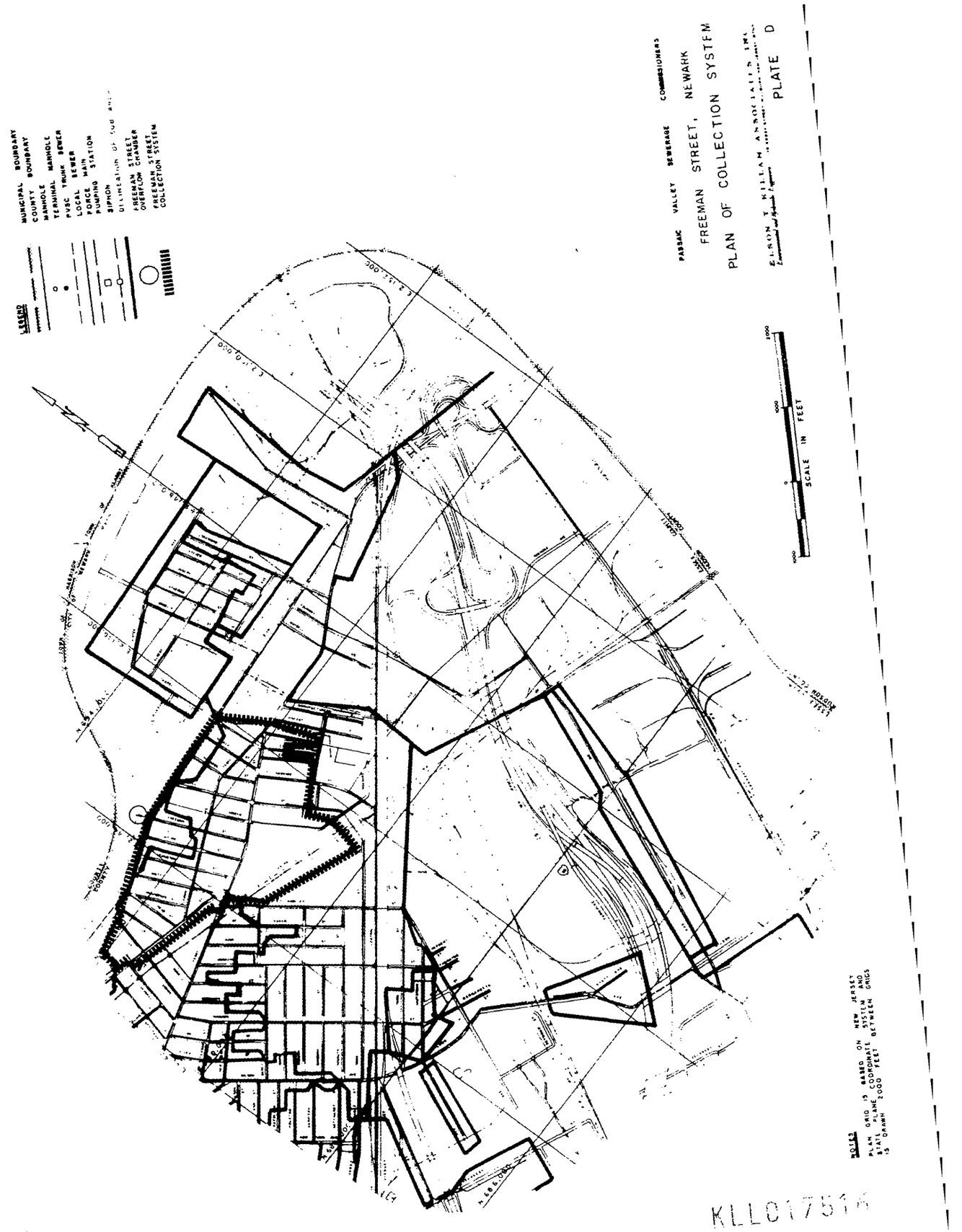
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KLL017479

LPRSA0197150

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KLLO17514

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EXHIBIT 2-4
DOCUMENTED PVSC BYPASSES

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 8:30 AM	6:00:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 9:30 AM	20:00:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/4/50 9:00 PM	8:30:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 9:00 AM	10:30:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/25/51 7:00 PM	3:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/29/51 8:30 AM	15:30:00	LPRSA0188625	ABC012645				
	1/29/51 7:30 PM	1/30/51 10:00 AM	14:30:00	LPRSA0188625	ABC012645				
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	2/11/51 6:00 PM	2/13/51 8:30 AM	38:30:00	LPRSA0188588	ABC012608				
	2/13/51 7:45 PM	2/14/51 10:00 AM	14:15:00	LPRSA0188588	ABC012608				
	2/14/51 5:45 PM	2/15/51 9:30 AM	15:45:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/17/51 10:00 PM	18:00:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 9:30 AM	16:30:00	LPRSA0188596	ABC012616				
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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
4/25/52 8:00 AM	4/25/52 7:00 PM	11:00:00	LPRSA0189744	ABC013764				
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4/29/52 4:15 PM	4/30/52 9:00 AM	16:45:00	LPRSA0189745	ABC013765				
5/5/52 9:00 AM	5/5/52 4:30 PM	7:30:00	LPRSA0189745	ABC013765				
5/6/52 3:00 PM	5/6/52 9:30 PM	6:30:00	LPRSA0189745	ABC013765				
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5/13/52 2:00 PM	5/14/52 8:00 AM	18:00:00	LPRSA0189743	ABC013763				
5/18/52 7:00 AM	5/19/52 9:00 AM	26:00:00	LPRSA0189741	ABC013761				
5/19/52 6:00 PM	5/20/52 2:30 PM	20:30:00	LPRSA0189741	ABC013761				
5/21/52 3:15 PM	5/22/52 9:00 AM	17:45:00	LPRSA0189741	ABC013761				
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5/25/52 8:00 AM	5/25/52 1:30 PM	5:30:00	LPRSA0189740	ABC013760				
5/26/52 10:00 AM	5/27/52 8:00 AM	22:00:00	LPRSA0189740	ABC013760				
5/31/52 3:30 AM	5/31/52 8:00 AM	4:30:00	LPRSA0189738	ABC013758				
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10/2/52 6:00 PM	10/2/52 9:30 PM	3:30:00	LPRSA0189707	ABC013727				
10/28/52 4:30 PM	10/29/52 8:00 AM	15:30:00	LPRSA0189706	ABC013726				
11/2/52 8:15 AM	11/2/52 1:15 PM	5:00:00	LPRSA0189705	ABC013725				
11/3/52 1:00 PM	11/4/52 8:00 AM	19:00:00	LPRSA0189703	ABC013723				
11/10/52 3:30 PM	11/11/52 8:00 AM	16:30:00	LPRSA0189704	ABC013724				
11/14/52 3:15 PM	12/1/52 12:45 PM	405:30:00	LPRSA0189701	ABC013721				
12/2/52 1:00 PM	12/5/52 5:00 PM	76:00:00	LPRSA0189702	ABC013722				
12/9/52 10:30 AM	1/18/53 4:15 PM	965:45:00	LPRSA0189655	ABC013675				
1/21/53 2:00 PM	1/22/53 8:00 AM	18:00:00	LPRSA0189656	ABC013676				
1/24/53 9:00 AM	1/24/53 3:00 PM	6:00:00	LPRSA0189657	ABC013677				
2/11/53 4:30 PM	2/13/53 9:30 AM	41:00:00	LPRSA0189658	ABC013678				
2/15/53 10:00 AM	2/15/53 3:30 PM	5:30:00	LPRSA0189659	ABC013679				
2/21/53 8:00 AM	2/21/53 1:30 PM	5:30:00	LPRSA0189660	ABC013680				
2/25/53 8:00 AM	3/10/53 7:00 PM	323:00:00	LPRSA0189661	ABC013681				

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
3/14/53 12:00 PM	3/15/53 2:30 PM	26:30:00	LPRSA0189663	ABC013683				
3/16/53 12:00 AM	3/23/53 1:00 PM	181:00:00	LPRSA0189663	ABC013683				
3/24/53 8:45 AM	3/24/53 4:00 PM	7:15:00	LPRSA0189663	ABC013683				
3/25/53 1:30 PM	3/25/53 7:30 PM	6:00:00	LPRSA0189663	ABC013683				
3/27/53 1:00 PM	3/28/53 7:00 PM	30:00:00	LPRSA0189663	ABC013683				
3/30/53 1:45 PM	3/31/53 9:00 AM	19:15:00	LPRSA0189663	ABC013683				
3/31/53 4:30 PM	4/6/53 9:00 AM	136:30:00	LPRSA0189663	ABC013683				
4/6/53 4:30 PM	4/10/53 1:30 PM	93:00:00	LPRSA0189663	ABC013683				
4/11/53 11:30 AM	4/13/53 9:30 AM	46:00:00	LPRSA0189663	ABC013683				
4/13/53 2:15 PM	4/14/53 8:30 AM	18:15:00	LPRSA0189663	ABC013683				
4/14/53 11:30 AM	4/15/53 9:00 AM	21:30:00	LPRSA0189663	ABC013683				
4/15/53 11:30 AM	4/16/53 2:30 PM	27:00:00	LPRSA0189663	ABC013683				
4/16/53 4:00 PM	4/17/53 8:00 AM	16:00:00	LPRSA0189663	ABC013683				
4/17/53 1:00 PM	4/23/53 1:00 PM	144:00:00	LPRSA0189663	ABC013683				
4/29/53 3:30 PM	4/30/53 8:00 AM	16:30:00	LPRSA0189663	ABC013683				
4/30/53 3:30 PM	5/1/53 11:30 AM	20:00:00	LPRSA0189663	ABC013683				
5/1/53 2:45 PM	5/4/53 8:30 AM	65:45:00	LPRSA0189663	ABC013683				
5/5/53 1:00 PM	5/8/53 9:00 AM	68:00:00	LPRSA0189663	ABC013683				
5/8/53 9:00 PM	5/9/53 8:00 AM	11:00:00	LPRSA0189663	ABC013683				
5/13/53 9:30 PM	5/14/53 9:00 AM	11:30:00	LPRSA0189663	ABC013683				
5/14/53 3:00 PM	5/15/53 9:45 AM	18:45:00	LPRSA0189663	ABC013683				
5/15/53 3:30 PM	5/16/53 8:00 AM	16:30:00	LPRSA0189663	ABC013683				
5/18/53 8:30 AM	5/22/53 5:45 PM	105:15:00	LPRSA0189663	ABC013683				
5/25/53 9:30 AM	5/25/53 3:30 PM	6:00:00	LPRSA0189663	ABC013683				
5/27/53 11:00 AM	5/27/53 1:00 PM	2:00:00	LPRSA0189663	ABC013683				
6/1/53 12:00 PM	6/6/53 8:00 AM	116:00:00	LPRSA0189663	ABC013683				
6/8/53 1:30 PM	6/11/53 11:30 AM	70:00:00	LPRSA0189663	ABC013683				
6/13/53 4:30 PM	6/14/53 1:30 PM	21:00:00	LPRSA0189674	ABC013694				
6/18/53 4:00 PM	6/19/53 9:00 AM	17:00:00	LPRSA0189676	ABC013696				
6/22/53 9:30 AM	6/22/53 6:15 PM	8:45:00	LPRSA0189677	ABC013697				
6/23/53 9:30 AM	7/2/53 1:30 PM	220:00:00	LPRSA0189678	ABC013698				
7/6/53 7:30 PM	7/7/53 8:00 AM	12:30:00	LPRSA0189681	ABC013701				
7/20/53 9:00 PM	7/21/53 8:15 AM	11:15:00	LPRSA0189682	ABC013702				
7/23/53 8:30 AM	7/23/53 3:00 PM	6:30:00	LPRSA0189684	ABC013704				
8/10/53 12:45 AM	8/10/53 8:30 AM	7:45:00	LPRSA0189685	ABC013705				
8/14/53 1:00 PM	8/14/53 7:30 PM	6:30:00	LPRSA0189686	ABC013706				
9/16/53 1:30 AM	9/16/53 8:00 AM	6:30:00	LPRSA0189688	ABC013708				
10/6/53 6:00 PM	10/7/53 8:30 AM	14:30:00	LPRSA0189689	ABC013709				
10/22/53 1:00 PM	10/28/53 1:45 PM	144:45:00	LPRSA0189691	ABC013711				
10/29/53 1:30 PM	10/30/53 8:30 AM	19:00:00	LPRSA0189693	ABC013713				
11/7/53 6:30 AM	11/8/53 2:00 PM	31:30:00	LPRSA0189695	ABC013715				
11/16/53 2:00 PM	11/20/53 11:30 AM	93:30:00	LPRSA0189696	ABC013716				
11/23/53 9:30 AM	11/23/53 4:15 PM	6:45:00	LPRSA0189698	ABC013718				
11/25/53 9:30 AM	11/26/53 8:30 AM	23:00:00	LPRSA0189652	ABC013672				
11/30/53 9:30 AM	12/4/53 10:30 AM	97:00:00	LPRSA0189651	ABC013671				
12/6/53 9:00 AM	12/7/53 8:40 AM	23:40:00	LPRSA0189650	ABC013670				
12/9/53 3:20 PM	12/10/53 11:30 AM	20:10:00	LPRSA0189649	ABC013669				
12/12/53 5:00 PM	12/13/53 8:00 AM	15:00:00	LPRSA0189648	ABC013668				
12/14/53 5:30 AM	12/14/53 12:00 PM	6:30:00	LPRSA0189647	ABC013667				
12/28/53 4:15 PM	12/29/53 9:00 AM	16:45:00	LPRSA0189646	ABC013666				
1/14/54 4:00 PM	1/18/54 9:00 AM	89:00:00	LPRSA0189592	ABC013612				
1/18/54 2:00 PM	1/21/54 9:00 AM	67:00:00	LPRSA0189591	ABC013611				
1/22/54 3:30 PM	1/25/54 9:15 AM	65:45:00	LPRSA0189590	ABC013610				
1/25/54 2:30 PM	1/27/54 4:00 PM	49:30:00	LPRSA0189590	ABC013610				

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
2/3/54 12:45 PM	2/4/54 8:30 AM	19:45:00	LPRSA0189589	ABC013609				
2/8/54 5:00 PM	2/9/54 9:00 AM	16:00:00	LPRSA0189588	ABC013608				
2/16/54 4:30 PM	2/17/54 1:15 PM	20:45:00	LPRSA0189587	ABC013607				
2/21/54 4:45 PM	2/22/54 8:15 AM	15:30:00	LPRSA0189586	ABC013606				
2/23/54 11:15 AM	2/27/54 8:15 AM	93:00:00	LPRSA0189621	ABC013641				
3/1/54 10:15 AM	3/5/54 1:00 PM	98:45:00	LPRSA0189619	ABC013639				
3/13/54 2:30 PM	3/15/54 8:30 AM	42:00:00	LPRSA0189618	ABC013638				
3/19/54 4:00 PM	3/20/54 8:30 AM	16:30:00	LPRSA0189617	ABC013637				
3/25/54 9:45 AM	3/26/54 7:45 AM	22:00:00	LPRSA0189616	ABC013636				
4/8/54 1:30 PM	4/8/54 3:45 PM	2:15:00	LPRSA0189613	ABC013633				
4/13/54 12:00 PM	4/13/54 4:00 PM	4:00:00	LPRSA0189623	ABC013643				
4/16/54 12:50 PM	4/18/54 9:45 AM	44:55:00	LPRSA0189632	ABC013652				
4/19/54 5:45 PM	4/21/54 4:30 PM	46:45:00	LPRSA0189615	ABC013635				
4/23/54 1:00 PM	4/23/54 4:00 PM	3:00:00	LPRSA0189614	ABC013634				
4/28/54 3:00 PM	4/28/54 4:45 PM	1:45:00	LPRSA0189612	ABC013632				
5/3/54 10:30 AM	5/22/54 8:30 AM	454:00:00	LPRSA0189631	ABC013651				
6/3/54 5:00 PM	6/8/54 4:00 PM	119:00:00	LPRSA0189630	ABC013650				
6/23/54 4:00 PM	6/24/54 8:00 AM	16:00:00	LPRSA0189628	ABC013648				
7/7/54 4:00 PM	7/8/54 9:00 AM	17:00:00	LPRSA0189624	ABC013644				
7/14/54 4:00 PM	7/15/54 8:30 AM	16:30:00	LPRSA0189634	ABC013654				
7/22/54 3:30 PM	7/23/54 8:30 AM	17:00:00	LPRSA0189633	ABC013653				
8/3/54 8:45 AM	8/4/54 8:45 AM	24:00:00	LPRSA0189620	ABC013640				
8/9/54 8:30 AM	8/9/54 1:30 PM	5:00:00	LPRSA0189622	ABC013642				
8/19/54 10:30 PM	8/20/54 9:00 AM	10:30:00	LPRSA0189611	ABC013631				
8/20/54 4:00 PM	8/22/54 8:00 AM	40:00:00	LPRSA0189610	ABC013630				
8/25/54 4:15 PM	8/26/54 8:45 AM	16:30:00	LPRSA0189609	ABC013629				
8/30/54 4:15 PM	8/31/54 4:30 AM	12:15:00	LPRSA0189608	ABC013628				
8/31/54 3:30 AM	9/1/54 8:00 AM	28:30:00	LPRSA0189608	ABC013628				
9/8/54 2:00 PM	9/9/54 8:00 AM	18:00:00	LPRSA0189607	ABC013627				
9/10/54 4:00 PM	9/12/54 1:30 PM	45:30:00	LPRSA0189606	ABC013626				
9/14/54 4:15 PM	9/18/54 8:00 AM	87:45:00	LPRSA0189605	ABC013625				
10/4/54 8:30 AM	10/8/54 4:00 PM	103:30:00	LPRSA0189604	ABC013624				
10/15/54 2:10 PM	10/15/54 11:00 PM	8:50:00	LPRSA0189603	ABC013623				
10/27/54 4:00 PM	10/28/54 9:00 AM	17:00:00	LPRSA0189602	ABC013622				
10/29/54 9:00 AM	11/1/54 8:00 AM	71:00:00	LPRSA0189601	ABC013621				
11/2/54 12:30 PM	11/2/54 5:30 PM	5:00:00	LPRSA0189600	ABC013620				
11/15/54 9:15 AM	11/15/54 3:00 PM	5:45:00	LPRSA0189597	ABC013617				
11/17/54 4:00 PM	11/18/54 10:00 AM	18:00:00	LPRSA0189597	ABC013617				
11/18/54 3:10 PM	11/20/54 6:00 AM	38:50:00	LPRSA0189597	ABC013617				
11/25/54 9:50 AM	11/29/54 9:15 AM	95:25:00	LPRSA0189597	ABC013617				
11/29/54 3:30 PM	11/30/54 12:30 PM	21:00:00	LPRSA0189597	ABC013617				
12/9/54 1:30 PM	12/9/54 5:30 PM	4:00:00	LPRSA0189596	ABC013616				
12/14/54 9:00 AM	12/14/54 3:30 PM	6:30:00	LPRSA0189595	ABC013615				
12/16/54 1:45 PM	12/16/54 7:45 PM	6:00:00	LPRSA0189594	ABC013614				
12/18/54 10:00 AM	12/19/54 8:00 AM	22:00:00	LPRSA0189593	ABC013613				
12/29/54 12:30 PM	12/30/54 3:15 PM	26:45:00	LPRSA0189585	ABC013605				
1/6/55 1:30 PM	1/6/55 3:30 PM	2:00:00	LPRSA0189582	ABC013602				
1/28/55 3:30 PM	1/31/55 1:00 PM	69:30:00	LPRSA0189580	ABC013600				
2/1/55 2:45 PM	2/2/55 10:30 AM	19:45:00	LPRSA0189580	ABC013600				
2/4/55 11:50 PM	2/7/55 12:55 AM	49:05:00	LPRSA0189580	ABC013600				
2/7/55 2:30 PM	2/8/55 9:00 AM	18:30:00	LPRSA0189580	ABC013600				
2/8/55 12:15 PM	2/12/55 12:00 PM	95:45:00	LPRSA0189580	ABC013600				
2/15/55 2:45 PM	2/15/55 5:45 PM	3:00:00	LPRSA0189580	ABC013600				
2/16/55 3:30 PM	2/16/55 6:30 PM	3:00:00	LPRSA0189580	ABC013600				

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
2/17/55 10:45 AM	2/18/55 9:00 AM	22:15:00	LPRSA0189580	ABC013600				
2/18/55 4:00 PM	2/19/55 8:45 AM	16:45:00	LPRSA0189579	ABC013599				
2/21/55 2:30 PM	2/23/55 1:00 PM	46:30:00	LPRSA0189579	ABC013599				
2/23/55 3:45 PM	2/24/55 9:45 AM	18:00:00	LPRSA0189579	ABC013599				
2/24/55 3:30 PM	2/25/55 9:00 AM	17:30:00	LPRSA0189579	ABC013599				
2/25/55 3:15 PM	2/26/55 8:45 AM	17:30:00	LPRSA0189579	ABC013599				
2/28/55 1:15 PM	3/2/55 9:00 AM	43:45:00	LPRSA0189579	ABC013599				
3/2/55 2:00 PM	3/3/55 1:00 PM	23:00:00	LPRSA0189579	ABC013599				
3/3/55 4:00 PM	3/4/55 10:15 AM	18:15:00	LPRSA0189579	ABC013599				
3/4/55 12:30 PM	3/6/55 5:15 PM	52:45:00	LPRSA0189579	ABC013599				
3/7/55 1:00 PM	3/7/55 3:45 PM	2:45:00	LPRSA0189578	ABC013598				
3/21/55 2:30 PM	3/22/55 3:00 PM	24:30:00	LPRSA0189577	ABC013597				
3/28/55 1:00 PM	3/29/55 10:00 AM	21:00:00	LPRSA0189576	ABC013596				
4/6/55 11:00 AM	4/7/55 9:00 AM	22:00:00	LPRSA0189575	ABC013595				
4/12/55 2:00 PM	4/13/55 12:45 PM	22:45:00	LPRSA0189574	ABC013594				
4/26/55 12:45 PM	4/27/55 8:45 AM	20:00:00	LPRSA0189573	ABC013593				
5/31/55 12:45 PM	6/1/55 7:45 AM	19:00:00	LPRSA0189572	ABC013592				
6/21/55 10:45 PM	6/22/55 8:00 AM	9:15:00	LPRSA0189571	ABC013591				
8/7/55 11:00 PM	8/8/55 2:15 AM	3:15:00	LPRSA0189570	ABC013590				
8/11/55 7:00 PM	8/12/55 3:15 PM	20:15:00	LPRSA0189569	ABC013589				
8/13/55 8:00 AM	8/13/55 12:30 PM	4:30:00	LPRSA0189569	ABC013589				
8/15/55 4:30 PM	8/16/55 8:30 AM	16:00:00	LPRSA0189568	ABC013588				
8/18/55 3:30 PM	8/19/55 2:30 AM	11:00:00	LPRSA0189567	ABC013587				
8/19/55 2:15 PM	8/20/55 8:50 AM	18:35:00	LPRSA0189567	ABC013587				
8/21/55 9:30 PM	8/22/55 8:45 AM	11:15:00	LPRSA0189566	ABC013586				
8/24/55 2:45 PM	8/25/55 8:45 AM	18:00:00	LPRSA0189565	ABC013585				
8/25/55 3:45 PM	8/26/55 8:45 AM	17:00:00	LPRSA0189564	ABC013584				
9/24/55 5:00 AM	9/26/55 8:00 AM	51:00:00	LPRSA0189563	ABC013583				
10/6/55 8:00 AM	10/6/55 12:30 PM	4:30:00	LPRSA0189562	ABC013582				
10/6/55 6:00 PM	10/7/55 9:45 AM	15:45:00	LPRSA0189562	ABC013582				
10/7/55 3:45 PM	10/10/55 7:30 AM	63:45:00	LPRSA0189562	ABC013582				
10/14/55 12:45 PM	10/16/55 8:40 PM	55:55:00	LPRSA0189561	ABC013581				
10/17/55 2:30 PM	10/19/55 9:30 AM	43:00:00	LPRSA0189561	ABC013581				
10/19/55 3:03 PM	10/20/55 4:00 PM	24:57:00	LPRSA0189561	ABC013581				
10/30/55 9:30 AM	10/30/55 1:30 PM	4:00:00	LPRSA0189560	ABC013580				
11/10/55 3:30 PM	11/11/55 3:30 AM	12:00:00	LPRSA0189559	ABC013579				
11/11/55 11:15 AM	11/12/55 8:15 AM	21:00:00	LPRSA0189559	ABC013579				
11/16/55 9:00 AM	11/16/55 2:00 PM	5:00:00	LPRSA0189558	ABC013578				
11/17/55 10:30 AM	11/18/55 9:30 AM	23:00:00	LPRSA0189558	ABC013578				
1/30/56 12:45 PM	1/31/56 7:30 AM	18:45:00	LPRSA0189556	ABC013576				
2/2/56 11:30 AM	2/3/56 7:30 AM	20:00:00	LPRSA0189555	ABC013575				
2/6/56 3:30 PM	2/7/56 8:15 AM	16:45:00	LPRSA0189554	ABC013574				
2/18/56 8:15 AM	2/18/56 3:15 PM	7:00:00	LPRSA0189553	ABC013573				
3/8/56 1:30 AM	3/9/56 8:15 AM	30:45:00	LPRSA0189552	ABC013572				
3/14/56 9:00 AM	3/15/56 8:30 AM	23:30:00	LPRSA0189551	ABC013571				
3/16/56 3:00 PM	3/17/56 9:30 AM	18:30:00	LPRSA0189550	ABC013570				
3/21/56 2:45 PM	3/22/56 9:45 AM	19:00:00	LPRSA0189549	ABC013569				
3/23/56 3:30 PM	3/25/56 9:00 AM	41:30:00	LPRSA0189548	ABC013568				
3/29/56 4:05 PM	3/30/56 8:50 AM	16:45:00	LPRSA0189547	ABC013567				
4/7/56 2:15 AM	4/7/56 9:15 AM	7:00:00	LPRSA0189546	ABC013566				
4/8/56 12:45 PM	4/9/56 9:00 AM	20:15:00	LPRSA0189546	ABC013566				
4/11/56 3:30 PM	4/12/56 8:05 AM	16:35:00	LPRSA0189545	ABC013565				
5/2/56 9:05 PM	5/3/56 8:45 AM	11:40:00	LPRSA0189544	ABC013564				
6/2/56 2:30 PM	6/3/56 11:40 AM	21:10:00	LPRSA0189543	ABC013563				

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

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	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	6/27/56 3:20 PM	6/27/56 6:00 PM	2:40:00	LPRSA0189542	ABC013562				
	7/16/56 2:15 PM	7/17/56 8:45 AM	18:30:00	LPRSA0189541	ABC013561				
	7/21/56 9:10 AM	7/21/56 2:45 PM	5:35:00	LPRSA0189540	ABC013560				
	7/27/56 9:30 AM	7/27/56 3:00 PM	5:30:00	LPRSA0189539	ABC013559				
	8/6/56 4:15 PM	8/7/56 8:00 AM	15:45:00	LPRSA0189538	ABC013558				
	8/21/56 4:00 AM	8/21/56 3:45 PM	11:45:00	LPRSA0189537	ABC013557				
	9/6/56 6:00 PM	9/6/56 10:20 PM	4:20:00	LPRSA0189536	ABC013556				
	9/7/56 9:30 AM	9/7/56 4:15 PM	6:45:00	LPRSA0189535	ABC013555				
	10/22/56 9:30 PM	10/23/56 10:45 AM	13:15:00	LPRSA0189533	ABC013553				
	10/23/56 12:00 PM	10/23/56 2:15 PM	2:15:00	LPRSA0189533	ABC013553				
	10/31/56 11:30 AM	10/31/56 7:15 PM	7:45:00	LPRSA0189532	ABC013552				
	11/1/56 10:00 AM	11/4/56 11:00 AM	73:00:00	LPRSA0189532	ABC013552				
	11/18/56 2:00 AM	11/18/56 10:45 AM	8:45:00	LPRSA0189531	ABC013551				
	11/22/56 12:15 AM	11/22/56 7:45 AM	7:30:00	LPRSA0189530	ABC013550				
	12/9/56 2:45 PM	12/10/56 8:15 AM	17:30:00	LPRSA0189529	ABC013549				
	12/14/56 8:00 AM	12/14/56 3:45 PM	7:45:00	LPRSA0189528	ABC013548				
	12/22/56 10:00 PM	12/23/56 9:45 AM	11:45:00	LPRSA0189527	ABC013547				
	1/23/57 3:30 AM	1/23/57 11:45 AM	8:15:00	LPRSA0189498	ABC013518				
	2/9/57 1:45 PM	2/10/57 8:30 AM	18:45:00	LPRSA0189497	ABC013517				
	2/26/57 3:30 PM	2/26/57 10:15 PM	6:45:00	LPRSA0189496	ABC013516				
	3/1/57 3:00 PM	3/2/57 10:15 AM	19:15:00	LPRSA0189524	ABC013544				
	3/8/57 9:15 AM	3/10/57 9:45 AM	48:30:00	LPRSA0189523	ABC013543				
	3/15/57 8:15 PM	3/16/57 12:15 AM	4:00:00	LPRSA0189522	ABC013542				
	3/19/57 9:15 PM	3/20/57 2:00 PM	16:45:00	LPRSA0189521	ABC013541				
	4/2/57 7:30 AM	4/2/57 1:30 PM	6:00:00	LPRSA0189520	ABC013540				
	4/4/57 8:55 PM	4/5/57 10:30 AM	13:35:00	LPRSA0189519	ABC013539				
	4/5/57 2:00 PM	4/6/57 1:00 PM	23:00:00	LPRSA0189518	ABC013538				
	4/8/57 3:50 PM	4/9/57 8:15 AM	16:25:00	LPRSA0189517	ABC013537				
	4/9/57 8:45 AM	4/10/57 3:30 PM	30:45:00	LPRSA0189516	ABC013536				
	4/10/57 8:45 AM	4/10/57 3:30 PM	6:45:00	LPRSA0189515	ABC013535				
	4/11/57 8:00 AM	4/11/57 3:30 PM	7:30:00	LPRSA0189514	ABC013534				
	4/12/57 8:00 AM	4/12/57 3:45 PM	7:45:00	LPRSA0189513	ABC013533				
	4/18/57 9:45 PM	4/19/57 1:15 PM	15:30:00	LPRSA0189512	ABC013532				
	4/23/57 6:40 AM	4/23/57 1:45 PM	7:05:00	LPRSA0189511	ABC013531				
	4/25/57 3:45 PM	4/26/57 9:15 AM	17:30:00	LPRSA0189510	ABC013530				
	4/29/57 1:00 PM	4/29/57 3:30 PM	2:30:00	LPRSA0189509	ABC013529				
	5/14/57 8:45 PM	5/15/57 12:30 AM	3:45:00	LPRSA0189508	ABC013528				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
	8/26/57 12:45 AM	8/26/57 9:00 AM	8:15:00	LPRSA0189507	ABC013527				
	9/10/57 10:30 PM	9/11/57 8:30 AM	10:00:00	LPRSA0189506	ABC013526				
	9/16/57 11:30 PM	9/17/57 9:00 AM	9:30:00	LPRSA0189505	ABC013525				
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	12/20/57 2:45 PM	12/21/57 10:05 AM	19:20:00	LPRSA0189501	ABC013521				
	12/26/57 11:00 AM	12/26/57 4:00 PM	5:00:00	LPRSA0189500	ABC013520				
	12/26/57 4:40 PM	12/26/57 6:30 PM	1:50:00	LPRSA0189500	ABC013520				
	1/14/58 2:00 PM	1/15/58 8:30 AM	18:30:00	LPRSA0189494	ABC013514				
	1/21/58 9:15 PM	1/22/58 11:45 AM	14:30:00	LPRSA0189492	ABC013512				
	1/22/58 4:00 PM	1/22/58 10:15 PM	6:15:00	LPRSA0189491	ABC013511				
	1/24/58 4:30 PM	1/26/58 10:35 AM	42:05:00	LPRSA0189490	ABC013510				
	2/7/58 2:30 PM	2/8/58 8:20 AM	17:50:00	LPRSA0189489	ABC013509				
	2/27/58 11:00 AM	2/28/58 3:45 PM	28:45:00	LPRSA0189488	ABC013508				
	3/3/58 9:15 PM	3/4/58 8:15 AM	11:00:00	LPRSA0189487	ABC013507				
	3/14/58 2:30 PM	3/15/58 3:00 PM	24:30:00	LPRSA0189486	ABC013506				

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
3/20/58 1:45 AM	3/22/58 9:00 AM	55:15:00	LPRSA0189485	ABC013505				
3/31/58 3:15 PM	3/31/58 10:35 PM	7:20:00	LPRSA0189484	ABC013504				
4/6/58 1:00 PM	4/7/58 9:00 PM	32:00:00	LPRSA0189483	ABC013503				
4/11/58 8:00 AM	4/12/58 10:30 AM	26:30:00	LPRSA0189482	ABC013502				
4/23/58 1:25 AM	4/23/58 4:40 AM	3:15:00	LPRSA0189481	ABC013501				
4/28/58 8:30 AM	4/28/58 3:45 PM	7:15:00	LPRSA0189480	ABC013500				
4/29/58 6:30 PM	4/30/58 8:00 AM	13:30:00	LPRSA0189479	ABC013499				
5/6/58 6:45 PM	5/7/58 4:35 AM	9:50:00	LPRSA0189478	ABC013498				
5/7/58 11:15 AM	5/7/58 6:00 PM	6:45:00	LPRSA0189478	ABC013498				
5/15/58 3:45 PM	5/15/58 5:10 PM	1:25:00	LPRSA0189477	ABC013497				
5/25/58 12:25 PM	5/26/58 5:25 PM	29:00:00	LPRSA0189476	ABC013496				
6/9/58 7:10 AM	6/9/58 8:00 AM	0:50:00	LPRSA0189475	ABC013495				
6/26/58 4:00 PM	6/27/58 5:45 AM	13:45:00	LPRSA0189474	ABC013494				
7/31/58 6:50 PM	8/1/58 8:15 AM	13:25:00	LPRSA0189473	ABC013493				
8/25/58 1:30 PM	8/26/58 8:00 AM	18:30:00	LPRSA0189472	ABC013492				
9/18/58 1:45 AM	9/18/58 8:30 AM	6:45:00	LPRSA0189471	ABC013491				
10/22/58 6:00 PM	10/23/58 6:10 PM	24:10:00	LPRSA0189469	ABC013489				
10/25/58 3:25 PM	10/27/58 6:00 AM	38:35:00	LPRSA0189468	ABC013488				
10/27/58 4:00 PM	10/28/58 2:25 AM	10:25:00	LPRSA0189467	ABC013487				
11/28/58 6:45 PM	11/29/58 9:40 AM	14:55:00	LPRSA0189466	ABC013486				
12/29/58 7:50 PM	12/30/58 4:15 AM	8:25:00	LPRSA0189465	ABC013485				
1/20/59 4:00 PM	1/21/59 8:00 AM	16:00:00	LPRSA0189463	ABC013483				
1/21/59 3:15 PM	1/22/59 4:35 AM	13:20:00	LPRSA0189462	ABC013482				
2/10/59 11:45 AM	2/10/59 11:55 PM	12:10:00	LPRSA0189461	ABC013481				
3/6/59 6:45 AM	3/7/59 9:15 AM	26:30:00	LPRSA0189458	ABC013478				
3/12/59 4:25 PM	3/13/59 7:00 AM	14:35:00	LPRSA0189459	ABC013479				
3/30/59 4:00 PM	3/31/59 9:00 AM	17:00:00	LPRSA0189460	ABC013480				
4/2/59 1:50 PM	4/3/59 8:00 AM	18:10:00	LPRSA0189457	ABC013477				
4/27/59 3:15 PM	4/28/59 8:30 AM	17:15:00	LPRSA0189456	ABC013476				
4/28/59 11:15 PM	4/29/59 8:25 AM	9:10:00	LPRSA0189455	ABC013475				
5/13/59 5:15 PM	5/13/59 8:45 PM	3:30:00	LPRSA0189438	ABC013458				
6/2/59 3:25 PM	6/3/59 7:30 AM	16:05:00	LPRSA0189454	ABC013474				
6/25/59 10:15 AM	6/25/59 12:30 PM	2:15:00	LPRSA0189453	ABC013473				
7/20/59 4:15 PM	7/20/59 5:15 PM	1:00:00	LPRSA0189452	ABC013472				
7/20/59 7:45 PM	7/20/59 11:20 PM	3:35:00	LPRSA0189452	ABC013472				
7/23/59 4:00 PM	7/23/59 6:35 PM	2:35:00	LPRSA0189451	ABC013471				
7/23/59 8:15 PM	7/23/59 11:05 PM	2:50:00	LPRSA0189451	ABC013471				
7/24/59 3:30 PM	7/24/59 5:45 PM	2:15:00	LPRSA0189450	ABC013470				
8/5/59 10:05 AM	8/6/59 8:00 AM	21:55:00	LPRSA0189448	ABC013468				
8/9/59 4:45 AM	8/9/59 12:00 PM	7:15:00	LPRSA0189447	ABC013467				
8/31/59 1:15 PM	9/1/59 8:45 AM	19:30:00	LPRSA0189445	ABC013465				
9/1/59 4:00 PM	9/1/59 11:40 PM	7:40:00	LPRSA0189445	ABC013465				
9/3/59 2:15 PM	9/3/59 11:10 PM	8:55:00	LPRSA0189444	ABC013464				
10/1/59 12:45 PM	10/1/59 3:30 PM	2:45:00	LPRSA0189443	ABC013463				
10/9/59 11:00 AM	10/10/59 1:45 PM	26:45:00	LPRSA0189440	ABC013460				
10/22/59 1:45 PM	10/22/59 6:05 PM	4:20:00	LPRSA0189436	ABC013456				
10/24/59 10:15 AM	10/25/59 10:30 AM	24:15:00	LPRSA0189435	ABC013455				
11/6/59 6:00 PM	11/7/59 5:00 PM	23:00:00	LPRSA0189434	ABC013454				
12/6/59 11:40 PM	12/8/59 8:45 AM	33:05:00	LPRSA0189431	ABC013451				
12/12/59 6:45 PM	12/13/59 9:00 AM	14:15:00	LPRSA0189430	ABC013450				
12/28/59 9:20 PM	12/29/59 1:15 PM	15:55:00	LPRSA0189429	ABC013449				
12/29/59 4:35 PM	12/30/59 8:15 AM	15:40:00	LPRSA0189428	ABC013448				
1/3/60 9:30 AM	1/4/60 8:10 AM	22:40:00	LPRSA0189427	ABC013447				

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
1/13/60 11:15 AM	1/14/60 8:25 AM	21:10:00	LPRSA0189426	ABC013446				
1/15/60 12:45 AM	1/16/60 1:10 PM	36:25:00	LPRSA0189425	ABC013445				
1/18/60 10:30 PM	1/19/60 8:10 AM	9:40:00	LPRSA0189424	ABC013444				
2/6/60 6:00 AM	2/6/60 12:30 PM	6:30:00	LPRSA0189423	ABC013443				
2/11/60 5:30 AM	2/11/60 5:50 PM	12:20:00	LPRSA0189422	ABC013442				
2/18/60 8:30 PM	2/19/60 9:50 PM	25:20:00	LPRSA0189421	ABC013441				
2/25/60 10:30 PM	2/26/60 3:10 PM	16:40:00	LPRSA0189420	ABC013440				
3/3/60 5:50 PM	3/4/60 9:30 AM	15:40:00	LPRSA0189419	ABC013439				
3/17/60 1:40 PM	3/17/60 11:20 PM	9:40:00	LPRSA0189418	ABC013438				
3/31/60 2:55 PM	4/1/60 8:10 AM	17:15:00	LPRSA0189417	ABC013437				
4/3/60 9:20 PM	4/4/60 10:55 AM	13:35:00	LPRSA0189416	ABC013436				
4/4/60 10:20 PM	4/6/60 9:40 AM	35:20:00	LPRSA0189415	ABC013435				
4/7/60 11:30 AM	4/8/60 4:25 PM	28:55:00	LPRSA0189414	ABC013434				
4/11/60 11:20 PM	4/12/60 8:02 AM	8:42:00	LPRSA0189413	ABC013433				
4/18/60 10:14 AM	4/18/60 5:30 PM	7:16:00	LPRSA0189412	ABC013432				
4/26/60 9:00 PM	4/27/60 12:00 PM	15:00:00	LPRSA0189411	ABC013431				
5/9/60 8:00 AM	5/9/60 5:55 PM	9:55:00	LPRSA0189410	ABC013430				
5/12/60 7:30 PM	5/13/60 5:30 PM	22:00:00	LPRSA0189409	ABC013429				
5/23/60 12:40 PM	5/24/60 8:45 AM	20:05:00	LPRSA0189408	ABC013428				
6/3/60 5:45 PM	6/4/60 8:00 PM	26:15:00	LPRSA0189407	ABC013427				
7/1/60 6:10 PM	7/1/60 9:20 PM	3:10:00	LPRSA0189406	ABC013426				
7/12/60 8:50 PM	7/13/60 8:20 AM	11:30:00	LPRSA0189405	ABC013425				
7/14/60 12:50 PM	7/14/60 9:20 PM	8:30:00	LPRSA0189404	ABC013424				
7/27/60 1:20 PM	7/28/60 8:20 AM	19:00:00	LPRSA0189403	ABC013423				
7/30/60 9:00 AM	7/31/60 8:15 AM	23:15:00	LPRSA0189402	ABC013422				
8/10/60 8:20 AM	8/10/60 12:22 PM	4:02:00	LPRSA0189401	ABC013421				
8/10/60 9:30 PM	8/11/60 8:10 AM	10:40:00	LPRSA0189400	ABC013420				
8/19/60 7:20 AM	8/20/60 9:00 AM	25:40:00	LPRSA0189399	ABC013419				
8/30/60 6:25 PM	8/30/60 8:15 PM	1:50:00	LPRSA0189398	ABC013418				
8/31/60 7:15 PM	9/1/60 8:15 AM	13:00:00	LPRSA0189398	ABC013418				
9/11/60 11:00 PM	9/13/60 8:15 AM	33:15:00	LPRSA0189397	ABC013417				
9/19/60 10:25 AM	9/19/60 4:30 PM	6:05:00	LPRSA0189396	ABC013416				
10/20/60 6:45 AM	10/20/60 6:05 PM	11:20:00	LPRSA0189395	ABC013415				
11/10/60 7:15 AM	11/10/60 6:15 PM	11:00:00	LPRSA0189394	ABC013414				
11/29/60 3:55 PM	11/29/60 11:30 PM	7:35:00	LPRSA0189393	ABC013413				
12/12/60 11:20 AM	12/13/60 10:15 AM	22:55:00	LPRSA0189392	ABC013412				
12/21/60 7:35 AM	12/21/60 9:35 PM	14:00:00	LPRSA0189391	ABC013411				
1/1/61 9:00 AM	1/2/61 8:10 AM	23:10:00	LPRSA0189389	ABC013409				
2/20/61 3:40 PM	2/20/61 9:50 PM	6:10:00	LPRSA0189388	ABC013408				
2/22/61 11:30 PM	2/24/61 8:30 AM	33:00:00	LPRSA0189387	ABC013407				
2/24/61 3:15 PM	2/27/61 8:15 AM	65:00:00	LPRSA0189386	ABC013406				
2/28/61 3:30 PM	2/28/61 10:30 PM	7:00:00	LPRSA0189385	ABC013405				
3/1/61 4:00 PM	3/2/61 8:05 AM	16:05:00	LPRSA0189378	ABC013398				
3/6/61 12:00 PM	3/7/61 8:10 AM	20:10:00	LPRSA0189379	ABC013399				
3/8/61 12:15 PM	3/9/61 8:25 AM	20:10:00	LPRSA0189380	ABC013400				
3/9/61 12:30 PM	3/10/61 11:55 AM	23:25:00	LPRSA0189381	ABC013401				
3/13/61 10:30 PM	3/15/61 8:15 AM	33:45:00	LPRSA0189382	ABC013402				
3/23/61 11:00 AM	3/24/61 12:30 PM	25:30:00	LPRSA0189383	ABC013403				
3/28/61 11:20 PM	3/29/61 8:10 AM	8:50:00	LPRSA0189384	ABC013404				
4/1/61 12:05 PM	4/2/61 9:15 AM	21:10:00	LPRSA0189377	ABC013397				
4/10/61 8:15 AM	4/10/61 3:30 PM	7:15:00	LPRSA0189376	ABC013396				
4/12/61 10:15 PM	4/13/61 11:05 PM	24:50:00	LPRSA0189375	ABC013395				
4/14/61 3:00 PM	4/14/61 4:00 PM	1:00:00	LPRSA0189374	ABC013394				
4/16/61 11:20 AM	4/17/61 8:00 AM	20:40:00	LPRSA0189373	ABC013393				

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
4/17/61 3:05 PM	4/17/61 10:50 PM	7:45:00	LPRSA0189372	ABC013392				
4/18/61 8:05 AM	4/18/61 11:05 PM	15:00:00	LPRSA0189371	ABC013391				
4/24/61 8:30 AM	4/25/61 8:10 AM	23:40:00	LPRSA0189370	ABC013390				
4/25/61 4:55 PM	4/28/61 8:30 AM	63:35:00	LPRSA0189368	ABC013388				
4/28/61 8:10 PM	4/29/61 10:30 AM	14:20:00	LPRSA0189367	ABC013387				
5/16/61 1:15 PM	5/16/61 9:55 PM	8:40:00	LPRSA0189365	ABC013385				
5/26/61 3:15 PM	5/26/61 9:20 PM	6:05:00	LPRSA0189364	ABC013384				
6/14/61 3:35 PM	6/14/61 7:40 PM	4:05:00	LPRSA0189362	ABC013382				
6/14/61 11:40 PM	6/15/61 8:20 AM	8:40:00	LPRSA0189361	ABC013381				
6/20/61 8:55 PM	6/21/61 11:30 PM	26:35:00	LPRSA0189360	ABC013380				
7/15/61 7:45 PM	7/17/61 8:20 AM	36:35:00	LPRSA0189358	ABC013378				
7/20/61 7:30 AM	7/20/61 3:45 PM	8:15:00	LPRSA0189357	ABC013377				
7/24/61 3:45 PM	7/25/61 8:20 AM	16:35:00	LPRSA0189356	ABC013376				
7/31/61 7:00 PM	8/1/61 8:45 AM	13:45:00	LPRSA0189355	ABC013375				
8/3/61 10:50 AM	8/3/61 3:35 PM	4:45:00	LPRSA0189354	ABC013374				
8/21/61 2:10 PM	8/22/61 8:00 AM	17:50:00	LPRSA0189353	ABC013373				
8/23/61 10:20 AM	8/24/61 8:20 AM	22:00:00	LPRSA0189352	ABC013372				
8/24/61 1:10 PM	8/24/61 3:35 PM	2:25:00	LPRSA0189351	ABC013371				
9/15/61 9:30 AM	9/15/61 8:45 PM	11:15:00	LPRSA0189349	ABC013369				
9/19/61 8:00 PM	9/21/61 6:30 PM	46:30:00	LPRSA0189348	ABC013368				
10/3/61 6:50 AM	10/4/61 11:15 AM	28:25:00	LPRSA0189347	ABC013367				
10/4/61 9:15 PM	10/6/61 12:05 PM	38:50:00	LPRSA0189346	ABC013366				
10/30/61 5:20 PM	10/30/61 11:25 PM	6:05:00	LPRSA0189344	ABC013364				
11/14/61 12:55 PM	11/14/61 11:15 PM	10:20:00	LPRSA0189343	ABC013363				
11/16/61 7:10 PM	11/17/61 8:20 AM	13:10:00	LPRSA0189342	ABC013362				
11/24/61 9:00 AM	11/25/61 8:30 AM	23:30:00	LPRSA0189341	ABC013361				
12/12/61 9:20 AM	12/13/61 9:25 AM	24:05:00	LPRSA0189339	ABC013359				
12/18/61 8:30 AM	12/18/61 11:15 PM	14:45:00	LPRSA0189338	ABC013358				
12/28/61 9:55 AM	12/28/61 11:00 PM	13:05:00	LPRSA0189337	ABC013357				
1/6/62 11:20 AM	1/7/62 9:40 AM	22:20:00	LPRSA0189336	ABC013356				
1/15/62 3:15 PM	1/15/62 9:00 PM	5:45:00	LPRSA0189335	ABC013355				
2/5/62 6:20 PM	2/6/62 8:25 AM	14:05:00	LPRSA0189333	ABC013353				
2/14/62 12:30 PM	2/14/62 8:55 PM	8:25:00	LPRSA0189332	ABC013352				
2/19/62 2:10 PM	2/20/62 7:00 AM	16:50:00	LPRSA0189331	ABC013351				
2/24/62 5:40 AM	2/25/62 11:10 AM	29:30:00	LPRSA0189330	ABC013350				
2/26/62 10:45 AM	3/1/62 8:00 AM	69:15:00	LPRSA0189329	ABC013349				
3/6/62 10:25 AM	3/7/62 8:15 AM	21:50:00	LPRSA0189328	ABC013348				
3/12/62 6:18 AM	3/13/62 10:45 PM	40:27:00	LPRSA0189327	ABC013347				
3/21/62 2:55 PM	3/22/62 8:15 AM	17:20:00	LPRSA0189326	ABC013346				
4/1/62 5:30 AM	4/2/62 9:00 AM	27:30:00	LPRSA0189325	ABC013345				
4/7/62 2:00 PM	4/9/62 8:15 AM	42:15:00	LPRSA0189324	ABC013344				
4/9/62 3:30 PM	4/10/62 8:10 AM	16:40:00	LPRSA0189323	ABC013343				
4/11/62 10:35 PM	4/12/62 7:05 AM	8:30:00	LPRSA0189322	ABC013342				
4/12/62 9:35 PM	4/13/62 11:30 PM	25:55:00	LPRSA0189321	ABC013341				
4/27/62 6:40 PM	4/28/62 3:00 AM	8:20:00	LPRSA0189320	ABC013340				
4/30/62 3:50 PM	5/1/62 8:00 AM	16:10:00	LPRSA0189311	ABC013331				
5/3/62 12:20 AM	5/3/62 7:10 AM	6:50:00	LPRSA0189319	ABC013339				
5/8/62 10:30 PM	5/9/62 8:10 AM	9:40:00	LPRSA0189318	ABC013338				
5/24/62 9:40 PM	5/25/62 8:20 AM	10:40:00	LPRSA0189317	ABC013337				
5/31/62 10:35 PM	6/1/62 7:03 AM	8:28:00	LPRSA0189316	ABC013336				
6/5/62 6:40 PM	6/6/62 8:15 AM	13:35:00	LPRSA0189315	ABC013335				
6/13/62 12:00 AM	6/14/62 3:30 PM	39:30:00	LPRSA0189314	ABC013334				
6/19/62 10:50 PM	6/20/62 8:10 AM	9:20:00	LPRSA0189313	ABC013333				
6/26/62 4:15 PM	6/27/62 8:15 AM	16:00:00	LPRSA0189312	ABC013332				

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	7/18/62 1:30 PM	7/18/62 4:55 PM	3:25:00	LPRSA0189310	ABC013330				
	7/23/62 5:15 PM	7/24/62 8:20 AM	15:05:00	LPRSA0189309	ABC013329				
	8/7/62 1:30 PM	8/8/62 8:15 AM	18:45:00	LPRSA0189308	ABC013328				
	8/9/62 1:10 PM	8/10/62 8:55 AM	19:45:00	LPRSA0189307	ABC013327				
	8/10/62 3:45 PM	8/11/62 12:45 PM	21:00:00	LPRSA0189306	ABC013326				
	8/17/62 5:15 PM	8/18/62 9:20 AM	16:05:00	LPRSA0189305	ABC013325				
	8/21/62 4:04 AM	8/21/62 2:40 PM	10:36:00	LPRSA0189304	ABC013324				
	8/28/62 5:00 AM	8/29/62 3:15 PM	34:15:00	LPRSA0189303	ABC013323				
	8/29/62 4:05 PM	8/29/62 9:30 PM	5:25:00	LPRSA0189302	ABC013322				
	9/5/62 9:15 AM	9/5/62 11:00 PM	13:45:00	LPRSA0189301	ABC013321				
	9/14/62 4:15 PM	9/14/62 6:25 PM	2:10:00	LPRSA0189300	ABC013320				
	9/17/62 4:00 PM	9/18/62 8:10 AM	16:10:00	LPRSA0189299	ABC013319				
	9/19/62 6:00 PM	9/20/62 2:05 PM	20:05:00	LPRSA0189298	ABC013318				
	9/25/62 11:15 PM	9/26/62 10:45 AM	11:30:00	LPRSA0189297	ABC013317				
	9/26/62 11:00 PM	9/28/62 7:50 PM	44:50:00	LPRSA0189296	ABC013316				
	10/4/62 10:25 PM	10/7/62 9:25 AM	59:00:00	LPRSA0189295	ABC013315				
	10/9/62 9:40 AM	10/10/62 12:50 PM	27:10:00	LPRSA0189294	ABC013314				
	10/11/62 11:10 PM	10/12/62 8:30 AM	9:20:00	LPRSA0189293	ABC013313				
	10/17/62 8:08 AM	10/17/62 12:15 PM	4:07:00	LPRSA0189292	ABC013312				
	10/23/62 10:55 AM	10/24/62 8:30 AM	21:35:00	LPRSA0189291	ABC013311				
	10/25/62 8:15 PM	10/26/62 11:05 PM	26:50:00	LPRSA0189290	ABC013310				
	10/30/62 12:30 PM	11/2/62 1:35 PM	73:05:00	LPRSA0189289	ABC013309				
	11/3/62 9:55 AM	11/5/62 8:00 AM	46:05:00	LPRSA0189288	ABC013308				
	11/9/62 4:25 PM	11/11/62 10:00 AM	41:35:00	LPRSA0189287	ABC013307				
	11/13/62 3:00 PM	11/14/62 8:10 AM	17:10:00	LPRSA0189286	ABC013306				
	11/18/62 10:15 PM	11/19/62 9:30 PM	23:15:00	LPRSA0189285	ABC013305				
	11/21/62 8:15 PM	11/23/62 9:00 AM	36:45:00	LPRSA0189284	ABC013304				
	12/5/62 8:15 AM	12/8/62 11:15 AM	75:00:00	LPRSA0189283	ABC013303				
	12/22/62 11:30 AM	12/24/62 9:00 AM	45:30:00	LPRSA0189282	ABC013302				
	12/26/62 1:30 PM	12/27/62 11:55 AM	22:25:00	LPRSA0189281	ABC013301				
	12/29/62 3:30 PM	12/30/62 11:50 AM	20:20:00	LPRSA0189280	ABC013300				
*	1/1/63 12:00 AM	10/14/74 11:59 PM							
*	9/28/75 12:00 AM	12/31/16 11:59 PM							
	Subtotal		**13691:59:00**						

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4a. Documented PVSC Bypasses at Union Outlet

(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark, West Orange, Little Falls)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
(1974-1975)							
10/15/74	10/16/74	42:45:00	LPRSA0232953	21.8	38.83	217	70,322
11/12/74	11/13/74	5:50:00	LPRSA0232953	25.0	6.08	217	11,004
12/1/74	12/2/74	15:13:00	LPRSA0232953	22.0	13.95	217	25,260
12/7/74	12/8/74	18:45:00	LPRSA0232953	25.9	20.23	217	36,643
12/16/74	12/16/74	20:55:00	LPRSA0232953	23.8	20.74	217	37,563
1/6/75	1/7/75	3:25:00	LPRSA0232953	19.5	2.78	217	5,027
1/8/75	1/9/75	12:55:00	LPRSA0232953	19.0	10.23	217	18,518
1/13/75	1/13/75	22:40:00	LPRSA0232953	20.0	18.89	217	34,207
1/18/75	1/18/75	14:45:00	LPRSA0232953	20.5	12.60	217	22,816
1/19/75	1/20/75	10:11:00	LPRSA0232953	25.0	10.61	217	19,210
1/29/75	1/29/75	22:00:00	LPRSA0232953	21.0	19.25	217	34,861
1/31/75	2/2/75	49:20:00	LPRSA0232953	22.3	45.84	217	83,012
2/17/75	2/18/75	4:45:00	LPRSA0232953	21.5	4.26	217	7,706
2/24/75	2/24/75	24:45:00	LPRSA0232953	27.4	28.26	217	51,171
3/12/75	3/12/75	14:30:00	LPRSA0232953	24.1	14.56	217	26,368
3/19/75	3/20/75	19:55:00	LPRSA0232953	28.7	23.82	217	43,131
4/3/75	4/3/75	12:50:00	LPRSA0232953	22.5	12.03	217	21,788
4/23/75	4/24/75	4:15:00	LPRSA0232954	12.0	2.13	217	3,848
4/24/75	4/25/75	9:00:00	LPRSA0232954	17.6	6.60	217	11,952
4/25/75	4/26/75	8:50:00	LPRSA0232954	16.2	5.96	217	10,798
5/4/75	5/5/75	13:10:00	LPRSA0232954	20.7	11.36	217	20,566
5/13/75	5/13/75	4:45:00	LPRSA0232954	27.0	5.34	217	9,677
6/1/75	6/1/75	6:05:00	LPRSA0232954	19.0	4.82	217	8,721
6/5/75	6/6/75	12:20:00	LPRSA0232954	20.5	10.53	217	19,078
6/6/75	6/6/75	8:45:00	LPRSA0232954	26.3	9.59	217	17,364
6/12/75	6/13/75	22:21:00	LPRSA0232954	22.0	20.49	217	37,102
6/28/75	6/28/75	2:00:00	LPRSA0232954	24.0	2.00	217	3,622
7/7/75	7/7/75	13:05:00	LPRSA0232954	23.0	12.54	217	22,706
7/9/75	7/9/75	4:30:00	LPRSA0232954	22.0	4.13	217	7,470
7/13/75	7/13/75	13:25:00	LPRSA0232954	33.0	18.45	217	33,408
7/14/75	7/14/75	12:15:00	LPRSA0232954	21.5	10.97	217	19,873
7/15/75	7/15/75	9:35:00	LPRSA0232954	20.0	7.99	217	14,462
7/20/75	7/21/75	13:25:00	LPRSA0232954	24.0	13.42	217	24,297
7/24/75	7/25/75	13:25:00	LPRSA0232954	35.3	19.73	217	35,737
8/24/75	8/25/75	7:35:00	LPRSA0232954	21.0	6.64	217	12,016
9/22/75	9/27/75	102:25:00	LPRSA0232955	30.1	128.45	217	232,612
Subtotal		**596:40:00**			**604.06**		**1,093,920**
Estimated Mass/Bypass Time (lb/hr)							**1,833**
Estimated Bypassed Volume Rate (MG/hr)				**1.012**			

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

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Exhibit 2-4b. Documented PVSC Bypasses at Verona Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 8:30 AM	6:00:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 9:30 AM	20:00:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/4/50 9:00 PM	8:30:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 9:00 AM	10:30:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/25/51 7:00 PM	3:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/29/51 8:30 AM	15:30:00	LPRSA0188625	ABC012645				
	1/29/51 7:30 PM	1/30/51 10:00 AM	14:30:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/1/51 3:00 PM	23:00:00	LPRSA0188628	ABC012648				
	2/7/51 11:00 AM	2/7/51 7:30 PM	8:30:00	LPRSA0188585	ABC012605				
	2/10/51 5:30 AM	2/10/51 12:00 PM	6:30:00	LPRSA0188588	ABC012608				
	2/11/51 6:00 PM	2/13/51 9:30 AM	39:30:00	LPRSA0188588	ABC012608				
	2/13/51 7:45 PM	2/14/51 10:00 AM	14:15:00	LPRSA0188588	ABC012608				
	2/14/51 5:45 PM	2/15/51 9:30 AM	15:45:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/17/51 10:00 PM	18:00:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 9:30 AM	16:30:00	LPRSA0188596	ABC012616				
	2/20/51 4:00 PM	2/21/51 5:30 PM	25:30:00	LPRSA0188596	ABC012616				
	2/22/51 10:30 AM	2/22/51 11:45 AM	1:15:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 2:30 PM	3/2/51 10:00 AM	19:30:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/20/51 12:00 PM	19:00:00	LPRSA0188616	ABC012636				
*	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/18/52 9:00 AM	29:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/21/52 9:00 AM	15:00:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/1/52 9:30 AM	12:30:00	LPRSA0189753	ABC013773				
	3/3/52 5:30 PM	3/5/52 2:30 PM	45:00:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/17/52 2:00 PM	153:00:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/19/52 7:00 PM	8:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/24/52 9:30 AM	40:30:00	LPRSA0189750	ABC013770				
	3/24/52 6:15 PM	3/25/52 9:30 AM	15:15:00	LPRSA0189750	ABC013770				
	4/4/52 4:45 PM	4/6/52 9:00 AM	40:15:00	LPRSA0189749	ABC013769				
	4/14/52 1:15 AM	4/14/52 10:30 AM	9:15:00	LPRSA0189748	ABC013768				
	4/14/52 2:30 PM	4/15/52 1:00 PM	22:30:00	LPRSA0189748	ABC013768				
	4/23/52 4:30 PM	4/24/52 9:00 AM	16:30:00	LPRSA0189747	ABC013767				
	4/25/52 9:00 AM	4/25/52 7:15 PM	10:15:00	LPRSA0189744	ABC013764				
	4/26/52 10:30 AM	4/28/52 4:00 PM	53:30:00	LPRSA0189744	ABC013764				
	4/29/52 3:45 PM	5/3/52 9:30 AM	89:45:00	LPRSA0189745	ABC013765				
	5/5/52 9:30 AM	5/5/52 4:45 PM	7:15:00	LPRSA0189745	ABC013765				

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Exhibit 2-4b. Documented PVSC Bypasses at Verona Avenue
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
5/6/52 3:15 PM	5/6/52 10:00 PM	6:45:00	LPRSA0189745	ABC013765				
5/11/52 10:00 PM	5/12/52 4:00 PM	18:00:00	LPRSA0189743	ABC013763				
5/13/52 2:30 PM	5/14/52 8:30 AM	18:00:00	LPRSA0189743	ABC013763				
5/18/52 7:15 AM	5/19/52 9:30 AM	26:15:00	LPRSA0189741	ABC013761				
5/19/52 6:30 PM	5/20/52 2:45 PM	20:15:00	LPRSA0189741	ABC013761				
5/21/52 3:30 PM	5/22/52 9:30 AM	18:00:00	LPRSA0189741	ABC013761				
5/22/52 4:00 PM	5/23/52 1:45 PM	21:45:00	LPRSA0189742	ABC013762				
5/25/52 8:45 AM	5/25/52 1:45 PM	5:00:00	LPRSA0189740	ABC013760				
5/26/52 10:15 AM	5/27/52 8:30 AM	22:15:00	LPRSA0189740	ABC013760				
6/2/52 2:45 PM	6/3/52 9:30 AM	18:45:00	LPRSA0189738	ABC013758				
6/9/52 8:30 AM	6/10/52 5:00 PM	32:30:00	LPRSA0189736	ABC013756				
6/11/52 2:00 PM	6/11/52 5:00 PM	3:00:00	LPRSA0189737	ABC013757				
6/17/52 4:40 PM	6/17/52 8:50 PM	4:10:00	LPRSA0189735	ABC013755				
6/19/52 4:00 PM	6/20/52 10:30 AM	18:30:00	LPRSA0189734	ABC013754				
6/27/52 3:40 PM	6/28/52 8:10 AM	16:30:00	LPRSA0189729	ABC013749				
6/29/52 12:15 AM	6/30/52 9:15 AM	33:00:00	LPRSA0189728	ABC013748				
7/8/52 3:45 PM	7/10/52 9:15 AM	41:30:00	LPRSA0189730	ABC013750				
7/21/52 3:45 PM	7/22/52 9:45 AM	18:00:00	LPRSA0189725	ABC013745				
7/31/52 4:15 PM	8/1/52 9:15 AM	17:00:00	LPRSA0189724	ABC013744				
8/2/52 3:40 PM	8/3/52 8:45 AM	17:05:00	LPRSA0189725	ABC013745				
8/6/52 2:15 PM	8/6/52 7:45 PM	5:30:00	LPRSA0189715	ABC013735				
8/8/52 1:15 PM	8/9/52 2:15 PM	25:00:00	LPRSA0189715	ABC013735				
8/10/52 8:45 AM	8/11/52 8:15 AM	23:30:00	LPRSA0189716	ABC013736				
8/11/52 4:45 PM	8/12/52 8:15 AM	15:30:00	LPRSA0189719	ABC013739				
8/12/52 4:15 PM	8/13/52 8:15 AM	16:00:00	LPRSA0189721	ABC013741				
8/13/52 4:45 PM	8/14/52 8:15 AM	15:30:00	LPRSA0189720	ABC013742				
8/15/52 4:15 PM	8/17/52 8:15 AM	40:00:00	LPRSA0189714	ABC013734				
8/21/52 3:45 PM	8/22/52 9:15 AM	17:30:00	LPRSA0189713	ABC013733				
8/30/52 9:15 AM	9/2/52 8:15 AM	71:00:00	LPRSA0189712	ABC013732				
9/2/52 4:15 PM	9/3/52 1:15 PM	21:00:00	LPRSA0189711	ABC013731				
9/15/52 3:15 PM	9/17/52 4:15 PM	49:00:00	LPRSA0189709	ABC013729				
9/18/52 12:15 PM	9/20/52 8:15 AM	44:00:00	LPRSA0189710	ABC013730				
9/23/52 9:45 AM	9/23/52 1:15 PM	3:30:00	LPRSA0189708	ABC013728				
10/2/52 6:15 PM	10/2/52 10:00 PM	3:45:00	LPRSA0189707	ABC013727				
10/28/52 4:45 PM	10/29/52 8:15 AM	15:30:00	LPRSA0189706	ABC013726				
11/2/52 8:30 AM	11/2/52 1:30 PM	5:00:00	LPRSA0189705	ABC013725				
11/3/52 1:15 PM	11/4/52 8:15 AM	19:00:00	LPRSA0189703	ABC013723				
11/10/52 3:45 PM	11/11/52 8:15 AM	16:30:00	LPRSA0189704	ABC013724				
12/2/52 1:15 PM	12/5/52 5:15 PM	76:00:00	LPRSA0189702	ABC013722				
12/9/52 10:45 AM	1/18/53 4:30 PM	965:45:00	LPRSA0189655	ABC013675				
1/21/53 2:15 PM	1/22/53 8:15 AM	18:00:00	LPRSA0189656	ABC013676				
1/24/53 9:15 AM	1/24/53 3:15 PM	6:00:00	LPRSA0189657	ABC013677				
2/11/53 4:45 PM	2/13/53 9:45 AM	41:00:00	LPRSA0189658	ABC013678				
2/15/53 10:15 AM	2/15/53 3:45 PM	5:30:00	LPRSA0189659	ABC013679				
2/21/53 8:15 AM	2/22/53 8:30 PM	36:15:00	LPRSA0189660	ABC013680				
2/25/53 8:15 AM	3/10/53 6:45 PM	322:30:00	LPRSA0189661	ABC013681				
3/15/53 12:15 AM	3/23/53 1:15 PM	205:00:00	LPRSA0189664	ABC013684				
3/24/53 9:00 AM	3/25/53 7:45 PM	34:45:00	LPRSA0189664	ABC013684				
3/30/53 2:15 PM	3/31/53 9:30 AM	19:15:00	LPRSA0189664	ABC013684				
5/5/53 4:30 PM	5/6/53 11:30 AM	19:00:00	LPRSA0189664	ABC013684				
5/8/53 10:00 AM	5/9/53 9:15 AM	23:15:00	LPRSA0189664	ABC013684				
5/13/53 9:45 AM	5/14/53 9:30 AM	23:45:00	LPRSA0189664	ABC013684				
5/14/53 3:00 PM	5/15/53 11:30 AM	20:30:00	LPRSA0189664	ABC013684				
5/24/53 12:00 PM	5/25/53 10:00 AM	22:00:00	LPRSA0189664	ABC013684				

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Exhibit 2-4b. Documented PVSC Bypasses at Verona Avenue
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
7/6/53 7:45 PM	7/7/53 8:15 AM	12:30:00	LPRSA0189681	ABC013701				
7/20/53 9:10 PM	7/21/53 8:30 AM	11:20:00	LPRSA0189682	ABC013702				
10/27/53 4:30 PM	10/28/53 2:15 PM	21:45:00	LPRSA0189692	ABC013712				
10/29/53 1:45 PM	10/29/53 4:00 PM	2:15:00	LPRSA0189693	ABC013713				
11/7/53 6:45 AM	11/8/53 2:15 PM	31:30:00	LPRSA0189695	ABC013715				
12/6/53 11:30 AM	12/7/53 8:20 AM	20:50:00	LPRSA0189650	ABC013670				
12/14/53 5:45 AM	12/14/53 12:15 PM	6:30:00	LPRSA0189647	ABC013667				
12/28/53 4:30 PM	12/29/53 9:15 AM	16:45:00	LPRSA0189646	ABC013666				
1/14/54 4:15 PM	1/18/54 9:15 AM	89:00:00	LPRSA0189592	ABC013612				
1/18/54 2:15 PM	1/21/54 9:30 AM	67:15:00	LPRSA0189591	ABC013611				
1/22/54 3:15 PM	1/25/54 9:30 AM	66:15:00	LPRSA0189590	ABC013610				
1/25/54 2:15 PM	2/2/54 9:45 AM	187:30:00	LPRSA0189590	ABC013610				
2/3/54 1:00 PM	2/4/54 9:00 AM	20:00:00	LPRSA0189589	ABC013609				
2/8/54 5:15 PM	2/9/54 9:15 AM	16:00:00	LPRSA0189588	ABC013608				
2/16/54 4:45 PM	2/17/54 1:30 PM	20:45:00	LPRSA0189587	ABC013607				
2/21/54 5:00 PM	2/22/54 8:30 AM	15:30:00	LPRSA0189586	ABC013606				
2/23/54 11:45 AM	2/24/54 1:00 PM	25:15:00	LPRSA0189621	ABC013641				
3/19/54 4:15 PM	3/20/54 2:30 PM	22:15:00	LPRSA0189617	ABC013637				
4/13/54 12:15 PM	4/13/54 3:30 PM	3:15:00	LPRSA0189623	ABC013643				
4/16/54 1:00 PM	4/18/54 10:00 AM	45:00:00	LPRSA0189632	ABC013652				
4/23/54 1:15 PM	4/25/54 9:15 AM	44:00:00	LPRSA0189614	ABC013634				
5/7/54 10:30 AM	5/14/54 4:00 PM	173:30:00	LPRSA0189631	ABC013651				
6/3/54 4:45 PM	6/9/54 9:30 AM	136:45:00	LPRSA0189630	ABC013650				
7/7/54 4:15 PM	7/8/54 9:15 AM	17:00:00	LPRSA0189624	ABC013644				
8/3/54 9:00 AM	8/4/54 9:00 AM	24:00:00	LPRSA0189620	ABC013640				
8/9/54 8:45 AM	8/9/54 1:45 PM	5:00:00	LPRSA0189622	ABC013642				
8/20/54 4:15 PM	8/22/54 8:15 AM	40:00:00	LPRSA0189610	ABC013630				
8/25/54 4:30 PM	8/26/54 9:00 AM	16:30:00	LPRSA0189609	ABC013629				
8/30/54 4:30 PM	9/1/54 9:15 AM	40:45:00	LPRSA0189608	ABC013628				
9/8/54 2:15 PM	9/9/54 9:00 AM	18:45:00	LPRSA0189607	ABC013627				
9/10/54 1:15 PM	9/12/54 9:00 AM	43:45:00	LPRSA0189606	ABC013626				
9/14/54 3:45 PM	9/18/54 9:00 AM	89:15:00	LPRSA0189605	ABC013625				
10/4/54 8:45 AM	10/8/54 3:45 PM	103:00:00	LPRSA0189604	ABC013624				
10/27/54 4:15 PM	10/28/54 9:15 AM	17:00:00	LPRSA0189602	ABC013622				
10/29/54 9:15 AM	10/30/54 8:45 AM	23:30:00	LPRSA0189601	ABC013621				
11/2/54 12:45 PM	11/4/54 9:00 AM	44:15:00	LPRSA0189600	ABC013620				
11/8/54 1:00 PM	11/9/54 1:00 PM	24:00:00	LPRSA0189599	ABC013619				
11/15/54 9:30 AM	11/29/54 9:30 AM	336:00:00	LPRSA0189597	ABC013617				
12/9/54 1:45 PM	12/9/54 5:45 PM	4:00:00	LPRSA0189596	ABC013616				
12/14/54 9:15 AM	12/14/54 3:45 PM	6:30:00	LPRSA0189595	ABC013615				
12/16/54 2:00 PM	12/16/54 8:00 PM	6:00:00	LPRSA0189594	ABC013614				
12/18/54 10:15 AM	12/19/54 8:15 AM	22:00:00	LPRSA0189593	ABC013613				
12/29/54 12:45 PM	12/30/54 3:00 PM	26:15:00	LPRSA0189585	ABC013605				
1/6/55 1:45 PM	1/7/55 9:00 AM	19:15:00	LPRSA0189582	ABC013602				
1/28/55 9:30 AM	2/4/55 10:00 AM	168:30:00	LPRSA0189580	ABC013600				
2/14/55 3:00 PM	2/18/55 4:15 PM	97:15:00	LPRSA0189580	ABC013600				
2/21/55 1:15 PM	3/7/55 9:30 AM	332:15:00	LPRSA0189579	ABC013599				
3/7/55 1:30 PM	3/7/55 4:00 PM	2:30:00	LPRSA0189578	ABC013598				
3/21/55 2:45 PM	3/23/55 1:30 PM	46:45:00	LPRSA0189577	ABC013597				
3/28/55 1:15 PM	3/30/55 4:15 PM	51:00:00	LPRSA0189576	ABC013596				
4/6/55 2:45 PM	4/7/55 4:00 PM	25:15:00	LPRSA0189575	ABC013595				
4/12/55 2:15 PM	4/14/55 1:15 PM	47:00:00	LPRSA0189574	ABC013594				
5/31/55 1:00 PM	5/31/55 6:00 PM	5:00:00	LPRSA0189572	ABC013592				

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Exhibit 2-4b. Documented PVSC Bypasses at Verona Avenue
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
6/21/55 11:00 PM	6/22/55 8:15 AM	9:15:00	LPRSA0189571	ABC013591				
8/7/55 11:15 PM	8/8/55 2:30 AM	3:15:00	LPRSA0189570	ABC013590				
8/11/55 7:15 PM	8/14/55 8:30 AM	61:15:00	LPRSA0189569	ABC013589				
8/15/55 4:45 PM	8/16/55 2:30 PM	21:45:00	LPRSA0189568	ABC013588				
8/18/55 4:00 PM	8/19/55 2:45 AM	10:45:00	LPRSA0189567	ABC013587				
8/21/55 9:45 PM	8/22/55 9:15 AM	11:30:00	LPRSA0189566	ABC013586				
8/24/55 3:00 PM	8/25/55 9:00 AM	18:00:00	LPRSA0189565	ABC013585				
8/25/55 4:00 PM	8/26/55 9:30 AM	17:30:00	LPRSA0189564	ABC013584				
9/24/55 5:15 AM	9/26/55 8:15 AM	51:00:00	LPRSA0189563	ABC013583				
10/6/55 8:15 AM	10/7/55 11:00 AM	26:45:00	LPRSA0189562	ABC013582				
10/14/55 11:15 AM	10/15/55 2:45 PM	27:30:00	LPRSA0189561	ABC013581				
10/16/55 2:50 PM	10/16/55 8:30 PM	5:40:00	LPRSA0189561	ABC013581				
10/17/55 3:45 PM	10/21/55 1:30 PM	93:45:00	LPRSA0189561	ABC013581				
10/30/55 9:45 AM	10/30/55 4:25 PM	6:40:00	LPRSA0189560	ABC013580				
11/10/55 3:45 PM	11/11/55 1:15 AM	9:30:00	LPRSA0189559	ABC013579				
11/11/55 11:00 AM	11/12/55 8:30 AM	21:30:00	LPRSA0189559	ABC013579				
11/16/55 9:15 AM	11/16/55 2:15 PM	5:00:00	LPRSA0189558	ABC013578				
1/30/56 1:00 PM	1/31/56 8:15 AM	19:15:00	LPRSA0189556	ABC013576				
2/2/56 11:45 AM	2/3/56 8:15 AM	20:30:00	LPRSA0189555	ABC013575				
2/6/56 3:45 PM	2/7/56 12:30 PM	20:45:00	LPRSA0189554	ABC013574				
2/18/56 8:30 AM	2/19/56 8:00 AM	23:30:00	LPRSA0189553	ABC013573				
3/8/56 1:45 AM	3/9/56 8:30 AM	30:45:00	LPRSA0189552	ABC013572				
3/14/56 9:15 AM	3/15/56 9:00 AM	23:45:00	LPRSA0189551	ABC013571				
3/21/56 3:20 PM	3/23/56 2:00 PM	46:40:00	LPRSA0189549	ABC013569				
3/29/56 4:30 PM	3/30/56 9:00 AM	16:30:00	LPRSA0189547	ABC013567				
4/7/56 2:25 AM	4/9/56 1:15 PM	58:50:00	LPRSA0189546	ABC013566				
4/11/56 6:00 PM	4/12/56 8:20 AM	14:20:00	LPRSA0189545	ABC013565				
5/2/56 9:20 PM	5/3/56 9:00 AM	11:40:00	LPRSA0189544	ABC013564				
6/2/56 3:10 PM	6/3/56 12:00 PM	20:50:00	LPRSA0189543	ABC013563				
6/27/56 5:00 PM	6/27/56 6:10 PM	1:10:00	LPRSA0189542	ABC013562				
7/16/56 2:30 PM	7/17/56 9:00 AM	18:30:00	LPRSA0189541	ABC013561				
7/21/56 9:45 AM	7/21/56 9:50 PM	12:05:00	LPRSA0189540	ABC013560				
7/27/56 9:45 AM	7/27/56 3:15 PM	5:30:00	LPRSA0189539	ABC013559				
8/6/56 4:30 PM	8/7/56 8:15 AM	15:45:00	LPRSA0189538	ABC013558				
8/21/56 4:15 AM	8/21/56 4:00 PM	11:45:00	LPRSA0189537	ABC013557				
9/6/56 6:15 PM	9/7/56 8:00 AM	13:45:00	LPRSA0189536	ABC013556				
9/7/56 10:00 AM	9/7/56 4:30 PM	6:30:00	LPRSA0189535	ABC013555				
9/27/56 4:00 PM	9/28/56 8:15 AM	16:15:00	LPRSA0189534	ABC013554				
10/22/56 9:45 PM	10/23/56 8:15 AM	10:30:00	LPRSA0189533	ABC013553				
10/31/56 11:45 AM	10/31/56 7:30 PM	7:45:00	LPRSA0189532	ABC013552				
11/1/56 10:15 AM	11/1/56 4:00 PM	5:45:00	LPRSA0189532	ABC013552				
11/18/56 2:15 AM	11/18/56 11:00 AM	8:45:00	LPRSA0189531	ABC013551				
11/22/56 12:30 AM	11/22/56 8:00 AM	7:30:00	LPRSA0189530	ABC013550				
12/9/56 3:00 PM	12/10/56 8:30 AM	17:30:00	LPRSA0189529	ABC013549				
12/14/56 8:15 AM	12/14/56 4:00 PM	7:45:00	LPRSA0189528	ABC013548				
12/22/56 10:15 PM	12/23/56 10:00 AM	11:45:00	LPRSA0189527	ABC013547				
1/23/57 3:45 AM	1/23/57 12:00 PM	8:15:00	LPRSA0189498	ABC013518				
2/9/57 2:00 PM	2/10/57 8:45 AM	18:45:00	LPRSA0189497	ABC013517				
2/26/57 3:45 PM	2/26/57 10:30 PM	6:45:00	LPRSA0189496	ABC013516				
3/1/57 3:15 PM	3/2/57 10:30 AM	19:15:00	LPRSA0189524	ABC013544				
3/8/57 9:30 AM	3/10/57 9:50 AM	48:20:00	LPRSA0189523	ABC013543				
3/15/57 8:35 PM	3/16/57 9:35 AM	13:00:00	LPRSA0189522	ABC013542				
3/19/57 9:30 PM	3/20/57 3:30 PM	18:00:00	LPRSA0189521	ABC013541				

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Exhibit 2-4b. Documented PVSC Bypasses at Verona Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	4/2/57 7:45 AM	4/2/57 1:45 PM	6:00:00	LPRSA0189520	ABC013540				
	4/4/57 9:10 PM	4/5/57 10:45 AM	13:35:00	LPRSA0189519	ABC013539				
	4/5/57 2:15 PM	4/6/57 1:20 PM	23:05:00	LPRSA0189518	ABC013538				
	4/9/57 9:00 AM	4/9/57 3:45 PM	6:45:00	LPRSA0189516	ABC013536				
	4/10/57 9:00 AM	4/10/57 3:45 PM	6:45:00	LPRSA0189515	ABC013535				
	4/11/57 8:15 AM	4/11/57 3:45 PM	7:30:00	LPRSA0189514	ABC013534				
	4/12/57 8:15 AM	4/12/57 4:00 PM	7:45:00	LPRSA0189513	ABC013533				
	4/18/57 10:00 PM	4/19/57 1:30 PM	15:30:00	LPRSA0189512	ABC013532				
	4/23/57 6:55 AM	4/23/57 2:00 PM	7:05:00	LPRSA0189511	ABC013531				
	4/25/57 4:00 PM	4/26/57 9:30 AM	17:30:00	LPRSA0189510	ABC013530				
	4/29/57 1:15 PM	4/29/57 3:45 PM	2:30:00	LPRSA0189509	ABC013529				
	5/14/57 9:00 PM	5/15/57 10:45 AM	13:45:00	LPRSA0189508	ABC013528				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
	8/26/57 1:30 AM	8/26/57 7:00 PM	17:30:00	LPRSA0189507	ABC013527				
	9/10/57 10:45 PM	9/11/57 8:45 AM	10:00:00	LPRSA0189506	ABC013526				
	9/17/57 12:00 AM	9/17/57 9:15 AM	9:15:00	LPRSA0189505	ABC013525				
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	10/23/58 2:15 AM	10/23/58 3:20 PM	13:05:00	LPRSA0189469	ABC013489				
	10/25/58 7:00 PM	10/27/58 1:30 PM	42:30:00	LPRSA0189468	ABC013488				
	3/6/59 2:15 AM	3/6/59 4:15 PM	14:00:00	LPRSA0189458	ABC013478				
	6/2/59 6:30 PM	6/3/59 8:00 AM	13:30:00	LPRSA0189454	ABC013474				
	9/1/59 6:30 PM	9/2/59 8:00 AM	13:30:00	LPRSA0189445	ABC013465				
	11/24/59 4:15 PM	11/25/59 8:25 AM	16:10:00	LPRSA0189432	ABC013452				
	12/7/59 2:30 AM	12/7/59 10:00 AM	7:30:00	LPRSA0189431	ABC013451				
	2/19/60 1:40 AM	2/19/60 10:15 AM	8:35:00	LPRSA0189421	ABC013441				
	4/3/60 10:00 PM	4/4/60 8:30 AM	10:30:00	LPRSA0189416	ABC013436				
	7/30/60 9:45 AM	7/31/60 9:00 AM	23:15:00	LPRSA0189402	ABC013422				
	8/19/60 3:45 PM	8/20/60 9:05 AM	17:20:00	LPRSA0189399	ABC013419				
	9/12/60 9:45 AM	9/13/60 8:30 AM	22:45:00	LPRSA0189397	ABC013417				
	9/19/60 10:30 AM	9/19/60 3:45 PM	5:15:00	LPRSA0189396	ABC013416				
	12/21/60 11:35 AM	12/22/60 9:30 AM	21:55:00	LPRSA0189391	ABC013411				
	1/1/61 9:15 AM	1/2/61 9:00 AM	23:45:00	LPRSA0189389	ABC013409				
	3/14/61 8:15 AM	3/14/61 1:00 PM	4:45:00	LPRSA0189382	ABC013402				
	3/23/61 1:45 PM	3/24/61 10:30 AM	20:45:00	LPRSA0189383	ABC013403				
	4/10/61 10:50 AM	4/10/61 3:15 PM	4:25:00	LPRSA0189376	ABC013396				
	4/13/61 6:05 AM	4/13/61 3:15 PM	9:10:00	LPRSA0189375	ABC013395				
	4/16/61 12:05 PM	4/17/61 8:15 AM	20:10:00	LPRSA0189373	ABC013393				
	4/24/61 10:00 AM	4/24/61 2:30 PM	4:30:00	LPRSA0189370	ABC013390				
	9/20/61 3:30 PM	9/21/61 3:00 PM	23:30:00	LPRSA0189348	ABC013368				
	12/18/61 11:15 AM	12/20/61 8:30 AM	45:15:00	LPRSA0189338	ABC013358				
	2/26/62 3:30 PM	2/27/62 8:15 AM	16:45:00	LPRSA0189329	ABC013349				
	2/27/62 1:30 PM	2/28/62 3:15 PM	25:45:00	LPRSA0189329	ABC013349				
	3/12/62 10:05 AM	3/13/62 8:20 AM	22:15:00	LPRSA0189327	ABC013347				
	3/21/62 3:05 PM	3/22/62 8:30 AM	17:25:00	LPRSA0189326	ABC013346				
	4/7/62 2:50 PM	4/9/62 8:30 AM	41:40:00	LPRSA0189324	ABC013344				
	4/9/62 3:40 PM	4/10/62 8:20 AM	16:40:00	LPRSA0189323	ABC013343				
	9/27/62 2:15 PM	9/28/62 1:30 PM	23:15:00	LPRSA0189296	ABC013316				
	10/5/62 9:20 AM	10/7/62 9:35 AM	48:15:00	LPRSA0189295	ABC013315				
	10/23/62 11:20 AM	10/23/62 3:45 PM	4:25:00	LPRSA0189291	ABC013311				
	10/25/62 10:45 PM	10/26/62 3:00 PM	16:15:00	LPRSA0189290	ABC013310				

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Exhibit 2-4b. Documented PVSC Bypasses at Verona Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	10/30/62 3:00 PM	10/31/62 10:30 AM	19:30:00	LPRSA0189289	ABC013309				
	11/3/62 10:00 AM	11/5/62 8:10 AM	46:10:00	LPRSA0189288	ABC013308				
	11/18/62 12:45 PM	11/19/62 8:15 AM	19:30:00	LPRSA0189285	ABC013305				
	11/21/62 10:10 PM	11/23/62 9:15 AM	35:05:00	LPRSA0189284	ABC013304				
	12/5/62 8:30 AM	12/6/62 3:00 PM	30:30:00	LPRSA0189283	ABC013303				
*	1/1/63 12:00 AM	12/31/74 11:59 PM							
	Subtotal		8516:55:00						

* Missing data.
Source: PVSC throw-out logs.

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Exhibit 2-4b. Documented PVSC Bypasses at Verona Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1975)							
	1/1/75	1/1/75	0:00:00	LPRSA0196644	*	*		
	6/29/75	6/29/75	0:00:00	LPRSA0196645	*	*		
*	6/30/75	12/31/04						
*	**Average Overflow**				7.01	0.75	243.0	1,525
	Estimated Mass/Bypass Time (lb/hr)							593
	Estimated Bypassed Volume Rate (MG/hr)				**0.292**			

* Note: On these dates, bypasses not measured; overflow data are used to calculate average mass and volume.
Regulator is noted as inoperable; both tide gates are leaking.

(2005-2014)

			Elapsed Time (hr)	Frequency of Overflows (#/yr)
	1/1/2005	12/31/2005	266.69	12
	1/1/2006	12/31/2006	595.73	43
	1/1/2007	12/31/2007	433.43	34
	1/1/2008	12/31/2008	608.10	46
	1/1/2009	12/31/2009	410.00	35
	1/1/2010	12/31/2010	461.08	36
	1/1/2011	12/31/2011	362.16	24
	1/1/2012	12/31/2012	43.34	6
	1/1/2013	12/31/2013	351.91	38
	1/1/2014	12/31/2014	351.91	38
*	1/1/2015	9/30/2016		
	Subtotal (2005-2014)		**3884.35**	
	Average annual bypass time (hr)		**388.44**	

* Missing data.
Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4c. Documented PVSC Bypasses at Herbert Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 8:30 AM	6:00:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 9:30 AM	20:00:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/4/50 9:00 PM	8:30:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0189637	ABC012657				
	12/15/50 10:30 PM	12/16/50 9:00 AM	10:30:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/25/51 7:00 PM	3:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/29/51 8:30 AM	15:30:00	LPRSA0188625	ABC012645				
	1/29/51 7:30 PM	1/30/51 10:00 AM	14:30:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648				
	2/10/51 5:30 AM	2/10/51 12:00 PM	6:30:00	LPRSA0188588	ABC012608				
	2/13/51 7:45 PM	2/14/51 10:00 AM	14:15:00	LPRSA0188588	ABC012608				
	2/14/51 5:45 PM	2/15/51 9:30 AM	15:45:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616				
	2/22/51 10:30 AM	2/22/51 11:45 AM	1:15:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 3:00 PM	3/2/51 10:00 AM	19:00:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/20/51 12:00 PM	19:00:00	LPRSA0188616	ABC012636				
	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/18/52 9:00 AM	29:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/21/52 1:00 PM	19:00:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/3/52 11:00 AM	62:00:00	LPRSA0189753	ABC013773				
	3/3/52 5:30 PM	3/5/52 2:30 PM	45:00:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/17/52 2:00 PM	153:00:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/21/52 11:00 AM	48:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/25/52 10:30 AM	65:30:00	LPRSA0189750	ABC013770				
	4/4/52 4:45 PM	4/6/52 9:00 AM	40:15:00	LPRSA0189749	ABC013769				
	4/14/52 4:00 AM	4/16/52 11:00 AM	55:00:00	LPRSA0189748	ABC013768				
	4/23/52 4:30 PM	4/24/52 10:00 AM	17:30:00	LPRSA0189747	ABC013767				
	4/25/52 11:00 AM	4/28/52 4:15 PM	77:15:00	LPRSA0189744	ABC013764				
	4/29/52 3:30 PM	5/5/52 5:00 PM	145:30:00	LPRSA0189745	ABC013765				
	5/6/52 3:30 PM	5/9/52 2:45 PM	71:15:00	LPRSA0189745	ABC013765				
	5/11/52 10:00 PM	5/13/52 10:30 AM	36:30:00	LPRSA0189743	ABC013763				
	5/18/52 7:30 AM	5/23/52 2:00 PM	126:30:00	LPRSA0189741	ABC013761				
	5/13/52 3:00 PM	5/14/52 9:00 AM	18:00:00	LPRSA0189743	ABC013763				
	5/25/52 9:00 AM	5/27/52 8:45 AM	47:45:00	LPRSA0189740	ABC013760				
	5/29/52 6:30 PM	6/3/52 10:00 AM	111:30:00	LPRSA0189738	ABC013758				
	6/3/52 12:45 PM	6/6/52 9:30 AM	68:45:00	LPRSA0189736	ABC013756				

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Exhibit 2-4c. Documented PVSC Bypasses at Herbert Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	6/9/52 8:45 AM	6/14/52 9:00 AM	120:15:00	LPRSA0189736	ABC013756				
	6/17/52 5:00 PM	6/18/52 10:30 AM	17:30:00	LPRSA0189735	ABC013755				
	6/19/52 3:45 PM	6/20/52 10:15 AM	18:30:00	LPRSA0189734	ABC013754				
	6/27/52 3:50 PM	6/28/52 8:20 AM	16:30:00	LPRSA0189729	ABC013749				
	6/29/52 12:30 AM	6/30/52 9:30 AM	33:00:00	LPRSA0189728	ABC013748				
	7/21/52 4:00 PM	7/22/52 10:00 AM	18:00:00	LPRSA0189725	ABC013745				
	7/31/52 4:30 PM	8/1/52 9:30 AM	17:00:00	LPRSA0189724	ABC013744				
	8/2/52 3:50 PM	8/3/52 9:00 AM	17:10:00	LPRSA0189725	ABC013745				
	8/6/52 2:30 PM	8/6/52 8:00 PM	5:30:00	LPRSA0189715	ABC013735				
	8/8/52 1:30 PM	8/11/52 8:45 AM	67:15:00	LPRSA0189715	ABC013735				
	8/11/52 5:00 PM	8/12/52 8:30 AM	15:30:00	LPRSA0189719	ABC013739				
	8/12/52 4:45 PM	8/13/52 8:30 AM	15:45:00	LPRSA0189721	ABC013741				
	8/13/52 4:30 PM	8/14/52 8:30 AM	16:00:00	LPRSA0189720	ABC013742				
	8/15/52 4:30 PM	8/17/52 8:30 AM	40:00:00	LPRSA0189714	ABC013734				
	8/21/52 4:00 PM	8/22/52 9:30 AM	17:30:00	LPRSA0189713	ABC013733				
	8/30/52 9:30 AM	9/2/52 8:30 AM	71:00:00	LPRSA0189712	ABC013732				
	9/2/52 4:30 PM	9/3/52 1:30 PM	21:00:00	LPRSA0189711	ABC013731				
	9/15/52 3:45 PM	9/17/52 4:30 PM	48:45:00	LPRSA0189709	ABC013729				
	9/18/52 12:30 PM	9/20/52 8:30 AM	44:00:00	LPRSA0189710	ABC013730				
	9/23/52 10:00 AM	9/23/52 1:30 PM	3:30:00	LPRSA0189708	ABC013728				
	10/2/52 6:30 PM	10/3/52 1:00 PM	18:30:00	LPRSA0189707	ABC013727				
	10/28/52 5:00 PM	10/29/52 8:30 AM	15:30:00	LPRSA0189706	ABC013726				
	11/2/52 8:45 AM	11/2/52 1:45 PM	5:00:00	LPRSA0189705	ABC013725				
	11/3/52 1:30 PM	11/4/52 8:30 AM	19:00:00	LPRSA0189703	ABC013723				
	11/10/52 4:00 PM	11/11/52 8:30 AM	16:30:00	LPRSA0189704	ABC013724				
	11/14/52 1:00 PM	12/1/52 1:00 PM	408:00:00	LPRSA0189701	ABC013721				
	12/2/52 1:30 PM	12/5/52 5:30 PM	76:00:00	LPRSA0189702	ABC013722				
	12/9/52 11:00 AM	1/18/53 4:45 PM	965:45:00	LPRSA0189655	ABC013675				
	1/21/53 2:30 PM	1/22/53 8:30 AM	18:00:00	LPRSA0189656	ABC013676				
	1/24/53 9:30 AM	1/24/53 3:30 PM	6:00:00	LPRSA0189657	ABC013677				
	2/11/53 5:00 PM	2/13/53 10:00 AM	41:00:00	LPRSA0189658	ABC013678				
	2/15/53 10:30 AM	2/15/53 4:00 PM	5:30:00	LPRSA0189659	ABC013679				
	2/21/53 8:30 AM	2/22/53 8:45 PM	36:15:00	LPRSA0189660	ABC013680				
	2/25/53 8:30 AM	3/10/53 6:30 PM	322:00:00	LPRSA0189661	ABC013681				
	3/15/53 1:30 PM	3/16/53 10:00 AM	20:30:00	LPRSA0189665	ABC013685				
	3/24/53 9:30 AM	3/26/53 9:30 AM	48:00:00	LPRSA0189665	ABC013685				
	3/30/53 2:30 PM	4/29/53 9:15 AM	714:45:00	LPRSA0189665	ABC013685				
	4/30/53 4:30 PM	5/1/53 1:15 PM	20:45:00	LPRSA0189665	ABC013685				
	5/8/53 10:30 AM	5/9/53 9:45 AM	23:15:00	LPRSA0189665	ABC013685				
	5/13/53 10:00 AM	5/22/53 6:30 PM	224:30:00	LPRSA0189665	ABC013685				
	6/13/53 4:45 PM	6/14/53 1:45 PM	21:00:00	LPRSA0189674	ABC013694				
	6/18/53 4:15 PM	6/19/53 9:15 AM	17:00:00	LPRSA0189676	ABC013696				
	6/22/53 9:45 AM	6/22/53 6:30 PM	8:45:00	LPRSA0189677	ABC013697				
	6/23/53 9:45 AM	7/2/53 1:45 PM	220:00:00	LPRSA0189678	ABC013698				
	10/29/53 2:00 PM	10/29/53 4:15 PM	2:15:00	LPRSA0189693	ABC013713				
	10/29/53 6:45 PM	10/30/53 8:30 AM	13:45:00	LPRSA0189694	ABC013714				
	11/7/53 7:00 AM	11/8/53 10:30 AM	27:30:00	LPRSA0189695	ABC013715				
*	11/16/53 9:30 AM			LPRSA0189653	ABC013673				
	11/23/53 9:45 AM	11/24/53 1:30 PM	27:45:00	LPRSA0189698	ABC013718				
	11/25/53 9:45 AM	11/26/53 8:45 AM	23:00:00	LPRSA0189652	ABC013672				
	11/30/53 9:45 AM	12/4/53 10:45 AM	97:00:00	LPRSA0189651	ABC013671				
	12/6/53 9:15 AM	12/7/53 9:30 AM	24:15:00	LPRSA0189650	ABC013670				
	12/9/53 4:15 PM	12/10/53 4:15 PM	24:00:00	LPRSA0189649	ABC013669				
	12/12/53 4:45 PM	12/13/53 8:15 AM	15:30:00	LPRSA0189648	ABC013668				

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Exhibit 2-4c. Documented PVSC Bypasses at Herbert Place
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
12/14/53 6:00 AM	12/15/53 10:30 AM	28:30:00	LPRSA0189647	ABC013667				
12/28/53 4:45 PM	12/29/53 1:15 PM	20:30:00	LPRSA0189646	ABC013666				
1/14/54 4:30 PM	1/18/54 9:30 AM	89:00:00	LPRSA0189592	ABC013612				
1/18/54 2:30 PM	1/22/54 9:30 AM	91:00:00	LPRSA0189591	ABC013611				
1/22/54 3:00 PM	1/25/54 10:00 AM	67:00:00	LPRSA0189590	ABC013610				
1/25/54 2:00 PM	2/2/54 9:45 AM	187:45:00	LPRSA0189590	ABC013610				
2/3/54 1:15 PM	2/4/54 9:15 AM	20:00:00	LPRSA0189589	ABC013609				
2/24/54 1:30 PM	2/27/54 8:30 AM	67:00:00	LPRSA0189621	ABC013641				
3/1/54 10:45 AM	3/5/54 1:30 PM	98:45:00	LPRSA0189619	ABC013639				
4/28/54 5:15 PM	4/29/54 9:15 AM	16:00:00	LPRSA0189612	ABC013632				
5/7/54 9:00 AM	5/26/54 10:45 AM	457:45:00	LPRSA0189631	ABC013651				
6/1/54 11:30 AM	6/9/54 9:45 AM	190:15:00	LPRSA0189630	ABC013650				
7/7/54 4:30 PM	7/8/54 9:30 AM	17:00:00	LPRSA0189624	ABC013644				
8/3/54 9:15 AM	8/4/54 9:15 AM	24:00:00	LPRSA0189620	ABC013640				
8/9/54 9:00 AM	8/11/54 9:30 AM	48:30:00	LPRSA0189622	ABC013642				
8/19/54 10:45 PM	8/20/54 10:00 AM	11:15:00	LPRSA0189611	ABC013631				
8/20/54 4:30 PM	8/22/54 8:30 AM	40:00:00	LPRSA0189610	ABC013630				
8/25/54 4:45 PM	8/26/54 9:15 AM	16:30:00	LPRSA0189609	ABC013629				
8/30/54 4:45 PM	9/1/54 9:30 AM	40:45:00	LPRSA0189608	ABC013628				
9/8/54 2:30 PM	9/9/54 9:15 AM	18:45:00	LPRSA0189607	ABC013627				
9/10/54 1:30 PM	9/12/54 9:15 AM	43:45:00	LPRSA0189606	ABC013626				
9/14/54 4:30 PM	9/18/54 1:00 PM	92:30:00	LPRSA0189605	ABC013625				
10/4/54 9:00 AM	10/8/54 3:30 PM	102:30:00	LPRSA0189604	ABC013624				
10/27/54 4:30 PM	10/28/54 9:30 AM	17:00:00	LPRSA0189602	ABC013622				
10/29/54 9:30 AM	10/30/54 9:00 AM	23:30:00	LPRSA0189601	ABC013621				
11/2/54 1:00 PM	11/4/54 9:15 AM	44:15:00	LPRSA0189600	ABC013620				
11/8/54 1:15 PM	11/9/54 1:15 PM	24:00:00	LPRSA0189599	ABC013619				
11/15/54 9:45 AM	12/2/54 2:30 AM	400:45:00	LPRSA0189597	ABC013617				
12/9/54 2:00 PM	12/10/54 1:15 PM	23:15:00	LPRSA0189596	ABC013616				
12/14/54 9:30 AM	12/15/54 1:00 PM	27:30:00	LPRSA0189595	ABC013615				
12/16/54 3:00 PM	12/16/54 8:15 PM	5:15:00	LPRSA0189594	ABC013614				
12/18/54 10:30 AM	12/19/54 8:30 AM	22:00:00	LPRSA0189593	ABC013613				
12/29/54 1:00 PM	12/30/54 2:45 PM	25:45:00	LPRSA0189585	ABC013605				
1/6/55 2:00 PM	1/7/55 9:15 AM	19:15:00	LPRSA0189582	ABC013602				
1/28/55 9:45 AM	2/4/55 10:15 AM	168:30:00	LPRSA0189580	ABC013600				
2/14/55 3:15 PM	2/18/55 4:30 PM	97:15:00	LPRSA0189580	ABC013600				
2/21/55 1:30 PM	3/7/55 9:45 AM	332:15:00	LPRSA0189579	ABC013599				
3/7/55 1:45 PM	3/7/55 4:15 PM	2:30:00	LPRSA0189578	ABC013598				
3/21/55 3:00 PM	3/23/55 1:45 PM	46:45:00	LPRSA0189577	ABC013597				
3/28/55 1:30 PM	3/30/55 4:30 PM	51:00:00	LPRSA0189576	ABC013596				
4/6/55 2:30 PM	4/7/55 4:15 PM	25:45:00	LPRSA0189575	ABC013595				
4/12/55 2:30 PM	4/14/55 1:30 PM	47:00:00	LPRSA0189574	ABC013594				
5/31/55 1:15 PM	5/31/55 6:15 PM	5:00:00	LPRSA0189572	ABC013592				
6/21/55 11:15 PM	6/22/55 8:30 AM	9:15:00	LPRSA0189571	ABC013591				
8/7/55 11:30 PM	8/8/55 8:15 AM	8:45:00	LPRSA0189570	ABC013590				
8/11/55 7:30 PM	8/14/55 8:45 AM	61:15:00	LPRSA0189569	ABC013589				
8/15/55 5:00 PM	8/16/55 2:45 PM	21:45:00	LPRSA0189568	ABC013588				
8/18/55 4:15 PM	8/20/55 9:15 AM	41:00:00	LPRSA0189567	ABC013587				
8/21/55 10:00 PM	8/24/55 12:45 PM	62:45:00	LPRSA0189566	ABC013586				
8/24/55 3:15 PM	8/25/55 9:15 AM	18:00:00	LPRSA0189565	ABC013585				
8/25/55 4:15 PM	8/26/55 9:45 AM	17:30:00	LPRSA0189564	ABC013584				
9/24/55 5:30 AM	9/26/55 8:30 AM	51:00:00	LPRSA0189563	ABC013583				
10/6/55 8:30 AM	10/7/55 1:15 PM	28:45:00	LPRSA0189562	ABC013582				

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Exhibit 2-4c. Documented PVSC Bypasses at Herbert Place
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
10/14/55 1:00 PM	10/15/55 3:00 PM	26:00:00	LPRSA0189561	ABC013581				
10/16/55 3:00 PM	10/25/55 10:00 AM	211:00:00	LPRSA0189561	ABC013581				
10/30/55 10:00 AM	11/1/55 1:30 PM	51:30:00	LPRSA0189560	ABC013580				
11/10/55 4:00 PM	11/12/55 8:45 AM	40:45:00	LPRSA0189559	ABC013579				
11/16/55 9:30 AM	11/18/55 9:45 AM	48:15:00	LPRSA0189558	ABC013578				
1/30/56 1:15 PM	1/31/56 8:30 AM	19:15:00	LPRSA0189556	ABC013576				
2/2/56 12:00 PM	2/3/56 8:30 AM	20:30:00	LPRSA0189555	ABC013575				
2/6/56 4:00 PM	2/7/56 12:45 PM	20:45:00	LPRSA0189554	ABC013574				
2/18/56 8:45 AM	2/19/56 8:15 AM	23:30:00	LPRSA0189553	ABC013573				
3/8/56 2:00 AM	3/9/56 8:45 AM	30:45:00	LPRSA0189552	ABC013572				
3/14/56 10:45 AM	3/15/56 10:30 AM	23:45:00	LPRSA0189551	ABC013571				
3/21/56 4:05 PM	3/23/56 2:45 PM	46:40:00	LPRSA0189549	ABC013569				
3/29/56 5:30 PM	3/30/56 10:00 AM	16:30:00	LPRSA0189547	ABC013567				
4/7/56 3:30 AM	4/9/56 1:30 PM	58:00:00	LPRSA0189546	ABC013566				
4/11/56 5:25 PM	4/12/56 10:35 AM	17:10:00	LPRSA0189545	ABC013565				
5/2/56 11:05 PM	5/3/56 11:00 AM	11:55:00	LPRSA0189544	ABC013564				
6/2/56 5:00 PM	6/4/56 11:45 AM	42:45:00	LPRSA0189543	ABC013563				
6/27/56 4:50 PM	6/27/56 8:15 PM	3:25:00	LPRSA0189542	ABC013562				
7/16/56 4:15 PM	7/17/56 10:45 AM	18:30:00	LPRSA0189541	ABC013561				
7/21/56 11:30 AM	7/21/56 11:35 PM	12:05:00	LPRSA0189540	ABC013560				
7/27/56 10:00 AM	7/27/56 4:15 PM	6:15:00	LPRSA0189539	ABC013559				
8/6/56 6:15 PM	8/7/56 10:00 AM	15:45:00	LPRSA0189538	ABC013558				
8/21/56 6:00 AM	8/22/56 9:40 AM	27:40:00	LPRSA0189537	ABC013557				
9/6/56 6:30 PM	9/7/56 8:15 AM	13:45:00	LPRSA0189536	ABC013556				
9/7/56 10:15 AM	9/8/56 1:00 PM	26:45:00	LPRSA0189535	ABC013555				
9/27/56 6:15 PM	9/28/56 10:00 AM	15:45:00	LPRSA0189534	ABC013554				
10/22/56 10:00 PM	10/23/56 8:30 AM	10:30:00	LPRSA0189533	ABC013553				
10/31/56 1:30 PM	10/31/56 8:15 PM	6:45:00	LPRSA0189532	ABC013552				
11/1/56 11:00 AM	11/4/56 11:30 AM	72:30:00	LPRSA0189532	ABC013552				
11/18/56 4:00 AM	11/18/56 12:45 PM	8:45:00	LPRSA0189531	ABC013551				
11/22/56 2:15 AM	11/22/56 9:45 AM	7:30:00	LPRSA0189530	ABC013550				
12/9/56 4:45 PM	12/10/56 10:15 AM	17:30:00	LPRSA0189529	ABC013549				
12/14/56 10:00 AM	12/17/56 9:30 AM	71:30:00	LPRSA0189528	ABC013548				
12/22/56 11:45 PM	12/23/56 11:45 AM	12:00:00	LPRSA0189527	ABC013547				
12/27/56 3:00 PM	12/28/56 10:30 AM	19:30:00	LPRSA0189526	ABC013546				
1/8/57 11:00 AM	1/15/57 11:00 AM	168:00:00	LPRSA0189499	ABC013519				
1/23/57 5:30 AM	1/23/57 3:45 PM	10:15:00	LPRSA0189498	ABC013518				
2/9/57 3:45 PM	2/10/57 10:30 AM	18:45:00	LPRSA0189497	ABC013517				
2/26/57 5:30 PM	2/27/57 2:30 PM	21:00:00	LPRSA0189496	ABC013516				
3/1/57 4:00 PM	3/2/57 12:15 PM	20:15:00	LPRSA0189524	ABC013544				
3/8/57 11:00 AM	3/10/57 10:50 AM	47:50:00	LPRSA0189523	ABC013543				
3/19/57 11:00 PM	3/21/57 10:15 AM	35:15:00	LPRSA0189521	ABC013541				
4/2/57 9:15 AM	4/2/57 4:00 PM	6:45:00	LPRSA0189520	ABC013540				
4/4/57 9:25 PM	4/5/57 11:00 AM	13:35:00	LPRSA0189519	ABC013539				
4/5/57 2:30 PM	4/6/57 2:00 PM	23:30:00	LPRSA0189518	ABC013538				
4/9/57 9:15 AM	4/9/57 4:00 PM	6:45:00	LPRSA0189516	ABC013536				
4/10/57 9:15 AM	4/10/57 4:00 PM	6:45:00	LPRSA0189515	ABC013535				
4/11/57 8:30 AM	4/11/57 4:00 PM	7:30:00	LPRSA0189514	ABC013534				
4/12/57 8:30 AM	4/12/57 4:15 PM	7:45:00	LPRSA0189513	ABC013533				
4/18/57 10:45 PM	4/19/57 2:00 PM	15:15:00	LPRSA0189512	ABC013532				
4/23/57 7:15 AM	4/23/57 2:15 PM	7:00:00	LPRSA0189511	ABC013531				
4/29/57 1:30 PM	4/29/57 4:00 PM	2:30:00	LPRSA0189509	ABC013529				
5/14/57 9:15 PM	5/15/57 11:00 AM	13:45:00	LPRSA0189508	ABC013528				

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Exhibit 2-4c. Documented PVSC Bypasses at Herbert Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
	8/26/57 2:15 AM	8/26/57 6:30 PM	16:15:00	LPRSA0189507	ABC013527				
	9/10/57 11:15 PM	9/11/57 9:15 AM	10:00:00	LPRSA0189506	ABC013526				
	9/17/57 12:45 AM	9/17/57 11:00 AM	10:15:00	LPRSA0189505	ABC013525				
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	12/26/57 12:45 PM	12/26/57 3:00 PM	2:15:00	LPRSA0189500	ABC013520				
	1/22/58 3:00 AM	1/22/58 8:15 AM	5:15:00	LPRSA0189492	ABC013512				
	2/28/58 3:30 AM	2/28/58 1:30 PM	10:00:00	LPRSA0189488	ABC013508				
	4/28/58 10:00 AM	4/28/58 2:00 PM	4:00:00	LPRSA0189480	ABC013500				
	4/29/58 9:15 PM	4/30/58 8:30 AM	11:15:00	LPRSA0189479	ABC013499				
	5/7/58 1:15 PM	5/8/58 9:00 AM	19:45:00	LPRSA0189478	ABC013498				
	10/22/58 7:45 PM	10/24/58 9:00 AM	37:15:00	LPRSA0189469	ABC013489				
	10/25/58 6:45 PM	10/27/58 1:45 PM	43:00:00	LPRSA0189468	ABC013488				
	11/28/58 10:30 PM	11/29/58 12:30 PM	14:00:00	LPRSA0189466	ABC013486				
	3/6/59 9:30 AM	3/7/59 10:45 AM	25:15:00	LPRSA0189458	ABC013478				
	5/13/59 7:15 PM	5/14/59 8:30 AM	13:15:00	LPRSA0189438	ABC013458				
	6/2/59 6:15 PM	6/3/59 10:00 AM	15:45:00	LPRSA0189454	ABC013474				
	8/5/59 11:00 AM	8/6/59 8:30 AM	21:30:00	LPRSA0189448	ABC013468				
	8/9/59 5:00 AM	8/9/59 6:30 AM	1:30:00	LPRSA0189447	ABC013467				
	8/31/59 2:00 PM	9/2/59 1:15 PM	47:15:00	LPRSA0189445	ABC013465				
	10/1/59 1:45 PM	10/2/59 8:45 AM	19:00:00	LPRSA0189443	ABC013463				
	10/7/59 5:15 PM	10/8/59 8:15 AM	15:00:00	LPRSA0189442	ABC013462				
	10/9/59 4:30 AM	10/9/59 9:15 AM	4:45:00	LPRSA0189441	ABC013461				
	10/9/59 11:45 AM	10/10/59 2:15 PM	26:30:00	LPRSA0189440	ABC013460				
	10/24/59 10:30 AM	10/25/59 10:45 AM	24:15:00	LPRSA0189435	ABC013455				
	11/24/59 5:00 PM	11/25/59 10:55 AM	17:55:00	LPRSA0189432	ABC013452				
	12/7/59 12:40 AM	12/7/59 8:30 AM	7:50:00	LPRSA0189431	ABC013451				
	12/12/59 7:45 PM	12/13/59 10:30 AM	14:45:00	LPRSA0189430	ABC013450				
	12/29/59 12:45 AM	12/29/59 9:15 AM	8:30:00	LPRSA0189429	ABC013449				
	2/6/60 6:45 AM	2/6/60 2:00 PM	7:15:00	LPRSA0189423	ABC013443				
	2/11/60 6:15 AM	2/11/60 1:00 PM	6:45:00	LPRSA0189422	ABC013442				
	2/18/60 11:30 PM	2/19/60 3:45 PM	16:15:00	LPRSA0189421	ABC013441				
	2/25/60 11:50 PM	2/26/60 1:50 PM	14:00:00	LPRSA0189420	ABC013440				
	3/17/60 4:00 PM	3/18/60 8:40 AM	16:40:00	LPRSA0189418	ABC013438				
	4/3/60 10:45 PM	4/4/60 11:55 AM	13:10:00	LPRSA0189416	ABC013436				
	7/14/60 1:30 PM	7/15/60 10:35 AM	21:05:00	LPRSA0189404	ABC013424				
	7/30/60 10:00 AM	7/31/60 9:10 AM	23:10:00	LPRSA0189402	ABC013422				
	8/19/60 8:20 AM	8/20/60 9:15 AM	24:55:00	LPRSA0189399	ABC013419				
	9/12/60 12:45 AM	9/13/60 8:50 AM	32:05:00	LPRSA0189397	ABC013417				
	9/19/60 11:50 AM	9/21/60 10:20 PM	58:30:00	LPRSA0189396	ABC013416				
	10/20/60 9:00 AM	10/20/60 3:50 PM	6:50:00	LPRSA0189395	ABC013415				
	11/10/60 9:05 AM	11/10/60 4:00 PM	6:55:00	LPRSA0189394	ABC013414				
	12/12/60 2:30 PM	12/14/60 1:45 PM	47:15:00	LPRSA0189392	ABC013412				
	12/21/60 8:30 AM	12/22/60 11:35 AM	27:05:00	LPRSA0189391	ABC013411				
	1/1/61 9:40 AM	1/2/61 9:30 AM	23:50:00	LPRSA0189389	ABC013409				
	3/9/61 1:10 PM	3/10/61 8:20 AM	19:10:00	LPRSA0189381	ABC013401				
	3/14/61 5:15 AM	3/15/61 1:00 PM	31:45:00	LPRSA0189382	ABC013402				
	3/23/61 1:25 PM	3/24/61 2:10 PM	24:45:00	LPRSA0189383	ABC013403				
	4/10/61 9:50 AM	4/11/61 2:00 PM	28:10:00	LPRSA0189376	ABC013396				
	4/13/61 6:55 AM	4/14/61 2:55 PM	32:00:00	LPRSA0189375	ABC013395				
	4/16/61 12:55 PM	4/17/61 1:40 PM	24:45:00	LPRSA0189373	ABC013393				

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Exhibit 2-4c. Documented PVSC Bypasses at Herbert Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	4/18/61 3:15 PM	4/20/61 1:30 PM	46:15:00	LPRSA0189371	ABC013391				
	4/24/61 9:45 AM	4/27/61 8:15 AM	70:30:00	LPRSA0189370	ABC013390				
	7/15/61 8:40 PM	7/17/61 10:30 AM	37:50:00	LPRSA0189358	ABC013378				
	7/20/61 9:15 AM	7/21/61 8:15 AM	23:00:00	LPRSA0189357	ABC013377				
	8/3/61 12:40 PM	8/4/61 11:05 AM	22:25:00	LPRSA0189354	ABC013374				
	8/21/61 3:10 PM	8/22/61 8:20 AM	17:10:00	LPRSA0189353	ABC013373				
	8/23/61 11:10 AM	8/24/61 2:00 PM	26:50:00	LPRSA0189352	ABC013372				
	9/19/61 4:15 PM	9/22/61 11:20 AM	67:05:00	LPRSA0189348	ABC013368				
	11/24/61 10:30 AM	11/25/61 10:40 AM	24:10:00	LPRSA0189341	ABC013361				
	12/18/61 9:00 AM	12/20/61 1:35 PM	52:35:00	LPRSA0189338	ABC013358				
	12/28/61 10:35 AM	12/29/61 9:15 AM	22:40:00	LPRSA0189337	ABC013357				
	1/6/62 12:30 PM	1/8/62 1:50 PM	49:20:00	LPRSA0189336	ABC013356				
	1/15/62 4:50 PM	1/16/62 8:15 AM	15:25:00	LPRSA0189335	ABC013355				
	1/26/62 3:45 PM	1/27/62 10:25 AM	18:40:00	LPRSA0189334	ABC013354				
	2/24/62 6:35 AM	2/25/62 12:10 PM	29:35:00	LPRSA0189330	ABC013350				
	2/26/62 11:25 AM	3/1/62 3:20 PM	75:55:00	LPRSA0189329	ABC013349				
	3/6/62 11:00 AM	3/7/62 9:20 AM	22:20:00	LPRSA0189328	ABC013348				
	3/12/62 8:15 AM	3/13/62 1:35 PM	29:20:00	LPRSA0189327	ABC013347				
	3/21/62 1:50 PM	3/22/62 8:50 AM	19:00:00	LPRSA0189326	ABC013346				
	4/1/62 6:15 AM	4/2/62 10:30 AM	28:15:00	LPRSA0189325	ABC013345				
	4/7/62 3:35 PM	4/9/62 9:15 AM	41:40:00	LPRSA0189324	ABC013344				
	4/9/62 4:15 PM	4/10/62 9:00 AM	16:45:00	LPRSA0189323	ABC013343				
	6/5/62 10:45 PM	6/6/62 8:30 AM	9:45:00	LPRSA0189315	ABC013335				
	6/13/62 1:45 PM	6/14/62 8:20 AM	18:35:00	LPRSA0189314	ABC013334				
	6/26/62 6:00 PM	6/27/62 8:30 AM	14:30:00	LPRSA0189312	ABC013332				
	7/18/62 2:10 PM	7/19/62 8:10 AM	18:00:00	LPRSA0189310	ABC013330				
	8/7/62 2:00 PM	8/8/62 8:30 AM	18:30:00	LPRSA0189308	ABC013328				
	8/9/62 8:45 PM	8/10/62 3:35 PM	18:50:00	LPRSA0189307	ABC013327				
	8/10/62 11:15 PM	8/11/62 1:50 PM	14:35:00	LPRSA0189306	ABC013326				
	8/17/62 6:45 PM	8/18/62 10:05 AM	15:20:00	LPRSA0189305	ABC013325				
	8/21/62 11:55 AM	8/22/62 1:45 PM	25:50:00	LPRSA0189304	ABC013324				
	8/28/62 6:00 AM	8/29/62 1:15 PM	31:15:00	LPRSA0189303	ABC013323				
	9/5/62 11:00 AM	9/6/62 8:10 AM	21:10:00	LPRSA0189301	ABC013321				
	9/17/62 6:40 PM	9/18/62 8:25 AM	13:45:00	LPRSA0189299	ABC013319				
	9/27/62 10:00 AM	9/29/62 11:20 AM	49:20:00	LPRSA0189296	ABC013316				
	10/5/62 5:15 AM	10/7/62 10:25 AM	53:10:00	LPRSA0189295	ABC013315				
	10/23/62 11:55 AM	10/24/62 10:55 AM	23:00:00	LPRSA0189291	ABC013311				
	10/25/62 11:25 PM	10/27/62 10:05 AM	34:40:00	LPRSA0189290	ABC013310				
	10/30/62 2:45 PM	11/1/62 3:00 PM	48:15:00	LPRSA0189289	ABC013309				
	11/3/62 10:10 AM	11/5/62 8:25 AM	46:15:00	LPRSA0189288	ABC013308				
	11/9/62 4:15 PM	11/11/62 11:50 AM	43:35:00	LPRSA0189287	ABC013307				
	11/13/62 3:50 PM	11/14/62 8:25 AM	16:35:00	LPRSA0189286	ABC013306				
	11/18/62 1:00 PM	11/19/62 3:35 PM	26:35:00	LPRSA0189285	ABC013305				
	11/21/62 10:20 PM	11/23/62 9:25 AM	35:05:00	LPRSA0189284	ABC013304				
	12/5/62 8:40 AM	12/8/62 11:00 AM	74:20:00	LPRSA0189283	ABC013303				
	12/22/62 1:00 PM	12/24/62 10:20 AM	45:20:00	LPRSA0189282	ABC013302				
	12/29/62 8:55 PM	12/30/62 12:45 PM	15:50:00	LPRSA0189280	ABC013300				
*	1/1/63 12:00 AM	9/30/74 11:59 PM							
	Subtotal		13434:55:00						

* Missing data.
Source: PVSC throw-out logs.

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Exhibit 2-4c. Documented PVSC Bypasses at Herbert Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
(1974-19745)								
	10/16/74 4:00 AM	10/17/74 8:00 PM	40:00:00	LPRSA0195712				
	12/2/74 1:00 AM	12/3/74 8:00 AM	31:00:00	LPRSA0195714				
	12/8/74 3:00 PM	12/9/74 9:00 AM	18:00:00	LPRSA0195714				
	12/16/74 11:00 AM	12/17/74 9:00 AM	22:00:00	LPRSA0195714				
	1/1/75	1/1/75	0:00:00	LPRSA0196708				
	1/9/75	1/9/75	1:00:00	LPRSA0196708	3.6	0.15	195	244
	1/9/75 6:00 AM	1/9/75 1:00 PM	6:00:00	LPRSA0195715				
	1/13/75	1/13/75	5:00:00	LPRSA0196708	10.6	2.21	195	3,599
	1/13/75 10:00 AM	1/14/75 8:00 AM	17:00:00	LPRSA0195715				
	1/18/75	1/18/75	2:48:00	LPRSA0196708	12.5	1.46	195	2,377
	1/18/75 3:00 PM	1/19/75 6:00 AM	12:12:00	LPRSA0195715				
	1/29/75	1/29/75	2:48:00	LPRSA0196708	2.0	0.23	195	380
	1/29/75 6:00 AM	1/29/75 3:00 PM	6:12:00	LPRSA0195715				
	2/24/75	2/24/75	0:30:00	LPRSA0196708	2.4	0.05	195	81
	2/24/75 5:00 AM	2/25/75 6:00 AM	24:30:00	LPRSA0195716				
	3/19/75 4:00 PM	3/20/75 1:00 PM	21:00:00	LPRSA0195717				
	4/3/75 8:00 AM	4/3/75 5:00 PM	9:00:00	LPRSA0195718				
	4/24/75 3:00 AM	4/24/75 8:00 AM	5:00:00	LPRSA0195718				
	4/25/75 2:00 AM	4/25/75 8:00 AM	6:00:00	LPRSA0195718				
	5/13/75 10:00 PM	5/14/75 8:00 AM	10:00:00	LPRSA0195719				
	6/1/75 7:00 AM	6/1/75 4:00 PM	9:00:00	LPRSA0195720				
	6/5/75	6/6/75	6:42:00	LPRSA0196709	11.4	3.18	195	5,187
	6/5/75 10:00 PM	6/6/75 11:00 AM	6:18:00	LPRSA0195720				
	6/6/75 5:00 PM	6/7/75 8:00 AM	15:00:00	LPRSA0195720				
	6/12/75 11:00 AM	6/13/75 9:00 PM	34:00:00	LPRSA0195720				
	7/4/75 6:00 AM	7/4/75 1:00 PM	7:00:00	LPRSA0195721				
	7/7/75 10:00 AM	7/7/75 11:00 PM	13:00:00	LPRSA0195721				
	7/9/75 8:00 PM	7/10/75 2:00 AM	6:00:00	LPRSA0195721				
	7/13/75 12:00 PM	7/16/75 5:00 PM	77:00:00	LPRSA0195721				
	7/25/75 3:00 AM	7/25/75 3:00 PM	12:00:00	LPRSA0195721				
	9/23/75 3:00 AM	9/28/75 11:00 AM	128:00:00	LPRSA0195722				
*	10/1/75	12/31/04						
Subtotal			**554:00:00**			**7.28**		**11,870**
Estimated Mass/Bypass Time (lb/hr)								**631**
Estimated Bypassed Volume Rate (MG/hr)					**0.387**			

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

		Elapsed Time (hours)	Frequency of Overflows (#/yr)
1/1/2005	12/31/2005	453.21	36
1/1/2006	12/31/2006	612.47	46
1/1/2007	12/31/2007	409.25	30
1/1/2008	12/31/2008	607.96	43
1/1/2009	12/31/2009	171.35	10
1/1/2010	12/31/2010	463.29	38
1/1/2011	12/31/2011	348.62	24

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Exhibit 2-4c. Documented PVSC Bypasses at Herbert Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	1/1/2012	12/31/2012	115.63	24				
	1/1/2013	12/31/2013	316.84	34				
	1/1/2014	12/31/2014	316.84	34				
*	1/1/2015	9/30/2016						
	Subtotal (2005-2014)		**3815.46**					
	Average annual bypass time (hr)		**381.55**					

* Missing data.
Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 8:30 AM	6:00:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 9:30 AM	20:00:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/4/50 9:00 PM	8:30:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 9:00 AM	10:30:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/25/51 7:00 PM	3:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/29/51 8:30 AM	15:30:00	LPRSA0188625	ABC012645				
	1/29/51 7:30 PM	1/30/51 10:00 AM	14:30:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648				
	2/7/51 11:00 AM	2/8/51 2:30 PM	27:30:00	LPRSA0188585	ABC012605				
	2/10/51 5:30 AM	2/10/51 12:00 PM	6:30:00	LPRSA0188588	ABC012608				
	2/13/51 7:45 PM	2/14/51 10:00 AM	14:15:00	LPRSA0188588	ABC012608				
	2/14/51 5:45 PM	2/15/51 9:30 AM	15:45:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616				
	2/22/51 10:30 AM	2/22/51 11:45 AM	1:15:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 3:00 PM	3/2/51 10:00 AM	19:00:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/20/51 12:00 PM	19:00:00	LPRSA0188616	ABC012636				
	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/18/52 9:00 AM	29:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/21/52 1:30 PM	19:30:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/3/52 11:00 AM	62:00:00	LPRSA0189753	ABC013773				
	3/3/52 5:30 PM	3/5/52 2:30 PM	45:00:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/17/52 2:00 PM	153:00:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/21/52 11:00 AM	48:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/25/52 10:30 AM	65:30:00	LPRSA0189750	ABC013770				
	4/4/52 4:45 PM	4/6/52 9:00 AM	40:15:00	LPRSA0189749	ABC013769				
	4/14/52 4:00 AM	4/16/52 11:00 AM	55:00:00	LPRSA0189748	ABC013768				
	4/23/52 4:30 PM	4/24/52 10:30 AM	18:00:00	LPRSA0189747	ABC013767				
	4/25/52 11:00 AM	4/28/52 5:00 PM	78:00:00	LPRSA0189744	ABC013764				
	4/29/52 3:15 PM	5/7/52 2:30 PM	191:15:00	LPRSA0189744	ABC013764				
	5/11/52 10:00 PM	5/13/52 11:00 AM	37:00:00	LPRSA0189743	ABC013763				
	5/18/52 7:45 AM	5/23/52 2:15 PM	126:30:00	LPRSA0189741	ABC013761				
	5/25/52 9:15 AM	5/27/52 9:00 AM	47:45:00	LPRSA0189740	ABC013760				
	5/29/52 6:15 PM	5/30/52 9:30 AM	15:15:00	LPRSA0189738	ABC013758				
	6/3/52 12:15 PM	6/6/52 9:45 AM	69:30:00	LPRSA0189736	ABC013756				
	6/9/52 9:00 AM	6/14/52 9:30 AM	120:30:00	LPRSA0189737	ABC013757				

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
6/17/52 5:15 PM	6/18/52 11:00 AM	17:45:00	LPRSA0189735	ABC013755				
6/19/52 3:30 PM	6/20/52 10:00 AM	18:30:00	LPRSA0189734	ABC013754				
6/27/52 4:00 PM	6/28/52 8:30 AM	16:30:00	LPRSA0189729	ABC013749				
6/29/52 12:45 AM	6/30/52 9:45 AM	33:00:00	LPRSA0189728	ABC013748				
7/8/52 4:00 PM	7/10/52 9:40 AM	41:40:00	LPRSA0189730	ABC013750				
7/21/52 4:15 PM	7/22/52 10:15 AM	18:00:00	LPRSA0189725	ABC013745				
7/31/52 4:45 PM	8/1/52 9:45 AM	17:00:00	LPRSA0189724	ABC013744				
8/2/52 4:00 PM	8/3/52 9:15 AM	17:15:00	LPRSA0189725	ABC013745				
8/6/52 3:00 PM	8/7/52 2:00 PM	23:00:00	LPRSA0189715	ABC013735				
8/8/52 2:00 PM	8/11/52 9:00 AM	67:00:00	LPRSA0189715	ABC013735				
8/11/52 5:15 PM	8/12/52 8:45 AM	15:30:00	LPRSA0189719	ABC013739				
8/12/52 5:00 PM	8/13/52 8:45 AM	15:45:00	LPRSA0189721	ABC013741				
8/13/52 4:45 PM	8/14/52 8:45 AM	16:00:00	LPRSA0189720	ABC013742				
8/15/52 4:45 PM	8/17/52 8:45 AM	40:00:00	LPRSA0189714	ABC013734				
8/21/52 4:15 PM	8/22/52 9:45 AM	17:30:00	LPRSA0189713	ABC013733				
8/30/52 9:45 AM	9/2/52 8:45 AM	71:00:00	LPRSA0189712	ABC013732				
9/2/52 4:45 PM	9/3/52 1:45 PM	21:00:00	LPRSA0189711	ABC013731				
9/15/52 4:00 PM	9/17/52 4:45 PM	48:45:00	LPRSA0189709	ABC013729				
9/18/52 12:45 PM	9/20/52 8:45 AM	44:00:00	LPRSA0189710	ABC013730				
9/23/52 10:15 AM	9/23/52 1:45 PM	3:30:00	LPRSA0189708	ABC013728				
10/2/52 6:45 PM	10/3/52 1:15 PM	18:30:00	LPRSA0189707	ABC013727				
10/28/52 5:15 PM	10/29/52 8:45 AM	15:30:00	LPRSA0189706	ABC013726				
11/2/52 9:00 AM	11/2/52 2:00 PM	5:00:00	LPRSA0189705	ABC013725				
11/3/52 1:45 PM	11/4/52 8:45 AM	19:00:00	LPRSA0189703	ABC013723				
11/10/52 4:15 PM	11/11/52 8:45 AM	16:30:00	LPRSA0189704	ABC013724				
11/14/52 1:15 PM	12/1/52 1:15 PM	408:00:00	LPRSA0189701	ABC013721				
12/2/52 1:45 PM	12/5/52 5:45 PM	76:00:00	LPRSA0189702	ABC013722				
1/21/53 2:45 PM	1/22/53 8:45 AM	18:00:00	LPRSA0189656	ABC013676				
1/24/53 9:45 AM	1/24/53 3:45 PM	6:00:00	LPRSA0189657	ABC013677				
2/11/53 5:15 PM	2/13/53 10:15 AM	41:00:00	LPRSA0189658	ABC013678				
2/15/53 10:45 AM	2/15/53 4:15 PM	5:30:00	LPRSA0189659	ABC013679				
2/21/53 8:45 AM	2/22/53 9:00 PM	36:15:00	LPRSA0189660	ABC013680				
2/25/53 8:45 AM	3/10/53 6:15 PM	321:30:00	LPRSA0189661	ABC013681				
3/15/53 1:00 PM	3/23/53 2:00 PM	193:00:00	LPRSA0189666	ABC013686				
3/24/53 9:45 AM	3/25/53 10:00 AM	24:15:00	LPRSA0189666	ABC013686				
3/25/53 3:45 PM	3/26/53 9:45 AM	18:00:00	LPRSA0189666	ABC013686				
3/30/53 2:45 PM	4/29/53 9:30 AM	714:45:00	LPRSA0189666	ABC013686				
4/30/53 4:30 PM	5/1/53 2:00 PM	21:30:00	LPRSA0189666	ABC013686				
5/1/53 4:45 PM	5/5/53 4:00 PM	95:15:00	LPRSA0189666	ABC013686				
5/8/53 10:15 PM	5/9/53 9:30 AM	11:15:00	LPRSA0189666	ABC013686				
5/13/53 11:00 PM	5/22/53 6:45 PM	211:45:00	LPRSA0189666	ABC013686				
5/25/53 10:00 AM	5/25/53 3:15 PM	5:15:00	LPRSA0189666	ABC013686				
5/27/53 10:45 AM	5/28/53 1:45 PM	27:00:00	LPRSA0189666	ABC013686				
6/13/53 5:00 PM	6/14/53 2:00 PM	21:00:00	LPRSA0189674	ABC013694				
6/18/53 4:30 PM	6/19/53 9:30 AM	17:00:00	LPRSA0189676	ABC013696				
6/22/53 10:00 AM	6/22/53 6:45 PM	8:45:00	LPRSA0189677	ABC013697				
6/23/53 10:00 AM	7/2/53 2:00 PM	220:00:00	LPRSA0189678	ABC013698				
7/6/53 8:00 PM	7/7/53 8:30 AM	12:30:00	LPRSA0189681	ABC013701				
7/20/53 9:25 PM	7/21/53 8:55 AM	11:30:00	LPRSA0189682	ABC013702				
7/23/53 8:45 AM	7/23/53 3:15 PM	6:30:00	LPRSA0189684	ABC013704				
8/10/53 1:00 AM	8/10/53 10:30 AM	9:30:00	LPRSA0189685	ABC013705				
8/14/53 1:15 PM	8/15/53 8:30 AM	19:15:00	LPRSA0189686	ABC013706				
9/16/53 1:45 AM	9/16/53 8:15 AM	6:30:00	LPRSA0189688	ABC013708				
10/6/53 6:15 PM	10/7/53 9:30 AM	15:15:00	LPRSA0189689	ABC013709				

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	10/27/53 4:50 PM	10/28/53 2:00 PM	21:10:00	LPRSA0189692	ABC013712				
	10/29/53 2:15 PM	10/29/53 4:30 PM	2:15:00	LPRSA0189693	ABC013713				
	10/29/53 7:00 PM	10/30/53 9:30 AM	14:30:00	LPRSA0189694	ABC013714				
	11/7/53 7:15 AM	11/8/53 10:45 AM	27:30:00	LPRSA0189695	ABC013715				
*	11/16/53 9:45 AM			LPRSA0189653	ABC013673				
	11/23/53 10:00 AM	11/24/53 1:45 PM	27:45:00	LPRSA0189698	ABC013718				
	11/25/53 10:00 AM	11/26/53 9:00 AM	23:00:00	LPRSA0189652	ABC013672				
	11/30/53 10:00 AM	12/4/53 11:00 AM	97:00:00	LPRSA0189651	ABC013671				
	12/6/53 9:30 AM	12/7/53 9:45 AM	24:15:00	LPRSA0189650	ABC013670				
	12/9/53 4:30 PM	12/10/53 4:30 PM	24:00:00	LPRSA0189649	ABC013669				
	12/12/53 4:30 PM	12/13/53 8:30 AM	16:00:00	LPRSA0189648	ABC013668				
	12/14/53 6:15 AM	12/14/53 3:30 PM	9:15:00	LPRSA0189647	ABC013667				
	12/28/53 5:00 PM	12/29/53 1:30 PM	20:30:00	LPRSA0189646	ABC013666				
	1/14/54 4:45 PM	1/18/54 9:45 AM	89:00:00	LPRSA0189592	ABC013612				
	1/18/54 2:45 PM	1/22/54 9:45 AM	91:00:00	LPRSA0189591	ABC013611				
	1/22/54 2:45 PM	1/25/54 10:00 AM	67:15:00	LPRSA0189590	ABC013610				
	1/25/54 1:45 PM	2/2/54 10:00 AM	188:15:00	LPRSA0189590	ABC013610				
	2/3/54 1:30 PM	2/4/54 9:30 AM	20:00:00	LPRSA0189589	ABC013609				
	2/8/54 5:30 PM	2/9/54 9:30 AM	16:00:00	LPRSA0189588	ABC013608				
	2/16/54 5:00 PM	2/17/54 2:00 PM	21:00:00	LPRSA0189587	ABC013607				
	2/21/54 5:15 PM	2/22/54 8:45 AM	15:30:00	LPRSA0189586	ABC013606				
	2/23/54 12:00 PM	2/27/54 8:45 AM	92:45:00	LPRSA0189621	ABC013641				
	3/1/54 11:00 AM	3/5/54 1:45 PM	98:45:00	LPRSA0189619	ABC013639				
	3/13/54 3:00 PM	3/15/54 9:30 AM	42:30:00	LPRSA0189618	ABC013638				
	3/19/54 4:30 PM	3/20/54 9:05 AM	16:35:00	LPRSA0189617	ABC013637				
	3/25/54 10:00 AM	3/26/54 8:15 AM	22:15:00	LPRSA0189616	ABC013636				
	4/8/54 1:45 PM	4/9/54 9:30 AM	19:45:00	LPRSA0189613	ABC013633				
	4/13/54 12:30 PM	4/13/54 3:40 PM	3:10:00	LPRSA0189623	ABC013643				
	4/16/54 1:10 PM	4/18/54 10:10 AM	45:00:00	LPRSA0189632	ABC013652				
	4/19/54 3:45 PM	4/21/54 4:20 PM	48:35:00	LPRSA0189615	ABC013635				
	4/23/54 1:30 PM	4/25/54 9:30 AM	44:00:00	LPRSA0189614	ABC013634				
	4/28/54 3:15 PM	4/29/54 9:30 AM	18:15:00	LPRSA0189612	ABC013632				
	5/3/54 10:45 AM	5/26/54 10:45 AM	552:00:00	LPRSA0189631	ABC013651				
	6/1/54 11:45 AM	6/9/54 10:00 AM	190:15:00	LPRSA0189630	ABC013650				
	7/7/54 4:45 PM	7/8/54 9:45 AM	17:00:00	LPRSA0189624	ABC013644				
	8/3/54 9:30 AM	8/4/54 9:30 AM	24:00:00	LPRSA0189620	ABC013640				
	8/9/54 9:15 AM	8/11/54 9:45 AM	48:30:00	LPRSA0189622	ABC013642				
	8/19/54 11:00 PM	8/20/54 10:15 AM	11:15:00	LPRSA0189611	ABC013631				
	8/20/54 4:45 PM	8/22/54 8:45 AM	40:00:00	LPRSA0189610	ABC013630				
	8/25/54 5:00 PM	8/26/54 9:30 AM	16:30:00	LPRSA0189609	ABC013629				
	8/30/54 5:00 PM	9/1/54 9:45 AM	40:45:00	LPRSA0189608	ABC013628				
	9/8/54 2:45 PM	9/9/54 9:30 AM	18:45:00	LPRSA0189607	ABC013627				
	9/10/54 1:45 PM	9/12/54 9:30 AM	43:45:00	LPRSA0189606	ABC013626				
	9/14/54 4:45 PM	9/18/54 1:15 PM	92:30:00	LPRSA0189605	ABC013625				
	10/4/54 9:15 AM	10/8/54 3:15 PM	102:00:00	LPRSA0189604	ABC013624				
	10/15/54 11:30 AM	10/16/54 7:00 AM	19:30:00	LPRSA0189603	ABC013623				
	10/27/54 4:45 PM	10/28/54 9:45 AM	17:00:00	LPRSA0189602	ABC013622				
	10/29/54 9:45 AM	10/30/54 9:15 AM	23:30:00	LPRSA0189601	ABC013621				
	11/2/54 1:15 PM	11/4/54 9:30 AM	44:15:00	LPRSA0189600	ABC013620				
	11/8/54 1:30 PM	11/9/54 1:30 PM	24:00:00	LPRSA0189599	ABC013619				
	11/15/54 10:00 AM	12/2/54 2:45 AM	400:45:00	LPRSA0189597	ABC013617				
	12/9/54 2:15 PM	12/10/54 1:30 PM	23:15:00	LPRSA0189596	ABC013616				
	12/14/54 9:45 AM	12/15/54 1:15 PM	27:30:00	LPRSA0189595	ABC013615				
	12/16/54 3:15 PM	12/16/54 8:30 PM	5:15:00	LPRSA0189594	ABC013614				

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
12/18/54 10:45 AM	12/19/54 8:45 AM	22:00:00	LPRSA0189593	ABC013613				
12/29/54 1:15 PM	12/30/54 2:30 PM	25:15:00	LPRSA0189585	ABC013605				
1/6/55 2:15 PM	1/7/55 9:30 AM	19:15:00	LPRSA0189582	ABC013602				
1/28/55 10:00 AM	2/4/55 10:30 AM	168:30:00	LPRSA0189580	ABC013600				
2/14/55 3:30 PM	2/18/55 4:45 PM	97:15:00	LPRSA0189580	ABC013600				
2/21/55 1:45 PM	3/7/55 10:00 AM	332:15:00	LPRSA0189579	ABC013599				
3/7/55 2:00 PM	3/7/55 4:30 PM	2:30:00	LPRSA0189578	ABC013598				
3/21/55 3:15 PM	3/23/55 2:00 PM	46:45:00	LPRSA0189577	ABC013597				
3/28/55 1:45 PM	3/30/55 4:45 PM	51:00:00	LPRSA0189576	ABC013596				
4/6/55 2:15 PM	4/7/55 4:30 PM	26:15:00	LPRSA0189575	ABC013595				
4/12/55 2:45 PM	4/14/55 1:45 PM	47:00:00	LPRSA0189574	ABC013594				
5/31/55 1:30 PM	5/31/55 6:30 PM	5:00:00	LPRSA0189572	ABC013592				
6/21/55 11:30 PM	6/22/55 8:45 AM	9:15:00	LPRSA0189571	ABC013591				
8/7/55 11:45 PM	8/8/55 8:30 AM	8:45:00	LPRSA0189570	ABC013590				
8/11/55 7:45 PM	8/14/55 9:00 AM	61:15:00	LPRSA0189569	ABC013589				
8/15/55 5:15 PM	8/16/55 3:00 PM	21:45:00	LPRSA0189568	ABC013588				
8/18/55 4:30 PM	8/20/55 9:30 AM	41:00:00	LPRSA0189567	ABC013587				
8/21/55 10:15 PM	8/24/55 1:00 PM	62:45:00	LPRSA0189566	ABC013586				
8/24/55 3:30 PM	8/25/55 9:30 AM	18:00:00	LPRSA0189565	ABC013585				
8/25/55 4:30 PM	8/26/55 10:00 AM	17:30:00	LPRSA0189564	ABC013584				
9/24/55 5:45 AM	9/26/55 8:45 AM	51:00:00	LPRSA0189563	ABC013583				
10/6/55 8:45 AM	10/7/55 1:30 PM	28:45:00	LPRSA0189562	ABC013582				
10/14/55 1:15 PM	10/15/55 3:15 PM	26:00:00	LPRSA0189561	ABC013581				
10/16/55 3:15 PM	10/25/55 10:15 AM	211:00:00	LPRSA0189561	ABC013581				
10/30/55 10:15 AM	11/1/55 1:45 PM	51:30:00	LPRSA0189560	ABC013580				
11/10/55 4:15 PM	11/12/55 9:00 AM	40:45:00	LPRSA0189559	ABC013579				
11/16/55 9:45 AM	11/18/55 10:00 AM	48:15:00	LPRSA0189558	ABC013578				
1/30/56 1:30 PM	1/31/56 8:45 AM	19:15:00	LPRSA0189556	ABC013576				
2/2/56 12:15 PM	2/3/56 8:45 AM	20:30:00	LPRSA0189555	ABC013575				
2/6/56 4:15 PM	2/7/56 1:00 PM	20:45:00	LPRSA0189554	ABC013574				
2/18/56 9:00 AM	2/19/56 8:30 AM	23:30:00	LPRSA0189553	ABC013573				
3/8/56 2:15 AM	3/9/56 9:00 AM	30:45:00	LPRSA0189552	ABC013572				
3/21/56 3:50 PM	3/23/56 2:30 PM	46:40:00	LPRSA0189549	ABC013569				
3/29/56 5:15 PM	3/30/56 9:45 AM	16:30:00	LPRSA0189547	ABC013567				
4/7/56 3:10 AM	4/9/56 1:45 PM	58:35:00	LPRSA0189546	ABC013566				
4/11/56 5:10 PM	4/12/56 10:20 AM	17:10:00	LPRSA0189545	ABC013565				
5/2/56 10:55 PM	5/3/56 10:45 AM	11:50:00	LPRSA0189544	ABC013564				
6/2/56 4:45 PM	6/4/56 11:30 AM	42:45:00	LPRSA0189543	ABC013563				
6/27/56 4:35 PM	6/27/56 6:15 PM	1:40:00	LPRSA0189542	ABC013562				
7/16/56 4:00 PM	7/17/56 10:30 AM	18:30:00	LPRSA0189541	ABC013561				
7/21/56 11:15 AM	7/21/56 11:20 PM	12:05:00	LPRSA0189540	ABC013560				
7/27/56 10:15 AM	7/28/56 9:35 AM	23:20:00	LPRSA0189539	ABC013559				
8/6/56 6:00 PM	8/7/56 9:45 AM	15:45:00	LPRSA0189538	ABC013558				
8/21/56 4:30 AM	8/22/56 9:25 AM	28:55:00	LPRSA0189537	ABC013557				
9/6/56 6:45 PM	9/7/56 8:30 AM	13:45:00	LPRSA0189536	ABC013556				
9/7/56 10:30 AM	9/8/56 12:45 PM	26:15:00	LPRSA0189535	ABC013555				
9/27/56 5:30 PM	9/28/56 9:45 AM	16:15:00	LPRSA0189534	ABC013554				
10/22/56 10:15 PM	10/23/56 8:45 AM	10:30:00	LPRSA0189533	ABC013553				
10/31/56 1:15 PM	10/31/56 8:00 PM	6:45:00	LPRSA0189532	ABC013552				
11/1/56 10:45 AM	11/4/56 11:45 AM	73:00:00	LPRSA0189532	ABC013552				
11/18/56 3:45 AM	11/18/56 12:30 PM	8:45:00	LPRSA0189531	ABC013551				
11/22/56 2:00 AM	11/22/56 9:30 AM	7:30:00	LPRSA0189530	ABC013550				
12/9/56 4:30 PM	12/10/56 10:00 AM	17:30:00	LPRSA0189529	ABC013549				

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	12/14/56 9:45 AM	12/17/56 9:15 AM	71:30:00	LPRSA0189528	ABC013548				
	12/22/56 11:30 PM	12/23/56 11:30 AM	12:00:00	LPRSA0189527	ABC013547				
	1/23/57 5:15 AM	1/23/57 3:30 PM	10:15:00	LPRSA0189498	ABC013518				
	2/9/57 3:30 PM	2/10/57 10:15 AM	18:45:00	LPRSA0189497	ABC013517				
	2/26/57 5:15 PM	2/27/57 2:15 PM	21:00:00	LPRSA0189496	ABC013516				
	3/1/57 3:45 PM	3/2/57 12:00 PM	20:15:00	LPRSA0189524	ABC013544				
	3/8/57 10:45 AM	3/10/57 10:40 AM	47:55:00	LPRSA0189523	ABC013543				
	3/19/57 10:45 PM	3/21/57 10:00 AM	35:15:00	LPRSA0189521	ABC013541				
	4/2/57 9:00 AM	4/2/57 3:45 PM	6:45:00	LPRSA0189520	ABC013540				
	4/4/57 9:40 PM	4/5/57 11:15 AM	13:35:00	LPRSA0189519	ABC013539				
	4/5/57 2:45 PM	4/6/57 1:50 PM	23:05:00	LPRSA0189518	ABC013538				
	4/9/57 10:45 AM	4/9/57 5:30 PM	6:45:00	LPRSA0189516	ABC013536				
	4/10/57 10:45 AM	4/10/57 5:30 PM	6:45:00	LPRSA0189515	ABC013535				
	4/11/57 10:00 AM	4/11/57 5:30 PM	7:30:00	LPRSA0189514	ABC013534				
	4/12/57 10:00 AM	4/12/57 5:45 PM	7:45:00	LPRSA0189513	ABC013533				
	4/18/57 10:30 PM	4/19/57 2:15 PM	15:45:00	LPRSA0189512	ABC013532				
	4/23/57 8:30 AM	4/23/57 3:30 PM	7:00:00	LPRSA0189511	ABC013531				
	4/29/57 1:45 PM	4/29/57 4:15 PM	2:30:00	LPRSA0189509	ABC013529				
	5/14/57 10:30 PM	5/15/57 12:15 PM	13:45:00	LPRSA0189508	ABC013528				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
	8/26/57 2:00 AM	8/26/57 6:45 PM	16:45:00	LPRSA0189507	ABC013527				
	9/10/57 11:30 PM	9/11/57 9:30 AM	10:00:00	LPRSA0189506	ABC013526				
	9/17/57 12:30 AM	9/17/57 10:45 AM	10:15:00	LPRSA0189505	ABC013525				
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	12/26/57 12:30 PM	12/26/57 2:45 PM	2:15:00	LPRSA0189500	ABC013520				
	1/22/58 3:20 AM	1/22/58 8:30 AM	5:10:00	LPRSA0189492	ABC013512				
	2/28/58 3:45 AM	2/28/58 1:45 PM	10:00:00	LPRSA0189488	ABC013508				
	4/28/58 10:15 AM	4/28/58 2:15 PM	4:00:00	LPRSA0189480	ABC013500				
	4/29/58 9:00 PM	4/30/58 8:45 AM	11:45:00	LPRSA0189479	ABC013499				
	5/7/58 1:00 PM	5/8/58 8:30 AM	19:30:00	LPRSA0189478	ABC013498				
	10/22/58 7:30 PM	10/24/58 10:30 AM	39:00:00	LPRSA0189469	ABC013489				
	10/25/58 6:30 PM	10/27/58 2:00 PM	43:30:00	LPRSA0189468	ABC013488				
	11/28/58 10:15 PM	11/29/58 12:15 PM	14:00:00	LPRSA0189466	ABC013486				
	3/6/59 9:15 AM	3/7/59 10:30 AM	25:15:00	LPRSA0189458	ABC013478				
	5/13/59 7:30 PM	5/14/59 8:45 AM	13:15:00	LPRSA0189438	ABC013458				
	6/2/59 6:00 PM	6/3/59 9:45 AM	15:45:00	LPRSA0189454	ABC013474				
	8/5/59 11:15 AM	8/6/59 9:30 AM	22:15:00	LPRSA0189448	ABC013468				
	8/9/59 5:15 AM	8/9/59 6:45 AM	1:30:00	LPRSA0189447	ABC013467				
	8/31/59 1:45 PM	9/3/59 9:45 AM	68:00:00	LPRSA0189445	ABC013465				
	10/1/59 1:30 PM	10/2/59 8:30 AM	19:00:00	LPRSA0189443	ABC013463				
	10/9/59 12:00 PM	10/10/59 2:30 PM	26:30:00	LPRSA0189440	ABC013460				
	10/24/59 10:45 AM	10/25/59 11:00 AM	24:15:00	LPRSA0189435	ABC013455				
	11/24/59 4:45 PM	11/25/59 10:40 AM	17:55:00	LPRSA0189432	ABC013452				
	12/7/59 1:00 AM	12/7/59 8:45 AM	7:45:00	LPRSA0189431	ABC013451				
	12/12/59 7:15 PM	12/13/59 9:45 AM	14:30:00	LPRSA0189430	ABC013450				
	12/29/59 12:20 AM	12/29/59 8:45 AM	8:25:00	LPRSA0189429	ABC013449				
	2/6/60 6:30 AM	2/6/60 1:45 PM	7:15:00	LPRSA0189423	ABC013443				
	2/11/60 6:00 AM	2/11/60 12:45 PM	6:45:00	LPRSA0189422	ABC013442				
	2/18/60 11:15 PM	2/19/60 3:30 PM	16:15:00	LPRSA0189421	ABC013441				
	2/26/60 12:10 AM	2/26/60 2:10 PM	14:00:00	LPRSA0189420	ABC013440				
	4/3/60 10:30 PM	4/4/60 11:40 AM	13:10:00	LPRSA0189416	ABC013436				

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
7/14/60 1:15 PM	7/15/60 10:15 AM	21:00:00	LPRSA0189404	ABC013424				
10/20/60 8:50 AM	10/20/60 3:30 PM	6:40:00	LPRSA0189395	ABC013415				
11/10/60 8:45 AM	11/10/60 3:45 PM	7:00:00	LPRSA0189394	ABC013414				
12/12/60 2:00 PM	12/14/60 1:30 PM	47:30:00	LPRSA0189392	ABC013412				
12/21/60 8:50 AM	12/22/60 9:15 AM	24:25:00	LPRSA0189391	ABC013411				
1/1/61 10:00 AM	1/2/61 10:00 AM	24:00:00	LPRSA0189389	ABC013409				
3/9/61 12:45 PM	3/10/61 8:40 AM	19:55:00	LPRSA0189381	ABC013401				
3/14/61 4:15 AM	3/15/61 1:20 PM	33:05:00	LPRSA0189382	ABC013402				
3/23/61 1:05 PM	3/24/61 1:50 PM	24:45:00	LPRSA0189383	ABC013403				
4/10/61 10:10 AM	4/11/61 2:20 PM	28:10:00	LPRSA0189376	ABC013396				
4/13/61 6:40 AM	4/14/61 2:35 PM	31:55:00	LPRSA0189375	ABC013395				
4/16/61 12:40 PM	4/17/61 1:20 PM	24:40:00	LPRSA0189373	ABC013393				
4/18/61 3:05 PM	4/20/61 1:45 PM	46:40:00	LPRSA0189371	ABC013391				
4/24/61 9:30 AM	4/27/61 8:30 AM	71:00:00	LPRSA0189370	ABC013390				
7/15/61 8:20 PM	7/17/61 8:40 AM	36:20:00	LPRSA0189358	ABC013378				
7/20/61 8:30 AM	7/21/61 8:35 AM	24:05:00	LPRSA0189357	ABC013377				
8/3/61 12:20 PM	8/4/61 10:50 AM	22:30:00	LPRSA0189354	ABC013374				
8/21/61 2:45 PM	8/22/61 8:40 AM	17:55:00	LPRSA0189353	ABC013373				
8/23/61 10:55 AM	8/24/61 1:45 PM	26:50:00	LPRSA0189352	ABC013372				
9/19/61 4:00 PM	9/22/61 11:05 AM	67:05:00	LPRSA0189348	ABC013368				
11/24/61 10:15 AM	11/25/61 10:25 AM	24:10:00	LPRSA0189341	ABC013361				
12/18/61 9:20 AM	12/20/61 1:20 PM	52:00:00	LPRSA0189338	ABC013358				
12/28/61 10:20 AM	12/29/61 8:30 AM	22:10:00	LPRSA0189337	ABC013357				
1/6/62 12:20 PM	1/8/62 1:35 PM	49:15:00	LPRSA0189336	ABC013356				
1/15/62 4:35 PM	1/16/62 8:30 AM	15:55:00	LPRSA0189335	ABC013355				
1/26/62 3:30 PM	1/27/62 10:10 AM	18:40:00	LPRSA0189334	ABC013354				
2/24/62 6:20 AM	2/25/62 11:45 AM	29:25:00	LPRSA0189330	ABC013350				
2/26/62 11:10 AM	3/1/62 3:00 PM	75:50:00	LPRSA0189329	ABC013349				
3/6/62 10:45 AM	3/7/62 9:05 AM	22:20:00	LPRSA0189328	ABC013348				
3/12/62 8:05 AM	3/13/62 1:20 PM	29:15:00	LPRSA0189327	ABC013347				
3/21/62 1:35 PM	3/22/62 9:10 AM	19:35:00	LPRSA0189326	ABC013346				
4/1/62 6:00 AM	4/2/62 10:50 AM	28:50:00	LPRSA0189325	ABC013345				
4/7/62 3:20 PM	4/9/62 9:05 AM	41:45:00	LPRSA0189324	ABC013344				
4/9/62 4:05 PM	4/10/62 8:50 AM	16:45:00	LPRSA0189323	ABC013343				
6/5/62 10:30 PM	6/6/62 8:40 AM	10:10:00	LPRSA0189315	ABC013335				
6/13/62 2:05 PM	6/14/62 8:40 AM	18:35:00	LPRSA0189314	ABC013334				
6/26/62 5:40 PM	6/27/62 8:50 AM	15:10:00	LPRSA0189312	ABC013332				
7/18/62 2:25 PM	7/19/62 8:30 AM	18:05:00	LPRSA0189310	ABC013330				
8/7/62 2:20 PM	8/8/62 8:45 AM	18:25:00	LPRSA0189308	ABC013328				
8/9/62 8:00 PM	8/10/62 3:20 PM	19:20:00	LPRSA0189307	ABC013327				
8/10/62 10:55 PM	8/11/62 1:30 PM	14:35:00	LPRSA0189306	ABC013326				
8/17/62 6:30 PM	8/18/62 9:55 AM	15:25:00	LPRSA0189305	ABC013325				
8/21/62 11:40 AM	8/22/62 1:30 PM	25:50:00	LPRSA0189304	ABC013324				
8/28/62 5:40 AM	8/29/62 1:35 PM	31:55:00	LPRSA0189303	ABC013323				
9/5/62 11:20 AM	9/6/62 8:30 AM	21:10:00	LPRSA0189301	ABC013321				
9/17/62 6:25 PM	9/18/62 8:40 AM	14:15:00	LPRSA0189299	ABC013319				
9/27/62 9:45 AM	9/29/62 11:00 AM	49:15:00	LPRSA0189296	ABC013316				
10/5/62 5:00 AM	10/7/62 10:10 AM	53:10:00	LPRSA0189295	ABC013315				
10/23/62 11:45 AM	10/24/62 10:40 AM	22:55:00	LPRSA0189291	ABC013311				
10/25/62 11:15 PM	10/27/62 10:15 AM	35:00:00	LPRSA0189290	ABC013310				
10/30/62 2:30 PM	11/1/62 2:45 PM	48:15:00	LPRSA0189289	ABC013309				
11/3/62 10:20 AM	11/5/62 8:40 AM	46:20:00	LPRSA0189288	ABC013308				
11/9/62 2:45 PM	11/11/62 10:15 AM	43:30:00	LPRSA0189287	ABC013307				

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	11/13/62 3:35 PM	11/14/62 8:40 AM	17:05:00	LPRSA0189286	ABC013306				
	11/18/62 1:15 PM	11/19/62 3:15 PM	26:00:00	LPRSA0189285	ABC013305				
	11/21/62 10:30 PM	11/23/62 9:35 AM	35:05:00	LPRSA0189284	ABC013304				
	12/5/62 8:50 AM	12/8/62 9:30 AM	72:40:00	LPRSA0189283	ABC013303				
	12/22/62 11:05 AM	12/24/62 9:15 AM	46:10:00	LPRSA0189282	ABC013302				
	12/29/62 8:20 PM	12/30/62 12:30 PM	16:10:00	LPRSA0189280	ABC013300				
*	1/1/63 12:00 AM	9/30/74 11:59 PM							
	Subtotal		12868:35:00						

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

(1974-1975)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	10/16/74 4:00 AM	10/17/74 8:00 PM	40:00:00	LPRSA0195712				
	12/2/74 1:00 AM	12/3/74 8:00 AM	31:00:00	LPRSA0195714				
	12/8/74 1:00 PM	12/9/74 8:00 AM	19:00:00	LPRSA0195714				
	12/16/74 11:00 AM	12/17/74 8:00 AM	21:00:00	LPRSA0195714				
	1/1/75	1/1/75	0:00:00	LPRSA0196788				
	1/9/75 6:00 AM	1/9/75 1:00 PM	7:00:00	LPRSA0195715				
	1/13/75 10:00 AM	1/14/75 8:00 AM	22:00:00	LPRSA0195715				
	1/18/75 3:00 PM	1/19/75 6:00 AM	15:00:00	LPRSA0195715				
	1/29/75	1/29/75	5:00:00	LPRSA0196788	3.9	0.81	212	1,436
	1/29/75 6:00 AM	1/29/75 3:00 PM	4:00:00	LPRSA0195715				
	2/24/75	2/24/75	8:04:48	LPRSA0196788	4.7	1.58	212	2,797
	2/24/75 5:00 AM	2/25/75 6:00 AM	16:55:12	LPRSA0195716				
	3/12/75	3/12/75	5:15:00	LPRSA0196788	8.6	1.88	212	3,325
	3/19/75	3/20/75	12:00:00	LPRSA0196788	9.4	4.70	212	8,308
	3/19/75 4:00 PM	3/20/75 12:00 PM	8:00:00	LPRSA0195717				
	4/3/75	4/3/75	6:45:00	LPRSA0196788	5.6	1.58	212	2,784
	4/3/75 8:00 AM	4/3/75 5:00 PM	2:15:00	LPRSA0195718				
	4/24/75	4/24/75	3:27:36	LPRSA0196788	1.7	0.25	212	433
	4/24/75 4:00 AM	4/24/75 8:00 AM	0:32:24	LPRSA0195718				
	4/24/75	4/25/75	1:34:48	LPRSA0196788	5.3	0.35	212	617
	4/25/75 2:00 AM	4/25/75 9:00 AM	5:25:12	LPRSA0195718				
	5/13/75	5/13/75	1:45:00	LPRSA0196788	5.6	0.41	212	722
	5/13/75 10:00 PM	5/14/75 9:00 AM	9:15:00	LPRSA0195719				
	6/1/75 7:00 AM	6/1/75 4:00 PM	9:00:00	LPRSA0195720				
	6/5/75	6/6/75	12:05:24	LPRSA0196789	2.0	1.01	212	1,781
	6/5/75 8:00 PM	6/6/75 11:00 AM	2:54:36	LPRSA0195720				
	6/6/75	6/6/75	6:00:00	LPRSA0196789	17.8	4.45	212	7,866
	6/6/75 3:00 PM	6/7/75 8:00 AM	11:00:00	LPRSA0195720				
	6/12/75 10:00 AM	6/13/75 8:00 AM	22:00:00	LPRSA0195720				
	7/4/75 4:00 AM	7/4/75 12:00 PM	8:00:00	LPRSA0195721				
	7/7/75 8:00 AM	7/7/75 10:00 PM	14:00:00	LPRSA0195721				
	7/9/75 6:00 PM	7/10/75 2:00 AM	8:00:00	LPRSA0195721				
	7/13/75 11:00 AM	7/16/75 5:00 PM	78:00:00	LPRSA0195721				
	7/25/75 2:00 AM	7/25/75 2:00 PM	12:00:00	LPRSA0195721				
	9/23/75 12:00 AM	9/28/75 10:00 AM	130:00:00	LPRSA0195722				
*	10/1/75	12/31/04						
Subtotal			**558:15:00**			**17.01**		**30,068**
Estimated Mass/Bypass Time (lb/hr)								**485**
Estimated Bypassed Volume Rate (MG/hr)					**0.275**			

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

		Elapsed Time (hours)	Frequency of Overflows (#/yr)
1/1/2005	12/31/2005	461.60	36
1/1/2006	12/31/2006	639.35	48
1/1/2007	12/31/2007	401.86	21

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Exhibit 2-4d. Documented PVSC Bypasses at 4th Avenue
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	1/1/2008	12/31/2008	597.55	44				
	1/1/2009	12/31/2009	514.49	52				
	1/1/2010	12/31/2010	470.02	39				
	1/1/2011	12/31/2011	648.85	62				
	1/1/2012	12/31/2012	165.77	35				
	1/1/2013	12/31/2013	363.34	39				
	1/1/2014	12/31/2014	363.34	39				
*	1/1/2015	9/30/2016						
	Subtotal (2005-2014)		**4626.17**					
	Average annual bypass time (hr)		**462.62**					

* Missing data.

Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 8:30 AM	6:00:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 9:30 AM	20:00:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/4/50 9:00 PM	8:30:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 9:00 AM	10:30:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/25/51 7:00 PM	3:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/29/51 8:30 AM	15:30:00	LPRSA0188625	ABC012645				
	1/29/51 7:30 PM	1/30/51 10:00 AM	14:30:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648				
	2/7/51 11:00 AM	2/8/51 2:30 PM	27:30:00	LPRSA0188585	ABC012605				
	2/10/51 5:30 AM	2/10/51 12:00 PM	6:30:00	LPRSA0188588	ABC012608				
	2/11/51 6:00 PM	2/13/51 1:30 PM	43:30:00	LPRSA0188588	ABC012608				
	2/13/51 7:45 PM	2/14/51 10:00 AM	14:15:00	LPRSA0188588	ABC012608				
	2/14/51 5:45 PM	2/15/51 9:30 AM	15:45:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616				
	2/22/51 10:30 AM	2/22/51 11:45 AM	1:15:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 1:00 PM	3/2/51 10:00 AM	21:00:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/14/51 3:00 PM	22:30:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/20/51 12:00 PM	19:00:00	LPRSA0188616	ABC012636				
*	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/18/52 9:00 AM	29:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/21/52 2:00 PM	20:00:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/3/52 11:00 AM	62:00:00	LPRSA0189753	ABC013773				
	3/3/52 5:30 PM	3/5/52 2:30 PM	45:00:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/17/52 2:00 PM	153:00:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/20/52 2:00 PM	27:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/25/52 10:30 AM	65:30:00	LPRSA0189750	ABC013770				
	4/4/52 5:30 PM	4/6/52 11:00 AM	41:30:00	LPRSA0189749	ABC013769				
	4/14/52 4:00 AM	4/16/52 11:00 AM	55:00:00	LPRSA0189748	ABC013768				
	4/23/52 6:00 PM	4/24/52 11:00 AM	17:00:00	LPRSA0189747	ABC013767				
	4/25/52 11:00 AM	4/25/52 8:00 PM	9:00:00	LPRSA0189744	ABC013764				
	4/26/52 2:30 PM	4/28/52 5:30 PM	51:00:00	LPRSA0189744	ABC013764				
	4/29/52 3:00 PM	5/7/52 2:00 PM	191:00:00	LPRSA0189744	ABC013764				
	5/11/52 10:00 PM	5/13/52 11:30 AM	37:30:00	LPRSA0189743	ABC013763				
	5/18/52 8:00 AM	5/23/52 2:30 PM	126:30:00	LPRSA0189741	ABC013761				
	5/13/52 3:30 PM	5/14/52 10:00 AM	18:30:00	LPRSA0189743	ABC013763				
	5/25/52 9:30 AM	5/27/52 9:30 AM	48:00:00	LPRSA0189740	ABC013760				

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
5/29/52 3:30 PM	6/3/52 10:30 AM	115:00:00	LPRSA0189738	ABC013758				
6/3/52 11:45 AM	6/6/52 10:00 AM	70:15:00	LPRSA0189736	ABC013756				
6/9/52 9:15 AM	6/14/52 9:45 AM	120:30:00	LPRSA0189737	ABC013757				
6/17/52 5:30 PM	6/18/52 11:30 AM	18:00:00	LPRSA0189735	ABC013755				
6/19/52 3:15 PM	6/20/52 9:45 AM	18:30:00	LPRSA0189734	ABC013754				
6/27/52 4:10 PM	6/28/52 8:45 AM	16:35:00	LPRSA0189729	ABC013749				
6/29/52 1:00 AM	6/30/52 10:00 AM	33:00:00	LPRSA0189728	ABC013748				
7/8/52 4:15 PM	7/10/52 10:00 AM	41:45:00	LPRSA0189730	ABC013750				
7/21/52 4:30 PM	7/22/52 10:30 AM	18:00:00	LPRSA0189725	ABC013745				
7/31/52 5:00 PM	8/1/52 10:00 AM	17:00:00	LPRSA0189724	ABC013744				
8/2/52 4:15 PM	8/3/52 9:30 AM	17:15:00	LPRSA0189725	ABC013745				
8/6/52 3:15 PM	8/11/52 9:15 AM	114:00:00	LPRSA0189715	ABC013735				
8/11/52 5:30 PM	8/12/52 9:00 AM	15:30:00	LPRSA0189719	ABC013739				
8/12/52 5:15 PM	8/13/52 9:00 AM	15:45:00	LPRSA0189721	ABC013741				
8/13/52 5:00 PM	8/14/52 9:00 AM	16:00:00	LPRSA0189720	ABC013742				
8/15/52 5:00 PM	8/17/52 9:00 AM	40:00:00	LPRSA0189714	ABC013734				
8/21/52 4:30 PM	8/22/52 10:00 AM	17:30:00	LPRSA0189713	ABC013733				
8/30/52 10:00 AM	9/2/52 9:00 AM	71:00:00	LPRSA0189712	ABC013732				
9/2/52 5:00 PM	9/3/52 2:00 PM	21:00:00	LPRSA0189711	ABC013731				
9/15/52 4:15 PM	9/17/52 5:00 PM	48:45:00	LPRSA0189709	ABC013729				
9/18/52 1:00 PM	9/20/52 9:00 AM	44:00:00	LPRSA0189710	ABC013730				
9/23/52 10:30 AM	9/23/52 2:00 PM	3:30:00	LPRSA0189708	ABC013728				
10/2/52 7:00 PM	10/3/52 1:30 PM	18:30:00	LPRSA0189707	ABC013727				
10/28/52 5:30 PM	10/29/52 9:00 AM	15:30:00	LPRSA0189706	ABC013726				
11/2/52 9:15 AM	11/2/52 2:15 PM	5:00:00	LPRSA0189705	ABC013725				
11/3/52 2:00 PM	11/4/52 9:00 AM	19:00:00	LPRSA0189703	ABC013723				
11/10/52 4:30 PM	11/11/52 9:00 AM	16:30:00	LPRSA0189704	ABC013724				
11/14/52 1:30 PM	12/1/52 1:30 PM	408:00:00	LPRSA0189701	ABC013721				
12/2/52 2:00 PM	12/5/52 6:00 PM	76:00:00	LPRSA0189702	ABC013722				
12/9/52 8:00 AM	1/18/53 2:30 PM	966:30:00	LPRSA0189655	ABC013675				
1/21/53 3:00 PM	1/22/53 9:00 AM	18:00:00	LPRSA0189656	ABC013676				
1/24/53 10:00 AM	1/24/53 4:00 PM	6:00:00	LPRSA0189657	ABC013677				
2/15/53 11:00 AM	2/15/53 4:30 PM	5:30:00	LPRSA0189659	ABC013679				
2/21/53 9:00 AM	2/21/53 2:00 PM	5:00:00	LPRSA0189660	ABC013680				
2/25/53 9:00 AM	3/10/53 6:00 PM	321:00:00	LPRSA0189661	ABC013681				
3/15/53 2:00 PM	3/16/53 1:30 PM	23:30:00	LPRSA0189667	ABC013687				
3/19/53 1:30 AM	3/19/53 4:30 PM	15:00:00	LPRSA0189667	ABC013687				
3/24/53 10:00 AM	3/25/53 10:15 AM	24:15:00	LPRSA0189667	ABC013687				
3/25/53 4:00 PM	3/25/53 8:00 PM	4:00:00	LPRSA0189667	ABC013687				
3/30/53 3:00 PM	3/31/53 9:45 AM	18:45:00	LPRSA0189667	ABC013687				
4/9/53 4:30 PM	4/10/53 2:00 PM	21:30:00	LPRSA0189667	ABC013687				
4/16/53 10:30 AM	4/17/53 5:30 PM	31:00:00	LPRSA0189667	ABC013687				
4/18/53 5:30 AM	4/20/53 10:00 AM	52:30:00	LPRSA0189667	ABC013687				
4/20/53 5:00 PM	5/1/53 2:15 PM	261:15:00	LPRSA0189667	ABC013687				
5/8/53 10:15 PM	5/9/53 9:45 AM	11:30:00	LPRSA0189667	ABC013687				
5/13/53 11:30 PM	5/22/53 7:00 PM	211:30:00	LPRSA0189667	ABC013687				
5/25/53 10:30 AM	5/25/53 3:00 PM	4:30:00	LPRSA0189667	ABC013687				
5/27/53 10:15 AM	5/28/53 2:00 PM	27:45:00	LPRSA0189667	ABC013687				
6/13/53 5:15 PM	6/14/53 2:15 PM	21:00:00	LPRSA0189674	ABC013694				
6/18/53 5:00 PM	6/19/53 9:45 AM	16:45:00	LPRSA0189676	ABC013696				
6/22/53 10:15 AM	7/2/53 2:15 PM	244:00:00	LPRSA0189677	ABC013697				
7/6/53 8:15 PM	7/7/53 8:45 AM	12:30:00	LPRSA0189681	ABC013701				
7/20/53 9:40 PM	7/21/53 9:15 AM	11:35:00	LPRSA0189682	ABC013702				
7/21/53 4:00 PM	7/22/53 8:30 AM	16:30:00	LPRSA0189683	ABC013703				

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	7/23/53 8:55 AM	7/23/53 3:30 PM	6:35:00	LPRSA0189684	ABC013704				
	8/10/53 1:15 AM	8/10/53 10:45 AM	9:30:00	LPRSA0189685	ABC013705				
	8/14/53 1:30 PM	8/15/53 8:45 AM	19:15:00	LPRSA0189686	ABC013706				
	9/16/53 2:00 AM	9/16/53 8:30 AM	6:30:00	LPRSA0189688	ABC013708				
	10/6/53 6:30 PM	10/7/53 9:45 AM	15:15:00	LPRSA0189689	ABC013709				
	10/20/53 8:30 AM	10/28/53 2:30 PM	198:00:00	LPRSA0189690	ABC013710				
	10/29/53 2:30 PM	10/29/53 4:45 PM	2:15:00	LPRSA0189693	ABC013713				
	10/29/53 7:15 PM	10/30/53 9:45 AM	14:30:00	LPRSA0189694	ABC013714				
	11/7/53 7:30 AM	11/8/53 11:00 AM	27:30:00	LPRSA0189695	ABC013715				
*	11/16/53 10:00 AM			LPRSA0189653	ABC013673				
	11/23/53 10:15 AM	11/23/53 4:00 PM	5:45:00	LPRSA0189698	ABC013718				
	11/25/53 10:15 AM	11/26/53 9:15 AM	23:00:00	LPRSA0189652	ABC013672				
	11/30/53 10:15 AM	12/5/53 8:00 AM	117:45:00	LPRSA0189651	ABC013671				
	12/6/53 9:45 AM	12/7/53 10:00 AM	24:15:00	LPRSA0189650	ABC013670				
	12/9/53 4:45 PM	12/10/53 4:45 PM	24:00:00	LPRSA0189649	ABC013669				
	12/12/53 4:14 PM	12/13/53 8:45 AM	16:31:00	LPRSA0189648	ABC013668				
	12/14/53 6:30 AM	12/14/53 3:15 PM	8:45:00	LPRSA0189647	ABC013667				
	12/28/53 5:15 PM	12/29/53 1:45 PM	20:30:00	LPRSA0189646	ABC013666				
	1/14/54 5:00 PM	1/18/54 10:00 AM	89:00:00	LPRSA0189592	ABC013612				
	1/18/54 3:00 PM	1/22/54 10:00 AM	91:00:00	LPRSA0189591	ABC013611				
	1/22/54 2:30 PM	1/25/54 10:30 AM	68:00:00	LPRSA0189590	ABC013610				
	1/25/54 1:30 PM	2/2/54 10:15 AM	188:45:00	LPRSA0189590	ABC013610				
	2/3/54 1:45 PM	2/4/54 9:45 AM	20:00:00	LPRSA0189589	ABC013609				
	2/8/54 5:45 PM	2/9/54 9:45 AM	16:00:00	LPRSA0189588	ABC013608				
	2/15/54 2:15 PM	2/19/54 1:30 PM	95:15:00	LPRSA0189587	ABC013607				
	2/21/54 5:30 PM	2/22/54 9:00 AM	15:30:00	LPRSA0189586	ABC013606				
	2/23/54 12:15 PM	2/27/54 9:00 AM	92:45:00	LPRSA0189621	ABC013641				
	3/1/54 11:15 AM	3/5/54 2:00 PM	98:45:00	LPRSA0189619	ABC013639				
	3/13/54 3:15 PM	3/15/54 9:45 AM	42:30:00	LPRSA0189618	ABC013638				
	3/19/54 4:45 PM	3/20/54 8:55 AM	16:10:00	LPRSA0189617	ABC013637				
	3/25/54 10:15 AM	3/26/54 8:30 AM	22:15:00	LPRSA0189616	ABC013636				
	4/8/54 2:00 PM	4/9/54 9:45 AM	19:45:00	LPRSA0189613	ABC013633				
	4/13/54 12:45 PM	4/13/54 3:30 PM	2:45:00	LPRSA0189623	ABC013643				
	4/16/54 1:20 PM	4/18/54 10:20 AM	45:00:00	LPRSA0189632	ABC013652				
	4/19/54 4:00 PM	4/21/54 4:15 PM	48:15:00	LPRSA0189615	ABC013635				
	4/23/54 1:45 PM	4/25/54 9:45 AM	44:00:00	LPRSA0189614	ABC013634				
	4/28/54 3:30 PM	4/29/54 9:45 AM	18:15:00	LPRSA0189612	ABC013632				
	5/3/54 11:00 AM	5/26/54 11:00 AM	552:00:00	LPRSA0189631	ABC013651				
	6/1/54 12:00 PM	6/9/54 10:15 AM	190:15:00	LPRSA0189630	ABC013650				
	6/10/54 3:15 PM	6/11/54 9:30 AM	18:15:00	LPRSA0189629	ABC013649				
	7/4/54 12:30 PM	7/6/54 9:30 AM	45:00:00	LPRSA0189625	ABC013645				
	7/7/54 5:00 PM	7/8/54 10:00 AM	17:00:00	LPRSA0189624	ABC013644				
	7/14/54 4:45 PM	7/15/54 12:15 PM	19:30:00	LPRSA0189634	ABC013654				
	7/22/54 3:45 PM	7/23/54 9:15 AM	17:30:00	LPRSA0189633	ABC013653				
	8/3/54 9:45 AM	8/4/54 9:45 AM	24:00:00	LPRSA0189620	ABC013640				
	8/9/54 9:30 AM	8/11/54 10:00 AM	48:30:00	LPRSA0189622	ABC013642				
	8/19/54 11:15 PM	8/20/54 10:30 AM	11:15:00	LPRSA0189611	ABC013631				
	8/20/54 5:00 PM	8/22/54 9:00 AM	40:00:00	LPRSA0189610	ABC013630				
	8/25/54 5:15 PM	8/26/54 9:45 AM	16:30:00	LPRSA0189609	ABC013629				
	8/30/54 5:15 PM	9/1/54 10:00 AM	40:45:00	LPRSA0189608	ABC013628				
	9/8/54 3:00 PM	9/9/54 9:45 AM	18:45:00	LPRSA0189607	ABC013627				
	9/10/54 2:00 PM	9/12/54 9:45 AM	43:45:00	LPRSA0189606	ABC013626				
	9/14/54 5:00 PM	9/18/54 1:30 PM	92:30:00	LPRSA0189605	ABC013625				
	10/4/54 9:30 AM	10/7/54 9:30 AM	72:00:00	LPRSA0189604	ABC013624				

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
10/15/54 11:45 AM	10/16/54 7:15 AM	19:30:00	LPRSA0189603	ABC013623				
10/27/54 5:00 PM	10/28/54 10:00 AM	17:00:00	LPRSA0189602	ABC013622				
10/29/54 10:00 AM	10/30/54 9:30 AM	23:30:00	LPRSA0189601	ABC013621				
11/2/54 1:30 PM	11/4/54 9:45 AM	44:15:00	LPRSA0189600	ABC013620				
11/8/54 1:45 PM	11/9/54 1:45 PM	24:00:00	LPRSA0189599	ABC013619				
11/15/54 10:15 AM	12/2/54 3:00 AM	400:45:00	LPRSA0189597	ABC013617				
12/9/54 2:30 PM	12/10/54 1:45 PM	23:15:00	LPRSA0189596	ABC013616				
12/14/54 10:00 AM	12/15/54 1:30 PM	27:30:00	LPRSA0189595	ABC013615				
12/16/54 3:30 PM	12/16/54 8:45 PM	5:15:00	LPRSA0189594	ABC013614				
12/29/54 1:30 PM	12/30/54 2:15 PM	24:45:00	LPRSA0189585	ABC013605				
1/6/55 2:30 PM	1/7/55 9:45 AM	19:15:00	LPRSA0189582	ABC013602				
1/28/55 10:15 AM	2/11/55 4:45 PM	342:30:00	LPRSA0189580	ABC013600				
2/14/55 3:45 PM	2/15/55 5:30 PM	25:45:00	LPRSA0189580	ABC013600				
2/21/55 2:00 PM	2/25/55 4:45 PM	98:45:00	LPRSA0189579	ABC013599				
2/28/55 1:15 PM	3/9/55 10:15 AM	213:00:00	LPRSA0189579	ABC013599				
3/7/55 2:15 PM	3/7/55 4:45 PM	2:30:00	LPRSA0189578	ABC013598				
3/21/55 3:30 PM	3/22/55 2:30 PM	23:00:00	LPRSA0189577	ABC013597				
3/28/55 2:00 PM	3/30/55 5:00 PM	51:00:00	LPRSA0189576	ABC013596				
4/6/55 2:00 PM	4/7/55 5:00 PM	27:00:00	LPRSA0189575	ABC013595				
4/12/55 3:00 PM	4/14/55 2:00 PM	47:00:00	LPRSA0189574	ABC013594				
5/31/55 1:45 PM	5/31/55 6:45 PM	5:00:00	LPRSA0189572	ABC013592				
6/21/55 11:45 PM	6/22/55 9:00 AM	9:15:00	LPRSA0189571	ABC013591				
8/8/55 12:00 AM	8/8/55 8:45 AM	8:45:00	LPRSA0189570	ABC013590				
8/11/55 8:00 PM	8/14/55 9:15 AM	61:15:00	LPRSA0189569	ABC013589				
8/15/55 5:30 PM	8/16/55 3:15 PM	21:45:00	LPRSA0189568	ABC013588				
8/18/55 4:45 PM	8/20/55 9:45 AM	41:00:00	LPRSA0189567	ABC013587				
8/21/55 10:30 PM	8/24/55 1:15 PM	62:45:00	LPRSA0189566	ABC013586				
8/24/55 3:45 PM	8/25/55 9:45 AM	18:00:00	LPRSA0189565	ABC013585				
8/25/55 4:45 PM	8/26/55 10:15 AM	17:30:00	LPRSA0189564	ABC013584				
9/24/55 6:00 AM	9/26/55 9:00 AM	51:00:00	LPRSA0189563	ABC013583				
10/6/55 9:00 AM	10/7/55 1:45 PM	28:45:00	LPRSA0189562	ABC013582				
10/14/55 9:45 AM	10/15/55 3:45 PM	30:00:00	LPRSA0189561	ABC013581				
10/16/55 3:30 PM	10/25/55 10:30 AM	211:00:00	LPRSA0189561	ABC013581				
10/30/55 10:30 AM	11/1/55 2:00 PM	51:30:00	LPRSA0189560	ABC013580				
11/10/55 4:30 PM	11/12/55 9:15 AM	40:45:00	LPRSA0189559	ABC013579				
11/16/55 10:00 AM	11/18/55 10:15 AM	48:15:00	LPRSA0189558	ABC013578				
1/30/56 1:45 PM	1/31/56 9:00 AM	19:15:00	LPRSA0189556	ABC013576				
2/2/56 12:30 PM	2/3/56 9:00 AM	20:30:00	LPRSA0189555	ABC013575				
2/6/56 4:30 PM	2/7/56 1:15 PM	20:45:00	LPRSA0189554	ABC013574				
2/18/56 9:15 AM	2/19/56 8:45 AM	23:30:00	LPRSA0189553	ABC013573				
3/8/56 2:30 AM	3/9/56 9:15 AM	30:45:00	LPRSA0189552	ABC013572				
3/14/56 9:30 AM	3/15/56 9:15 AM	23:45:00	LPRSA0189551	ABC013571				
3/21/56 3:35 PM	3/23/56 9:30 AM	41:55:00	LPRSA0189549	ABC013569				
3/29/56 5:00 PM	3/30/56 9:20 AM	16:20:00	LPRSA0189547	ABC013567				
4/7/56 2:50 AM	4/9/56 2:00 PM	59:10:00	LPRSA0189546	ABC013566				
4/11/56 4:55 PM	4/12/56 8:40 AM	15:45:00	LPRSA0189545	ABC013565				
5/2/56 9:50 PM	5/3/56 9:30 AM	11:40:00	LPRSA0189544	ABC013564				
6/2/56 3:30 PM	6/3/56 12:15 PM	20:45:00	LPRSA0189543	ABC013563				
6/27/56 3:15 PM	6/27/56 6:30 PM	3:15:00	LPRSA0189542	ABC013562				
7/16/56 2:45 PM	7/17/56 9:15 AM	18:30:00	LPRSA0189541	ABC013561				
7/21/56 10:00 AM	7/21/56 10:05 PM	12:05:00	LPRSA0189540	ABC013560				
7/27/56 10:30 AM	7/28/56 8:20 AM	21:50:00	LPRSA0189539	ABC013559				
8/6/56 4:45 PM	8/7/56 8:30 AM	15:45:00	LPRSA0189538	ABC013558				

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	8/21/56 4:45 AM	8/21/56 4:30 PM	11:45:00	LPRSA0189537	ABC013557				
	9/6/56 7:00 PM	9/7/56 8:45 AM	13:45:00	LPRSA0189536	ABC013556				
	9/7/56 10:45 AM	9/8/56 12:30 PM	25:45:00	LPRSA0189535	ABC013555				
	9/27/56 4:15 PM	9/28/56 8:30 AM	16:15:00	LPRSA0189534	ABC013554				
	10/22/56 10:30 PM	10/23/56 9:00 AM	10:30:00	LPRSA0189533	ABC013553				
	10/31/56 12:00 PM	10/31/56 7:45 PM	7:45:00	LPRSA0189532	ABC013552				
	11/1/56 10:30 AM	11/4/56 12:00 PM	73:30:00	LPRSA0189532	ABC013552				
	11/18/56 2:30 AM	11/18/56 11:15 AM	8:45:00	LPRSA0189531	ABC013551				
	11/22/56 12:45 AM	11/22/56 8:15 AM	7:30:00	LPRSA0189530	ABC013550				
	12/9/56 3:15 PM	12/10/56 8:45 AM	17:30:00	LPRSA0189529	ABC013549				
	12/14/56 8:30 AM	12/17/56 8:00 AM	71:30:00	LPRSA0189528	ABC013548				
	12/22/56 10:30 PM	12/23/56 10:15 AM	11:45:00	LPRSA0189527	ABC013547				
	1/23/57 4:00 AM	1/23/57 2:15 PM	10:15:00	LPRSA0189498	ABC013518				
	2/9/57 2:15 PM	2/10/57 9:00 AM	18:45:00	LPRSA0189497	ABC013517				
	2/26/57 4:00 PM	2/27/57 1:00 PM	21:00:00	LPRSA0189496	ABC013516				
	3/1/57 3:30 PM	3/2/57 10:45 AM	19:15:00	LPRSA0189524	ABC013544				
	3/8/57 9:45 AM	3/10/57 10:00 AM	48:15:00	LPRSA0189523	ABC013543				
	3/19/57 9:45 PM	3/21/57 9:00 AM	35:15:00	LPRSA0189521	ABC013541				
	4/2/57 8:00 AM	4/2/57 3:30 PM	7:30:00	LPRSA0189520	ABC013540				
	4/4/57 9:55 PM	4/5/57 11:30 AM	13:35:00	LPRSA0189519	ABC013539				
	4/5/57 3:00 PM	4/6/57 1:35 PM	22:35:00	LPRSA0189518	ABC013538				
	4/9/57 9:30 AM	4/9/57 4:15 PM	6:45:00	LPRSA0189516	ABC013536				
	4/10/57 9:30 AM	4/10/57 4:15 PM	6:45:00	LPRSA0189515	ABC013535				
	4/11/57 8:45 AM	4/11/57 4:15 PM	7:30:00	LPRSA0189514	ABC013534				
	4/12/57 8:45 AM	4/12/57 4:30 PM	7:45:00	LPRSA0189513	ABC013533				
	4/18/57 10:15 PM	4/19/57 1:45 PM	15:30:00	LPRSA0189512	ABC013532				
	4/23/57 10:00 AM	4/23/57 3:45 PM	5:45:00	LPRSA0189511	ABC013531				
	5/14/57 10:45 PM	5/15/57 12:30 PM	13:45:00	LPRSA0189508	ABC013528				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
	8/26/57 1:45 AM	8/27/57 8:15 AM	30:30:00	LPRSA0189507	ABC013527				
	9/10/57 11:00 PM	9/11/57 9:00 AM	10:00:00	LPRSA0189506	ABC013526				
	9/17/57 12:15 AM	9/17/57 10:30 AM	10:15:00	LPRSA0189505	ABC013525				
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	11/30/57 1:00 PM	11/30/57 9:00 PM	8:00:00	LPRSA0189503	ABC013523				
	12/9/57 12:00 PM	12/9/57 2:00 PM	2:00:00	LPRSA0189502	ABC013522				
	12/20/57 4:15 PM	12/21/57 10:30 AM	18:15:00	LPRSA0189501	ABC013521				
	12/26/57 11:20 AM	12/26/57 4:00 PM	4:40:00	LPRSA0189500	ABC013520				
	1/14/58 7:30 PM	1/15/58 9:00 AM	13:30:00	LPRSA0189494	ABC013514				
	1/22/58 12:05 AM	1/22/58 10:15 AM	10:10:00	LPRSA0189492	ABC013512				
	2/7/58 4:05 PM	2/8/58 9:00 AM	16:55:00	LPRSA0189489	ABC013509				
	2/27/58 3:45 PM	2/28/58 2:00 PM	22:15:00	LPRSA0189488	ABC013508				
	4/6/58 3:00 PM	4/7/58 9:00 AM	18:00:00	LPRSA0189483	ABC013503				
	4/11/58 3:30 PM	4/12/58 3:30 PM	24:00:00	LPRSA0189482	ABC013502				
	4/28/58 8:15 AM	4/28/58 3:15 PM	7:00:00	LPRSA0189480	ABC013500				
	4/29/58 8:30 PM	4/30/58 9:00 AM	12:30:00	LPRSA0189479	ABC013499				
	5/6/58 9:30 PM	5/7/58 8:30 AM	11:00:00	LPRSA0189478	ABC013498				
	5/7/58 11:30 AM	5/8/58 4:00 PM	28:30:00	LPRSA0189478	ABC013498				
	8/25/58 2:00 PM	8/26/58 8:30 AM	18:30:00	LPRSA0189472	ABC013492				
	10/1/58 2:00 PM	10/2/58 8:30 AM	18:30:00	LPRSA0189470	ABC013490				
	10/22/58 8:00 PM	10/24/58 9:15 AM	37:15:00	LPRSA0189469	ABC013489				
	10/25/58 5:45 PM	10/27/58 2:45 PM	45:00:00	LPRSA0189468	ABC013488				
	11/28/58 8:45 PM	11/29/58 10:45 AM	14:00:00	LPRSA0189466	ABC013486				

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
3/6/59 9:45 AM	3/7/59 11:00 AM	25:15:00	LPRSA0189458	ABC013478				
5/13/59 7:45 PM	5/14/59 9:00 AM	13:15:00	LPRSA0189438	ABC013458				
5/22/59 4:45 PM	5/22/59 8:00 PM	3:15:00	LPRSA0189439	ABC013459				
6/2/59 5:45 PM	6/3/59 8:15 AM	14:30:00	LPRSA0189454	ABC013474				
8/5/59 10:45 AM	8/6/59 9:00 AM	22:15:00	LPRSA0189448	ABC013468				
8/9/59 5:30 AM	8/10/59 10:00 AM	28:30:00	LPRSA0189447	ABC013467				
8/31/59 1:30 PM	9/3/59 8:30 AM	67:00:00	LPRSA0189445	ABC013465				
10/1/59 1:15 PM	10/1/59 3:45 PM	2:30:00	LPRSA0189443	ABC013463				
10/9/59 12:15 PM	10/10/59 3:00 PM	26:45:00	LPRSA0189440	ABC013460				
10/24/59 11:30 AM	10/25/59 11:45 AM	24:15:00	LPRSA0189435	ABC013455				
11/24/59 4:30 PM	11/25/59 10:25 AM	17:55:00	LPRSA0189432	ABC013452				
12/7/59 1:15 AM	12/8/59 10:20 AM	33:05:00	LPRSA0189431	ABC013451				
12/12/59 7:00 PM	12/13/59 9:15 AM	14:15:00	LPRSA0189430	ABC013450				
12/29/59 12:00 AM	12/29/59 9:45 AM	9:45:00	LPRSA0189429	ABC013449				
1/3/60 10:30 AM	1/4/60 9:00 AM	22:30:00	LPRSA0189427	ABC013447				
1/13/60 11:30 AM	1/14/60 8:45 AM	21:15:00	LPRSA0189426	ABC013446				
2/6/60 6:15 AM	2/6/60 1:30 PM	7:15:00	LPRSA0189423	ABC013443				
2/18/60 11:00 PM	2/19/60 3:15 PM	16:15:00	LPRSA0189421	ABC013441				
2/25/60 11:30 PM	2/26/60 1:30 PM	14:00:00	LPRSA0189420	ABC013440				
3/17/60 3:45 PM	3/18/60 8:20 AM	16:35:00	LPRSA0189418	ABC013438				
4/3/60 10:10 PM	4/4/60 11:25 AM	13:15:00	LPRSA0189416	ABC013436				
4/18/60 1:00 PM	4/18/60 3:45 PM	2:45:00	LPRSA0189412	ABC013432				
7/14/60 1:00 PM	7/15/60 10:00 AM	21:00:00	LPRSA0189404	ABC013424				
7/30/60 10:10 AM	7/31/60 9:20 AM	23:10:00	LPRSA0189402	ABC013422				
8/19/60 8:30 AM	8/20/60 9:30 AM	25:00:00	LPRSA0189399	ABC013419				
9/12/60 12:30 AM	9/13/60 9:10 AM	32:40:00	LPRSA0189397	ABC013417				
9/19/60 10:50 AM	9/21/60 9:30 PM	58:40:00	LPRSA0189396	ABC013416				
10/20/60 9:15 AM	10/21/60 8:30 AM	23:15:00	LPRSA0189395	ABC013415				
11/10/60 8:30 AM	11/10/60 3:30 PM	7:00:00	LPRSA0189394	ABC013414				
12/12/60 12:20 PM	12/14/60 12:30 PM	48:10:00	LPRSA0189392	ABC013412				
12/21/60 9:15 AM	12/22/60 9:30 AM	24:15:00	LPRSA0189391	ABC013411				
1/1/61 10:30 AM	1/2/61 10:40 AM	24:10:00	LPRSA0189389	ABC013409				
3/9/61 12:55 PM	3/10/61 9:10 AM	20:15:00	LPRSA0189381	ABC013401				
3/14/61 4:45 AM	3/15/61 1:35 PM	32:50:00	LPRSA0189382	ABC013402				
3/23/61 12:45 PM	3/24/61 1:30 PM	24:45:00	LPRSA0189383	ABC013403				
4/10/61 10:30 AM	4/11/61 2:40 PM	28:10:00	LPRSA0189376	ABC013396				
4/13/61 6:25 AM	4/14/61 2:15 PM	31:50:00	LPRSA0189375	ABC013395				
4/16/61 12:25 PM	4/17/61 1:00 PM	24:35:00	LPRSA0189373	ABC013393				
4/18/61 2:45 PM	4/20/61 2:00 PM	47:15:00	LPRSA0189371	ABC013391				
4/24/61 9:15 AM	4/27/61 8:50 AM	71:35:00	LPRSA0189370	ABC013390				
7/15/61 8:00 PM	7/17/61 9:00 AM	37:00:00	LPRSA0189358	ABC013378				
7/20/61 8:50 AM	7/21/61 8:50 AM	24:00:00	LPRSA0189357	ABC013377				
8/3/61 12:00 PM	8/4/61 10:30 AM	22:30:00	LPRSA0189354	ABC013374				
8/21/61 2:30 PM	8/22/61 9:00 AM	18:30:00	LPRSA0189353	ABC013373				
8/23/61 10:40 AM	8/24/61 1:30 PM	26:50:00	LPRSA0189352	ABC013372				
9/15/61 10:30 AM	9/15/61 2:45 PM	4:15:00	LPRSA0189349	ABC013369				
9/19/61 3:15 PM	9/22/61 10:50 AM	67:35:00	LPRSA0189348	ABC013368				
11/24/61 9:45 AM	11/25/61 10:10 AM	24:25:00	LPRSA0189341	ABC013361				
12/18/61 9:40 AM	12/20/61 1:00 PM	51:20:00	LPRSA0189338	ABC013358				
12/28/61 10:05 AM	12/29/61 8:50 AM	22:45:00	LPRSA0189337	ABC013357				
1/6/62 12:00 PM	1/8/62 1:15 PM	49:15:00	LPRSA0189336	ABC013356				
1/15/62 4:15 PM	1/16/62 8:45 AM	16:30:00	LPRSA0189335	ABC013355				

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	1/26/62 3:15 PM	1/27/62 9:45 AM	18:30:00	LPRSA0189334	ABC013354				
	2/24/62 6:05 AM	2/25/62 11:30 AM	29:25:00	LPRSA0189330	ABC013350				
	2/26/62 10:50 AM	3/1/62 8:20 AM	69:30:00	LPRSA0189329	ABC013349				
	3/6/62 10:30 AM	3/7/62 8:45 AM	22:15:00	LPRSA0189328	ABC013348				
	3/12/62 7:50 AM	3/13/62 1:00 PM	29:10:00	LPRSA0189327	ABC013347				
	3/21/62 1:15 PM	3/22/62 9:30 AM	20:15:00	LPRSA0189326	ABC013346				
	4/1/62 5:45 AM	4/2/62 11:10 AM	29:25:00	LPRSA0189325	ABC013345				
	4/7/62 3:05 PM	4/9/62 8:50 AM	41:45:00	LPRSA0189324	ABC013344				
	4/9/62 3:55 PM	4/10/62 8:35 AM	16:40:00	LPRSA0189323	ABC013343				
	6/5/62 10:15 PM	6/6/62 9:00 AM	10:45:00	LPRSA0189315	ABC013335				
	6/13/62 2:25 PM	6/14/62 9:00 AM	18:35:00	LPRSA0189314	ABC013334				
	6/26/62 5:15 PM	6/27/62 9:10 AM	15:55:00	LPRSA0189312	ABC013332				
	7/18/62 2:40 PM	7/19/62 8:45 AM	18:05:00	LPRSA0189310	ABC013330				
	8/7/62 2:30 PM	8/8/62 9:00 AM	18:30:00	LPRSA0189308	ABC013328				
	8/9/62 7:45 PM	8/10/62 3:00 PM	19:15:00	LPRSA0189307	ABC013327				
	8/10/62 10:40 PM	8/11/62 1:00 PM	14:20:00	LPRSA0189306	ABC013326				
	8/17/62 6:10 PM	8/18/62 9:35 AM	15:25:00	LPRSA0189305	ABC013325				
	8/21/62 11:20 AM	8/22/62 1:10 PM	25:50:00	LPRSA0189304	ABC013324				
	8/28/62 5:25 AM	8/29/62 1:50 PM	32:25:00	LPRSA0189303	ABC013323				
	9/5/62 11:35 AM	9/6/62 8:45 AM	21:10:00	LPRSA0189301	ABC013321				
	9/17/62 6:10 PM	9/18/62 9:00 AM	14:50:00	LPRSA0189299	ABC013319				
	9/27/62 9:30 AM	9/29/62 10:45 AM	49:15:00	LPRSA0189296	ABC013316				
	10/5/62 4:45 AM	10/7/62 9:50 AM	53:05:00	LPRSA0189295	ABC013315				
	10/23/62 11:35 AM	10/24/62 10:30 AM	22:55:00	LPRSA0189291	ABC013311				
	10/25/62 11:00 PM	10/27/62 9:55 AM	34:55:00	LPRSA0189290	ABC013310				
	10/30/62 2:15 PM	11/1/62 2:30 PM	48:15:00	LPRSA0189289	ABC013309				
	11/3/62 10:25 AM	11/5/62 9:00 AM	46:35:00	LPRSA0189288	ABC013308				
	11/9/62 3:00 PM	11/11/62 10:30 AM	43:30:00	LPRSA0189287	ABC013307				
	11/13/62 3:20 PM	11/14/62 8:55 AM	17:35:00	LPRSA0189286	ABC013306				
	11/18/62 1:30 PM	11/19/62 3:00 PM	25:30:00	LPRSA0189285	ABC013305				
	11/21/62 10:40 PM	11/23/62 9:45 AM	35:05:00	LPRSA0189284	ABC013304				
	12/5/62 9:00 AM	12/8/62 9:45 AM	72:45:00	LPRSA0189283	ABC013303				
	12/22/62 12:05 PM	12/24/62 9:30 AM	45:25:00	LPRSA0189282	ABC013302				
	12/29/62 8:35 PM	12/30/62 12:10 PM	15:35:00	LPRSA0189280	ABC013300				
*	1/1/63 12:00 AM	9/12/74 11:59 PM							
	Subtotal		14096:36:00						

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street

(Newark)

(1974-1975)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	9/13/74	9/14/74	0:00:00	LPRSA0196840				
	10/16/74 4:00 AM	10/17/74 9:00 PM	41:00:00	LPRSA0195712				
	12/2/74 1:00 AM	12/2/74 8:00 AM	7:00:00	LPRSA0195714				
	12/8/74 1:00 PM	12/9/74 8:00 AM	19:00:00	LPRSA0195714				
	12/16/74 11:00 AM	12/17/74 8:00 AM	21:00:00	LPRSA0195714				
	1/9/75 6:00 AM	1/9/75 1:00 PM	7:00:00	LPRSA0195715				
	1/13/75 10:00 AM	1/14/75 9:00 AM	23:00:00	LPRSA0195715				
	1/18/75	1/18/75	15:15:00	LPRSA0196840	60.0	38.13	253	80,555
	1/18/75 3:00 PM	1/19/75 6:00 AM	0:00:00	LPRSA0195715				
	1/29/75	1/29/75	9:37:48	LPRSA0196840	54.2	21.75	253	45,951
	1/29/75 6:00 AM	1/29/75 4:00 PM	0:22:12	LPRSA0195715				
	2/24/75	2/24/75	10:37:12	LPRSA0196840	34.1	15.09	253	31,882
	2/24/75 5:00 AM	2/25/75 6:00 AM	14:22:48	LPRSA0195716				
	3/12/75	3/12/75	5:00:00	LPRSA0196840	86.7	18.06	253	38,165
	3/19/75 5:00 PM	3/20/75 1:00 PM	20:00:00	LPRSA0195717				
	4/3/75	4/3/75	3:30:00	LPRSA0196840	96.5	14.07	253	29,735
	4/3/75 9:00 AM	4/3/75 5:00 PM	4:30:00	LPRSA0195718				
	4/24/75 4:00 AM	4/24/75 9:00 AM	5:00:00	LPRSA0195718				
	4/24/75	4/25/75	6:55:12	LPRSA0196840	44.8	12.92	253	27,293
	4/25/75 2:00 AM	4/25/75 9:00 AM	0:04:48	LPRSA0195718				
	5/13/75	5/13/75	10:13:12	LPRSA0196841	59.1	25.17	253	53,175
	5/13/75 11:00 PM	5/14/75 9:00 AM	0:00:00	LPRSA0195719				
	6/1/75 7:00 AM	6/1/75 5:00 PM	10:00:00	LPRSA0195720				
	6/5/75 8:00 PM	6/6/75 11:00 AM	15:00:00	LPRSA0195720				
	6/6/75 3:00 PM	6/7/75 8:00 AM	17:00:00	LPRSA0195720				
	6/12/75 10:00 AM	6/13/75 9:00 AM	23:00:00	LPRSA0195720				
	7/4/75 4:00 AM	7/4/75 12:00 PM	8:00:00	LPRSA0195721				
	7/7/75 8:00 AM	7/7/75 10:00 PM	14:00:00	LPRSA0195721				
	7/9/75 6:00 PM	7/10/75 2:00 AM	8:00:00	LPRSA0195721				
	7/13/75 12:00 PM	7/16/75 5:00 PM	77:00:00	LPRSA0195721				
	7/25/75 2:00 AM	7/25/75 3:00 PM	13:00:00	LPRSA0195721				
*	10/1/75	12/31/04						
Subtotal			**408:28:12**			**145.18**		**306,756**
Estimated Mass/Bypass Time (lb/hr)								**5,017**
Estimated Bypassed Volume Rate (MG/hr)					**2.375**			

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

		Elapsed Time (hours)	Frequency of Overflows (#/yr)
1/1/2005	12/31/2005	458.78	35
1/1/2006	12/31/2006	640.37	36
1/1/2007	12/31/2007	463.07	35
1/1/2008	12/31/2008	601.26	47
1/1/2009	12/31/2009	518.99	52
1/1/2010	12/31/2010	410.43	36
1/1/2011	12/31/2011	638.14	62

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Exhibit 2-4e. Documented PVSC Bypasses at Clay Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	1/1/2012	12/31/2012	163.31	35				
	1/1/2013	12/31/2013	364.10	39				
	1/1/2014	12/31/2014	364.10	39				
*	1/1/2015	9/30/2016						
	Subtotal (2005-2014)		**4622.55**					
	Average annual bypass time (hr)		**462.26**					

* Missing data.
Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4f. Documented PVSC Bypasses at Rector Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Volume (MG)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)									
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629						
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674					
	10/10/50 2:30 AM	10/10/50 1:00 PM	10:30:00	LPRSA0188652	ABC012672					
	10/12/50 1:30 PM	10/13/50 11:00 AM	21:30:00	LPRSA0188650	ABC012670					
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668					
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666					
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663					
	12/4/50 12:30 PM	12/5/50 9:30 AM	21:00:00	LPRSA0188641	ABC012661					
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657					
	12/15/50 10:30 PM	12/16/50 2:30 PM	16:00:00	LPRSA0188639	ABC012659					
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655					
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653					
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639					
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651					
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641					
	1/25/51 4:00 PM	1/26/51 10:00 AM	18:00:00	LPRSA0188623	ABC012643					
	1/28/51 5:00 PM	1/30/51 10:00 AM	41:00:00	LPRSA0188625	ABC012645					
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648					
	2/10/51 5:30 AM	2/10/51 2:30 PM	9:00:00	LPRSA0188588	ABC012608					
	2/11/51 6:00 PM	2/15/51 2:30 PM	92:30:00	LPRSA0188588	ABC012608					
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608					
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616					
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616					
	3/1/51 1:00 PM	3/2/51 10:00 AM	21:00:00	LPRSA0188604	ABC012624					
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626					
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629					
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632					
	3/19/51 5:00 PM	3/21/51 9:00 AM	40:00:00	LPRSA0188616	ABC012636					
*	3/22/51 12:00 AM	12/31/51 11:59 PM								
	2/17/52 3:30 AM	2/19/52 11:00 AM	55:30:00	LPRSA0189755	ABC013775					
	2/20/52 6:00 PM	2/22/52 10:30 AM	40:30:00	LPRSA0189754	ABC013774					
	2/29/52 9:00 PM	3/7/52 10:30 AM	157:30:00	LPRSA0189753	ABC013773					
	3/11/52 5:00 AM	3/18/52 10:30 AM	173:30:00	LPRSA0189752	ABC013772					
	3/19/52 10:30 AM	3/21/52 11:00 AM	48:30:00	LPRSA0189751	ABC013771					
	3/22/52 5:00 PM	3/26/52 11:00 AM	90:00:00	LPRSA0189750	ABC013770					
	4/5/52 8:00 AM	4/7/52 11:00 AM	51:00:00	LPRSA0189749	ABC013769					
	4/14/52 4:00 AM	4/17/52 11:00 AM	79:00:00	LPRSA0189748	ABC013768					
	4/25/52 11:00 AM	5/9/52 4:30 PM	341:30:00	LPRSA0189744	ABC013764					
	5/11/52 10:00 PM	5/14/52 2:30 PM	64:30:00	LPRSA0189743	ABC013763					
	5/18/52 8:15 AM	5/23/52 3:00 PM	126:45:00	LPRSA0189741	ABC013761					
	5/25/52 9:45 AM	5/27/52 1:00 PM	51:15:00	LPRSA0189740	ABC013760					
	5/29/52 3:45 PM	6/14/52 10:00 AM	378:15:00	LPRSA0189736	ABC013756					
	6/17/52 5:40 PM	6/18/52 1:30 PM	19:50:00	LPRSA0189735	ABC013755					
	6/19/52 3:00 PM	6/20/52 9:30 AM	18:30:00	LPRSA0189734	ABC013754					
	6/27/52 4:20 PM	6/28/52 9:00 AM	16:40:00	LPRSA0189729	ABC013749					
	6/29/52 1:30 AM	6/30/52 10:15 AM	32:45:00	LPRSA0189728	ABC013748					
	7/8/52 4:30 PM	7/10/52 4:45 PM	48:15:00	LPRSA0189730	ABC013750					
	7/21/52 4:45 PM	7/22/52 10:45 AM	18:00:00	LPRSA0189725	ABC013745					
	7/31/52 5:15 PM	8/1/52 10:15 AM	17:00:00	LPRSA0189724	ABC013744					
	8/2/52 4:30 PM	8/3/52 9:45 AM	17:15:00	LPRSA0189725	ABC013745					
	8/6/52 3:30 PM	8/11/52 9:30 AM	114:00:00	LPRSA0189715	ABC013735					

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Exhibit 2-4f. Documented PVSC Bypasses at Rector Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Volume (MG)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	8/12/52 5:30 PM	8/14/52 9:15 AM	39:45:00	LPRSA0189721	ABC013741					
	8/15/52 5:15 PM	8/17/52 9:15 AM	40:00:00	LPRSA0189714	ABC013734					
	8/21/52 4:45 PM	8/22/52 1:00 PM	20:15:00	LPRSA0189713	ABC013733					
	8/30/52 10:15 AM	9/2/52 9:15 AM	71:00:00	LPRSA0189712	ABC013732					
	9/2/52 5:15 PM	9/4/52 9:00 AM	39:45:00	LPRSA0189711	ABC013731					
	9/15/52 4:30 PM	9/17/52 5:15 PM	48:45:00	LPRSA0189709	ABC013729					
	9/18/52 1:15 PM	9/20/52 9:15 AM	44:00:00	LPRSA0189710	ABC013730					
	9/23/52 10:45 AM	9/24/52 9:30 AM	22:45:00	LPRSA0189708	ABC013728					
	10/2/52 7:15 PM	10/3/52 1:45 PM	18:30:00	LPRSA0189707	ABC013727					
	10/28/52 5:45 PM	10/29/52 9:15 AM	15:30:00	LPRSA0189706	ABC013726					
	11/2/52 9:30 AM	11/2/52 2:30 PM	5:00:00	LPRSA0189705	ABC013725					
	11/3/52 2:15 PM	11/4/52 9:15 AM	19:00:00	LPRSA0189703	ABC013723					
	11/10/52 4:45 PM	11/11/52 9:15 AM	16:30:00	LPRSA0189704	ABC013724					
	11/14/52 1:45 PM	12/1/52 1:45 PM	408:00:00	LPRSA0189701	ABC013721					
	12/2/52 2:15 PM	12/8/52 9:00 AM	138:45:00	LPRSA0189702	ABC013722					
	12/9/52 8:15 AM	1/18/53 2:45 PM	966:30:00	LPRSA0189655	ABC013675					
	1/21/53 3:15 PM	1/22/53 1:00 PM	21:45:00	LPRSA0189656	ABC013676					
	1/24/53 10:15 AM	1/25/53 10:00 AM	23:45:00	LPRSA0189657	ABC013677					
	2/11/53 5:30 PM	2/13/53 10:30 AM	41:00:00	LPRSA0189658	ABC013678					
	2/15/53 11:15 AM	2/16/53 2:00 PM	26:45:00	LPRSA0189659	ABC013679					
	2/25/53 9:15 AM	3/11/53 9:30 AM	336:15:00	LPRSA0189661	ABC013681					
	3/13/53 3:45 PM	3/14/53 12:15 PM	20:30:00	LPRSA0189668	ABC013688					
	3/17/53 2:45 PM	4/29/53 10:30 AM	1027:45:00	LPRSA0189668	ABC013688					
*	4/30/53 5:15 PM			LPRSA0189668	ABC013688					
	6/13/53 5:30 PM	6/15/53 10:45 AM	41:15:00	LPRSA0189674	ABC013694					
	6/22/53 10:30 AM	7/2/53 2:30 PM	244:00:00	LPRSA0189677	ABC013697					
	7/6/53 8:30 PM	7/7/53 9:00 AM	12:30:00	LPRSA0189681	ABC013701					
	7/20/53 9:45 PM	7/21/53 9:20 AM	11:35:00	LPRSA0189682	ABC013702					
	7/21/53 4:15 PM	7/22/53 8:45 AM	16:30:00	LPRSA0189683	ABC013703					
	7/23/53 9:05 AM	7/24/53 1:00 PM	27:55:00	LPRSA0189684	ABC013704					
	8/10/53 1:30 AM	8/10/53 11:00 AM	9:30:00	LPRSA0189685	ABC013705					
	8/14/53 1:45 PM	8/15/53 9:00 AM	19:15:00	LPRSA0189686	ABC013706					
	10/6/53 6:45 PM	10/7/53 10:00 AM	15:15:00	LPRSA0189689	ABC013709					
	10/20/53 8:45 AM	10/29/53 5:00 PM	224:15:00	LPRSA0189690	ABC013710					
	11/7/53 7:45 AM	11/8/53 11:15 AM	27:30:00	LPRSA0189695	ABC013715					
*	11/16/53 10:15 AM			LPRSA0189653	ABC013673					
	11/23/53 10:30 AM	11/23/53 3:45 PM	5:15:00	LPRSA0189698	ABC013718					
	11/25/53 12:45 PM	11/26/53 9:30 AM	20:45:00	LPRSA0189652	ABC013672					
	11/30/53 10:30 AM	12/5/53 8:15 AM	117:45:00	LPRSA0189651	ABC013671					
	12/6/53 10:00 AM	12/8/53 9:30 AM	47:30:00	LPRSA0189650	ABC013670					
	12/9/53 5:00 PM	12/11/53 9:30 AM	40:30:00	LPRSA0189649	ABC013669					
	12/14/53 6:45 AM	12/15/53 1:15 PM	30:30:00	LPRSA0189647	ABC013667					
	1/15/54 1:45 PM	1/18/54 10:30 AM	68:45:00	LPRSA0189592	ABC013612					
	1/20/54 2:30 PM	1/22/54 1:00 PM	46:30:00	LPRSA0189591	ABC013611					
	1/25/54 3:30 AM	2/2/54 1:30 PM	202:00:00	LPRSA0189590	ABC013610					
	2/3/54 2:00 PM	2/4/54 10:00 AM	20:00:00	LPRSA0189589	ABC013609					
	2/15/54 2:30 PM	2/19/54 1:45 PM	95:15:00	LPRSA0189587	ABC013607					
	2/21/54 5:45 PM	2/22/54 9:15 AM	15:30:00	LPRSA0189586	ABC013606					
	2/23/54 12:30 PM	2/27/54 9:15 AM	92:45:00	LPRSA0189621	ABC013641					
	3/1/54 11:30 AM	3/5/54 2:15 PM	98:45:00	LPRSA0189619	ABC013639					
	3/13/54 3:30 PM	3/15/54 10:00 AM	42:30:00	LPRSA0189618	ABC013638					
	3/19/54 5:00 PM	3/20/54 2:15 PM	21:15:00	LPRSA0189617	ABC013637					
	3/25/54 10:30 AM	3/26/54 10:15 AM	23:45:00	LPRSA0189616	ABC013636					

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Exhibit 2-4f. Documented PVSC Bypasses at Rector Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Volume (MG)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
4/8/54 2:15 PM	4/9/54 10:00 AM	19:45:00	LPRSA0189613	ABC013633					
4/13/54 1:00 PM	4/13/54 3:20 PM	2:20:00	LPRSA0189623	ABC013643					
4/16/54 1:30 PM	4/18/54 10:30 AM	45:00:00	LPRSA0189632	ABC013652					
4/19/54 4:15 PM	4/21/54 4:00 PM	47:45:00	LPRSA0189615	ABC013635					
4/23/54 2:00 PM	4/25/54 10:00 AM	44:00:00	LPRSA0189614	ABC013634					
4/28/54 3:45 PM	4/29/54 10:00 AM	18:15:00	LPRSA0189612	ABC013632					
5/3/54 11:15 AM	5/26/54 9:30 AM	550:15:00	LPRSA0189631	ABC013651					
6/1/54 12:15 PM	6/9/54 10:30 AM	190:15:00	LPRSA0189630	ABC013650					
6/10/54 3:00 PM	6/11/54 9:45 AM	18:45:00	LPRSA0189629	ABC013649					
7/2/54 9:30 AM	7/2/54 11:15 AM	1:45:00	LPRSA0189627	ABC013647					
7/2/54 2:00 PM	7/2/54 4:30 PM	2:30:00	LPRSA0189626	ABC013646					
7/4/54 12:45 PM	7/6/54 9:45 AM	45:00:00	LPRSA0189625	ABC013645					
7/7/54 5:15 PM	7/8/54 1:30 PM	20:15:00	LPRSA0189624	ABC013644					
7/14/54 5:00 PM	7/15/54 12:30 PM	19:30:00	LPRSA0189634	ABC013654					
7/22/54 4:00 PM	7/23/54 9:30 AM	17:30:00	LPRSA0189633	ABC013653					
8/3/54 10:00 AM	8/4/54 10:00 AM	24:00:00	LPRSA0189620	ABC013640					
8/9/54 9:45 AM	8/11/54 10:15 AM	48:30:00	LPRSA0189622	ABC013642					
8/19/54 11:30 PM	8/20/54 10:45 AM	11:15:00	LPRSA0189611	ABC013631					
8/20/54 7:15 PM	8/22/54 9:15 AM	38:00:00	LPRSA0189610	ABC013630					
8/25/54 5:30 PM	8/26/54 1:30 PM	20:00:00	LPRSA0189609	ABC013629					
9/8/54 3:15 PM	9/9/54 1:30 PM	22:15:00	LPRSA0189607	ABC013627					
9/10/54 2:15 PM	9/12/54 10:00 AM	43:45:00	LPRSA0189606	ABC013626					
10/7/54 9:45 AM	10/8/54 2:00 PM	28:15:00	LPRSA0189604	ABC013624					
10/15/54 12:00 PM	10/16/54 7:30 AM	19:30:00	LPRSA0189603	ABC013623					
10/27/54 5:15 PM	10/28/54 1:30 AM	8:15:00	LPRSA0189602	ABC013622					
10/29/54 10:15 AM	10/30/54 9:45 AM	23:30:00	LPRSA0189601	ABC013621					
11/2/54 1:45 PM	11/5/54 3:00 PM	73:15:00	LPRSA0189600	ABC013620					
11/8/54 2:00 PM	11/9/54 2:00 PM	24:00:00	LPRSA0189599	ABC013619					
11/15/54 10:30 AM	12/2/54 3:15 AM	400:45:00	LPRSA0189597	ABC013617					
12/9/54 2:45 PM	12/10/54 2:00 PM	23:15:00	LPRSA0189596	ABC013616					
12/14/54 10:15 AM	12/15/54 1:45 PM	27:30:00	LPRSA0189595	ABC013615					
12/18/54 11:00 AM	12/19/54 9:00 AM	22:00:00	LPRSA0189593	ABC013613					
12/29/54 1:45 PM	12/30/54 2:00 PM	24:15:00	LPRSA0189585	ABC013605					
1/6/55 2:45 PM	1/7/55 10:00 AM	19:15:00	LPRSA0189582	ABC013602					
1/28/55 10:30 AM	3/9/55 10:30 AM	960:00:00	LPRSA0189580	ABC013600					
4/6/55 3:00 PM	4/7/55 9:15 AM	18:15:00	LPRSA0189575	ABC013595					
4/12/55 3:15 PM	4/15/55 9:45 AM	66:30:00	LPRSA0189574	ABC013594					
5/31/55 2:15 PM	5/31/55 4:30 PM	2:15:00	LPRSA0189572	ABC013592					
6/22/55 12:00 AM	6/22/55 9:15 AM	9:15:00	LPRSA0189571	ABC013591					
8/8/55 2:00 AM	8/8/55 9:00 AM	7:00:00	LPRSA0189570	ABC013590					
8/19/55 12:15 AM	8/20/55 10:00 AM	33:45:00	LPRSA0189567	ABC013587					
8/22/55 10:45 PM	8/24/55 1:30 PM	38:45:00	LPRSA0189566	ABC013586					
9/24/55 7:30 AM	9/26/55 9:15 AM	49:45:00	LPRSA0189563	ABC013583					
10/6/55 9:15 AM	10/7/55 2:00 PM	28:45:00	LPRSA0189562	ABC013582					
10/14/55 10:15 AM	10/25/55 1:45 PM	267:30:00	LPRSA0189561	ABC013581					
10/30/55 10:45 AM	11/1/55 2:15 PM	51:30:00	LPRSA0189560	ABC013580					
11/10/55 4:45 PM	11/12/55 9:30 AM	40:45:00	LPRSA0189559	ABC013579					
11/16/55 10:15 AM	11/18/55 10:30 AM	48:15:00	LPRSA0189558	ABC013578					
1/30/56 2:15 PM	1/31/56 9:15 AM	19:00:00	LPRSA0189556	ABC013576					
2/2/56 12:45 PM	2/3/56 9:15 AM	20:30:00	LPRSA0189555	ABC013575					
2/6/56 4:45 PM	2/7/56 1:30 PM	20:45:00	LPRSA0189554	ABC013574					
2/18/56 9:30 AM	2/19/56 9:00 AM	23:30:00	LPRSA0189553	ABC013573					
3/8/56 2:45 AM	3/9/56 9:30 AM	30:45:00	LPRSA0189552	ABC013572					

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Exhibit 2-4f. Documented PVSC Bypasses at Rector Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Volume (MG)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	3/14/56 9:45 AM	3/15/56 9:30 AM	23:45:00	LPRSA0189551	ABC013571					
	3/21/56 6:30 PM	3/23/56 9:45 AM	39:15:00	LPRSA0189549	ABC013569					
	4/11/56 4:35 PM	4/12/56 10:05 AM	17:30:00	LPRSA0189545	ABC013565					
	5/2/56 10:45 PM	5/3/56 10:30 AM	11:45:00	LPRSA0189544	ABC013564					
	6/2/56 4:30 PM	6/4/56 11:15 AM	42:45:00	LPRSA0189543	ABC013563					
	6/27/56 4:20 PM	6/27/56 7:30 PM	3:10:00	LPRSA0189542	ABC013562					
	7/16/56 3:45 PM	7/17/56 10:15 AM	18:30:00	LPRSA0189541	ABC013561					
	7/21/56 11:00 AM	7/21/56 11:05 PM	12:05:00	LPRSA0189540	ABC013560					
	7/27/56 10:45 AM	7/28/56 9:20 AM	22:35:00	LPRSA0189539	ABC013559					
	8/6/56 5:45 PM	8/7/56 9:30 AM	15:45:00	LPRSA0189538	ABC013558					
	8/21/56 5:00 AM	8/22/56 9:15 AM	28:15:00	LPRSA0189537	ABC013557					
	9/6/56 7:15 PM	9/7/56 9:00 AM	13:45:00	LPRSA0189536	ABC013556					
	9/7/56 11:00 AM	9/8/56 12:15 PM	25:15:00	LPRSA0189535	ABC013555					
	9/27/56 5:15 PM	9/28/56 9:30 AM	16:15:00	LPRSA0189534	ABC013554					
	10/22/56 10:45 PM	10/23/56 9:15 AM	10:30:00	LPRSA0189533	ABC013553					
	10/31/56 1:00 PM	11/4/56 12:15 PM	95:15:00	LPRSA0189532	ABC013552					
	11/18/56 3:30 AM	11/18/56 12:15 PM	8:45:00	LPRSA0189531	ABC013551					
	11/22/56 1:45 AM	11/22/56 9:15 AM	7:30:00	LPRSA0189530	ABC013550					
	12/9/56 4:15 PM	12/10/56 9:45 AM	17:30:00	LPRSA0189529	ABC013549					
	12/14/56 9:30 AM	12/17/56 9:00 AM	71:30:00	LPRSA0189528	ABC013548					
	12/22/56 11:20 PM	12/23/56 11:15 AM	11:55:00	LPRSA0189527	ABC013547					
	1/23/57 5:00 AM	1/23/57 3:15 PM	10:15:00	LPRSA0189498	ABC013518					
	2/9/57 3:15 PM	2/10/57 10:00 AM	18:45:00	LPRSA0189497	ABC013517					
	2/26/57 5:00 PM	2/27/57 2:00 PM	21:00:00	LPRSA0189496	ABC013516					
	3/1/57 5:45 PM	3/2/57 11:45 PM	30:00:00	LPRSA0189524	ABC013544					
	3/8/57 11:15 AM	3/10/57 11:00 AM	47:45:00	LPRSA0189523	ABC013543					
	3/19/57 11:15 PM	3/21/57 10:30 AM	35:15:00	LPRSA0189521	ABC013541					
	4/2/57 9:30 AM	4/2/57 3:15 PM	5:45:00	LPRSA0189520	ABC013540					
	4/9/57 10:30 AM	4/9/57 5:15 PM	6:45:00	LPRSA0189516	ABC013536					
	4/10/57 10:30 AM	4/10/57 5:15 PM	6:45:00	LPRSA0189515	ABC013535					
	4/11/57 9:45 AM	4/11/57 5:15 PM	7:30:00	LPRSA0189514	ABC013534					
	4/12/57 9:45 AM	4/12/57 5:30 PM	7:45:00	LPRSA0189513	ABC013533					
	4/23/57 8:15 AM	4/23/57 3:15 PM	7:00:00	LPRSA0189511	ABC013531					
	5/14/57 10:15 PM	5/15/57 12:00 PM	13:45:00	LPRSA0189508	ABC013528					
*	5/16/57 12:00 AM	8/25/57 11:59 PM								
*	9/18/57 12:00 AM	12/19/57 11:59 PM								
	5/7/58 12:45 PM	5/8/58 8:15 AM	19:30:00	LPRSA0189478	ABC013498					
	10/22/58 10:30 PM	10/24/58 9:30 AM	35:00:00	LPRSA0189469	ABC013489					
	10/25/58 6:15 PM	10/27/58 2:15 PM	44:00:00	LPRSA0189468	ABC013488					
	11/28/58 10:00 PM	11/29/58 12:00 PM	14:00:00	LPRSA0189466	ABC013486					
	3/6/59 9:00 AM	3/7/59 10:15 AM	25:15:00	LPRSA0189458	ABC013478					
	6/2/59 7:45 PM	6/3/59 9:30 AM	13:45:00	LPRSA0189454	ABC013474					
	8/5/59 12:00 PM	8/5/59 3:45 PM	3:45:00	LPRSA0189448	ABC013468					
	8/9/59 5:45 AM	8/9/59 6:50 AM	1:05:00	LPRSA0189447	ABC013467					
	9/1/59 6:45 PM	9/2/59 1:30 PM	18:45:00	LPRSA0189445	ABC013465					
	12/7/59 1:30 AM	12/7/59 9:00 AM	7:30:00	LPRSA0189431	ABC013451					
	2/26/60 1:30 AM	2/26/60 10:00 AM	8:30:00	LPRSA0189420	ABC013440					
	4/3/60 10:20 PM	4/4/60 8:50 AM	10:30:00	LPRSA0189416	ABC013436					
	7/30/60 10:20 AM	7/31/60 9:30 AM	23:10:00	LPRSA0189402	ABC013422					
	8/19/60 9:10 AM	8/20/60 9:45 AM	24:35:00	LPRSA0189399	ABC013419					
	9/12/60 8:20 AM	9/13/60 10:20 AM	26:00:00	LPRSA0189397	ABC013417					

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Exhibit 2-4f. Documented PVSC Bypasses at Rector Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Volume (MG)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	9/19/60 11:10 AM	9/20/60 2:00 PM	26:50:00	LPRSA0189396	ABC013416					
	12/12/60 1:00 PM	12/14/60 1:00 PM	48:00:00	LPRSA0189392	ABC013412					
	12/21/60 9:40 AM	12/22/60 11:15 AM	25:35:00	LPRSA0189391	ABC013411					
	3/14/61 8:45 AM	3/14/61 2:30 PM	5:45:00	LPRSA0189382	ABC013402					
	3/23/61 3:10 PM	3/24/61 10:50 AM	19:40:00	LPRSA0189383	ABC013403					
	4/10/61 11:20 AM	4/11/61 8:30 AM	21:10:00	LPRSA0189376	ABC013396					
	4/13/61 9:40 AM	4/14/61 8:30 AM	22:50:00	LPRSA0189375	ABC013395					
	4/16/61 1:15 PM	4/17/61 9:00 AM	19:45:00	LPRSA0189373	ABC013393					
	4/25/61 8:40 PM	4/26/61 8:20 AM	11:40:00	LPRSA0189369	ABC013389					
	7/20/61 12:40 PM	7/21/61 9:25 AM	20:45:00	LPRSA0189357	ABC013377					
	9/20/61 2:20 PM	9/22/61 10:35 AM	44:15:00	LPRSA0189348	ABC013368					
	12/18/61 12:25 PM	12/21/61 8:15 AM	67:50:00	LPRSA0189338	ABC013358					
	2/26/62 1:15 PM	2/27/62 8:40 AM	19:25:00	LPRSA0189329	ABC013349					
	2/27/62 1:50 PM	3/1/62 8:45 AM	42:55:00	LPRSA0189329	ABC013349					
	3/12/62 8:30 AM	3/13/62 3:00 PM	30:30:00	LPRSA0189327	ABC013347					
	9/5/62 1:15 PM	9/6/62 1:10 PM	23:55:00	LPRSA0189301	ABC013321					
	9/17/62 7:45 PM	9/18/62 1:20 PM	17:35:00	LPRSA0189299	ABC013319					
	9/27/62 12:20 PM	9/28/62 1:50 PM	25:30:00	LPRSA0189296	ABC013316					
	10/5/62 7:50 AM	10/6/62 9:35 AM	25:45:00	LPRSA0189295	ABC013315					
	11/3/62 10:40 AM	11/5/62 9:35 AM	46:55:00	LPRSA0189288	ABC013308					
	11/9/62 3:15 PM	11/11/62 10:45 AM	43:30:00	LPRSA0189287	ABC013307					
	11/18/62 1:45 PM	11/19/62 8:35 AM	18:50:00	LPRSA0189285	ABC013305					
	11/21/62 10:50 PM	11/23/62 9:55 AM	35:05:00	LPRSA0189284	ABC013304					
	12/5/62 10:00 AM	12/8/62 10:00 AM	72:00:00	LPRSA0189283	ABC013303					
	12/22/62 12:25 PM	12/24/62 9:50 AM	45:25:00	LPRSA0189282	ABC013302					
*	1/1/63 12:00 AM	9/30/74 11:59 PM								
	Subtotal		13196:35:00							

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4f. Documented PVSC Bypasses at Rector Street

(Newark)

(1974-1975)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Volume (MG)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	10/16/74 9:00 AM	10/17/74 9:00 PM	36:00:00	LPRSA0195712					
	12/2/74 5:00 AM	12/3/74 9:00 AM	28:00:00	LPRSA0195714					
	12/8/74 1:00 PM	12/9/74 8:00 AM	19:00:00	LPRSA0195714					
	12/16/74 12:00 PM	12/17/74 9:00 AM	21:00:00	LPRSA0195714					
	1/25/75	1/25/75	0:00:00	LPRSA0196980					
	1/29/75	1/29/75	5:30:00	LPRSA0196980	19.9	4.60	4.56	163	6,204
	1/29/75 7:00 AM	1/29/75 12:00 PM	0:00:00	LPRSA0195715					
	3/19/75 6:00 PM	3/20/75 9:00 AM	15:00:00	LPRSA0195717					
	4/3/75 9:00 AM	4/3/75 11:00 PM	14:00:00	LPRSA0195718					
	6/6/75	6/6/75	7:22:48	LPRSA0196980	1.9	0.60	0.58	163	795
	6/6/75 1:00 AM	6/6/75 9:00 AM	0:37:12	LPRSA0195720					
	6/6/75 5:00 PM	6/7/75 1:00 AM	8:00:00	LPRSA0195720					
	6/12/75 11:00 AM	6/13/75 2:00 PM	27:00:00	LPRSA0195720					
	7/4/75 5:00 AM	7/4/75 12:00 PM	7:00:00	LPRSA0195721					
	7/7/75 9:00 AM	7/7/75 10:00 PM	13:00:00	LPRSA0195721					
	7/9/75 7:00 PM	7/10/75 3:00 AM	8:00:00	LPRSA0195721					
	7/13/75	7/14/75	20:49:48	LPRSA0196980	7.9	6.90	6.86	163	9,327
	7/13/75 2:00 PM	7/14/75 10:00 AM	0:00:00	LPRSA0195721					
	7/14/75 12:00 PM	7/17/75 9:00 AM	69:00:00	LPRSA0195721					
	7/25/75 2:00 AM	7/25/75 2:00 PM	12:00:00	LPRSA0195721					
	8/6/75	8/7/75	0:00:00	LPRSA0196980					
	9/23/75 12:00 AM	9/28/75 10:00 AM	130:00:00	LPRSA0195722					
*	10/1/75	12/31/04							
Subtotal			**441:19:48**				**12.00**		**16,325**
Estimated Mass/Bypass Time (lb/hr)									**484**
Estimated Bypassed Volume Rate (MG/hr)					**0.356**				

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

			Elapsed Time (hours)	Frequency of Overflows (#/yr)
	1/1/2005	12/31/2005	427.81	35
	1/1/2006	12/31/2006	655.57	48
	1/1/2007	12/31/2007	429.47	35
	1/1/2008	12/31/2008	597.21	46
	1/1/2009	12/31/2009	473.08	50
	1/1/2010	12/31/2010	434.18	37
	1/1/2011	12/31/2011	661.67	62
	1/1/2012	12/31/2012	176.78	39
	1/1/2013	12/31/2013	361.37	39
	1/1/2014	12/31/2014	361.37	39
*	1/1/2015	9/30/2016		
Subtotal (2005-2014)			**4578.51**	
Average annual bypass time (hr)			**457.85**	

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Exhibit 2-4f. Documented PVSC Bypasses at Rector Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Volume (MG)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)

* Missing data.

Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4g. Documented PVSC Bypasses at Saybrook Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 1:00 PM	10:30:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 11:00 AM	21:30:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/5/50 9:30 AM	21:00:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 2:30 PM	16:00:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188639	ABC012659				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/26/51 10:00 AM	18:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/30/51 10:00 AM	41:00:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648				
	2/10/51 5:30 AM	2/10/51 2:30 PM	9:00:00	LPRSA0188588	ABC012608				
	2/11/51 6:00 PM	2/15/51 2:30 PM	92:30:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 1:00 PM	3/2/51 10:00 AM	21:00:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/21/51 9:00 AM	40:00:00	LPRSA0188616	ABC012636				
*	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/19/52 11:00 AM	55:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/22/52 10:30 AM	40:30:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/7/52 10:30 AM	157:30:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/18/52 10:30 AM	173:30:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/21/52 11:00 AM	48:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/26/52 11:00 AM	90:00:00	LPRSA0189750	ABC013770				
	4/5/52 8:00 AM	4/7/52 11:00 AM	51:00:00	LPRSA0189749	ABC013769				
	4/14/52 4:00 AM	4/17/52 11:00 AM	79:00:00	LPRSA0189748	ABC013768				
	4/25/52 11:00 AM	5/9/52 4:30 PM	341:30:00	LPRSA0189744	ABC013764				
	5/11/52 10:00 PM	5/14/52 2:30 PM	64:30:00	LPRSA0189743	ABC013763				
	5/18/52 8:30 AM	5/23/52 3:15 PM	126:45:00	LPRSA0189741	ABC013761				
	5/25/52 10:00 AM	5/27/52 1:15 PM	51:15:00	LPRSA0189740	ABC013760				
	5/29/52 4:00 PM	6/14/52 10:15 AM	378:15:00	LPRSA0189736	ABC013756				
	6/17/52 6:00 PM	6/18/52 2:00 PM	20:00:00	LPRSA0189735	ABC013755				
	6/19/52 2:30 PM	6/20/52 9:15 AM	18:45:00	LPRSA0189734	ABC013754				
	6/27/52 4:30 PM	6/28/52 9:15 AM	16:45:00	LPRSA0189729	ABC013749				
	6/29/52 1:45 AM	6/30/52 10:45 AM	33:00:00	LPRSA0189728	ABC013748				
	7/8/52 4:45 PM	7/10/52 4:30 PM	47:45:00	LPRSA0189730	ABC013750				
	7/21/52 5:00 PM	7/22/52 1:00 PM	20:00:00	LPRSA0189725	ABC013745				
	7/31/52 5:20 PM	8/1/52 10:20 AM	17:00:00	LPRSA0189724	ABC013744				
	8/2/52 4:45 PM	8/3/52 10:00 AM	17:15:00	LPRSA0189725	ABC013745				
	8/6/52 3:45 PM	8/11/52 9:45 AM	114:00:00	LPRSA0189715	ABC013735				

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Exhibit 2-4g. Documented PVSC Bypasses at Saybrook Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	8/12/52 5:45 PM	8/14/52 9:30 AM	39:45:00	LPRSA0189721	ABC013741				
	8/15/52 5:30 PM	8/17/52 9:30 AM	40:00:00	LPRSA0189714	ABC013734				
	8/21/52 5:00 PM	8/22/52 1:15 PM	20:15:00	LPRSA0189713	ABC013733				
	8/30/52 10:30 AM	9/2/52 9:30 AM	71:00:00	LPRSA0189712	ABC013732				
	9/2/52 5:30 PM	9/4/52 9:15 AM	39:45:00	LPRSA0189711	ABC013731				
	9/15/52 5:00 PM	9/17/52 5:30 PM	48:30:00	LPRSA0189709	ABC013729				
	9/18/52 1:30 PM	9/20/52 9:30 AM	44:00:00	LPRSA0189710	ABC013730				
	9/23/52 11:00 AM	9/24/52 9:45 AM	22:45:00	LPRSA0189708	ABC013728				
	10/2/52 7:30 PM	10/3/52 2:00 PM	18:30:00	LPRSA0189707	ABC013727				
	10/28/52 6:00 PM	10/29/52 9:30 AM	15:30:00	LPRSA0189706	ABC013726				
	11/2/52 9:45 AM	11/2/52 2:45 PM	5:00:00	LPRSA0189705	ABC013725				
	11/3/52 2:30 PM	11/4/52 9:30 AM	19:00:00	LPRSA0189703	ABC013723				
	11/10/52 5:00 PM	11/11/52 9:30 AM	16:30:00	LPRSA0189704	ABC013724				
	11/14/52 2:00 PM	12/1/52 2:00 PM	408:00:00	LPRSA0189701	ABC013721				
	12/2/52 2:30 PM	12/8/52 9:15 AM	138:45:00	LPRSA0189702	ABC013722				
	12/9/52 8:30 AM	1/18/53 3:00 PM	966:30:00	LPRSA0189655	ABC013675				
	1/21/53 3:30 PM	1/22/53 1:15 PM	21:45:00	LPRSA0189656	ABC013676				
	1/24/53 10:30 AM	1/25/53 10:15 AM	23:45:00	LPRSA0189657	ABC013677				
	2/11/53 5:45 PM	2/13/53 10:45 AM	41:00:00	LPRSA0189658	ABC013678				
	2/15/53 11:30 AM	2/16/53 2:15 PM	26:45:00	LPRSA0189659	ABC013679				
	2/25/53 9:30 AM	3/11/53 9:45 AM	336:15:00	LPRSA0189661	ABC013681				
*		3/14/53 1:00 PM		LPRSA0189669	ABC013689				
	3/17/53 3:00 PM	4/29/53 11:30 AM	1028:30:00	LPRSA0189669	ABC013689				
	4/30/53 5:30 PM	5/8/53 3:45 PM	190:15:00	LPRSA0189669	ABC013689				
*	5/8/53 10:30 AM			LPRSA0189669	ABC013689				
	6/13/53 5:45 PM	6/15/53 11:00 AM	41:15:00	LPRSA0189674	ABC013694				
	6/22/53 10:45 AM	7/2/53 2:45 PM	244:00:00	LPRSA0189677	ABC013697				
	7/6/53 8:45 PM	7/7/53 9:15 AM	12:30:00	LPRSA0189681	ABC013701				
	7/20/53 9:50 PM	7/21/53 9:25 AM	11:35:00	LPRSA0189682	ABC013702				
	7/21/53 4:30 PM	7/22/53 9:00 AM	16:30:00	LPRSA0189683	ABC013703				
	7/23/53 9:15 AM	7/24/53 1:15 PM	28:00:00	LPRSA0189684	ABC013704				
	8/10/53 1:45 AM	8/10/53 11:15 AM	9:30:00	LPRSA0189685	ABC013705				
	8/14/53 2:00 PM	8/15/53 9:15 AM	19:15:00	LPRSA0189686	ABC013706				
	10/6/53 7:15 PM	10/7/53 10:15 AM	15:00:00	LPRSA0189689	ABC013709				
	10/20/53 9:00 AM	10/29/53 5:15 PM	224:15:00	LPRSA0189690	ABC013710				
	11/7/53 8:00 AM	11/8/53 11:30 AM	27:30:00	LPRSA0189695	ABC013715				
*	11/16/53 10:30 AM			LPRSA0189653	ABC013673				
	11/23/53 10:45 AM	11/23/53 3:30 PM	4:45:00	LPRSA0189698	ABC013718				
	11/25/53 1:00 PM	11/26/53 9:45 AM	20:45:00	LPRSA0189652	ABC013672				
	11/30/53 10:45 AM	12/5/53 8:30 AM	117:45:00	LPRSA0189651	ABC013671				
	12/6/53 10:15 AM	12/8/53 9:45 AM	47:30:00	LPRSA0189650	ABC013670				
	12/9/53 5:15 PM	12/11/53 9:45 AM	40:30:00	LPRSA0189649	ABC013669				
	12/14/53 7:00 AM	12/15/53 1:30 PM	30:30:00	LPRSA0189647	ABC013667				
	1/15/54 1:30 PM	1/18/54 10:15 AM	68:45:00	LPRSA0189592	ABC013612				
	1/20/54 2:45 PM	1/22/54 1:15 PM	46:30:00	LPRSA0189591	ABC013611				
	1/25/54 3:45 AM	2/2/54 1:45 PM	202:00:00	LPRSA0189590	ABC013610				
	2/3/54 2:15 PM	2/4/54 10:15 AM	20:00:00	LPRSA0189589	ABC013609				
	2/15/54 2:45 PM	2/19/54 2:00 PM	95:15:00	LPRSA0189587	ABC013607				
	2/21/54 6:00 PM	2/22/54 9:30 AM	15:30:00	LPRSA0189586	ABC013606				
	2/23/54 12:45 PM	2/27/54 9:30 AM	92:45:00	LPRSA0189621	ABC013641				
	3/1/54 11:45 AM	3/5/54 2:30 PM	98:45:00	LPRSA0189619	ABC013639				
	3/13/54 3:45 PM	3/15/54 10:15 AM	42:30:00	LPRSA0189618	ABC013638				
	3/19/54 5:15 PM	3/20/54 2:00 PM	20:45:00	LPRSA0189617	ABC013637				

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Exhibit 2-4g. Documented PVSC Bypasses at Saybrook Place
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
3/25/54 10:45 AM	3/26/54 10:30 AM	23:45:00	LPRSA0189616	ABC013636				
4/8/54 2:30 PM	4/9/54 10:15 AM	19:45:00	LPRSA0189613	ABC013633				
4/13/54 1:15 PM	4/13/54 3:10 PM	1:55:00	LPRSA0189623	ABC013643				
4/16/54 1:40 PM	4/18/54 10:40 AM	45:00:00	LPRSA0189632	ABC013652				
4/19/54 4:30 PM	4/21/54 3:45 PM	47:15:00	LPRSA0189615	ABC013635				
4/23/54 2:15 PM	4/25/54 10:15 AM	44:00:00	LPRSA0189614	ABC013634				
4/28/54 4:00 PM	4/29/54 10:15 AM	18:15:00	LPRSA0189612	ABC013632				
5/3/54 11:30 AM	5/27/54 8:30 AM	573:00:00	LPRSA0189631	ABC013651				
6/1/54 12:30 PM	6/9/54 10:45 AM	190:15:00	LPRSA0189630	ABC013650				
6/10/54 2:45 PM	6/11/54 10:00 AM	19:15:00	LPRSA0189629	ABC013649				
7/2/54 9:45 AM	7/2/54 11:30 AM	1:45:00	LPRSA0189627	ABC013647				
7/2/54 2:15 PM	7/2/54 4:15 PM	2:00:00	LPRSA0189626	ABC013646				
7/4/54 1:00 PM	7/6/54 10:00 AM	45:00:00	LPRSA0189625	ABC013645				
7/7/54 5:30 PM	7/8/54 1:45 PM	20:15:00	LPRSA0189624	ABC013644				
7/14/54 5:15 PM	7/15/54 12:45 PM	19:30:00	LPRSA0189634	ABC013654				
7/22/54 4:15 PM	7/23/54 9:45 AM	17:30:00	LPRSA0189633	ABC013653				
8/3/54 10:15 AM	8/4/54 10:15 AM	24:00:00	LPRSA0189620	ABC013640				
8/9/54 10:00 AM	8/11/54 10:30 AM	48:30:00	LPRSA0189622	ABC013642				
8/19/54 11:45 PM	8/20/54 11:00 AM	11:15:00	LPRSA0189611	ABC013631				
8/20/54 7:30 PM	8/22/54 9:30 AM	38:00:00	LPRSA0189610	ABC013630				
8/25/54 5:45 PM	8/26/54 1:45 PM	20:00:00	LPRSA0189609	ABC013629				
9/8/54 3:30 PM	9/9/54 1:45 PM	22:15:00	LPRSA0189607	ABC013627				
9/10/54 2:30 PM	9/12/54 10:15 AM	43:45:00	LPRSA0189606	ABC013626				
10/7/54 10:00 AM	10/8/54 2:15 PM	28:15:00	LPRSA0189604	ABC013624				
10/15/54 12:15 PM	10/16/54 7:45 AM	19:30:00	LPRSA0189603	ABC013623				
10/27/54 5:30 PM	10/28/54 1:45 AM	8:15:00	LPRSA0189602	ABC013622				
10/29/54 10:30 AM	10/30/54 10:00 AM	23:30:00	LPRSA0189601	ABC013621				
11/2/54 2:00 PM	11/5/54 10:00 PM	80:00:00	LPRSA0189600	ABC013620				
11/8/54 2:15 PM	11/9/54 2:15 PM	24:00:00	LPRSA0189599	ABC013619				
11/15/54 10:45 AM	12/2/54 3:30 AM	400:45:00	LPRSA0189597	ABC013617				
12/9/54 3:00 PM	12/10/54 2:15 PM	23:15:00	LPRSA0189596	ABC013616				
12/14/54 10:30 AM	12/15/54 2:00 PM	27:30:00	LPRSA0189595	ABC013615				
12/18/54 11:15 AM	12/19/54 9:15 AM	22:00:00	LPRSA0189593	ABC013613				
12/29/54 2:00 PM	12/30/54 1:45 PM	23:45:00	LPRSA0189585	ABC013605				
1/6/55 3:00 PM	1/7/55 10:15 AM	19:15:00	LPRSA0189582	ABC013602				
1/28/55 10:45 AM	3/9/55 10:45 AM	960:00:00	LPRSA0189580	ABC013600				
4/6/55 3:15 PM	4/7/55 9:30 AM	18:15:00	LPRSA0189575	ABC013595				
4/12/55 3:30 PM	4/15/55 10:00 AM	66:30:00	LPRSA0189574	ABC013594				
5/31/55 2:30 PM	5/31/55 4:45 PM	2:15:00	LPRSA0189572	ABC013592				
6/22/55 12:15 AM	6/22/55 9:30 AM	9:15:00	LPRSA0189571	ABC013591				
8/8/55 1:45 AM	8/8/55 9:15 AM	7:30:00	LPRSA0189570	ABC013590				
8/19/55 12:30 AM	8/20/55 10:15 AM	33:45:00	LPRSA0189567	ABC013587				
8/22/55 11:00 PM	8/24/55 1:45 PM	38:45:00	LPRSA0189566	ABC013586				
9/24/55 7:45 AM	9/26/55 9:30 AM	49:45:00	LPRSA0189563	ABC013583				
10/6/55 9:30 AM	10/7/55 2:15 PM	28:45:00	LPRSA0189562	ABC013582				
10/14/55 10:00 AM	10/25/55 1:30 PM	267:30:00	LPRSA0189561	ABC013581				
10/30/55 11:00 AM	11/1/55 2:30 PM	51:30:00	LPRSA0189560	ABC013580				
11/10/55 5:00 PM	11/12/55 9:45 AM	40:45:00	LPRSA0189559	ABC013579				
11/16/55 10:30 AM	11/18/55 10:45 AM	48:15:00	LPRSA0189558	ABC013578				
1/30/56 2:30 PM	1/31/56 9:30 AM	19:00:00	LPRSA0189556	ABC013576				
2/2/56 1:00 PM	2/3/56 9:30 AM	20:30:00	LPRSA0189555	ABC013575				
4/11/56 4:20 PM	4/12/56 9:55 AM	17:35:00	LPRSA0189545	ABC013565				
6/27/56 4:15 PM	6/27/56 7:15 PM	3:00:00	LPRSA0189542	ABC013562				

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Exhibit 2-4g. Documented PVSC Bypasses at Saybrook Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	3/6/59 2:00 AM	3/7/59 11:15 AM	33:15:00	LPRSA0189458	ABC013478				
	6/2/59 7:30 PM	6/3/59 9:15 AM	13:45:00	LPRSA0189454	ABC013474				
	9/1/59 7:00 PM	9/2/59 8:45 AM	13:45:00	LPRSA0189445	ABC013465				
	10/23/58 2:30 AM	10/23/58 3:35 PM	13:05:00	LPRSA0189469	ABC013489				
	10/25/58 6:00 PM	10/27/58 2:30 PM	44:30:00	LPRSA0189468	ABC013488				
	11/28/58 9:45 PM	11/29/58 11:45 AM	14:00:00	LPRSA0189466	ABC013486				
	1/3/60 9:45 AM	1/4/60 3:40 PM	29:55:00	LPRSA0189427	ABC013447				
	2/19/60 1:00 AM	2/19/60 1:15 PM	12:15:00	LPRSA0189421	ABC013441				
	2/26/60 2:00 AM	2/26/60 10:20 AM	8:20:00	LPRSA0189420	ABC013440				
	7/14/60 2:00 PM	7/15/60 8:15 AM	18:15:00	LPRSA0189404	ABC013424				
	8/19/60 4:00 PM	8/20/60 9:40 AM	17:40:00	LPRSA0189399	ABC013419				
	9/12/60 10:05 AM	9/13/60 10:00 AM	23:55:00	LPRSA0189397	ABC013417				
	9/19/60 11:30 AM	9/21/60 9:50 PM	58:20:00	LPRSA0189396	ABC013416				
	12/21/60 11:15 AM	12/22/60 11:05 AM	23:50:00	LPRSA0189391	ABC013411				
	3/14/61 8:55 AM	3/14/61 2:15 PM	5:20:00	LPRSA0189382	ABC013402				
	3/23/61 3:00 PM	3/24/61 11:00 AM	20:00:00	LPRSA0189383	ABC013403				
	4/10/61 11:30 AM	4/11/61 8:40 AM	21:10:00	LPRSA0189376	ABC013396				
	4/13/61 9:50 AM	4/14/61 8:45 AM	22:55:00	LPRSA0189375	ABC013395				
	4/16/61 1:25 PM	4/17/61 9:10 AM	19:45:00	LPRSA0189373	ABC013393				
	4/25/61 8:30 PM	4/26/61 8:30 AM	12:00:00	LPRSA0189369	ABC013389				
	7/20/61 12:30 PM	7/21/61 9:15 AM	20:45:00	LPRSA0189357	ABC013377				
	9/20/61 2:05 PM	9/22/61 10:20 AM	44:15:00	LPRSA0189348	ABC013368				
	12/18/61 12:15 PM	12/20/61 8:50 AM	44:35:00	LPRSA0189338	ABC013358				
	2/26/62 1:25 PM	2/27/62 8:55 AM	19:30:00	LPRSA0189329	ABC013349				
	2/27/62 2:00 PM	3/1/62 9:05 AM	43:05:00	LPRSA0189329	ABC013349				
	3/12/62 8:40 AM	3/13/62 3:10 PM	30:30:00	LPRSA0189327	ABC013347				
	9/5/62 1:25 PM	9/6/62 1:20 PM	23:55:00	LPRSA0189301	ABC013321				
	9/17/62 7:30 PM	9/18/62 1:30 PM	18:00:00	LPRSA0189299	ABC013319				
	9/27/62 12:30 PM	9/28/62 2:00 PM	25:30:00	LPRSA0189296	ABC013316				
	10/5/62 8:00 AM	10/6/62 9:50 AM	25:50:00	LPRSA0189295	ABC013315				
	11/3/62 10:35 AM	11/5/62 9:25 AM	46:50:00	LPRSA0189288	ABC013308				
	11/9/62 3:20 PM	11/11/62 10:55 AM	43:35:00	LPRSA0189287	ABC013307				
	11/18/62 2:00 PM	11/19/62 8:50 AM	18:50:00	LPRSA0189285	ABC013305				
	11/21/62 11:00 PM	11/23/62 10:05 AM	35:05:00	LPRSA0189284	ABC013304				
	12/5/62 10:05 AM	12/6/62 2:45 PM	28:40:00	LPRSA0189283	ABC013303				
	12/22/62 12:40 PM	12/24/62 10:00 AM	45:20:00	LPRSA0189282	ABC013302				
*	1/1/63 12:00 AM	9/30/75 11:59 PM							
	Subtotal		12493:50:00						

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4g. Documented PVSC Bypasses at Saybrook Place
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1974-1975)							
	10/16/74 10:00 AM	10/17/74 9:00 PM	35:00:00	LPRSA0195712				
	12/2/74 6:00 AM	12/3/74 10:00 AM	28:00:00	LPRSA0195714				
	1/8/75	1/8/75	0:00:00	LPRSA0197017	*	*		
	4/3/75 9:00 AM	4/4/75 12:00 AM	15:00:00	LPRSA0195718				
	6/6/75 1:00 AM	6/6/75 9:00 AM	8:00:00	LPRSA0195720				
	6/6/75 5:00 PM	6/7/75 1:00 AM	8:00:00	LPRSA0195720				
	6/12/75 11:00 AM	6/13/75 2:00 PM	27:00:00	LPRSA0195720				
	6/29/75	6/29/75	0:00:00	LPRSA0197018	*	*		
	7/7/75 9:00 AM	7/7/75 10:00 PM	13:00:00	LPRSA0195721				
	7/9/75 7:00 PM	7/10/75 3:00 AM	8:00:00	LPRSA0195721				
	7/13/75 2:00 PM	7/14/75 9:00 AM	19:00:00	LPRSA0195721				
	7/14/75 12:00 PM	7/17/75 9:00 AM	69:00:00	LPRSA0195721				
	7/25/75 2:00 AM	7/25/75 2:00 PM	12:00:00	LPRSA0195721				
	9/23/75 3:00 AM	9/28/75 10:00 AM	127:00:00	LPRSA0195722				
*	10/1/75	12/31/04						
Subtotal			**369:00:00**		18.54	1.94	121.2	1,966
Estimated Mass/Bypass Time (lb/hr)								782
Estimated Bypassed Volume Rate (MG/hr)					**0.773**			

* Tide gates not functioning properly and bypasses not measured; overflow data are used to calculate average mass and volume.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

		Elapsed Time (hours)	Frequency of Overflows (#/yr)
1/1/2005	12/31/2005	430.13	35
1/1/2006	12/31/2006	665.85	49
1/1/2007	12/31/2007	437.60	36
1/1/2008	12/31/2008	607.02	46
1/1/2009	12/31/2009	504.90	52
1/1/2010	12/31/2010	448.16	39
1/1/2011	12/31/2011	671.17	62
1/1/2012	12/31/2012	172.94	38
1/1/2013	12/31/2013	254.64	21
1/1/2014	12/31/2014	254.64	21
* 1/1/2015	9/30/2016		
Subtotal (2005-2014)		**4447.05**	
Average annual bypass time (hr)		**444.71**	

* Missing data.
Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4h. Documented PVSC Bypasses at City Dock
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 1:00 PM	10:30:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 11:00 AM	21:30:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/5/50 9:30 AM	21:00:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 2:30 PM	16:00:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/26/51 10:00 AM	18:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/30/51 10:00 AM	41:00:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648				
	2/10/51 5:30 AM	2/10/51 2:30 PM	9:00:00	LPRSA0188588	ABC012608				
	2/11/51 6:00 PM	2/15/51 2:30 PM	92:30:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 1:00 PM	3/2/51 10:00 AM	21:00:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/21/51 9:00 AM	40:00:00	LPRSA0188616	ABC012636				
*	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/19/52 11:00 AM	55:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/22/52 10:30 AM	40:30:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/7/52 10:30 AM	157:30:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/18/52 10:30 AM	173:30:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/21/52 11:00 AM	48:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/26/52 11:00 AM	90:00:00	LPRSA0189750	ABC013770				
	4/5/52 8:00 AM	4/7/52 11:00 AM	51:00:00	LPRSA0189749	ABC013769				
	4/14/52 4:00 AM	4/17/52 11:00 AM	79:00:00	LPRSA0189748	ABC013768				
	4/25/52 11:00 AM	5/9/52 4:30 PM	341:30:00	LPRSA0189744	ABC013764				
	5/11/52 10:00 PM	5/14/52 2:30 PM	64:30:00	LPRSA0189743	ABC013763				
	5/18/52 8:45 AM	5/23/52 3:30 PM	126:45:00	LPRSA0189741	ABC013761				
	5/25/52 10:15 AM	5/27/52 1:30 PM	51:15:00	LPRSA0189740	ABC013760				
	5/29/52 4:15 PM	6/14/52 10:30 AM	378:15:00	LPRSA0189736	ABC013756				
	6/17/52 6:15 PM	6/18/52 2:30 PM	20:15:00	LPRSA0189735	ABC013755				
	6/19/52 2:15 PM	6/20/52 9:00 AM	18:45:00	LPRSA0189734	ABC013754				
	6/27/52 4:40 PM	6/28/52 9:30 AM	16:50:00	LPRSA0189729	ABC013749				
	6/29/52 2:00 AM	6/30/52 10:50 AM	32:50:00	LPRSA0189728	ABC013748				
	7/8/52 5:00 PM	7/10/52 4:15 PM	47:15:00	LPRSA0189730	ABC013750				
	7/21/52 5:15 PM	7/22/52 1:30 PM	20:15:00	LPRSA0189725	ABC013745				
	7/31/52 5:25 PM	8/1/52 10:25 AM	17:00:00	LPRSA0189724	ABC013744				
	8/2/52 5:00 PM	8/3/52 10:15 AM	17:15:00	LPRSA0189725	ABC013745				
	8/6/52 4:00 PM	8/11/52 10:00 AM	114:00:00	LPRSA0189715	ABC013735				

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Exhibit 2-4h. Documented PVSC Bypasses at City Dock
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
*	8/12/52 6:00 PM			LPRSA0189721	ABC013741				
	8/15/52 5:45 PM	8/17/52 9:45 AM	40:00:00	LPRSA0189714	ABC013734				
	8/21/52 5:15 PM	8/22/52 1:30 PM	20:15:00	LPRSA0189713	ABC013733				
	8/30/52 10:45 AM	9/2/52 9:45 AM	71:00:00	LPRSA0189712	ABC013732				
	9/2/52 5:45 PM	9/4/52 9:30 AM	39:45:00	LPRSA0189711	ABC013731				
	9/15/52 5:15 PM	9/17/52 5:45 PM	48:30:00	LPRSA0189709	ABC013729				
	9/18/52 1:45 PM	9/20/52 9:45 AM	44:00:00	LPRSA0189710	ABC013730				
	9/23/52 11:15 AM	9/24/52 10:00 AM	22:45:00	LPRSA0189708	ABC013728				
	10/2/52 7:45 PM	10/3/52 2:15 PM	18:30:00	LPRSA0189707	ABC013727				
	10/28/52 6:15 PM	10/29/52 9:45 AM	15:30:00	LPRSA0189706	ABC013726				
	11/3/52 2:45 PM	11/4/52 9:45 AM	19:00:00	LPRSA0189703	ABC013723				
	11/10/52 5:15 PM	11/11/52 9:45 AM	16:30:00	LPRSA0189704	ABC013724				
	11/14/52 2:15 PM	12/1/52 2:15 PM	408:00:00	LPRSA0189701	ABC013721				
	12/2/52 2:45 PM	12/8/52 9:30 AM	138:45:00	LPRSA0189702	ABC013722				
	12/9/52 8:45 AM	1/18/53 3:15 PM	966:30:00	LPRSA0189655	ABC013675				
	1/21/53 3:45 PM	1/22/53 1:30 PM	21:45:00	LPRSA0189656	ABC013676				
	1/24/53 10:45 AM	1/25/53 10:30 AM	23:45:00	LPRSA0189657	ABC013677				
	2/11/53 6:00 PM	2/13/53 11:00 AM	41:00:00	LPRSA0189658	ABC013678				
	2/15/53 11:45 AM	2/16/53 2:30 PM	26:45:00	LPRSA0189659	ABC013679				
	2/25/53 9:45 AM	3/11/53 10:00 AM	336:15:00	LPRSA0189661	ABC013681				
*		3/14/53 1:15 PM		LPRSA0189670	ABC013690				
	3/17/53 3:15 PM	4/28/53 1:30 PM	1006:15:00	LPRSA0189670	ABC013690				
	4/29/53 9:30 AM	4/29/53 3:30 PM	6:00:00	LPRSA0189670	ABC013690				
	4/30/53 5:45 PM	5/8/53 4:00 PM	190:15:00	LPRSA0189670	ABC013690				
*	5/8/53 11:30 AM			LPRSA0189670	ABC013690				
	6/13/53 6:00 PM	6/15/53 11:15 AM	41:15:00	LPRSA0189674	ABC013694				
	6/22/53 11:00 AM	7/2/53 3:00 PM	244:00:00	LPRSA0189677	ABC013697				
	7/6/53 9:00 PM	7/7/53 9:30 AM	12:30:00	LPRSA0189681	ABC013701				
	7/20/53 10:00 PM	7/21/53 9:35 AM	11:35:00	LPRSA0189682	ABC013702				
	7/21/53 4:45 PM	7/22/53 9:15 AM	16:30:00	LPRSA0189683	ABC013703				
	7/23/53 9:25 AM	7/24/53 1:30 PM	28:05:00	LPRSA0189684	ABC013704				
	8/14/53 2:15 PM	8/15/53 9:30 AM	19:15:00	LPRSA0189686	ABC013706				
	10/6/53 7:30 PM	10/7/53 10:30 AM	15:00:00	LPRSA0189689	ABC013709				
	10/20/53 9:15 AM	10/29/53 5:30 PM	224:15:00	LPRSA0189690	ABC013710				
	11/7/53 8:15 AM	11/8/53 11:45 AM	27:30:00	LPRSA0189695	ABC013715				
*	11/16/53 10:45 AM			LPRSA0189653	ABC013673				
	11/23/53 11:00 AM	11/23/53 3:15 PM	4:15:00	LPRSA0189698	ABC013718				
	11/25/53 1:15 PM	11/26/53 10:00 AM	20:45:00	LPRSA0189652	ABC013672				
	11/30/53 11:00 AM	12/5/53 8:45 AM	117:45:00	LPRSA0189651	ABC013671				
	12/6/53 10:30 AM	12/8/53 10:00 AM	47:30:00	LPRSA0189650	ABC013670				
	12/9/53 5:30 PM	12/11/53 10:00 AM	40:30:00	LPRSA0189649	ABC013669				
	12/14/53 7:15 AM	12/15/53 1:45 PM	30:30:00	LPRSA0189647	ABC013667				
	1/15/54 2:00 PM	1/18/54 10:45 AM	68:45:00	LPRSA0189592	ABC013612				
	1/20/54 3:00 PM	1/22/54 1:30 PM	46:30:00	LPRSA0189591	ABC013611				
	1/25/54 4:00 AM	2/2/54 2:00 PM	202:00:00	LPRSA0189590	ABC013610				
	2/3/54 2:30 PM	2/4/54 10:30 AM	20:00:00	LPRSA0189589	ABC013609				
	2/15/54 3:00 PM	2/19/54 2:15 PM	95:15:00	LPRSA0189587	ABC013607				
	2/21/54 6:15 PM	2/22/54 9:45 AM	15:30:00	LPRSA0189586	ABC013606				
	2/23/54 1:00 PM	2/27/54 9:45 AM	92:45:00	LPRSA0189621	ABC013641				
	3/1/54 12:00 PM	3/5/54 2:45 PM	98:45:00	LPRSA0189619	ABC013639				
	3/13/54 4:00 PM	3/15/54 10:30 AM	42:30:00	LPRSA0189618	ABC013638				
	3/19/54 5:30 PM	3/20/54 1:40 PM	20:10:00	LPRSA0189617	ABC013637				
	3/25/54 11:00 AM	3/26/54 10:45 AM	23:45:00	LPRSA0189616	ABC013636				

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Exhibit 2-4h. Documented PVSC Bypasses at City Dock
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	4/8/54 2:45 PM	4/9/54 10:30 AM	19:45:00	LPRSA0189613	ABC013633				
	4/13/54 1:30 PM	4/13/54 3:00 PM	1:30:00	LPRSA0189623	ABC013643				
	4/16/54 1:50 PM	4/18/54 10:50 AM	45:00:00	LPRSA0189632	ABC013652				
	4/19/54 4:45 PM	4/21/54 3:30 PM	46:45:00	LPRSA0189615	ABC013635				
	4/23/54 2:30 PM	4/25/54 10:30 AM	44:00:00	LPRSA0189614	ABC013634				
	4/28/54 4:15 PM	4/29/54 10:30 AM	18:15:00	LPRSA0189612	ABC013632				
	5/3/54 11:45 AM	5/26/54 9:45 AM	550:00:00	LPRSA0189631	ABC013651				
	6/1/54 12:45 PM	6/3/54 4:30 PM	51:45:00	LPRSA0189630	ABC013650				
	7/2/54 10:00 AM	7/2/54 5:00 PM	7:00:00	LPRSA0189626	ABC013646				
	7/4/54 1:15 PM	7/4/54 2:30 PM	1:15:00	LPRSA0189625	ABC013645				
	9/10/54 2:45 PM	9/12/54 10:30 AM	43:45:00	LPRSA0189606	ABC013626				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	9/12/60 12:20 PM	9/13/60 9:30 AM	21:10:00	LPRSA0189397	ABC013417				
*	1/1/63 12:00 AM	12/31/74 11:59 PM							
	Subtotal		8676:55:00						

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4h. Documented PVSC Bypasses at City Dock
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1975)							
	1/1/75	1/1/75	0:00:00	LPRSA0197075	*	*		
	7/20/75	7/20/75	0:00:00	LPRSA0197076	*	*		
*	7/21/75	12/31/04						
*	**Average Overflow**				42.5	1.62	260	3,517
	Estimated Mass/Bypass Time (lb/hr)							3,845
	Estimated Bypassed Volume Rate (MG/hr)				**1.771**			

* Note: Regulator appeared inoperable and tide gates were closed; overflow data are used to calculate average mass and volume.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

			Elapsed Time (hours)	Frequency of Overflows (#/yr)
	1/1/2005	12/31/2005	447.37	36
	1/1/2006	12/31/2006	656.49	47
	1/1/2007	12/31/2007	367.35	23
	1/1/2008	12/31/2008	561.00	35
	1/1/2009	12/31/2009	505.69	52
	1/1/2010	12/31/2010	459.27	39
	1/1/2011	12/31/2011	597.82	60
	1/1/2012	12/31/2012	181.96	39
	1/1/2013	12/31/2013	310.70	33
	1/1/2014	12/31/2014	310.70	33
*	1/1/2015	9/30/2016		
	Subtotal (2005-2014)		**4398.35**	
	Average annual bypass time (hr)		**439.84**	

* Missing data.
Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4i. Documented PVSC Bypasses at Jackson Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 1:00 PM	10:30:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 11:00 AM	21:30:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/5/50 9:30 AM	21:00:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 2:30 PM	16:00:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/26/51 10:00 AM	18:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/30/51 10:00 AM	41:00:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648				
	2/10/51 5:30 AM	2/10/51 2:30 PM	9:00:00	LPRSA0188588	ABC012608				
	2/11/51 6:00 PM	2/15/51 2:30 PM	92:30:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 1:00 PM	3/2/51 10:00 AM	21:00:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/21/51 9:00 AM	40:00:00	LPRSA0188616	ABC012636				
*	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/19/52 11:00 AM	55:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/22/52 10:30 AM	40:30:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/7/52 10:30 AM	157:30:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/18/52 10:30 AM	173:30:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/21/52 11:00 AM	48:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/26/52 11:00 AM	90:00:00	LPRSA0189750	ABC013770				
	4/5/52 8:00 AM	4/7/52 11:00 AM	51:00:00	LPRSA0189749	ABC013769				
	4/14/52 4:00 AM	4/17/52 11:00 AM	79:00:00	LPRSA0189748	ABC013768				
	4/25/52 11:00 AM	5/9/52 4:30 PM	341:30:00	LPRSA0189744	ABC013764				
	5/11/52 10:00 PM	5/14/52 2:30 PM	64:30:00	LPRSA0189743	ABC013763				
	5/18/52 9:00 AM	5/23/52 3:45 PM	126:45:00	LPRSA0189741	ABC013761				
	5/25/52 10:30 AM	5/27/52 1:45 PM	51:15:00	LPRSA0189740	ABC013760				
	5/29/52 4:40 PM	6/14/52 10:45 AM	378:05:00	LPRSA0189736	ABC013756				
	6/17/52 6:30 PM	6/18/52 3:00 PM	20:30:00	LPRSA0189735	ABC013755				
	6/19/52 2:00 PM	6/20/52 8:45 AM	18:45:00	LPRSA0189734	ABC013754				
	6/27/52 4:50 PM	6/28/52 9:45 AM	16:55:00	LPRSA0189729	ABC013749				
	6/29/52 2:30 AM	6/30/52 11:00 AM	32:30:00	LPRSA0189728	ABC013748				
	7/8/52 5:15 PM	7/10/52 4:00 PM	46:45:00	LPRSA0189730	ABC013750				
	7/21/52 5:30 PM	7/22/52 1:45 PM	20:15:00	LPRSA0189725	ABC013745				
	7/31/52 5:35 PM	8/1/52 10:35 AM	17:00:00	LPRSA0189724	ABC013744				
	8/2/52 5:15 PM	8/3/52 10:30 AM	17:15:00	LPRSA0189725	ABC013745				
	8/6/52 4:15 PM	8/11/52 10:15 AM	114:00:00	LPRSA0189715	ABC013735				

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Exhibit 2-4i. Documented PVSC Bypasses at Jackson Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	8/12/52 6:15 PM	8/14/52 9:45 AM	39:30:00	LPRSA0189721	ABC013741				
	8/15/52 6:00 PM	8/17/52 10:00 AM	40:00:00	LPRSA0189714	ABC013734				
	8/21/52 5:30 PM	8/22/52 1:45 PM	20:15:00	LPRSA0189713	ABC013733				
	8/30/52 11:00 AM	9/2/52 10:00 AM	71:00:00	LPRSA0189712	ABC013732				
	9/2/52 6:00 PM	9/4/52 9:45 AM	39:45:00	LPRSA0189711	ABC013731				
	9/15/52 5:30 PM	9/17/52 6:00 PM	48:30:00	LPRSA0189709	ABC013729				
	9/18/52 2:00 PM	9/20/52 10:00 AM	44:00:00	LPRSA0189710	ABC013730				
	9/23/52 11:30 AM	9/24/52 10:15 AM	22:45:00	LPRSA0189708	ABC013728				
	10/2/52 8:00 PM	10/3/52 2:30 PM	18:30:00	LPRSA0189707	ABC013727				
	10/28/52 6:30 PM	10/29/52 10:00 AM	15:30:00	LPRSA0189706	ABC013726				
	11/3/52 3:00 PM	11/4/52 10:00 AM	19:00:00	LPRSA0189703	ABC013723				
	11/10/52 5:30 PM	11/11/52 10:00 AM	16:30:00	LPRSA0189704	ABC013724				
	11/14/52 2:30 PM	12/1/52 2:30 PM	408:00:00	LPRSA0189701	ABC013721				
	12/2/52 3:00 PM	12/8/52 9:45 AM	138:45:00	LPRSA0189702	ABC013722				
	12/9/52 9:00 AM	1/18/53 3:30 PM	966:30:00	LPRSA0189655	ABC013675				
	1/21/53 4:00 PM	1/22/53 1:45 PM	21:45:00	LPRSA0189656	ABC013676				
	1/24/53 11:00 AM	1/25/53 10:45 AM	23:45:00	LPRSA0189657	ABC013677				
	2/11/53 6:15 PM	2/13/53 11:15 AM	41:00:00	LPRSA0189658	ABC013678				
	2/15/53 12:00 PM	2/16/53 2:45 PM	26:45:00	LPRSA0189659	ABC013679				
	2/25/53 10:00 AM	3/11/53 10:15 AM	336:15:00	LPRSA0189661	ABC013681				
*		3/14/53 1:30 PM		LPRSA0189671	ABC013691				
	3/17/53 3:30 PM	4/29/53 11:00 AM	1027:30:00	LPRSA0189671	ABC013691				
	4/30/53 6:20 PM	5/8/53 4:15 PM	189:55:00	LPRSA0189671	ABC013691				
*	5/8/53 10:30 AM			LPRSA0189671	ABC013691				
	6/13/53 6:15 PM	6/15/53 11:30 AM	41:15:00	LPRSA0189674	ABC013694				
	6/22/53 11:15 AM	7/2/53 3:15 PM	244:00:00	LPRSA0189677	ABC013697				
	7/6/53 9:15 PM	7/7/53 9:45 AM	12:30:00	LPRSA0189681	ABC013701				
	7/20/53 10:15 PM	7/21/53 10:00 AM	11:45:00	LPRSA0189682	ABC013702				
	7/21/53 5:10 PM	7/22/53 9:30 AM	16:20:00	LPRSA0189683	ABC013703				
	7/23/53 9:35 AM	7/24/53 1:45 PM	28:10:00	LPRSA0189684	ABC013704				
	8/14/53 2:30 PM	8/15/53 9:45 AM	19:15:00	LPRSA0189686	ABC013706				
	10/20/53 9:30 AM	10/29/53 5:45 PM	224:15:00	LPRSA0189690	ABC013710				
	11/7/53 8:30 AM	11/8/53 12:00 PM	27:30:00	LPRSA0189695	ABC013715				
*	11/16/53 11:00 AM			LPRSA0189653	ABC013673				
	11/23/53 11:15 AM	11/23/53 3:00 PM	3:45:00	LPRSA0189698	ABC013718				
	11/25/53 1:30 PM	11/26/53 10:15 AM	20:45:00	LPRSA0189652	ABC013672				
	11/30/53 11:15 AM	12/5/53 9:00 AM	117:45:00	LPRSA0189651	ABC013671				
	12/6/53 10:45 AM	12/8/53 10:15 AM	47:30:00	LPRSA0189650	ABC013670				
	12/9/53 5:45 PM	12/11/53 10:15 AM	40:30:00	LPRSA0189649	ABC013669				
	12/14/53 7:30 AM	12/15/53 2:00 PM	30:30:00	LPRSA0189647	ABC013667				
	1/15/54 2:15 PM	1/18/54 11:00 AM	68:45:00	LPRSA0189592	ABC013612				
	1/20/54 3:15 PM	1/22/54 1:45 PM	46:30:00	LPRSA0189591	ABC013611				
	1/25/54 4:15 AM	2/2/54 2:15 PM	202:00:00	LPRSA0189590	ABC013610				
	2/3/54 2:45 PM	2/4/54 10:45 AM	20:00:00	LPRSA0189589	ABC013609				
	2/15/54 3:15 PM	2/19/54 2:30 PM	95:15:00	LPRSA0189587	ABC013607				
	2/21/54 6:30 PM	2/22/54 10:00 AM	15:30:00	LPRSA0189586	ABC013606				
	2/23/54 1:15 PM	2/27/54 10:00 AM	92:45:00	LPRSA0189621	ABC013641				
	3/1/54 12:15 PM	3/5/54 3:00 PM	98:45:00	LPRSA0189619	ABC013639				
	3/13/54 4:15 PM	3/15/54 10:45 AM	42:30:00	LPRSA0189618	ABC013638				
	3/19/54 5:45 PM	3/20/54 1:25 PM	19:40:00	LPRSA0189617	ABC013637				
	3/25/54 11:15 AM	3/26/54 11:00 AM	23:45:00	LPRSA0189616	ABC013636				
	4/8/54 3:00 PM	4/9/54 10:45 AM	19:45:00	LPRSA0189613	ABC013633				
	4/13/54 1:45 PM	4/13/54 2:50 PM	1:05:00	LPRSA0189623	ABC013643				

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Exhibit 2-4i. Documented PVSC Bypasses at Jackson Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
4/16/54 2:00 PM	4/18/54 11:00 AM	45:00:00	LPRSA0189632	ABC013652				
4/19/54 5:00 PM	4/21/54 3:15 PM	46:15:00	LPRSA0189615	ABC013635				
4/23/54 2:45 PM	4/25/54 10:45 AM	44:00:00	LPRSA0189614	ABC013634				
4/28/54 4:30 PM	4/29/54 10:45 AM	18:15:00	LPRSA0189612	ABC013632				
5/3/54 12:00 PM	5/26/54 10:00 AM	550:00:00	LPRSA0189631	ABC013651				
6/1/54 1:00 PM	6/9/54 11:15 AM	190:15:00	LPRSA0189630	ABC013650				
6/10/54 2:30 PM	6/11/54 10:15 AM	19:45:00	LPRSA0189629	ABC013649				
7/2/54 10:15 AM	7/2/54 5:15 PM	7:00:00	LPRSA0189626	ABC013646				
7/4/54 1:30 PM	7/5/54 10:15 AM	20:45:00	LPRSA0189625	ABC013645				
7/7/54 5:45 PM	7/8/54 2:00 PM	20:15:00	LPRSA0189624	ABC013644				
7/14/54 5:30 PM	7/15/54 1:00 PM	19:30:00	LPRSA0189634	ABC013654				
7/22/54 4:30 PM	7/23/54 10:00 AM	17:30:00	LPRSA0189633	ABC013653				
8/3/54 10:30 AM	8/4/54 10:30 AM	24:00:00	LPRSA0189620	ABC013640				
8/9/54 10:15 AM	8/11/54 10:45 AM	48:30:00	LPRSA0189622	ABC013642				
8/19/54 12:00 AM	8/20/54 11:15 AM	35:15:00	LPRSA0189611	ABC013631				
8/20/54 7:45 PM	8/22/54 9:45 AM	38:00:00	LPRSA0189610	ABC013630				
8/25/54 6:00 PM	8/26/54 2:00 PM	20:00:00	LPRSA0189609	ABC013629				
9/8/54 3:45 PM	9/9/54 2:00 PM	22:15:00	LPRSA0189607	ABC013627				
9/10/54 3:00 PM	9/12/54 10:45 AM	43:45:00	LPRSA0189606	ABC013626				
10/7/54 10:15 AM	10/8/54 2:30 PM	28:15:00	LPRSA0189604	ABC013624				
10/15/54 12:30 PM	10/16/54 8:00 AM	19:30:00	LPRSA0189603	ABC013623				
10/27/54 5:45 PM	10/28/54 2:00 AM	8:15:00	LPRSA0189602	ABC013622				
10/29/54 10:45 AM	10/30/54 10:15 AM	23:30:00	LPRSA0189601	ABC013621				
11/2/54 2:15 PM	11/5/54 3:15 PM	73:00:00	LPRSA0189600	ABC013620				
11/8/54 2:30 PM	11/9/54 2:30 PM	24:00:00	LPRSA0189599	ABC013619				
11/15/54 11:00 AM	12/2/54 3:45 AM	400:45:00	LPRSA0189597	ABC013617				
12/9/54 3:15 PM	12/10/54 2:30 PM	23:15:00	LPRSA0189596	ABC013616				
12/14/54 10:45 AM	12/15/54 2:15 PM	27:30:00	LPRSA0189595	ABC013615				
12/18/54 11:30 AM	12/19/54 9:30 AM	22:00:00	LPRSA0189593	ABC013613				
12/29/54 2:15 PM	12/30/54 1:30 PM	23:15:00	LPRSA0189585	ABC013605				
1/6/55 3:15 PM	1/7/55 10:30 AM	19:15:00	LPRSA0189582	ABC013602				
1/28/55 11:00 AM	3/9/55 11:00 AM	960:00:00	LPRSA0189580	ABC013600				
4/6/55 3:30 PM	4/7/55 9:45 AM	18:15:00	LPRSA0189575	ABC013595				
4/12/55 3:45 PM	4/15/55 10:15 AM	66:30:00	LPRSA0189574	ABC013594				
5/31/55 2:45 PM	5/31/55 5:00 PM	2:15:00	LPRSA0189572	ABC013592				
6/22/55 12:30 AM	6/22/55 9:45 AM	9:15:00	LPRSA0189571	ABC013591				
8/8/55 1:30 AM	8/8/55 9:30 AM	8:00:00	LPRSA0189570	ABC013590				
8/19/55 12:45 AM	8/20/55 10:30 AM	33:45:00	LPRSA0189567	ABC013587				
8/22/55 11:15 PM	8/24/55 2:00 PM	38:45:00	LPRSA0189566	ABC013586				
9/24/55 8:00 AM	9/26/55 9:45 AM	49:45:00	LPRSA0189563	ABC013583				
10/6/55 9:45 AM	10/7/55 2:30 PM	28:45:00	LPRSA0189562	ABC013582				
10/14/55 10:30 AM	10/25/55 2:00 PM	267:30:00	LPRSA0189561	ABC013581				
10/30/55 11:15 AM	11/1/55 2:45 PM	51:30:00	LPRSA0189560	ABC013580				
11/10/55 5:15 PM	11/12/55 10:00 AM	40:45:00	LPRSA0189559	ABC013579				
11/16/55 10:45 AM	11/18/55 11:00 AM	48:15:00	LPRSA0189558	ABC013578				
1/30/56 2:45 PM	1/31/56 9:45 AM	19:00:00	LPRSA0189556	ABC013576				
2/2/56 1:15 PM	2/3/56 9:45 AM	20:30:00	LPRSA0189555	ABC013575				
2/6/56 5:00 PM	2/7/56 1:45 PM	20:45:00	LPRSA0189554	ABC013574				
2/18/56 9:45 AM	2/19/56 9:15 AM	23:30:00	LPRSA0189553	ABC013573				
3/8/56 3:30 AM	3/9/56 10:15 AM	30:45:00	LPRSA0189552	ABC013572				
3/14/56 10:30 AM	3/15/56 10:15 AM	23:45:00	LPRSA0189551	ABC013571				
3/21/56 6:15 PM	3/23/56 10:30 AM	40:15:00	LPRSA0189549	ABC013569				
4/11/56 3:30 PM	4/12/56 9:40 AM	18:10:00	LPRSA0189545	ABC013565				

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Exhibit 2-4i. Documented PVSC Bypasses at Jackson Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	5/2/56 10:30 PM	5/3/56 10:15 AM	11:45:00	LPRSA0189544	ABC013564				
	6/2/56 4:20 PM	6/4/56 11:00 AM	42:40:00	LPRSA0189543	ABC013563				
	6/27/56 4:00 PM	6/27/56 7:00 PM	3:00:00	LPRSA0189542	ABC013562				
	7/16/56 3:30 PM	7/17/56 10:00 AM	18:30:00	LPRSA0189541	ABC013561				
	7/21/56 10:45 AM	7/21/56 10:50 PM	12:05:00	LPRSA0189540	ABC013560				
	7/27/56 11:30 AM	7/28/56 9:05 AM	21:35:00	LPRSA0189539	ABC013559				
	8/6/56 5:30 PM	8/7/56 9:15 AM	15:45:00	LPRSA0189538	ABC013558				
	8/21/56 5:45 AM	8/22/56 9:00 AM	27:15:00	LPRSA0189537	ABC013557				
	9/6/56 7:30 PM	9/7/56 10:00 AM	14:30:00	LPRSA0189536	ABC013556				
	9/7/56 11:15 AM	9/8/56 12:00 PM	24:45:00	LPRSA0189535	ABC013555				
	9/27/56 5:00 PM	9/28/56 9:15 AM	16:15:00	LPRSA0189534	ABC013554				
	10/22/56 11:00 PM	10/23/56 9:30 AM	10:30:00	LPRSA0189533	ABC013553				
	10/31/56 12:45 PM	11/4/56 12:45 PM	96:00:00	LPRSA0189532	ABC013552				
	11/18/56 3:15 AM	11/18/56 12:00 PM	8:45:00	LPRSA0189531	ABC013551				
	11/22/56 1:30 AM	11/22/56 9:00 AM	7:30:00	LPRSA0189530	ABC013550				
	12/9/56 4:00 PM	12/10/56 9:30 AM	17:30:00	LPRSA0189529	ABC013549				
	12/14/56 9:15 AM	12/17/56 8:45 AM	71:30:00	LPRSA0189528	ABC013548				
	12/22/56 11:10 PM	12/23/56 11:00 AM	11:50:00	LPRSA0189527	ABC013547				
	1/23/57 4:45 AM	1/23/57 3:00 PM	10:15:00	LPRSA0189498	ABC013518				
	2/9/57 3:00 PM	2/10/57 9:45 AM	18:45:00	LPRSA0189497	ABC013517				
	2/26/57 4:45 PM	2/27/57 1:45 PM	21:00:00	LPRSA0189496	ABC013516				
	3/1/57 5:30 PM	3/2/57 11:30 PM	30:00:00	LPRSA0189524	ABC013544				
	3/8/57 10:30 AM	3/10/57 10:30 AM	48:00:00	LPRSA0189523	ABC013543				
	3/19/57 10:30 PM	3/21/57 9:45 AM	35:15:00	LPRSA0189521	ABC013541				
	4/2/57 8:45 AM	4/2/57 3:00 PM	6:15:00	LPRSA0189520	ABC013540				
	4/9/57 10:15 AM	4/9/57 5:00 PM	6:45:00	LPRSA0189516	ABC013536				
	4/10/57 10:15 AM	4/10/57 5:00 PM	6:45:00	LPRSA0189515	ABC013535				
	4/11/57 9:30 AM	4/11/57 5:00 PM	7:30:00	LPRSA0189514	ABC013534				
	4/12/57 9:30 AM	4/12/57 5:15 PM	7:45:00	LPRSA0189513	ABC013533				
	4/23/57 8:00 AM	4/23/57 3:00 PM	7:00:00	LPRSA0189511	ABC013531				
	5/14/57 10:00 PM	5/15/57 11:45 AM	13:45:00	LPRSA0189508	ABC013528				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	10/23/58 3:00 AM	10/24/58 10:15 AM	31:15:00	LPRSA0189469	ABC013489				
	11/28/58 9:30 PM	11/29/58 11:30 AM	14:00:00	LPRSA0189466	ABC013486				
	3/6/59 8:45 AM	3/7/59 10:00 AM	25:15:00	LPRSA0189458	ABC013478				
	6/2/59 7:15 PM	6/3/59 9:00 AM	13:45:00	LPRSA0189454	ABC013474				
	8/5/59 11:45 AM	8/5/59 3:30 PM	3:45:00	LPRSA0189448	ABC013468				
	8/9/59 6:00 AM	8/9/59 7:10 AM	1:10:00	LPRSA0189447	ABC013467				
	9/1/59 8:00 PM	9/3/59 9:45 AM	37:45:00	LPRSA0189445	ABC013465				
	12/7/59 1:45 AM	12/7/59 9:15 AM	7:30:00	LPRSA0189431	ABC013451				
	2/26/60 3:15 AM	2/26/60 11:30 AM	8:15:00	LPRSA0189420	ABC013440				
	7/14/60 2:45 PM	7/15/60 9:15 AM	18:30:00	LPRSA0189404	ABC013424				
	7/30/60 10:40 AM	7/31/60 10:00 AM	23:20:00	LPRSA0189402	ABC013422				
	8/19/60 10:10 AM	8/20/60 10:15 AM	24:05:00	LPRSA0189399	ABC013419				
	9/12/60 9:20 AM	9/13/60 11:15 AM	25:55:00	LPRSA0189397	ABC013417				
	12/21/60 10:50 AM	12/22/60 10:40 AM	23:50:00	LPRSA0189391	ABC013411				
	3/14/61 9:45 AM	3/14/61 2:00 PM	4:15:00	LPRSA0189382	ABC013402				
	3/23/61 2:40 PM	3/24/61 11:50 AM	21:10:00	LPRSA0189383	ABC013403				
	4/25/61 8:15 PM	4/26/61 9:00 AM	12:45:00	LPRSA0189369	ABC013389				

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Exhibit 2-4i. Documented PVSC Bypasses at Jackson Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	7/20/61 1:40 PM	7/21/61 10:10 AM	20:30:00	LPRSA0189357	ABC013377				
	9/20/61 1:45 PM	9/22/61 10:00 AM	44:15:00	LPRSA0189348	ABC013368				
	12/18/61 11:55 AM	12/20/61 9:10 AM	45:15:00	LPRSA0189338	ABC013358				
	2/26/62 2:10 PM	2/27/62 9:45 AM	19:35:00	LPRSA0189329	ABC013349				
	2/27/62 2:50 PM	3/1/62 9:55 AM	43:05:00	LPRSA0189329	ABC013349				
	3/12/62 9:35 AM	3/13/62 3:25 PM	29:50:00	LPRSA0189327	ABC013347				
	9/5/62 2:10 PM	9/6/62 9:35 AM	19:25:00	LPRSA0189301	ABC013321				
	9/17/62 7:10 PM	9/18/62 1:50 PM	18:40:00	LPRSA0189299	ABC013319				
	9/27/62 1:20 PM	9/28/62 2:45 PM	25:25:00	LPRSA0189296	ABC013316				
	10/5/62 9:00 AM	10/6/62 10:40 AM	25:40:00	LPRSA0189295	ABC013315				
	11/3/62 11:15 AM	11/5/62 10:35 AM	47:20:00	LPRSA0189288	ABC013308				
	11/9/62 4:00 PM	11/11/62 11:35 AM	43:35:00	LPRSA0189287	ABC013307				
	11/21/62 11:45 PM	11/23/62 10:45 AM	35:00:00	LPRSA0189284	ABC013304				
	12/5/62 10:40 AM	12/8/62 10:45 AM	72:05:00	LPRSA0189283	ABC013303				
*	1/1/63 12:00 AM	9/30/74 11:59 PM							
	Subtotal		13064:55:00						

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4i. Documented PVSC Bypasses at Jackson Street
(Newark)

(1974-1975)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	10/16/74 9:00 AM	10/17/74 9:00 PM	36:00:00	LPRSA0195712				
	12/2/74 6:00 AM	12/3/74 9:00 AM	27:00:00	LPRSA0195714				
	12/8/74 2:00 PM	12/9/74 9:00 AM	19:00:00	LPRSA0195714				
	12/16/74 1:00 PM	12/17/74 10:00 AM	21:00:00	LPRSA0195714				
	1/13/75 11:00 AM	1/14/75 9:00 AM	22:00:00	LPRSA0195715				
	1/18/75 2:00 PM	1/19/75 7:00 AM	17:00:00	LPRSA0195715				
	1/29/75 7:00 AM	1/29/75 11:00 AM	4:00:00	LPRSA0195715				
	3/19/75 7:00 PM	3/20/75 9:00 AM	14:00:00	LPRSA0195717				
	4/3/75 10:00 AM	4/4/75 12:00 AM	14:00:00	LPRSA0195718				
*	5/1/75	5/1/75	0:00:00	LPRSA0197119	*	*		
	6/6/75 1:00 AM	6/6/75 9:00 AM	8:00:00	LPRSA0195720				
	6/6/75 4:00 PM	6/7/75 2:00 AM	10:00:00	LPRSA0195720				
	6/12/75 11:00 AM	6/13/75 3:00 PM	28:00:00	LPRSA0195720				
	7/4/75 5:00 AM	7/4/75 1:00 PM	8:00:00	LPRSA0195721				
	7/7/75 9:00 AM	7/7/75 10:00 PM	13:00:00	LPRSA0195721				
	7/9/75 8:00 PM	7/10/75 3:00 AM	7:00:00	LPRSA0195721				
	7/13/75 2:00 PM	7/14/75 9:00 AM	19:00:00	LPRSA0195721				
	7/14/75 12:00 PM	7/17/75 9:00 AM	69:00:00	LPRSA0195721				
	7/25/75 3:00 AM	7/25/75 2:00 PM	11:00:00	LPRSA0195721				
*	9/23/75	9/24/75	0:00:00	LPRSA0197119	*	*		
	9/23/75 3:00 AM	9/28/75 11:00 AM	128:00:00	LPRSA0195722				
*	10/1/75	12/31/04						
Subtotal			**475:00:00**		16.6	0.535	100	446
Estimated Mass/Bypass Time (lb/hr)								**577**
Estimated Bypassed Volume Rate (MG/hr)					**0.692**			

* Note: Tide gates were mostly closed and bypasses not measured; overflow data are used to calculate average mass and volume.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

			Elapsed Time (hours)	Frequency of Overflows (#/yr)
	1/1/2005	12/31/2005	400.92	35
	1/1/2006	12/31/2006	654.23	49
	1/1/2007	12/31/2007	435.23	36
	1/1/2008	12/31/2008	588.77	47
	1/1/2009	12/31/2009	508.30	52
	1/1/2010	12/31/2010	454.75	39
	1/1/2011	12/31/2011	647.87	62
	1/1/2012	12/31/2012	138.54	35
	1/1/2013	12/31/2013	283.95	31
	1/1/2014	12/31/2014	283.95	31
*	1/1/2015	9/30/2016		
	Subtotal (2005-2014)		**4396.51**	
	Average annual bypass time (hr)		**439.65**	

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Exhibit 2-4i. Documented PVSC Bypasses at Jackson Street (Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)

* Missing data.

Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4j. Documented PVSC Bypasses at Polk Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 1:00 PM	10:30:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 11:00 AM	21:30:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/5/50 9:30 AM	21:00:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 2:30 PM	16:00:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188621	ABC012641				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188623	ABC012643				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188625	ABC012645				
	1/25/51 4:00 PM	1/26/51 10:00 AM	18:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/30/51 10:00 AM	41:00:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648				
	2/10/51 5:30 AM	2/10/51 2:30 PM	9:00:00	LPRSA0188588	ABC012608				
	2/11/51 6:00 PM	2/15/51 2:30 PM	92:30:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 1:00 PM	3/2/51 10:00 AM	21:00:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/21/51 9:00 AM	40:00:00	LPRSA0188616	ABC012636				
*	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/19/52 11:00 AM	55:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/22/52 10:30 AM	40:30:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/7/52 10:30 AM	157:30:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/18/52 10:30 AM	173:30:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/21/52 11:00 AM	48:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/26/52 11:00 AM	90:00:00	LPRSA0189750	ABC013770				
	4/5/52 8:00 AM	4/7/52 11:00 AM	51:00:00	LPRSA0189749	ABC013769				
	4/14/52 4:00 AM	4/17/52 11:00 AM	79:00:00	LPRSA0189748	ABC013768				
	4/25/52 11:00 AM	5/9/52 4:30 PM	341:30:00	LPRSA0189744	ABC013764				
	5/11/52 10:00 PM	5/14/52 2:30 PM	64:30:00	LPRSA0189743	ABC013763				
	5/18/52 9:15 AM	5/23/52 3:50 PM	126:35:00	LPRSA0189741	ABC013761				
	5/25/52 10:45 AM	5/27/52 2:00 PM	51:15:00	LPRSA0189740	ABC013760				
	5/29/52 5:15 PM	6/14/52 11:00 AM	377:45:00	LPRSA0189736	ABC013756				
	6/17/52 6:45 PM	6/18/52 3:15 PM	20:30:00	LPRSA0189735	ABC013755				
	6/19/52 1:45 PM	6/20/52 8:35 AM	18:50:00	LPRSA0189734	ABC013754				
	6/27/52 5:00 PM	6/28/52 10:00 AM	17:00:00	LPRSA0189729	ABC013749				
	6/29/52 2:50 AM	6/30/52 11:15 AM	32:25:00	LPRSA0189728	ABC013748				
	7/8/52 5:30 PM	7/10/52 3:45 PM	46:15:00	LPRSA0189730	ABC013750				
	7/21/52 5:45 PM	7/22/52 2:00 PM	20:15:00	LPRSA0189725	ABC013745				
	7/31/52 5:40 PM	8/1/52 10:40 AM	17:00:00	LPRSA0189724	ABC013744				
	8/2/52 5:20 PM	8/3/52 10:45 AM	17:25:00	LPRSA0189725	ABC013745				
	8/6/52 4:30 PM	8/11/52 10:30 AM	114:00:00	LPRSA0189715	ABC013735				

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Exhibit 2-4j. Documented PVSC Bypasses at Polk Street

(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	8/12/52 6:30 PM	8/14/52 10:00 AM	39:30:00	LPRSA0189721	ABC013741				
	8/15/52 6:15 PM	8/17/52 10:15 AM	40:00:00	LPRSA0189714	ABC013734				
	8/21/52 5:45 PM	8/22/52 2:00 PM	20:15:00	LPRSA0189713	ABC013733				
	8/30/52 11:15 AM	9/2/52 10:15 AM	71:00:00	LPRSA0189712	ABC013732				
	9/2/52 6:15 PM	9/4/52 10:00 AM	39:45:00	LPRSA0189711	ABC013731				
	9/15/52 5:45 PM	9/17/52 6:15 PM	48:30:00	LPRSA0189709	ABC013729				
	9/18/52 2:15 PM	9/20/52 10:15 AM	44:00:00	LPRSA0189710	ABC013730				
	9/23/52 11:45 AM	9/24/52 10:30 AM	22:45:00	LPRSA0189708	ABC013728				
	10/2/52 8:15 PM	10/3/52 2:45 PM	18:30:00	LPRSA0189707	ABC013727				
	10/28/52 6:45 PM	10/29/52 10:15 AM	15:30:00	LPRSA0189706	ABC013726				
	11/3/52 3:15 PM	11/4/52 10:15 AM	19:00:00	LPRSA0189703	ABC013723				
	11/10/52 5:45 PM	11/11/52 10:15 AM	16:30:00	LPRSA0189704	ABC013724				
	11/14/52 2:45 PM	12/1/52 2:45 PM	408:00:00	LPRSA0189701	ABC013721				
	12/2/52 3:15 PM	12/8/52 10:00 AM	138:45:00	LPRSA0189702	ABC013722				
	12/9/52 9:15 AM	1/18/53 3:45 PM	966:30:00	LPRSA0189655	ABC013675				
	1/21/53 4:15 PM	1/22/53 2:00 PM	21:45:00	LPRSA0189656	ABC013676				
	1/24/53 11:15 AM	1/25/53 11:00 AM	23:45:00	LPRSA0189657	ABC013677				
	2/11/53 6:30 PM	2/13/53 11:30 AM	41:00:00	LPRSA0189658	ABC013678				
	2/15/53 12:15 PM	2/16/53 3:00 PM	26:45:00	LPRSA0189659	ABC013679				
	2/25/53 10:15 AM	3/11/53 10:30 AM	336:15:00	LPRSA0189661	ABC013681				
*		3/14/53 1:30 PM		LPRSA0189672	ABC013692				
	3/17/53 3:45 PM	4/29/53 11:30 AM	1027:45:00	LPRSA0189672	ABC013692				
	4/30/53 6:15 PM	5/8/53 4:30 PM	190:15:00	LPRSA0189672	ABC013692				
*	5/8/53 10:45 AM			LPRSA0189672	ABC013692				
	6/13/53 6:30 PM	6/15/53 11:45 AM	41:15:00	LPRSA0189674	ABC013694				
	6/22/53 11:30 AM	7/2/53 3:30 PM	244:00:00	LPRSA0189677	ABC013697				
	7/6/53 9:30 PM	7/7/53 10:00 AM	12:30:00	LPRSA0189681	ABC013701				
	7/20/53 10:30 PM	7/21/53 10:15 AM	11:45:00	LPRSA0189682	ABC013702				
	7/21/53 5:30 PM	7/22/53 9:45 AM	16:15:00	LPRSA0189683	ABC013703				
	7/23/53 9:45 AM	7/24/53 2:00 PM	28:15:00	LPRSA0189684	ABC013704				
	8/14/53 2:45 PM	8/15/53 10:00 AM	19:15:00	LPRSA0189686	ABC013706				
	10/20/53 9:45 AM	10/29/53 6:00 PM	224:15:00	LPRSA0189690	ABC013710				
	11/7/53 8:45 AM	11/8/53 12:15 PM	27:30:00	LPRSA0189695	ABC013715				
*	11/16/53 11:15 AM			LPRSA0189653	ABC013673				
	11/23/53 11:30 AM	11/23/53 2:45 PM	3:15:00	LPRSA0189698	ABC013718				
	11/25/53 1:45 PM	11/26/53 10:30 AM	20:45:00	LPRSA0189652	ABC013672				
	11/30/53 11:30 AM	12/5/53 9:15 AM	117:45:00	LPRSA0189651	ABC013671				
	12/6/53 11:00 AM	12/8/53 10:30 AM	47:30:00	LPRSA0189650	ABC013670				
	12/9/53 6:00 PM	12/11/53 10:30 AM	40:30:00	LPRSA0189649	ABC013669				
	12/14/53 7:45 AM	12/15/53 2:15 PM	30:30:00	LPRSA0189647	ABC013667				
	1/15/54 2:30 PM	1/18/54 11:15 AM	68:45:00	LPRSA0189592	ABC013612				
	1/20/54 3:30 PM	1/22/54 2:00 PM	46:30:00	LPRSA0189591	ABC013611				
	1/25/54 4:30 AM	2/2/54 2:30 PM	202:00:00	LPRSA0189590	ABC013610				
	2/3/54 3:00 PM	2/4/54 11:00 AM	20:00:00	LPRSA0189589	ABC013609				
	2/15/54 3:30 PM	2/19/54 2:45 PM	95:15:00	LPRSA0189587	ABC013607				
	2/21/54 6:45 PM	2/22/54 10:15 AM	15:30:00	LPRSA0189586	ABC013606				
	2/23/54 1:30 PM	2/27/54 10:15 AM	92:45:00	LPRSA0189621	ABC013641				
	3/1/54 12:30 PM	3/5/54 3:15 PM	98:45:00	LPRSA0189619	ABC013639				
	3/13/54 4:30 PM	3/15/54 11:00 AM	42:30:00	LPRSA0189618	ABC013638				
	3/19/54 6:00 PM	3/20/54 1:10 PM	19:10:00	LPRSA0189617	ABC013637				
	3/25/54 11:30 AM	3/26/54 11:15 AM	23:45:00	LPRSA0189616	ABC013636				
	4/8/54 3:15 PM	4/9/54 11:00 AM	19:45:00	LPRSA0189613	ABC013633				
	4/13/54 2:00 PM	4/13/54 2:40 PM	0:40:00	LPRSA0189623	ABC013643				

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Exhibit 2-4j. Documented PVSC Bypasses at Polk Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
4/16/54 2:10 PM	4/18/54 11:10 AM	45:00:00	LPRSA0189632	ABC013652				
4/19/54 5:15 PM	4/21/54 3:00 PM	45:45:00	LPRSA0189615	ABC013635				
4/23/54 3:00 PM	4/25/54 11:00 AM	44:00:00	LPRSA0189614	ABC013634				
4/28/54 4:45 PM	4/29/54 11:00 AM	18:15:00	LPRSA0189612	ABC013632				
5/3/54 12:15 PM	5/26/54 10:15 AM	550:00:00	LPRSA0189631	ABC013651				
6/1/54 1:15 PM	6/9/54 11:30 AM	190:15:00	LPRSA0189630	ABC013650				
6/10/54 2:15 PM	6/11/54 10:30 AM	20:15:00	LPRSA0189629	ABC013649				
7/2/54 10:30 AM	7/2/54 5:30 PM	7:00:00	LPRSA0189626	ABC013646				
7/4/54 1:45 PM	7/5/54 10:15 AM	20:30:00	LPRSA0189625	ABC013645				
7/7/54 6:00 PM	7/8/54 2:15 PM	20:15:00	LPRSA0189624	ABC013644				
7/14/54 5:45 PM	7/15/54 1:15 PM	19:30:00	LPRSA0189634	ABC013654				
7/22/54 4:45 PM	7/23/54 10:15 AM	17:30:00	LPRSA0189633	ABC013653				
8/3/54 10:45 AM	8/4/54 10:45 AM	24:00:00	LPRSA0189620	ABC013640				
8/9/54 10:30 AM	8/11/54 11:00 AM	48:30:00	LPRSA0189622	ABC013642				
8/19/54 12:15 AM	8/20/54 11:30 AM	35:15:00	LPRSA0189611	ABC013631				
8/20/54 8:00 PM	8/22/54 10:00 AM	38:00:00	LPRSA0189610	ABC013630				
8/25/54 6:15 PM	8/26/54 2:15 PM	20:00:00	LPRSA0189609	ABC013629				
9/8/54 4:00 PM	9/9/54 2:15 PM	22:15:00	LPRSA0189607	ABC013627				
9/10/54 3:15 PM	9/12/54 11:00 AM	43:45:00	LPRSA0189606	ABC013626				
10/7/54 10:30 AM	10/8/54 2:45 PM	28:15:00	LPRSA0189604	ABC013624				
10/15/54 12:45 PM	10/16/54 8:15 AM	19:30:00	LPRSA0189603	ABC013623				
10/27/54 6:00 PM	10/28/54 2:15 AM	8:15:00	LPRSA0189602	ABC013622				
10/29/54 11:00 AM	10/30/54 10:30 AM	23:30:00	LPRSA0189601	ABC013621				
11/2/54 2:30 PM	11/5/54 3:30 PM	73:00:00	LPRSA0189600	ABC013620				
11/8/54 2:45 PM	11/9/54 2:45 PM	24:00:00	LPRSA0189599	ABC013619				
11/15/54 11:15 AM	12/2/54 4:00 AM	400:45:00	LPRSA0189597	ABC013617				
12/9/54 3:30 PM	12/10/54 2:45 PM	23:15:00	LPRSA0189596	ABC013616				
12/14/54 11:00 AM	12/15/54 2:30 PM	27:30:00	LPRSA0189595	ABC013615				
12/18/54 11:45 AM	12/19/54 9:45 AM	22:00:00	LPRSA0189593	ABC013613				
12/29/54 2:30 PM	12/30/54 1:15 PM	22:45:00	LPRSA0189585	ABC013605				
1/6/55 3:30 PM	1/7/55 10:45 AM	19:15:00	LPRSA0189582	ABC013602				
1/28/55 11:15 AM	3/9/55 11:15 AM	960:00:00	LPRSA0189580	ABC013600				
4/6/55 3:45 PM	4/7/55 10:00 AM	18:15:00	LPRSA0189575	ABC013595				
4/12/55 4:00 PM	4/15/55 10:30 AM	66:30:00	LPRSA0189574	ABC013594				
5/31/55 3:00 PM	5/31/55 5:15 PM	2:15:00	LPRSA0189572	ABC013592				
6/22/55 12:45 AM	6/22/55 10:00 AM	9:15:00	LPRSA0189571	ABC013591				
8/8/55 1:15 AM	8/8/55 9:45 AM	8:30:00	LPRSA0189570	ABC013590				
8/19/55 1:00 AM	8/20/55 4:45 AM	27:45:00	LPRSA0189567	ABC013587				
8/22/55 11:30 PM	8/24/55 2:15 PM	38:45:00	LPRSA0189566	ABC013586				
9/24/55 8:15 AM	9/26/55 10:00 AM	49:45:00	LPRSA0189563	ABC013583				
10/6/55 10:00 AM	10/7/55 2:45 PM	28:45:00	LPRSA0189562	ABC013582				
10/14/55 10:45 AM	10/25/55 2:15 PM	267:30:00	LPRSA0189561	ABC013581				
10/30/55 11:30 AM	11/1/55 3:00 PM	51:30:00	LPRSA0189560	ABC013580				
11/10/55 5:30 PM	11/12/55 10:15 AM	40:45:00	LPRSA0189559	ABC013579				
11/16/55 11:00 AM	11/18/55 11:15 AM	48:15:00	LPRSA0189558	ABC013578				
1/30/56 3:00 PM	1/31/56 10:00 AM	19:00:00	LPRSA0189556	ABC013576				
2/2/56 1:30 PM	2/3/56 10:00 AM	20:30:00	LPRSA0189555	ABC013575				
2/6/56 5:15 PM	2/7/56 2:00 PM	20:45:00	LPRSA0189554	ABC013574				
2/18/56 10:00 AM	2/19/56 9:30 AM	23:30:00	LPRSA0189553	ABC013573				
3/8/56 3:15 AM	3/9/56 10:00 AM	30:45:00	LPRSA0189552	ABC013572				
3/14/56 10:15 AM	3/15/56 10:00 AM	23:45:00	LPRSA0189551	ABC013571				
3/21/56 5:45 PM	3/23/56 10:15 AM	40:30:00	LPRSA0189549	ABC013569				
4/11/56 3:15 PM	4/12/56 9:25 AM	18:10:00	LPRSA0189545	ABC013565				

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Exhibit 2-4j. Documented PVSC Bypasses at Polk Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	5/2/56 10:15 PM	5/3/56 10:00 AM	11:45:00	LPRSA0189544	ABC013564				
	6/2/56 4:10 PM	6/4/56 10:45 AM	42:35:00	LPRSA0189543	ABC013563				
	6/27/56 3:45 PM	6/27/56 6:50 PM	3:05:00	LPRSA0189542	ABC013562				
	7/16/56 3:15 PM	7/17/56 9:45 AM	18:30:00	LPRSA0189541	ABC013561				
	7/21/56 10:30 AM	7/21/56 10:35 PM	12:05:00	LPRSA0189540	ABC013560				
	7/27/56 11:15 AM	7/28/56 8:50 AM	21:35:00	LPRSA0189539	ABC013559				
	8/6/56 5:15 PM	8/7/56 9:00 AM	15:45:00	LPRSA0189538	ABC013558				
	8/21/56 5:30 AM	8/22/56 8:50 AM	27:20:00	LPRSA0189537	ABC013557				
	9/6/56 7:45 PM	9/7/56 9:15 AM	13:30:00	LPRSA0189536	ABC013556				
	9/7/56 11:30 AM	9/8/56 11:45 AM	24:15:00	LPRSA0189535	ABC013555				
	9/27/56 4:45 PM	9/28/56 9:00 AM	16:15:00	LPRSA0189534	ABC013554				
	10/22/56 11:15 PM	10/23/56 9:45 AM	10:30:00	LPRSA0189533	ABC013553				
	10/31/56 12:30 PM	11/4/56 1:00 PM	96:30:00	LPRSA0189532	ABC013552				
	11/18/56 3:00 AM	11/18/56 11:45 AM	8:45:00	LPRSA0189531	ABC013551				
	11/22/56 1:15 AM	11/22/56 8:45 AM	7:30:00	LPRSA0189530	ABC013550				
	12/9/56 3:45 PM	12/10/56 9:15 AM	17:30:00	LPRSA0189529	ABC013549				
	12/14/56 9:00 AM	12/17/56 8:30 AM	71:30:00	LPRSA0189528	ABC013548				
	12/22/56 11:00 PM	12/23/56 10:45 AM	11:45:00	LPRSA0189527	ABC013547				
	1/23/57 4:30 AM	1/23/57 2:45 PM	10:15:00	LPRSA0189498	ABC013518				
	2/9/57 2:45 PM	2/10/57 9:30 AM	18:45:00	LPRSA0189497	ABC013517				
	2/26/57 4:30 PM	2/27/57 1:30 PM	21:00:00	LPRSA0189496	ABC013516				
	3/1/57 5:15 PM	3/2/57 11:15 PM	30:00:00	LPRSA0189524	ABC013544				
	3/8/57 10:15 AM	3/10/57 10:20 AM	48:05:00	LPRSA0189523	ABC013543				
	3/19/57 10:15 PM	3/21/57 9:30 AM	35:15:00	LPRSA0189521	ABC013541				
	4/2/57 8:30 AM	4/2/57 2:45 PM	6:15:00	LPRSA0189520	ABC013540				
	4/9/57 10:00 AM	4/9/57 4:45 PM	6:45:00	LPRSA0189516	ABC013536				
	4/10/57 10:00 AM	4/10/57 4:45 PM	6:45:00	LPRSA0189515	ABC013535				
	4/11/57 9:15 AM	4/11/57 4:45 PM	7:30:00	LPRSA0189514	ABC013534				
	4/12/57 9:15 AM	4/12/57 5:00 PM	7:45:00	LPRSA0189513	ABC013533				
	4/23/57 7:45 AM	4/23/57 2:45 PM	7:00:00	LPRSA0189511	ABC013531				
	5/14/57 9:45 PM	5/15/57 11:30 AM	13:45:00	LPRSA0189508	ABC013528				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	2/28/58 4:15 AM	2/28/58 9:45 AM	5:30:00	LPRSA0189488	ABC013508				
	4/28/58 9:30 AM	4/28/58 2:30 PM	5:00:00	LPRSA0189480	ABC013500				
	4/29/58 8:15 PM	4/30/58 9:15 AM	13:00:00	LPRSA0189479	ABC013499				
	10/23/58 3:15 AM	10/24/58 10:00 AM	30:45:00	LPRSA0189469	ABC013489				
	11/28/58 9:15 PM	11/29/58 11:15 AM	14:00:00	LPRSA0189466	ABC013486				
	3/6/59 8:30 AM	3/7/59 9:45 AM	25:15:00	LPRSA0189458	ABC013478				
	6/2/59 7:00 PM	6/3/59 8:45 AM	13:45:00	LPRSA0189454	ABC013474				
	9/1/59 7:50 PM	9/3/59 10:30 AM	38:40:00	LPRSA0189445	ABC013465				
	12/7/59 2:00 AM	12/7/59 9:30 AM	7:30:00	LPRSA0189431	ABC013451				
	2/19/60 1:20 AM	2/19/60 1:40 PM	12:20:00	LPRSA0189421	ABC013441				
	2/26/60 3:00 AM	2/26/60 11:10 AM	8:10:00	LPRSA0189420	ABC013440				
	7/14/60 2:30 PM	7/15/60 9:00 AM	18:30:00	LPRSA0189404	ABC013424				
	7/30/60 10:50 AM	7/31/60 10:20 AM	23:30:00	LPRSA0189402	ABC013422				
	8/19/60 9:50 AM	8/20/60 10:00 AM	24:10:00	LPRSA0189399	ABC013419				
	9/12/60 9:00 AM	9/13/60 11:00 AM	26:00:00	LPRSA0189397	ABC013417				
	12/21/60 10:30 AM	12/22/60 10:25 AM	23:55:00	LPRSA0189391	ABC013411				
	3/14/61 9:30 AM	3/14/61 1:45 PM	4:15:00	LPRSA0189382	ABC013402				

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Exhibit 2-4j. Documented PVSC Bypasses at Polk Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	3/23/61 2:20 PM	3/24/61 11:35 AM	21:15:00	LPRSA0189383	ABC013403				
	4/10/61 12:10 PM	4/11/61 9:20 AM	21:10:00	LPRSA0189376	ABC013396				
	4/13/61 11:10 AM	4/14/61 9:30 AM	22:20:00	LPRSA0189375	ABC013395				
	4/16/61 2:00 PM	4/17/61 10:15 AM	20:15:00	LPRSA0189373	ABC013393				
	4/25/61 8:00 PM	4/26/61 9:20 AM	13:20:00	LPRSA0189369	ABC013389				
	7/20/61 1:25 PM	7/21/61 9:55 AM	20:30:00	LPRSA0189357	ABC013377				
	9/19/61 3:35 PM	9/22/61 9:45 PM	78:10:00	LPRSA0189348	ABC013368				
	12/18/61 11:45 AM	12/20/61 11:00 AM	47:15:00	LPRSA0189338	ABC013358				
	2/26/62 1:55 PM	2/27/62 9:30 AM	19:35:00	LPRSA0189329	ABC013349				
	2/27/62 2:35 PM	3/1/62 9:45 AM	43:10:00	LPRSA0189329	ABC013349				
	3/12/62 9:25 AM	3/13/62 3:45 PM	30:20:00	LPRSA0189327	ABC013347				
	9/5/62 2:00 PM	9/6/62 9:25 AM	19:25:00	LPRSA0189301	ABC013321				
	9/27/62 1:05 PM	9/28/62 2:30 PM	25:25:00	LPRSA0189296	ABC013316				
	10/5/62 8:45 AM	10/6/62 10:25 AM	25:40:00	LPRSA0189295	ABC013315				
	11/3/62 11:10 AM	11/5/62 10:20 AM	47:10:00	LPRSA0189288	ABC013308				
	11/9/62 3:50 PM	11/11/62 11:25 AM	43:35:00	LPRSA0189287	ABC013307				
	11/21/62 11:30 PM	11/23/62 10:30 AM	35:00:00	LPRSA0189284	ABC013304				
	12/5/62 10:35 AM	12/8/62 10:30 AM	71:55:00	LPRSA0189283	ABC013303				
*	1/1/63 12:00 AM	9/30/74 11:59 PM							
	Subtotal		13170:00:00						

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4j. Documented PVSC Bypasses at Polk Street
(Newark)

(1974-1975)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	10/16/74 10:00 AM	10/17/74 10:00 PM	36:00:00	LPRSA0195712				
	12/2/74 6:00 AM	12/3/74 9:00 AM	27:00:00	LPRSA0195714				
	12/8/74 2:00 PM	12/9/74 9:00 AM	19:00:00	LPRSA0195714				
	12/16/74 1:00 PM	12/17/74 9:00 AM	20:00:00	LPRSA0195714				
	1/13/75 11:00 AM	1/14/75 9:00 AM	22:00:00	LPRSA0195715				
	1/18/75 4:00 PM	1/19/75 7:00 AM	15:00:00	LPRSA0195715				
	1/29/75 7:00 AM	1/29/75 11:00 AM	4:00:00	LPRSA0195715				
	2/23/75	2/23/75	0:00:00	LPRSA0197152				
	3/12/75	3/12/75	3:15:00	LPRSA0197152	*	*		
	3/19/75 6:00 PM	3/20/75 9:00 AM	15:00:00	LPRSA0195717				
	4/3/75 10:00 AM	4/4/75 12:00 AM	14:00:00	LPRSA0195718				
	4/24/75	4/25/75	0:40:00	LPRSA0197152	*	*		
	6/6/75 1:00 AM	6/6/75 8:00 AM	7:00:00	LPRSA0195720				
	6/6/75 2:00 PM	6/7/75 2:00 AM	12:00:00	LPRSA0195720				
	6/12/75 10:00 AM	6/13/75 3:00 PM	29:00:00	LPRSA0195720				
	7/4/75 5:00 AM	7/4/75 1:00 PM	8:00:00	LPRSA0195721				
	7/7/75 9:00 AM	7/7/75 10:00 PM	13:00:00	LPRSA0195721				
	7/9/75 7:00 PM	7/10/75 3:00 AM	8:00:00	LPRSA0195721				
	7/13/75 2:00 PM	7/14/75 9:00 AM	19:00:00	LPRSA0195721				
	7/14/75 11:00 AM	7/17/75 8:00 AM	69:00:00	LPRSA0195721				
	7/25/75 3:00 AM	7/25/75 2:00 PM	11:00:00	LPRSA0195721				
	8/6/75	8/7/75	0:00:00	LPRSA0197153				
	9/23/75 3:00 AM	9/28/75 11:00 AM	128:00:00	LPRSA0195722				
*	10/1/75	12/31/04						
Subtotal			**479:55:00**		19.3	1.915	104	1,662
Estimated Mass/Bypass Time (lb/hr)								**696**
Estimated Bypassed Volume Rate (MG/hr)					**0.802**			

* Note: Tide gates were mostly closed and bypasses not measured; overflow data are used to calculate average mass and volume.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

			Elapsed Time (hours)	Frequency of Overflows (#/yr)
	1/1/2005	12/31/2005	446.72	37
	1/1/2006	12/31/2006	556.20	33
	1/1/2007	12/31/2007	313.09	25
	1/1/2008	12/31/2008	605.36	47
	1/1/2009	12/31/2009	507.24	52
	1/1/2010	12/31/2010	464.28	39
	1/1/2011	12/31/2011	617.55	55
	1/1/2012	12/31/2012	184.19	39
	1/1/2013	12/31/2013	358.25	38
	1/1/2014	12/31/2014	358.25	38
*	1/1/2015	9/30/2016		
Subtotal (2005-2014)			**4411.13**	

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Exhibit 2-4j. Documented PVSC Bypasses at Polk Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
Average annual bypass time (hr)		**441.11**					

* Missing data.
Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4k. Documented PVSC Bypasses at Freeman Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/4/50 10:00 PM	10/5/50 11:30 AM	13:30:00	LPRSA0188654	ABC012674				
	10/10/50 2:30 AM	10/10/50 1:00 PM	10:30:00	LPRSA0188652	ABC012672				
	10/12/50 1:30 PM	10/13/50 11:00 AM	21:30:00	LPRSA0188650	ABC012670				
	10/23/50 1:30 PM	10/24/50 9:00 AM	19:30:00	LPRSA0188648	ABC012668				
	11/20/50 6:00 PM	11/21/50 9:00 AM	15:00:00	LPRSA0188646	ABC012666				
	11/25/50 9:00 AM	11/25/50 1:00 PM	4:00:00	LPRSA0188643	ABC012663				
	12/4/50 12:30 PM	12/5/50 9:30 AM	21:00:00	LPRSA0188641	ABC012661				
	12/7/50 4:00 PM	12/8/50 11:30 AM	19:30:00	LPRSA0188637	ABC012657				
	12/15/50 10:30 PM	12/16/50 2:30 PM	16:00:00	LPRSA0188639	ABC012659				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/7/51 5:00 PM	1/8/51 9:00 AM	16:00:00	LPRSA0188633	ABC012653				
	1/11/51 5:30 PM	1/12/51 8:30 AM	15:00:00	LPRSA0188619	ABC012639				
	1/14/51 6:00 PM	1/15/51 12:00 PM	18:00:00	LPRSA0188631	ABC012651				
	1/23/51 2:00 AM	1/24/51 2:00 PM	36:00:00	LPRSA0188621	ABC012641				
	1/25/51 4:00 PM	1/26/51 10:00 AM	18:00:00	LPRSA0188623	ABC012643				
	1/28/51 5:00 PM	1/30/51 10:00 AM	41:00:00	LPRSA0188625	ABC012645				
	1/31/51 4:00 PM	2/2/51 10:00 AM	42:00:00	LPRSA0188628	ABC012648				
	2/10/51 5:30 AM	2/10/51 2:30 PM	9:00:00	LPRSA0188588	ABC012608				
	2/11/51 6:00 PM	2/15/51 2:30 PM	92:30:00	LPRSA0188588	ABC012608				
	2/17/51 4:00 AM	2/18/51 11:30 AM	31:30:00	LPRSA0188588	ABC012608				
	2/19/51 5:00 PM	2/20/51 2:30 PM	21:30:00	LPRSA0188596	ABC012616				
	2/23/51 8:30 AM	2/23/51 10:00 AM	1:30:00	LPRSA0188596	ABC012616				
	3/1/51 1:00 PM	3/2/51 10:00 AM	21:00:00	LPRSA0188604	ABC012624				
	3/3/51 3:00 PM	3/5/51 10:30 AM	43:30:00	LPRSA0188606	ABC012626				
	3/13/51 4:30 PM	3/15/51 9:30 AM	41:00:00	LPRSA0188609	ABC012629				
	3/16/51 4:00 PM	3/19/51 9:30 AM	65:30:00	LPRSA0188612	ABC012632				
	3/19/51 5:00 PM	3/21/51 9:00 AM	40:00:00	LPRSA0188616	ABC012636				
*	3/22/51 12:00 AM	12/31/51 11:59 PM							
	2/17/52 3:30 AM	2/19/52 11:00 AM	55:30:00	LPRSA0189755	ABC013775				
	2/20/52 6:00 PM	2/22/52 10:30 AM	40:30:00	LPRSA0189754	ABC013774				
	2/29/52 9:00 PM	3/7/52 10:30 AM	157:30:00	LPRSA0189753	ABC013773				
	3/11/52 5:00 AM	3/18/52 10:30 AM	173:30:00	LPRSA0189752	ABC013772				
	3/19/52 10:30 AM	3/21/52 11:00 AM	48:30:00	LPRSA0189751	ABC013771				
	3/22/52 5:00 PM	3/26/52 11:00 AM	90:00:00	LPRSA0189750	ABC013770				
	4/5/52 8:00 AM	4/7/52 11:00 AM	51:00:00	LPRSA0189749	ABC013769				
	4/14/52 4:00 AM	4/17/52 11:00 AM	79:00:00	LPRSA0189748	ABC013768				
	4/25/52 11:00 AM	5/9/52 4:30 PM	341:30:00	LPRSA0189744	ABC013764				
	5/11/52 10:00 PM	5/14/52 2:30 PM	64:30:00	LPRSA0189743	ABC013763				
	5/18/52 10:00 AM	5/23/52 4:00 PM	126:00:00	LPRSA0189741	ABC013761				
	5/25/52 11:00 AM	5/27/52 2:30 PM	51:30:00	LPRSA0189740	ABC013760				
	5/29/52 5:45 PM	6/14/52 11:15 AM	377:30:00	LPRSA0189736	ABC013756				
	6/17/52 7:00 PM	6/18/52 3:30 PM	20:30:00	LPRSA0189735	ABC013755				
	6/19/52 1:30 PM	6/20/52 8:30 AM	19:00:00	LPRSA0189734	ABC013754				
	6/27/52 5:00 PM	6/28/52 10:00 AM	17:00:00	LPRSA0189729	ABC013749				
	6/29/52 3:30 AM	6/30/52 11:30 AM	32:00:00	LPRSA0189728	ABC013748				
	7/8/52 5:45 PM	7/10/52 3:30 PM	45:45:00	LPRSA0189730	ABC013750				
	7/21/52 6:00 PM	7/22/52 2:30 PM	20:30:00	LPRSA0189725	ABC013745				
	7/31/52 5:45 PM	8/1/52 11:00 AM	17:15:00	LPRSA0189724	ABC013744				
	8/2/52 5:30 PM	8/3/52 11:00 AM	17:30:00	LPRSA0189725	ABC013745				
	8/6/52 4:45 PM	8/11/52 10:45 AM	114:00:00	LPRSA0189715	ABC013735				

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Exhibit 2-4k. Documented PVSC Bypasses at Freeman Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	8/12/52 6:45 PM	8/14/52 10:15 AM	39:30:00	LPRSA0189721	ABC013741				
	8/15/52 6:30 PM	8/17/52 10:30 AM	40:00:00	LPRSA0189714	ABC013734				
	8/21/52 6:00 PM	8/22/52 2:30 PM	20:30:00	LPRSA0189713	ABC013733				
	8/30/52 11:30 AM	9/2/52 10:30 AM	71:00:00	LPRSA0189712	ABC013732				
	9/2/52 6:30 PM	9/4/52 10:15 AM	39:45:00	LPRSA0189711	ABC013731				
	9/15/52 6:00 PM	9/17/52 6:30 PM	48:30:00	LPRSA0189709	ABC013729				
	9/18/52 2:30 PM	9/20/52 10:30 AM	44:00:00	LPRSA0189710	ABC013730				
	9/23/52 12:00 PM	9/24/52 10:45 AM	22:45:00	LPRSA0189708	ABC013728				
	10/2/52 8:30 PM	10/3/52 3:00 PM	18:30:00	LPRSA0189707	ABC013727				
	10/28/52 7:00 PM	10/29/52 10:30 AM	15:30:00	LPRSA0189706	ABC013726				
	11/3/52 3:30 PM	11/4/52 10:30 AM	19:00:00	LPRSA0189703	ABC013723				
	11/10/52 6:00 PM	11/11/52 10:30 AM	16:30:00	LPRSA0189704	ABC013724				
	11/14/52 3:00 PM	12/1/52 3:00 PM	408:00:00	LPRSA0189701	ABC013721				
	12/2/52 3:30 PM	12/8/52 10:15 AM	138:45:00	LPRSA0189702	ABC013722				
	12/9/52 9:30 AM	1/18/53 4:00 PM	966:30:00	LPRSA0189655	ABC013675				
	1/21/53 4:30 PM	1/22/53 2:15 PM	21:45:00	LPRSA0189656	ABC013676				
	1/24/53 11:30 AM	1/25/53 11:30 AM	24:00:00	LPRSA0189657	ABC013677				
	2/11/53 6:45 PM	2/13/53 11:45 AM	41:00:00	LPRSA0189658	ABC013678				
	2/15/53 12:30 PM	2/16/53 3:15 PM	26:45:00	LPRSA0189659	ABC013679				
	2/25/53 10:30 AM	3/11/53 10:45 AM	336:15:00	LPRSA0189661	ABC013681				
*		3/14/53 2:30 PM		LPRSA0189673	ABC013693				
	3/17/53 4:00 PM	4/29/53 11:30 AM	1027:30:00	LPRSA0189673	ABC013693				
	4/30/53 6:45 PM	5/8/53 4:45 PM	190:00:00	LPRSA0189673	ABC013693				
*	5/8/53 11:30 AM			LPRSA0189673	ABC013693				
	6/13/53 6:45 PM	6/15/53 12:00 PM	41:15:00	LPRSA0189674	ABC013694				
	6/22/53 11:45 AM	7/2/53 3:45 PM	244:00:00	LPRSA0189677	ABC013697				
	7/6/53 9:45 PM	7/7/53 10:15 AM	12:30:00	LPRSA0189681	ABC013701				
	7/20/53 10:45 PM	7/21/53 10:30 AM	11:45:00	LPRSA0189682	ABC013702				
	7/21/53 5:50 PM	7/22/53 10:00 AM	16:10:00	LPRSA0189683	ABC013703				
	7/23/53 10:00 AM	7/24/53 2:30 PM	28:30:00	LPRSA0189684	ABC013704				
	8/14/53 3:00 PM	8/15/53 10:15 AM	19:15:00	LPRSA0189686	ABC013706				
	10/20/53 10:00 AM	10/29/53 6:15 PM	224:15:00	LPRSA0189690	ABC013710				
	11/7/53 9:00 AM	11/8/53 12:30 PM	27:30:00	LPRSA0189695	ABC013715				
	11/23/53 11:45 AM	11/23/53 2:30 PM	2:45:00	LPRSA0189698	ABC013718				
	7/20/53 10:45 PM	7/21/53 10:30 AM	11:45:00	LPRSA0189682	ABC013702				
*	11/16/53 11:30 AM			LPRSA0189653	ABC013673				
	11/25/53 2:00 PM	11/26/53 10:45 AM	20:45:00	LPRSA0189652	ABC013672				
	11/30/53 11:45 AM	12/5/53 9:30 AM	117:45:00	LPRSA0189651	ABC013671				
	12/6/53 11:15 AM	12/8/53 10:45 AM	47:30:00	LPRSA0189650	ABC013670				
	12/9/53 6:15 PM	12/11/53 10:45 AM	40:30:00	LPRSA0189649	ABC013669				
	12/14/53 8:00 AM	12/15/53 2:30 PM	30:30:00	LPRSA0189647	ABC013667				
	1/15/54 2:45 PM	1/18/54 11:30 AM	68:45:00	LPRSA0189592	ABC013612				
	1/20/54 3:45 PM	1/22/54 2:15 PM	46:30:00	LPRSA0189591	ABC013611				
	1/25/54 4:45 AM	2/2/54 2:45 PM	202:00:00	LPRSA0189590	ABC013610				
	2/3/54 3:15 PM	2/4/54 11:15 AM	20:00:00	LPRSA0189589	ABC013609				
	2/15/54 4:00 PM	2/19/54 3:00 PM	95:00:00	LPRSA0189587	ABC013607				
	2/21/54 7:00 PM	2/22/54 10:30 AM	15:30:00	LPRSA0189586	ABC013606				
	2/23/54 2:00 PM	2/27/54 10:30 AM	92:30:00	LPRSA0189621	ABC013641				
	3/1/54 12:45 PM	3/5/54 3:30 PM	98:45:00	LPRSA0189619	ABC013639				
	3/13/54 4:45 PM	3/15/54 11:15 AM	42:30:00	LPRSA0189618	ABC013638				
	3/19/54 6:15 PM	3/20/54 12:55 PM	18:40:00	LPRSA0189617	ABC013637				
	3/25/54 11:45 AM	3/26/54 11:30 AM	23:45:00	LPRSA0189616	ABC013636				
	4/8/54 3:30 PM	4/9/54 11:15 AM	19:45:00	LPRSA0189613	ABC013633				

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Exhibit 2-4k. Documented PVSC Bypasses at Freeman Street
(Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
4/13/54 2:15 PM	4/13/54 2:30 PM	0:15:00	LPRSA0189623	ABC013643				
4/16/54 2:20 PM	4/18/54 11:20 AM	45:00:00	LPRSA0189632	ABC013652				
4/19/54 5:30 PM	4/21/54 2:45 PM	45:15:00	LPRSA0189615	ABC013635				
4/23/54 3:15 PM	4/25/54 11:15 AM	44:00:00	LPRSA0189614	ABC013634				
4/28/54 5:00 PM	4/29/54 11:15 AM	18:15:00	LPRSA0189612	ABC013632				
5/3/54 12:30 PM	5/26/54 10:30 AM	550:00:00	LPRSA0189631	ABC013651				
6/1/54 1:30 PM	6/9/54 11:45 AM	190:15:00	LPRSA0189630	ABC013650				
6/10/54 2:00 PM	6/11/54 10:45 AM	20:45:00	LPRSA0189629	ABC013649				
7/2/54 10:45 AM	7/2/54 5:45 PM	7:00:00	LPRSA0189626	ABC013646				
7/4/54 2:00 PM	7/5/54 10:30 AM	20:30:00	LPRSA0189625	ABC013645				
7/7/54 6:15 PM	7/8/54 2:30 PM	20:15:00	LPRSA0189624	ABC013644				
7/14/54 6:00 PM	7/15/54 1:30 PM	19:30:00	LPRSA0189634	ABC013654				
7/22/54 5:00 PM	7/23/54 10:30 AM	17:30:00	LPRSA0189633	ABC013653				
8/3/54 11:00 AM	8/4/54 11:00 AM	24:00:00	LPRSA0189620	ABC013640				
8/9/54 10:45 AM	8/11/54 11:15 AM	48:30:00	LPRSA0189622	ABC013642				
8/19/54 12:30 AM	8/20/54 11:45 AM	35:15:00	LPRSA0189611	ABC013631				
8/20/54 8:15 PM	8/22/54 10:15 AM	38:00:00	LPRSA0189610	ABC013630				
8/25/54 6:30 PM	8/26/54 2:30 PM	20:00:00	LPRSA0189609	ABC013629				
9/8/54 4:15 PM	9/9/54 2:30 PM	22:15:00	LPRSA0189607	ABC013627				
9/10/54 3:30 PM	9/12/54 11:15 AM	43:45:00	LPRSA0189606	ABC013626				
10/7/54 10:45 AM	10/8/54 3:00 PM	28:15:00	LPRSA0189604	ABC013624				
10/15/54 1:00 PM	10/16/54 8:30 AM	19:30:00	LPRSA0189603	ABC013623				
10/27/54 6:15 PM	10/28/54 2:30 AM	8:15:00	LPRSA0189602	ABC013622				
10/29/54 11:15 AM	10/30/54 10:45 AM	23:30:00	LPRSA0189601	ABC013621				
11/2/54 2:45 PM	11/5/54 3:45 PM	73:00:00	LPRSA0189600	ABC013620				
11/8/54 3:00 PM	11/9/54 3:00 PM	24:00:00	LPRSA0189599	ABC013619				
11/15/54 11:30 AM	12/2/54 4:15 AM	400:45:00	LPRSA0189597	ABC013617				
12/9/54 3:45 PM	12/10/54 3:00 PM	23:15:00	LPRSA0189596	ABC013616				
12/14/54 11:15 AM	12/15/54 2:45 PM	27:30:00	LPRSA0189595	ABC013615				
12/18/54 12:00 PM	12/19/54 10:00 AM	22:00:00	LPRSA0189593	ABC013613				
12/29/54 2:45 PM	12/30/54 1:00 PM	22:15:00	LPRSA0189585	ABC013605				
1/6/55 3:45 PM	1/7/55 11:00 AM	19:15:00	LPRSA0189582	ABC013602				
1/28/55 11:30 AM	3/9/55 11:30 AM	960:00:00	LPRSA0189580	ABC013600				
4/6/55 4:00 PM	4/7/55 10:15 AM	18:15:00	LPRSA0189575	ABC013595				
4/12/55 4:15 PM	4/15/55 10:45 AM	66:30:00	LPRSA0189574	ABC013594				
5/31/55 3:15 PM	5/31/55 5:30 PM	2:15:00	LPRSA0189572	ABC013592				
6/22/55 1:00 AM	6/22/55 10:15 AM	9:15:00	LPRSA0189571	ABC013591				
8/8/55 1:00 AM	8/8/55 10:00 AM	9:00:00	LPRSA0189570	ABC013590				
8/19/55 1:15 AM	8/20/55 11:00 AM	33:45:00	LPRSA0189567	ABC013587				
8/22/55 11:45 PM	8/24/55 2:30 PM	38:45:00	LPRSA0189566	ABC013586				
9/24/55 8:30 AM	9/26/55 10:15 AM	49:45:00	LPRSA0189563	ABC013583				
10/6/55 10:15 AM	10/7/55 3:00 PM	28:45:00	LPRSA0189562	ABC013582				
10/14/55 11:00 AM	10/25/55 2:30 PM	267:30:00	LPRSA0189561	ABC013581				
10/30/55 11:45 AM	11/1/55 3:15 PM	51:30:00	LPRSA0189560	ABC013580				
11/10/55 5:45 PM	11/12/55 10:30 AM	40:45:00	LPRSA0189559	ABC013579				
11/16/55 11:15 AM	11/18/55 11:30 AM	48:15:00	LPRSA0189558	ABC013578				
1/30/56 3:15 PM	1/31/56 10:15 AM	19:00:00	LPRSA0189556	ABC013576				
2/2/56 1:45 PM	2/3/56 10:15 AM	20:30:00	LPRSA0189555	ABC013575				
2/6/56 5:30 PM	2/7/56 2:15 PM	20:45:00	LPRSA0189554	ABC013574				
2/18/56 10:15 AM	2/19/56 9:45 AM	23:30:00	LPRSA0189553	ABC013573				
3/8/56 3:00 AM	3/9/56 9:45 AM	30:45:00	LPRSA0189552	ABC013572				
3/14/56 10:00 AM	3/15/56 9:45 AM	23:45:00	LPRSA0189551	ABC013571				
3/21/56 5:30 PM	3/23/56 10:00 AM	40:30:00	LPRSA0189549	ABC013569				

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Exhibit 2-4k. Documented PVSC Bypasses at Freeman Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	4/11/56 3:00 PM	4/12/56 9:10 AM	18:10:00	LPRSA0189545	ABC013565				
	5/2/56 10:00 PM	5/3/56 9:45 AM	11:45:00	LPRSA0189544	ABC013564				
	6/2/56 3:50 PM	6/4/56 10:30 AM	42:40:00	LPRSA0189543	ABC013563				
	6/27/56 3:35 PM	6/27/56 6:45 PM	3:10:00	LPRSA0189542	ABC013562				
	7/16/56 3:00 PM	7/17/56 9:30 AM	18:30:00	LPRSA0189541	ABC013561				
	7/21/56 10:15 AM	7/21/56 10:20 PM	12:05:00	LPRSA0189540	ABC013560				
	7/27/56 11:00 AM	7/28/56 8:35 AM	21:35:00	LPRSA0189539	ABC013559				
	8/6/56 5:00 PM	8/7/56 8:45 AM	15:45:00	LPRSA0189538	ABC013558				
	8/21/56 5:15 AM	8/22/56 8:35 AM	27:20:00	LPRSA0189537	ABC013557				
	9/6/56 8:00 PM	9/7/56 9:30 AM	13:30:00	LPRSA0189536	ABC013556				
	9/7/56 11:45 AM	9/8/56 11:30 AM	23:45:00	LPRSA0189535	ABC013555				
	9/27/56 4:30 PM	9/28/56 8:45 AM	16:15:00	LPRSA0189534	ABC013554				
	10/22/56 11:30 PM	10/23/56 10:00 AM	10:30:00	LPRSA0189533	ABC013553				
	10/31/56 12:15 PM	11/4/56 1:15 PM	97:00:00	LPRSA0189532	ABC013552				
	11/18/56 2:45 AM	11/18/56 11:30 AM	8:45:00	LPRSA0189531	ABC013551				
	11/22/56 1:00 AM	11/22/56 8:30 AM	7:30:00	LPRSA0189530	ABC013550				
	12/9/56 3:30 PM	12/10/56 9:00 AM	17:30:00	LPRSA0189529	ABC013549				
	12/14/56 8:45 AM	12/17/56 8:15 AM	71:30:00	LPRSA0189528	ABC013548				
	12/22/56 10:45 PM	12/23/56 10:30 AM	11:45:00	LPRSA0189527	ABC013547				
	1/23/57 4:15 AM	1/23/57 2:30 PM	10:15:00	LPRSA0189498	ABC013518				
	2/9/57 2:30 PM	2/10/57 9:15 AM	18:45:00	LPRSA0189497	ABC013517				
	2/26/57 4:15 PM	2/27/57 1:15 PM	21:00:00	LPRSA0189496	ABC013516				
	3/1/57 5:00 PM	3/2/57 11:00 PM	30:00:00	LPRSA0189524	ABC013544				
	3/8/57 10:00 AM	3/10/57 10:10 AM	48:10:00	LPRSA0189523	ABC013543				
	3/19/57 10:00 PM	3/21/57 9:15 AM	35:15:00	LPRSA0189521	ABC013541				
	4/2/57 8:15 AM	4/2/57 2:30 PM	6:15:00	LPRSA0189520	ABC013540				
	4/9/57 9:45 AM	4/9/57 4:30 PM	6:45:00	LPRSA0189516	ABC013536				
	4/10/57 9:45 AM	4/10/57 4:30 PM	6:45:00	LPRSA0189515	ABC013535				
	4/11/57 9:00 AM	4/11/57 4:30 PM	7:30:00	LPRSA0189514	ABC013534				
	4/12/57 9:00 AM	4/12/57 4:45 PM	7:45:00	LPRSA0189513	ABC013533				
	4/23/57 7:30 AM	4/23/57 2:30 PM	7:00:00	LPRSA0189511	ABC013531				
	5/14/57 9:30 PM	5/15/57 11:15 AM	13:45:00	LPRSA0189508	ABC013528				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	2/28/58 4:00 AM	2/28/58 9:30 AM	5:30:00	LPRSA0189488	ABC013508				
	10/23/58 3:30 AM	10/24/58 9:45 AM	30:15:00	LPRSA0189469	ABC013489				
	11/28/58 9:00 PM	11/29/58 11:00 AM	14:00:00	LPRSA0189466	ABC013486				
	3/6/59 8:15 AM	3/7/59 9:30 AM	25:15:00	LPRSA0189458	ABC013478				
	6/2/59 6:45 PM	6/3/59 8:30 AM	13:45:00	LPRSA0189454	ABC013474				
	8/5/59 11:30 AM	8/5/59 3:15 PM	3:45:00	LPRSA0189448	ABC013468				
	8/9/59 6:15 AM	8/9/59 7:30 AM	1:15:00	LPRSA0189447	ABC013467				
	9/1/59 7:30 PM	9/3/59 10:15 AM	38:45:00	LPRSA0189445	ABC013465				
	12/7/59 2:15 AM	12/7/59 9:45 AM	7:30:00	LPRSA0189431	ABC013451				
	2/26/60 2:30 AM	2/26/60 10:40 AM	8:10:00	LPRSA0189420	ABC013440				
	7/14/60 2:20 PM	7/15/60 8:45 AM	18:25:00	LPRSA0189404	ABC013424				
	7/30/60 11:00 AM	7/31/60 10:45 AM	23:45:00	LPRSA0189402	ABC013422				
	8/19/60 9:30 AM	8/20/60 11:00 AM	25:30:00	LPRSA0189399	ABC013419				
	9/12/60 8:40 AM	9/13/60 10:40 AM	26:00:00	LPRSA0189397	ABC013417				
	12/21/60 10:15 AM	12/22/60 10:10 AM	23:55:00	LPRSA0189391	ABC013411				
	3/14/61 9:15 AM	3/14/61 1:35 PM	4:20:00	LPRSA0189382	ABC013402				

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Exhibit 2-4k. Documented PVSC Bypasses at Freeman Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	3/23/61 2:05 PM	3/24/61 11:20 AM	21:15:00	LPRSA0189383	ABC013403				
	4/10/61 11:55 AM	4/11/61 9:05 AM	21:10:00	LPRSA0189376	ABC013396				
	4/13/61 10:50 AM	4/14/61 9:15 AM	22:25:00	LPRSA0189375	ABC013395				
	4/16/61 1:50 PM	4/17/61 9:35 AM	19:45:00	LPRSA0189373	ABC013393				
	4/25/61 7:45 PM	4/26/61 9:40 AM	13:55:00	LPRSA0189369	ABC013389				
	7/20/61 1:10 PM	7/21/61 9:45 AM	20:35:00	LPRSA0189357	ABC013377				
	9/20/61 1:30 PM	9/22/61 9:15 AM	43:45:00	LPRSA0189348	ABC013368				
	11/29/61 9:30 AM	12/20/61 10:30 AM	505:00:00	LPRSA0189340	ABC013360				
	2/26/62 1:45 PM	2/27/62 9:20 AM	19:35:00	LPRSA0189329	ABC013349				
	2/27/62 2:25 PM	3/1/62 9:30 AM	43:05:00	LPRSA0189329	ABC013349				
	3/12/62 9:10 AM	3/13/62 4:00 PM	30:50:00	LPRSA0189327	ABC013347				
	9/5/62 1:45 PM	9/6/62 9:15 AM	19:30:00	LPRSA0189301	ABC013321				
	9/27/62 12:50 PM	9/28/62 2:20 PM	25:30:00	LPRSA0189296	ABC013316				
	10/5/62 8:30 AM	10/6/62 10:10 AM	25:40:00	LPRSA0189295	ABC013315				
	11/3/62 11:00 AM	11/5/62 10:05 AM	47:05:00	LPRSA0189288	ABC013308				
	11/9/62 3:40 PM	11/11/62 11:15 AM	43:35:00	LPRSA0189287	ABC013307				
	11/21/62 11:15 PM	11/23/62 10:15 AM	35:00:00	LPRSA0189284	ABC013304				
	12/5/62 10:25 AM	12/8/62 10:20 AM	71:55:00	LPRSA0189283	ABC013303				
*	1/1/63 12:00 AM	9/30/74 11:59 PM							
	Subtotal		13585:25:00						

* Missing data.

Source: PVSC throw-out logs.

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Exhibit 2-4k. Documented PVSC Bypasses at Freeman Street
(Newark)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1974-1975)							
	10/16/74 10:00 AM	10/17/74 9:00 PM	35:00:00	LPRSA0195712				
	12/2/74 6:00 AM	12/3/74 9:00 AM	27:00:00	LPRSA0195714				
	12/8/74 2:00 PM	12/9/74 9:00 AM	19:00:00	LPRSA0195714				
	12/16/74 1:00 PM	12/17/74 9:00 AM	20:00:00	LPRSA0195714				
	1/13/75 11:00 AM	1/14/75 9:00 AM	22:00:00	LPRSA0195715				
	1/18/75 4:00 PM	1/19/75 6:00 AM	14:00:00	LPRSA0195715				
	1/29/75 6:00 AM	1/29/75 11:00 AM	5:00:00	LPRSA0195715				
	2/23/75	2/23/75	0:00:00	LPRSA0197189				
	3/19/75 6:00 PM	3/20/75 8:00 AM	14:00:00	LPRSA0195717				
	4/3/75	4/3/75	6:25:00	LPRSA0197189	*	*		
	4/3/75 9:00 AM	4/4/75 12:00 AM	8:35:00	LPRSA0195718				
	4/24/75	4/24/75	0:30:00	LPRSA0197189	*	*		
	4/25/75	4/26/75	0:00:00	LPRSA0197189				
	6/6/75 1:00 AM	6/6/75 8:00 AM	7:00:00	LPRSA0195720				
	6/6/75 10:00 AM	6/7/75 1:00 AM	15:00:00	LPRSA0195720				
	6/12/75 10:00 AM	6/13/75 2:00 PM	28:00:00	LPRSA0195720				
	7/4/75 5:00 AM	7/4/75 1:00 PM	8:00:00	LPRSA0195721				
	7/7/75 9:00 AM	7/7/75 10:00 PM	13:00:00	LPRSA0195721				
	7/9/75 7:00 PM	7/10/75 3:00 AM	8:00:00	LPRSA0195721				
	7/13/75 2:00 PM	7/14/75 9:00 AM	19:00:00	LPRSA0195721				
	7/14/75 11:00 AM	7/17/75 8:00 AM	69:00:00	LPRSA0195721				
	7/25/75 3:00 AM	7/25/75 2:00 PM	11:00:00	LPRSA0195721				
	9/23/75 3:00 AM	9/28/75 11:00 AM	128:00:00	LPRSA0195722				
*	10/1/75	12/31/04						
Subtotal			**477:30:00**		4.8	1.22	421	4,286
Estimated Mass/Bypass Time (lb/hr)								**695**
Estimated Bypassed Volume Rate (MG/hr)					**0.198**			

* Note: Bypasses were not measured; overflow data are used to calculate average mass and volume.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

(2005-2014)

			Elapsed Time (hours)	Frequency of Overflows (#/yr)
	1/1/2005	12/31/2005	249.59	12
	1/1/2006	12/31/2006	632.34	48
	1/1/2007	12/31/2007	402.22	29
	1/1/2008	12/31/2008	409.04	26
	1/1/2009	12/31/2009	453.61	46
	1/1/2010	12/31/2010	427.08	36
	1/1/2011	12/31/2011	645.16	62
	1/1/2012	12/31/2012	179.77	39
	1/1/2013	12/31/2013	359.22	39
	1/1/2014	12/31/2014	359.22	39
*	1/1/2015	9/30/2016		
	Subtotal (2005-2014)		**4117.25**	

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Exhibit 2-4k. Documented PVSC Bypasses at Freeman Street (Newark)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
Average annual bypass time (hr)		**411.73**					

* Missing data.

Source: PVSC, NJPDES permit reports to NJDEP, CSO Regulator Events, 2008-2015.

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Exhibit 2-4l. Documented PVSC Bypasses at Yantacaw

(Paterson, Passaic, Clifton, Garfield, and upstream of 3rd River)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	(1950-1962)								
*	8/2/24 12:00 PM	10/3/50 11:59 PM		LPRSA0198629					
	10/5/50 2:00 AM	10/5/50 11:30 AM	9:30:00	LPRSA0188654	ABC012674				
	11/25/50 1:00 PM	11/26/50 9:30 AM	20:30:00	LPRSA0188643	ABC012663				
	12/4/50 8:30 PM	12/5/50 8:30 AM	12:00:00	LPRSA0188641	ABC012661				
	12/8/50 2:00 AM	12/8/50 9:00 AM	7:00:00	LPRSA0188637	ABC012657				
	12/29/50 12:30 PM	12/30/50 11:30 AM	23:00:00	LPRSA0188635	ABC012655				
	1/14/51 9:00 PM	1/15/51 9:00 AM	12:00:00	LPRSA0188631	ABC012651				
	1/23/51 4:00 AM	1/24/51 8:00 AM	36:00:00	LPRSA0188621	ABC012641				
	2/1/51 3:00 PM	2/2/51 8:00 AM	17:00:00	LPRSA0188628	ABC012648				
	2/7/51 11:00 AM	2/8/51 8:30 AM	21:30:00	LPRSA0188585	ABC012605				
	2/17/51 9:30 PM	2/18/51 9:30 AM	12:00:00	LPRSA0188588	ABC012608				
	2/21/51 9:30 AM	2/22/51 9:00 AM	23:30:00	LPRSA0188596	ABC012616				
	3/14/51 11:00 AM	3/14/51 1:30 PM	2:30:00	LPRSA0188609	ABC012629				
	3/20/51 5:30 AM	3/20/51 9:00 AM	3:30:00	LPRSA0188616	ABC012636				
*	3/22/51 12:00 AM	12/31/51 11:59 PM							
	3/11/52 9:30 AM	3/12/52 9:30 AM	24:00:00	LPRSA0189752	ABC013772				
	3/19/52 3:15 PM	3/20/52 9:00 AM	17:45:00	LPRSA0189751	ABC013771				
	4/25/52 6:00 PM	4/26/52 9:00 AM	15:00:00	LPRSA0189744	ABC013764				
	4/28/52 9:30 AM	4/29/52 10:00 AM	24:30:00	LPRSA0189744	ABC013764				
	5/5/52 3:30 PM	5/6/52 2:00 PM	22:30:00	LPRSA0189745	ABC013765				
	5/6/52 8:00 PM	5/7/52 9:00 AM	13:00:00	LPRSA0189745	ABC013765				
	5/11/52 11:30 PM	5/12/52 1:00 PM	13:30:00	LPRSA0189743	ABC013763				
	5/20/52 11:00 AM	5/21/52 9:30 AM	22:30:00	LPRSA0189741	ABC013761				
	5/25/52 11:30 AM	5/26/52 9:30 AM	22:00:00	LPRSA0189740	ABC013760				
	6/1/52 4:00 AM	6/1/52 7:00 AM	3:00:00	LPRSA0189738	ABC013758				
	6/1/52 10:00 AM	6/2/52 9:30 AM	23:30:00	LPRSA0189738	ABC013758				
	6/4/52 9:00 PM	6/5/52 9:00 AM	12:00:00	LPRSA0189736	ABC013756				
	6/9/52 2:30 PM	6/10/52 8:30 AM	18:00:00	LPRSA0189737	ABC013757				
	6/10/52 4:00 PM	6/11/52 8:30 AM	16:30:00	LPRSA0189737	ABC013757				
	6/11/52 4:00 PM	6/12/52 8:30 AM	16:30:00	LPRSA0189737	ABC013757				
	6/12/52 3:00 PM	6/13/52 9:00 AM	18:00:00	LPRSA0189737	ABC013757				
	6/17/52 8:30 PM	6/18/52 8:30 AM	12:00:00	LPRSA0189735	ABC013755				
	6/19/52 12:30 PM	6/20/52 8:15 AM	19:45:00	LPRSA0189734	ABC013754				
	8/6/52 6:30 PM	8/7/52 9:00 AM	14:30:00	LPRSA0189715	ABC013735				
	10/2/52 9:00 PM	10/3/52 8:00 AM	11:00:00	LPRSA0189707	ABC013727				
	11/2/52 8:00 AM	11/2/52 1:00 PM	5:00:00	LPRSA0189705	ABC013725				
	11/15/52 6:00 PM	11/28/52 9:00 AM	303:00:00	LPRSA0189701	ABC013721				
	12/5/52 2:00 PM	12/6/52 8:00 AM	18:00:00	LPRSA0189702	ABC013722				
	1/24/53 2:00 PM	1/25/53 8:00 AM	18:00:00	LPRSA0189657	ABC013677				
	2/15/53 2:00 PM	2/16/53 9:00 AM	19:00:00	LPRSA0189659	ABC013679				
	2/21/53 10:00 AM	2/22/53 8:00 AM	22:00:00	LPRSA0189660	ABC013680				
	2/25/53 1:00 PM	3/10/53 7:30 PM	318:30:00	LPRSA0189661	ABC013681				
	3/13/53 2:30 PM	3/16/53 8:00 AM	65:30:00	LPRSA0189662	ABC013682				
	3/17/53 1:30 PM	3/18/53 9:30 AM	20:00:00	LPRSA0189662	ABC013682				
	3/24/53 12:00 PM	3/25/53 3:30 PM	27:30:00	LPRSA0189662	ABC013682				
	4/7/53 7:15 AM	4/8/53 9:30 AM	26:15:00	LPRSA0189662	ABC013682				
	4/10/53 10:00 AM	4/11/53 10:30 AM	24:30:00	LPRSA0189662	ABC013682				
	4/12/53 9:00 AM	4/13/53 10:00 AM	25:00:00	LPRSA0189662	ABC013682				
	4/16/53 9:00 AM	4/17/53 10:30 AM	25:30:00	LPRSA0189662	ABC013682				
	5/22/53 4:30 PM	5/25/53 8:30 AM	64:00:00	LPRSA0189662	ABC013682				

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Exhibit 2-4l. Documented PVSC Bypasses at Yantacaw

(Paterson, Passaic, Clifton, Garfield, and upstream of 3rd River)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
	5/25/53 2:30 PM	5/27/53 9:30 AM	43:00:00	LPRSA0189662	ABC013682				
	6/22/53 2:30 PM	6/23/53 8:45 AM	18:15:00	LPRSA0189677	ABC013697				
	6/30/53 4:30 PM	6/30/53 6:30 PM	2:00:00	LPRSA0189679	ABC013699				
	7/23/53 10:30 AM	7/24/53 8:45 AM	22:15:00	LPRSA0189684	ABC013704				
	8/14/53 6:30 PM	8/15/53 11:00 AM	16:30:00	LPRSA0189687	ABC013707				
	10/28/53 9:15 AM	10/28/53 1:30 PM	4:15:00	LPRSA0189692	ABC013712				
	11/7/53 11:30 AM	11/8/53 9:00 AM	21:30:00	LPRSA0189695	ABC013715				
	11/23/53 1:00 PM	11/24/53 9:45 AM	20:45:00	LPRSA0189698	ABC013718				
	12/14/53 8:45 AM	12/15/53 9:00 AM	24:15:00	LPRSA0189647	ABC013667				
	2/17/54 10:30 AM	2/17/54 4:30 PM	6:00:00	LPRSA0189587	ABC013607				
	3/3/54 1:45 PM	3/4/54 9:00 AM	19:15:00	LPRSA0189619	ABC013639				
	5/21/54 9:30 AM	5/21/54 5:00 PM	7:30:00	LPRSA0189631	ABC013651				
	8/9/54 12:30 PM	8/10/54 8:30 AM	20:00:00	LPRSA0189622	ABC013642				
	8/31/54 1:30 AM	8/31/54 3:30 PM	14:00:00	LPRSA0189608	ABC013628				
	9/11/54 2:45 AM	9/11/54 3:30 PM	12:45:00	LPRSA0189606	ABC013626				
	10/15/54 2:30 PM	10/15/54 11:30 PM	9:00:00	LPRSA0189603	ABC013623				
	10/29/54 12:45 PM	10/29/54 4:00 PM	3:15:00	LPRSA0189601	ABC013621				
	11/2/54 3:00 PM	11/3/54 9:30 AM	18:30:00	LPRSA0189600	ABC013620				
	11/20/54 4:00 AM	11/25/54 10:00 AM	126:00:00	LPRSA0189597	ABC013617				
	12/9/54 4:30 PM	12/10/54 10:00 AM	17:30:00	LPRSA0189596	ABC013616				
	12/14/54 12:45 PM	12/15/54 8:30 AM	19:45:00	LPRSA0189595	ABC013615				
	2/2/55 10:00 AM	2/4/55 2:30 PM	52:30:00	LPRSA0189580	ABC013600				
	2/6/55 7:05 PM	2/7/55 10:30 AM	15:25:00	LPRSA0189580	ABC013600				
	2/11/55 3:30 PM	2/12/55 10:00 AM	18:30:00	LPRSA0189580	ABC013600				
	2/15/55 5:00 PM	2/16/55 9:45 AM	16:45:00	LPRSA0189580	ABC013600				
	2/16/55 6:00 PM	2/17/55 9:45 AM	15:45:00	LPRSA0189580	ABC013600				
	2/23/55 10:30 AM	2/23/55 4:45 PM	6:15:00	LPRSA0189579	ABC013599				
	3/1/55 1:00 PM	3/1/55 4:30 PM	3:30:00	LPRSA0189579	ABC013599				
	3/4/55 3:00 AM	3/4/55 1:45 PM	10:45:00	LPRSA0189579	ABC013599				
	3/6/55 4:35 PM	3/7/55 10:30 AM	17:55:00	LPRSA0189579	ABC013599				
	3/22/55 10:15 AM	3/23/55 9:45 AM	23:30:00	LPRSA0189577	ABC013597				
	8/12/55 4:45 AM	8/12/55 1:15 PM	8:30:00	LPRSA0189569	ABC013589				
	8/12/55 2:30 PM	8/13/55 3:15 PM	24:45:00	LPRSA0189569	ABC013589				
	8/18/55 11:30 PM	8/19/55 10:30 AM	11:00:00	LPRSA0189567	ABC013587				
	10/6/55 11:30 AM	10/6/55 5:00 PM	5:30:00	LPRSA0189562	ABC013582				
	10/14/55 3:15 PM	10/15/55 9:00 AM	17:45:00	LPRSA0189561	ABC013581				
	10/16/55 4:45 PM	10/17/55 10:30 AM	17:45:00	LPRSA0189561	ABC013581				
	10/30/55 12:00 PM	11/1/55 3:30 PM	51:30:00	LPRSA0189560	ABC013580				
	11/11/55 12:15 AM	11/11/55 10:00 AM	9:45:00	LPRSA0189559	ABC013579				
	11/16/55 11:45 AM	11/17/55 9:30 AM	21:45:00	LPRSA0189558	ABC013578				
	2/6/56 9:30 PM	2/7/56 9:00 AM	11:30:00	LPRSA0189554	ABC013574				
	2/18/56 11:00 AM	2/18/56 2:20 PM	3:20:00	LPRSA0189553	ABC013573				
	3/14/56 11:30 AM	3/14/56 3:00 PM	3:30:00	LPRSA0189551	ABC013571				
	9/6/56 8:45 PM	9/6/56 11:00 PM	2:15:00	LPRSA0189536	ABC013556				
	10/31/56 3:00 PM	11/1/56 8:30 AM	17:30:00	LPRSA0189532	ABC013552				
	12/14/56 1:30 PM	12/15/56 9:45 AM	20:15:00	LPRSA0189528	ABC013548				
	2/26/57 7:00 PM	2/27/57 8:30 AM	13:30:00	LPRSA0189496	ABC013516				
	3/15/57 10:50 PM	3/16/57 12:00 PM	13:10:00	LPRSA0189522	ABC013542				
	5/15/57 11:15 PM	5/16/57 8:55 AM	9:40:00	LPRSA0189508	ABC013528				
*	5/16/57 12:00 AM	8/25/57 11:59 PM							

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Exhibit 2-4l. Documented PVSC Bypasses at Yantacaw

(Paterson, Passaic, Clifton, Garfield, and upstream of 3rd River)

	Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers		Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
*	9/18/57 12:00 AM	12/19/57 11:59 PM							
	10/1/58 10:30 AM	10/1/58 5:15 PM	6:45:00	LPRSA0189470	ABC013490				
	10/23/58 5:00 AM	10/23/58 1:30 PM	8:30:00	LPRSA0189469	ABC013489				
	7/26/59 2:30 AM	7/26/59 10:00 AM	7:30:00	LPRSA0189450	ABC013470				
	8/13/59 7:00 PM	8/13/59 10:45 PM	3:45:00	LPRSA0189446	ABC013466				
	10/14/59 8:00 PM	10/15/59 12:00 AM	4:00:00	LPRSA0189437	ABC013457				
	11/4/59 7:30 PM	11/4/59 11:00 PM	3:30:00	LPRSA0189433	ABC013453				
	5/3/61 3:00 PM	5/4/61 12:10 AM	9:10:00	LPRSA0189366	ABC013386				
	6/1/61 3:00 PM	6/2/61 9:15 AM	18:15:00	LPRSA0189363	ABC013383				
	4/27/62 5:30 PM	4/28/62 5:30 AM	12:00:00	LPRSA0189320	ABC013340				
	11/10/62 8:00 AM	11/10/62 9:15 AM	1:15:00	LPRSA0189287	ABC013307				
*	1/1/63 12:00 AM	9/30/74 11:59 PM							
Subtotal			**2485:55:00**						

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Exhibit 2-4l. Documented PVSC Bypasses at Yantacaw

(Paterson, Passaic, Clifton, Garfield, and upstream of 3rd River)

Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	Avg Overflow Rate (MGD)	Calculated Volume (MG)	Avg TSS - Storm (mg/l)	Mass (lb)
(1975)							
9/25/75	9/27/75	0:00:00	LPRSA0203966	*	*	451	*
Average (per hour)		1:00:00	LPRSA0195596	**122.0**	**5.08**	**451**	**19,133**
Estimated Mass/Bypass Time (lb/hr)							**19,133**
Estimated Bypassed Volume Rate (MG/hr)				5.083			

* Note: During this study, the outlet was inactive. Average flows and mass are used in estimates.

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, prepared for PVSC, 1976.

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EXHIBIT 2-5
AVERAGE PVSC SYSTEM FLOW

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Exhibit 2-5. Average PVSC System Flow (MGD)

Year	Average Daily Flow (MGD)	Source
1924	86.20	[1]
1925	100.12	[1]
1926	108.55	[1]
1927	126.65	[1]
1928	143.43	[1]
1929	143.75	[1]
1930	148.75	[2]
1931	163.22	[2]
1932	154.10	[2]
1933	166.18	[2]
1934	165.51	[2]
1935	158.17	[2]
1936	164.35	[2]
1937	166.63	[2]
1938	155.94	[2]
1939	159.51	[2]
1940	146.78	[2]
1941	172.48	[2]
1942	175.69	[2]
1943	169.29	[2]
1944	154.02	[2]
1945	180.27	[2]
1946	187.21	[2]
1947	181.66	[2]
1948	193.73	[2]
1949	194.07	[2]
1950	201.02	[3]
1951	185.73	[3]
1952	195.80	[3]
1967	250.00	[4]
1971	252.15	[5]
1972	258.22	[5]
1973	259.62	[5]
1974	244.44	[5]
1975	258.53	[5]
1976	250.50	[5]

Sources:

[1] PVSC, Exhibit 2: Chart Showing Ave. Daily Sewage Flow - 1924 to 1931, October 11, 1932 [LPRSA0192818].
[2] Bogert-Childs Engineering Associates, Report on Improving Sedimentation and Dispersal Facilities, prepared for the PVSC, May 1951, Table 3 [MAXUS 2399661; KLL022263].
[3] PVSC, Average Daily Sewage Flow [LPRSA0192046].
[4] Interstate Sanitation Commission, Report of the Interstate Sanitation Commission, 1967, p. A-1 [LPRSA0022340].
[5] PVSC Annual Reports, 1971 -1976 [LPRSA0005524; 5773; 5908; 6065; 6156; 6322].

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EXHIBIT 2-6
HISTORICAL SAMPLING FOR COCS

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Exhibit 2-6. Historical Sampling for Contaminants of Concern (COCs)

					Metals:							PAHs:											
Sample Date	Units	Location	TSS	PCBs	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benzo (a) Pyrene	Benzo (ghi) Perylene	Benzo (k) Fluoranthene	Chrysene	Dibenzo (a,h) Anthracene	Fluoranthene	Fluorene	Naphthalene	Pyrene
Jul-59	ppm	PVSC Influent	540																				
pre-1992	ppm	PVSC Influent	450																				
post-1992	ppm	PVSC Influent	200																				
1977	ug/l	Bloomington, IN POTW (3.6 MGD)		145																			
		Baltimore, MD POTW (180 MGD)		15																			
	lb/MG	Bloomington, IN POTW (3.6 MGD)		1.21																			
		Baltimore, MD POTW (180 MGD)		0.13																			
1978	lb/day	PVSC Influent (average flow=280 MGD)			98	1523	499	1869	119	991	5694												
	lb/MG	PVSC Influent			0.35	5.44	1.78	6.68	0.43	3.54	20.34												
1986	lb/day	PVSC Influent Treatment Plant (1)										24.9	37.7	60.5	342.8	41.2	490.1	20.5	76.3	146.5	67.3	164.8	42.2
	lb/MG	PVSC Influent Treatment Plant (1)										0.09	0.13	0.22	1.22	0.15	1.75	0.07	0.27	0.52	0.24	0.59	0.15
1999	ng/l	PVSC Influent -High Flow Events (avg)		300																			
	lb/MG	(conversion)		0.003																			

Sources:

PVSC, Monthly Summarized Laboratory Report: Influent and Effluent Newark Bay Treatment Plant, July 1959 [LPRSA0194412].
Hazen and Sawyer, Maximization of the Conveyance of Wastewater: Final Report, prepared for the PVSC, December 1996, p.2.
EPA, PCBs Removal in Publicly-Owned Treatment Works, July 16, 1977, p.2.
PVSC, Heavy Metals Source Determination, Phase II, 1980 (Summarizing Phase I work in 1978) [LPRSA0009923 and 0009955].
CFM Incorporated, Investigation of Organic Priority Pollutants in the Influent to the PVSC Treatment Plant, May 1986, Tables 2-3 (measurements taken 11/84-1/86).

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EXHIBIT 2-7
SUMMARY OF PVSC BYPASSES: TIME, VOLUME, AND MASS

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Exhibit 2-7a. Summary of Documented PVSC Bypasses: Time, Volume and Mass

Bypass	Documented Time Bypassed 1950-2014 (Hr:Min:Sec)	Estimated Volume (MG)	Estimated Mass Bypassed (lb)	Estimated PCBs Bypassed (lb)	Estimated Mercury Bypassed (lb)	Estimated Copper Bypassed (lb)	Estimated Lead Bypassed (lb)	Estimated PAHs Bypassed (lb)*
Yantacaw	2485:55:00	12,637	47,561,885	1,582	5,371	22,520	84,350	68,365
Union Outlet	14288:39:00	14,466	26,196,613	1,811	6,148	25,780	96,558	78,259
Verona Avenue	12401:16:00	3,623	6,082,315	312	1,275	5,345	20,020	16,226
Herbert Place	17804:22:36	6,897	9,916,585	678	2,586	10,842	40,610	32,914
4th Avenue	18053:00:12	4,956	7,525,970	461	1,810	7,588	28,421	23,035
Clay Street	19127:37:12	45,420	83,212,677	4,312	16,738	70,186	262,880	213,061
Rector Street	18216:25:24	6,485	7,602,427	608	2,375	9,960	37,305	30,235
Saybrook Place	17309:53:00	13,374	29,215,700	1,244	4,881	20,467	76,657	62,130
City Dock	13075:16:00	23,154	40,970,087	1,923	8,020	33,630	125,959	102,088
Jackson Street	17936:25:36	12,406	8,957,558	1,172	4,562	19,129	71,646	58,068
Polk Street	18061:02:48	14,486	10,884,187	1,371	5,330	22,349	83,708	67,844
Freeman Street	18180:10:00	3,598	11,067,181	348	1,339	5,614	21,026	17,041
Total		**161,503**	**289,193,187**	**15,822**	**60,432**	**253,409**	**949,142**	**769,267**

*Includes a subset of PAHs (see Exhibit 2-6 for listing).

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Exhibit 2-7b. Summary of Estimated Total PVSC Bypasses During 1924-2016: Time, Volume and Mass

Bypass	Estimated Total Time Bypassed 1924-2016 (Hr:Min:Sec)	Estimated Volume (MG)	Estimated Mass Bypassed (lb)	Estimated PCBs Bypassed (lb)	Estimated Mercury Bypassed (lb)	Estimated Copper Bypassed (lb)	Estimated Lead Bypassed (lb)	Estimated PAHs Bypassed (lb)*
Yantacaw	9353:37:26	47,548	178,958,529	5,621	20,208	84,737	317,380	257,232
Union Outlet	53939:46:09	54,608	98,892,427	6,455	23,208	97,319	364,508	295,429
Verona Avenue	48626:11:44	14,208	25,679,962	1,456	5,382	22,567	84,526	68,507
Herbert Place	68520:37:32	26,543	39,984,396	2,284	10,426	43,718	163,744	132,712
4th Avenue	69487:54:29	19,078	30,665,149	1,666	7,373	30,918	115,804	93,858
Clay Street	73006:49:42	173,360	336,192,234	15,669	67,623	283,562	1,062,078	860,800
Rector Street	70164:59:00	24,980	30,961,811	2,194	9,673	40,563	151,930	123,137
Saybrook Place	71465:11:16	55,215	128,569,673	4,935	21,479	90,067	337,345	273,414
City Dock	47656:06:49	84,391	160,207,171	6,331	31,361	131,503	492,544	399,201
Jackson Street	68922:12:27	47,671	36,329,289	4,227	18,501	77,580	290,577	235,509
Polk Street	69409:56:36	55,673	44,139,691	4,934	21,614	90,634	339,469	275,135
Freeman Street	69874:09:42	13,829	44,690,992	1,259	5,406	22,669	84,907	68,816
Total		**617,103**	**1,155,271,324**	**57,032**	**242,254**	**1,015,838**	**3,804,812**	**3,083,750**

*Includes a subset of PAHs (see Exhibit 2-6 for listing).

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EXHIBIT 2-8
ANCHOR QEA ASSESSMENT OF CSOS

Evaluation of Solids Contributions to the Passaic River from Passaic Valley Sewerage Commission Combined Sewer Overflows

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Prepared for
Shook, Hardy & Bacon L.L.P.

1 Objectives

The objective of the work presented here is to evaluate the contribution of solids that the Passaic Valley Sewerage Commission (PVSC) has discharged to the Passaic River via combined sewer overflows (CSOs) and bypasses from its system during wet weather (i.e., rainfall) events. The evaluation uses PVSC flow and solids information from a comprehensive study of its collection system (Killam 1976) to estimate solids loads from the PVSC CSOs to the Passaic River. The data generated during the Killam (1976) study were used to develop an empirical relationship between rainfall and overflow volumes to estimate CSO discharges for years without overflow measurements. Estimates of solids concentrations in the overflows were applied to the overflow volumes to estimate the mass of solids discharged from the PVSC CSOs between Water Year (WY) 1924 and WY2016.

2 Methodology and Data

2.1 Methodology

Between October 1974 and September 1975 (referred to as WY1975), Elson T. Killam Associates, Inc. (Killam) conducted a comprehensive study of the PVSC interceptor and collection system to support an evaluation of alternatives aimed at eliminating overflows to the Passaic River. This study included physical characterization of the PVSC system and its components and measurement of flow and quality of the overflows over a 1-year period (Killam 1976).

This evaluation includes several parts:

1. Flow and solids concentration information collected during the WY1975 study period were used to estimate the total mass of solids (i.e., solids load) that entered the Passaic River during overflow events occurring in this WY.
2. An empirical relationship was established between total rainfall and the total overflow volume discharged from the PVSC CSOs to the Passaic River in order to estimate flow volumes and solids loads from PVSC operations from 1924 to 2016. For the period prior to the Killam study (i.e., WY1924 to WY1974), this relationship was applied to historic precipitation records from WY1924

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to WY1974 to estimate the overflow volume for each year during this period. The average solids concentration measured during the WY1975 study was then applied to these overflow volumes to estimate the mass of solids discharged from the PVSC CSOs to the Passaic River for each year.

3. For the period after the Killam study (i.e., WY1976 to WY2016), the empirical relationship was applied to local precipitation records to estimate the number and magnitude of overflow events that occurred during this period. Then, average solids concentrations from the 1976 Killam study, a 2007 Hatch Mott MacDonald study, and a 2014 Newark stormwater study (Amar et al. 2014) were applied to the estimated overflow volumes to estimate the mass of solids discharged from the PVSC CSOs to the Passaic River for each year.

2.2 Data

Data from several sources were used in this evaluation, including:

- Overflow volumes and solids concentration measurements from the PVSC CSOs to the Passaic River in WY1975 (Killam 1976)
- Precipitation records from the National Oceanic and Atmospheric Administration (NOAA) weather station at Jersey City (1924 to 1948)
- Precipitation records from the NOAA weather station at Newark Liberty International Airport (Newark Airport; 1949 to 2013)
- Precipitation records from the weather station at Newark Airport, as reported by Weather Underground (www.wunderground.com) (2014 to 2016)
- Solids concentration information from the wastewater and CSO outfalls (USFWPCA 1969)
- Solids concentration information from PVSC system (Hatch Mott MacDonald 2007)
- Solids concentration information from Newark stormwater (Amar et al. 2014)

3 PVSC CSO Solids Loads

3.1 WY1975

Between October 1974 and September 1975, Killam conducted a comprehensive study of 73 CSOs (65 active, 8 inactive) within the PVSC collection system (Figure 3-1 and Table 3-1). The study focused on identifying and characterizing each CSO, and understanding the number, magnitude, and quality of observed overflows in response to measured precipitation events. To accomplish the latter objective, rainfall volume and duration were recorded for weather events occurring in the region. Dry and wet weather flow measurements were obtained from each CSO. Due to the large number of CSOs, the monitoring was conducted over variable time frames within the year; thus, no complete annual record of rainfall or overflow exists for any CSO location. In addition to overflow volume, sampling of total suspended solids (TSS), biochemical oxygen demand (BOD), and chemical oxygen demand (COD) was performed for a subset of overflow events to determine the quality of the overflows.

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Killam reported that overflows sent approximately 7,600 million gallons (MG) of combined stormwater and sewage to the Passaic River over the monitored 1-year period. Total solids load from the CSOs was not computed in the report. This overflow volume does not include an additional 3,400 MG that were discharged from the South Side Interceptor overflows and diversions from valve closings, bypasses, the Second River Union Outlet sanitary bypass, and other sanitary system overflows (Killam 1976).

For the evaluation, measured rainfall volume, duration, intensity, and overflow volume were analyzed for each CSO location to investigate correlations that would allow one to use rainfall information to estimate overflow volume in other years (i.e., those before and after WY1975). Correlations for individual CSOs were poor due to data paucity; therefore, a system-wide relationship between rainfall and overflow volume was examined. The total daily overflow volume for each precipitation event, as reported by Killam (1976), is plotted against the daily rainfall in Figure 3-2. Reported overflow volume correlated well with daily rainfalls and a linear regression provided a good fit to the data (Figure 3-2).

The relationship shown in Figure 3-2 and precipitation records from Newark Airport for the same 1-year period were used to estimate the total overflow volume from the PVSC CSOs for comparison to that reported by Killam (1976). Because rainfall events of short duration or low intensity did not always generate runoff and overflow events during the Killam study, rainfall events less than 0.1 inch were assumed to generate no overflows and were not included in the overflow volume calculations. Using this empirical relationship and the Newark Airport precipitation records yielded an estimated overflow volume from the PVSC CSOs of 7,000 MG during WY1975. These numbers compare reasonably well with those reported by Killam (1976), providing confidence that the empirical relationship derived from the Killam study provides a reasonable tool to estimate overflow volumes in other years.

To estimate solids concentrations in the overflows, we reviewed the TSS data generated during the Killam study. Similar to the overflow monitoring, water quality monitoring was not conducted for the full year at any one station, and data exist for only a subset of the observed overflows. Additionally, sampling occurred at many CSOs during dry-weather flow to determine solids concentrations of the baseline flows to the PVSC treatment plant. Therefore, to accurately assess TSS concentrations in overflows, TSS reported by Killam (1976) when overflows were not noted were excluded from this analysis. The cumulative frequency distribution of the TSS concentrations measured by Killam is shown in Figure 3-3. Measurements range from approximately 20 milligrams per liter (mg/L) to 400 mg/L. The average TSS concentration of 147 mg/L was assumed to represent the average condition during an overflow event.

The total mass of solids discharged from the PVSC overflows for WY1975 was computed as the product of the reported total overflow volume (7,600 MG) and the average TSS concentration in the

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overflow (147 mg/L). The calculations indicate that PVSC overflows delivered, on average, approximately 9.3 million pounds (lbs; 4,700 tons) of solids to the Passaic River during WY1975.

3.2 WY1924 to WY1974

No known regular sampling or flow measurements were conducted on CSO overflows prior to 1976. As such, impacts of infrastructure and usage changes on overflow volumes and TSS since 1924 are not known. To assess historical trends, overflow behavior and TSS levels were assumed to be similar to those observed in 1975, and the empirical overflow volume-rainfall relationship developed from the Killam study data was used to estimate overflow volumes discharged from the PVSC CSOs to the Passaic River for WY1924 to WY1974.

Rainfall data collected by NOAA at the Newark Airport weather station were used in this evaluation to forecast and hindcast overflow volumes and solids loading values from the PVSC CSOs to the Passaic River. Hourly rainfall records at Newark Airport are available for 1949 through 2013. For 2013 through 2016, daily Newark Airport rainfall records were downloaded from Weather Underground. For 1924 to 1948, rainfall data from nearby NOAA Jersey City weather station were used to calculate overflow volumes from 1924 to 1948.

The empirical overflow volume-rainfall relationship (shown in Figure 3-2) was used, along with the Jersey City/Newark Airport precipitation records, to estimate the annual volume of PVSC overflows for WY1924 to WY1974 (Figure 3-4). The average TSS concentration of 147 mg/L from the Killam study data (WY1975) was applied to the estimated overflow volumes to compute the historical solids loads from the PVSC CSOs to the Passaic River. It is likely the solids concentrations in overflows were higher in the decades before the Federal Water Pollution Control Act of 1972 than the levels measured during WY1975. However, without specific data, TSS concentration scaling assumptions could not be made. The annual solids loads estimated for WY1924 to WY1974 are shown in Figure 3-5.

3.3 WY1976 to WY2016

Similar to the WY1924 to WY1974 period, the empirical overflow volume-rainfall relationship (shown in Figure 3-2) was used along with the Newark Airport precipitation records to estimate the annual volume of PVSC overflows for WY1976 to WY2016. The estimated overflows for this period are shown in Figure 3-4.

Since 1975, the municipalities served by the PVSC have continued to develop, industrial dischargers have changed, and several federal and state regulations impacting allowable discharges were enacted (i.e., 1977 Clean Water Act, 1987 Water Quality Act, and 2004 New Jersey Stormwater Management rules). To capture the changing landscape of the PVSC system and the associated reduction in solids concentrations that resulted from best management practices (BMPs) within the

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watershed, data collected for the PVSC and City of Newark after 1975 were used to adjust the assumed solids concentrations in overflows for WY1976 to WY2016.

In 2007, Hatch Mott MacDonald conducted a modeling study on behalf of the PVSC. The results of this modeling indicated an average TSS concentration in the PVSC overflows of approximately 90 mg/L. This value was used to represent average TSS conditions for 1988. The reduction in TSS between WY1976 and WY1988 is likely due to responses to the Clean Water and Federal Water Pollution Control acts that regulate discharges and required application of BMP technology to reduce pollutant loads to waterbodies. To reflect these changing conditions in the solids load evaluation, a linear reduction in solids concentration from 147 mg/L in WY1976 to 90 mg/L in WY1988 was assumed (Figure 3-6).

City of Newark stormwater reporting from 2014 indicates that typical stormwater TSS concentrations average 80 mg/L (Amar et al. 2014). The additional reduction in TSS concentration since 1988 is assumed to be an effect of the implementation of 2004 New Jersey Stormwater Management rules. Therefore, for this evaluation, a linear reduction in solids concentration from 90 mg/L in WY2004 to 80 mg/L in WY2014 was applied (Figure 3-6). Water quality reporting data are not currently available for individual CSOs, therefore the average of 80 mg/L was assumed to approximate contemporary TSS concentrations in overflows for WY2014 to WY2016 (Figure 3-6).

Solids loads to the Passaic River between WY1976 to WY2016 were estimated by multiplying the overflow volumes shown in Figure 3-4 and the TSS concentrations shown in Figure 3-6; results of this calculation are shown in Figure 3-5. The estimated solids loads shown in Figure 3-5 do not include the effects of significant storm events such as Hurricane Sandy, which rendered the PVSC plant inoperable for several days in 2012 (Climate Central 2013).

3.4 Summary

Based on this evaluation, the PVSC CSOs are estimated to have delivered 594 million lbs (297,000 tons) over the entire period examined (i.e., WY1924 and WY2016). This is likely an underestimate of the total solids load discharged over this period for the following reasons:

- The average solids concentration (i.e., 147 mg/L) used to represent TSS levels in historical overflows from the PVSC CSOs is likely lower than the levels in discharges occurring earlier than WY1975. This conclusion is supported by the TSS level found in a 1969 CSO study conducted by the U.S. Federal Water Pollution Control Administration (USFWPCA) and the New Jersey State Department of Health, with an average TSS of 238 mg/L from 15 CSOs, ranging from 8 to 1,230 mg/L (USFWPCA 1969).
- The Killam (1976) study identified eight inactive CSOs during their characterization of the PVSC system. These inactive CSOs were historically active and, thus, discharged combined sewage and stormwater during their active life.
- The Newark Bay treatment plant pumping facility was upgraded between 1953 and 1956, and additional upgrades were performed in 1964 (USFWPCA 1969). Overflow occurrence and

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discharge volume may have declined as a result of these upgrades, which would indicate that the overflow volumes estimated using the empirical relationship between overflow volume and rainfall developed using the Killam (1976) measurements likely underestimate discharges from the PVSC CSOs prior to these updates.

- The estimated PVSC CSO solids loads do not include the effects of significant storm events such as Hurricane Sandy, which rendered the PVSC plant inoperable for several days in 2012 (Climate Central 2013), discharges due to maintenance or system malfunctions, or other intentional discharges that are not represented in the Killam (1976) study data.

References

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Killam (Elson T. Killam Associates, Inc.), 1976. *Report Upon Overflow Analysis to Passaic Valley Sewerage Commissioners Passaic River Overflows.*

USFWPCA (U.S. Federal Water Pollution Control Administration), 1969. *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor.*

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Table 3-1
PVSC CSOs Included in the 1976 Killam Report

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CSO Location	Discharge Permit Number	City	Status
Garden State Paper Company	009/G-001	Garfield	Inactive
Dundee Island	070/Q-002	Passaic	Active
Lodi Force Main	027/L-001	Passaic	Inactive
Passaic Tail Race	069/Q-001	Passaic	Inactive
Wallington Pump Station	005	Wallington	Inactive
Woodward Avenue	017/R-001	Rutherford	Inactive
Pierrepont Avenue	072/R-002	Rutherford	Active
Rutherford Avenue	073/R-003	Rutherford	Active
Yantacaw Pump Station	004	Clifton	Inactive
Yantacaw Street	003	Clifton	Inactive
North Arlington	006	North Arlington	Inactive
Curtis Place	042/P-001	Paterson	Active
Mulberry Street	043/P-002	Paterson	Active
West Broadway	044/P-003	Paterson	Active
Bank Street	045/P-004	Paterson	Active
Bridge Street	046/P-005	Paterson	Active
Montgomery Street	047/P-006	Paterson	Active
Straight Street	048/P-007	Paterson	Active
Franklin Street	049/P-008	Paterson	Active
Keen Street	050/P-009	Paterson	Active
Warren Street	051/P-010	Paterson	Active
Sixth Avenue	052/P-011	Paterson	Active
East 5th Street and 5th Avenue	053/P-012	Paterson	Active
East 11th Street	054/P-013	Paterson	Active
East 12th Street & Fourth Avenue	055/P-014	Paterson	Active
S.U.M. Park	056/P-015	Paterson	Active
Northwest St	057/P-016	Paterson	Active
Arch Street	058/P-017	Paterson	Active
Jefferson Street	059/P-018	Paterson	Active
Stout Street	069/P-019	Paterson	Active
North Straight Street	061/P-020	Paterson	Active
Bergen Street	062/P-021	Paterson	Active
Short street	063/P-022	Paterson	Active
Second Avenue	064/P-023	Paterson	Active
Third Avenue	065/P-024	Paterson	Active
Tenth Avenue and East 33rd Street	066/P-025	Paterson	Active
Twentieth Avenue	067/P-026	Paterson	Active
Market Street	068/P-027	Paterson	Active
Hudson Street	007	Paterson	Active
Stewart Avenue	017/K-001	Kearny	Active
Washington Avenue	018/K-002	Kearny	Active
Nairne Avenue	020/K-004	Kearny	Active
Marshall Street	021/K-005	Kearny	Active
Johnston Avenue	022/K-006	Kearny	Active
Ivy Street	023/K-007	Kearny	Active
Bergen Avenue	024/K-008	kearny	Active
Bergen Avenue	019/K-003	kearny	Active
Tappan Street	025/K-009	Kearny	Active
Dukes Street	026/K-010	Kearny	Active

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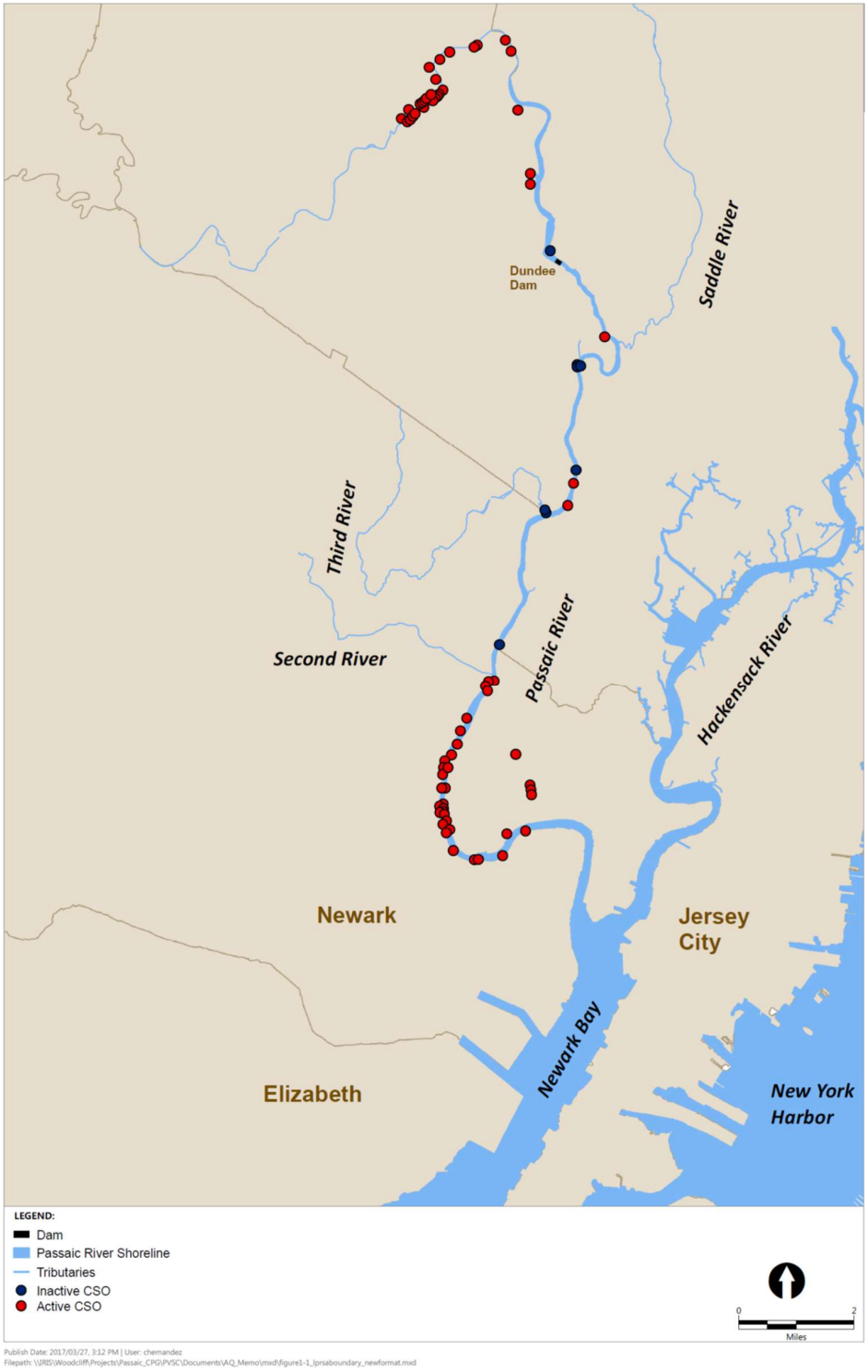
Table 3-1
PVSC CSOs Included in the 1976 Killam Report

Privileged and Confidential
Attorney Work Product
Prepared at Request of Counsel

CSO Location	Discharge Permit Number	City	Status
Central Avenue	008/E-001	E. Newark	Active
New Street (Hamilton Avenue)	010/H-001	Harrison	Active
Cleveland Avenue	011/H-002	Harrison	Active
Harrison Avenue	012/H-003	Harrison	Active
Dey Street	013/H-004	Harrison	Active
Middlesex Street	014/H-005	Harrison	Active
Bergen Street	015/H-006	Harrison	Active
Worthington Avenue	016/K-004	Harrison	Active
Verona Avenue	028/N-001	Newark	Active
Delavan Avenue	029/N-002	Newark	Active
Herbert Place	030/N-003	Newark	Active
Third Avenue	031/N-004	Newark	Active
Fourth Avenue	032/N-005	Newark	Active
Clay Street	033/N-006	Newark	Active
Orange Street	034/N-007	Newark	Active
Bridge Street	035/N-008	Newark	Active
Rector Street	036/N-009	Newark	Active
Saybrook Place	037/N-010	Newark	Active
City Dock	038/N-011	Newark	Active
Jackson Street	039/N-012	Newark	Active
Polk Street	040/N-013	Newark	Active
Freeman Street	041/N-014	Newark	Active
Passaic Street	033/N-006C	Newark	Active
Union Outlet	---	Newark	Active

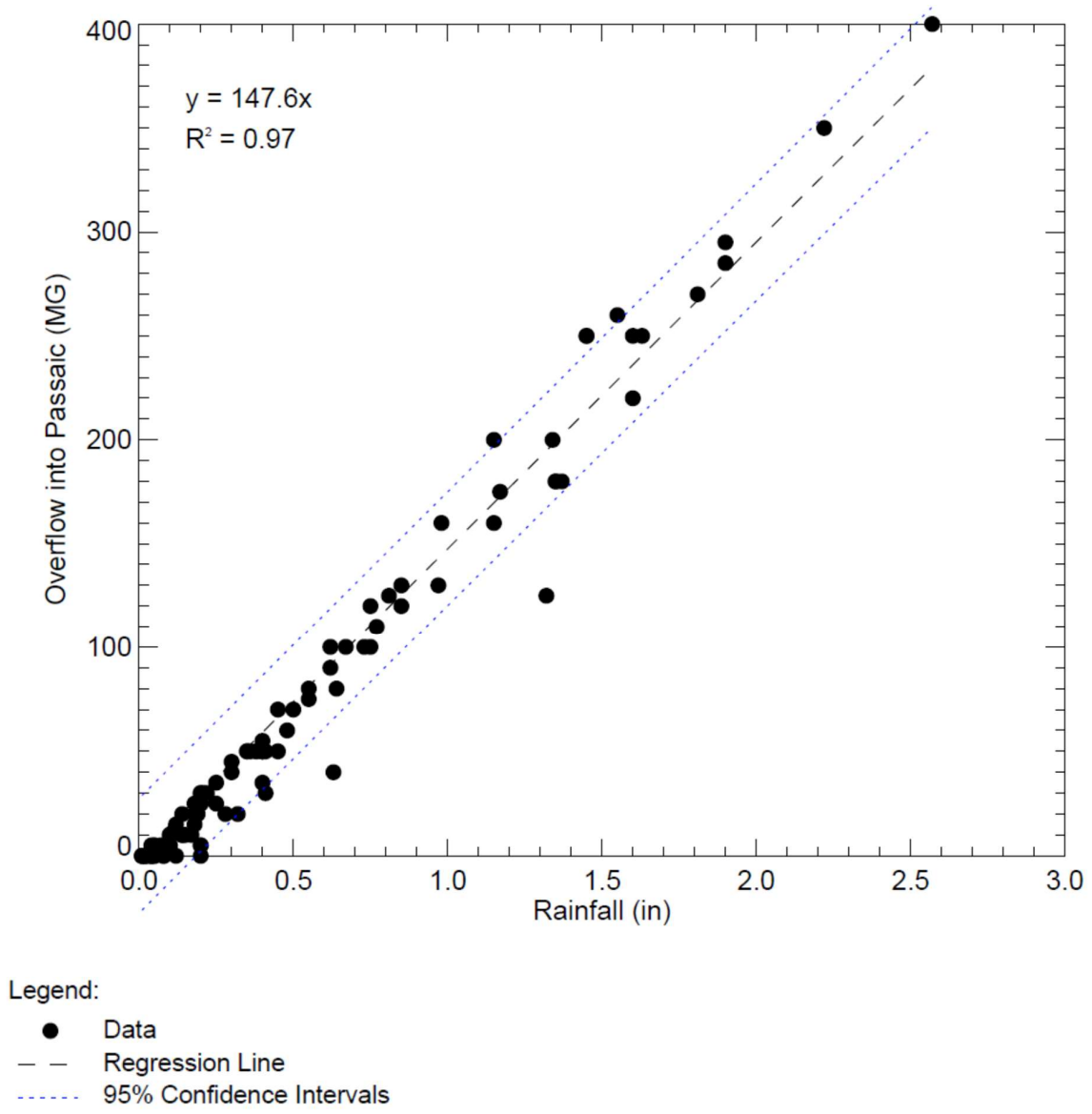
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Figure 3-1
PVSC CSO Locations included in the 1976 Killam Report



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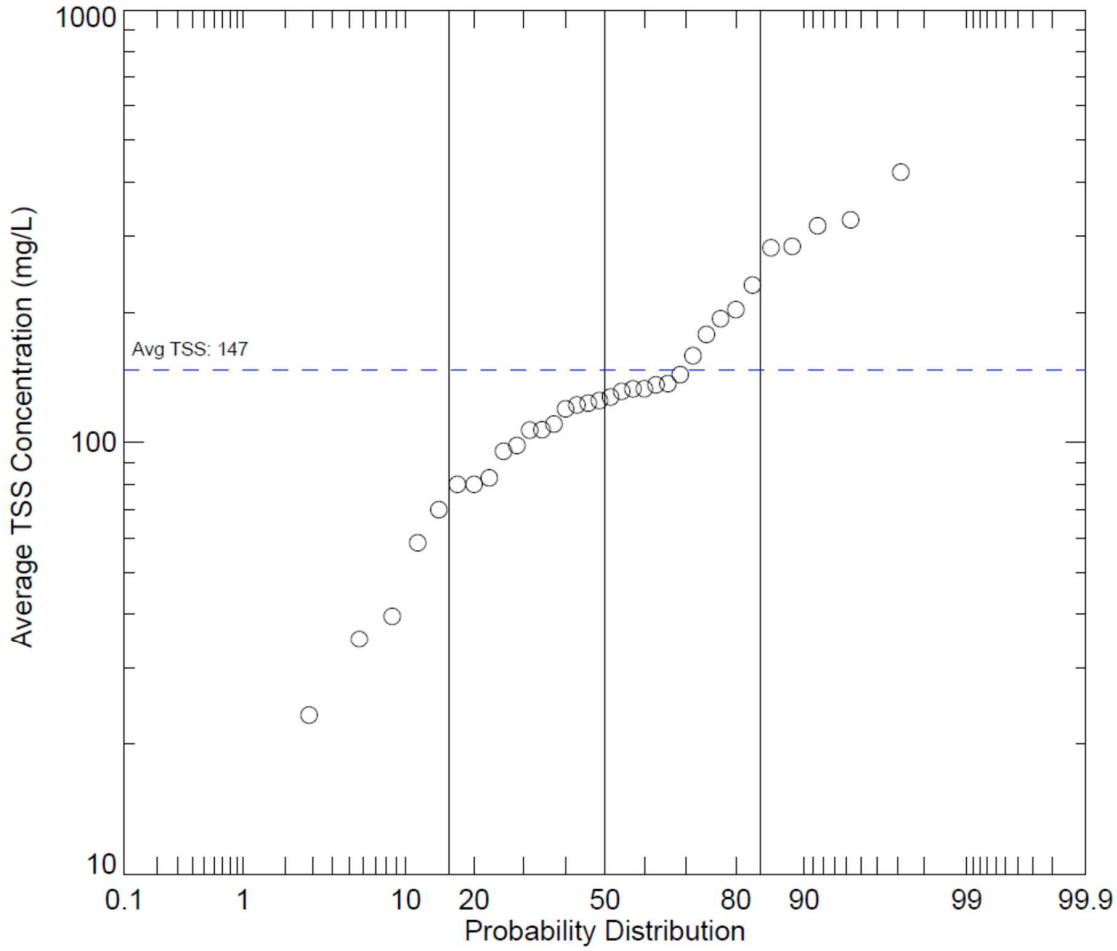
Figure 3-2
Correlation Between Reported Total Overflow Volume and Daily Rainfall in WY1975



Notes:
Second River Union manual overflow volumes not included. Overflow from non-PVSC CSOs in Newark not included. Storm sewer overflow not included. Values from Table 6 of 1976 Killam report.

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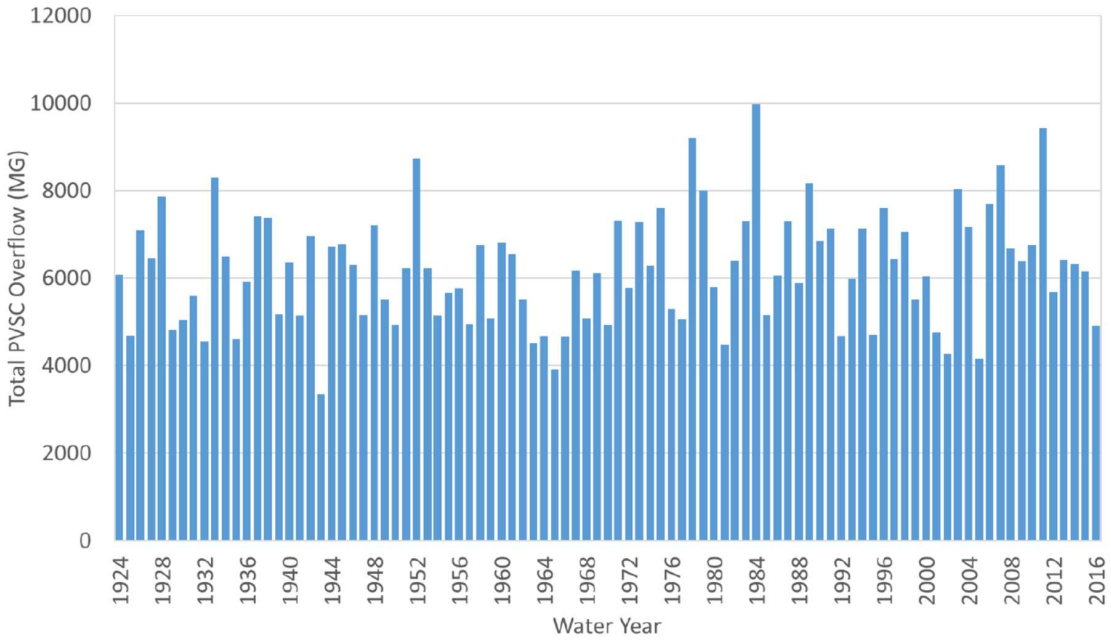
Figure 3-3
Cumulative Frequency Distribution of Average TSS Concentrations Measured during Overflow Events in WY1975



Notes:
TSS measurements collected when overflow not explicitly noted in PVSC report are excluded. Data from all available stations shown.

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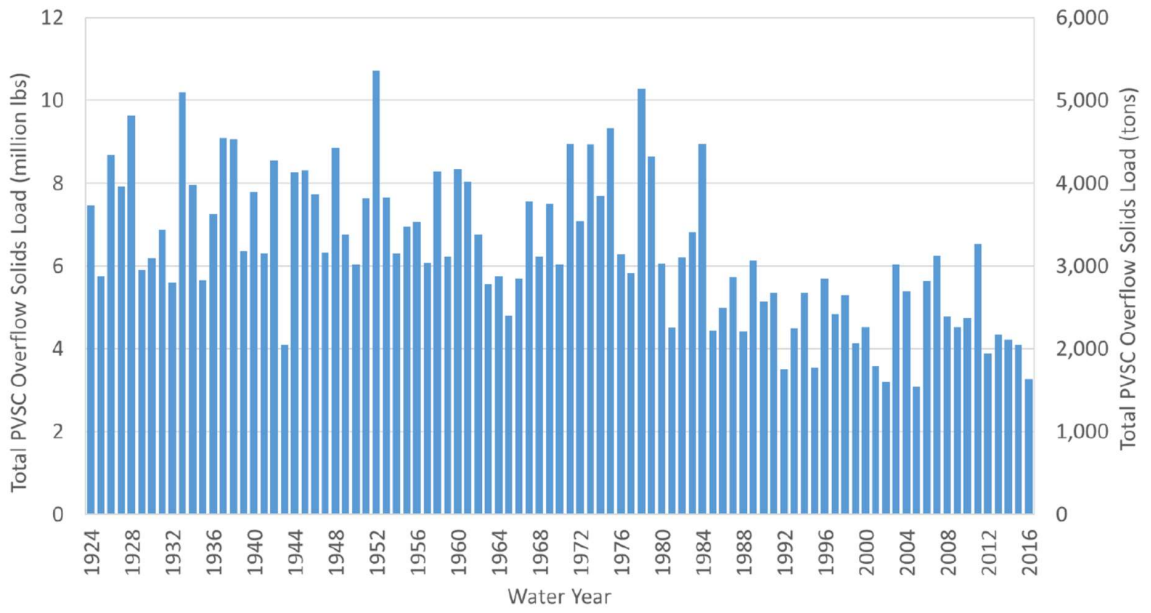
Figure 3-4
Estimated Annual PVSC Overflow Volume for WY1924 through WY2016



Note:
Manual bypass volumes at Union Outlet excluded.

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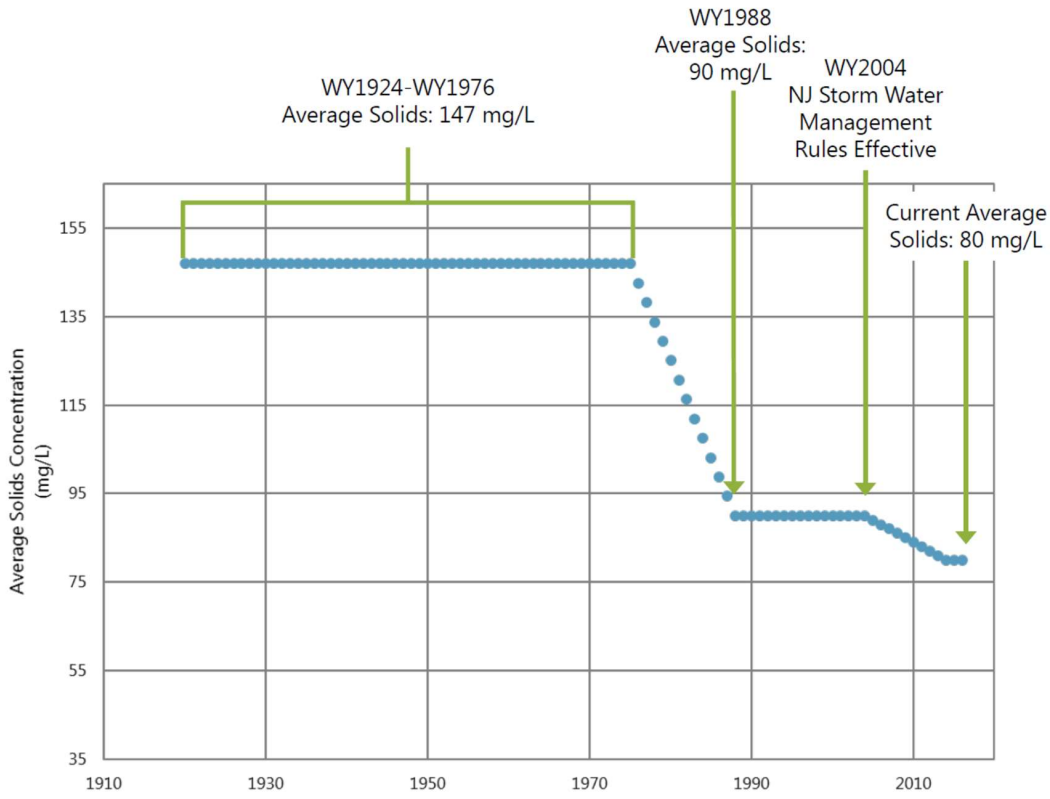
Figure 3-5
Estimated Annual Solids Loads from the PVSC CSOs to the Passaic River for WY1924 through WY2016



Note:
Manual bypass volumes at Union Outlet excluded.

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Figure 3-6
TSS Concentrations in PVSC Overflows Used for the Load Estimates for WY1924 through WY2016



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Anchor QEA Annual CSO Estimates

Water Year	Total Overflow Volume (MG)*	Total CSO Load (1E6 lbs)	Total CSO Load (tons)
1924	6,080	7.46	3,729
1925	4,682	5.74	2,872
1926	7,083	8.69	4,345
1927	6,453	7.92	3,958
1928	7,855	9.64	4,819
1929	4,803	5.89	2,946
1930	5,039	6.18	3,091
1931	5,598	6.87	3,434
1932	4,561	5.60	2,798
1933	8,307	10.19	5,096
1934	6,486	7.96	3,978
1935	4,611	5.66	2,829
1936	5,917	7.26	3,630
1937	7,410	9.09	4,545
1938	7,383	9.06	4,529
1939	5,179	6.35	3,177
1940	6,351	7.79	3,896
1941	5,145	6.31	3,156
1942	6,962	8.54	4,271
1943	3,346	4.11	2,053
1944	6,728	8.25	4,127
1945	6,775	8.31	4,156
1946	6,301	7.73	3,865
1947	5,150	6.32	3,159
1948	7,215	8.85	4,426
1949	5,517	6.77	3,384
1950	4,917	6.03	3,016
1951	6,226	7.64	3,819
1952	8,733	10.71	5,357
1953	6,239	7.65	3,827
1954	5,139	6.31	3,153
1955	5,665	6.95	3,475
1956	5,768	7.08	3,538
1957	4,945	6.07	3,033
1958	6,751	8.28	4,141
1959	5,070	6.22	3,110
1960	6,800	8.34	4,171
1961	6,546	8.03	4,016
1962	5,513	6.76	3,382
1963	4,527	5.55	2,777
1964	4,677	5.74	2,869
1965	3,908	4.80	2,398
1966	4,648	5.70	2,851
1967	6,171	7.57	3,786
1968	5,069	6.22	3,109
1969	6,112	7.50	3,749
1970	4,917	6.03	3,016
1971	7,300	8.96	4,478
1972	5,774	7.08	3,542
1973	7,281	8.93	4,466
1974	6,280	7.71	3,853
1975	7,600	9.33	4,663
1976	5,287	6.29	3,146
1977	5,055	5.83	2,916
1978	9,200	10.28	5,138
1979	8,001	8.65	4,323
1980	5,804	6.06	3,029
1981	4,474	4.51	2,253
1982	6,394	6.21	3,103
1983	7,293	6.81	3,406
1984	9,984	8.96	4,480
1985	5,151	4.43	2,217
1986	6,047	4.98	2,492
1987	7,283	5.74	2,868
1988	5,883	4.42	2,210
1989	8,161	6.13	3,065
1990	6,837	5.14	2,568
1991	7,122	5.35	2,675
1992	4,674	3.51	1,756
1993	5,987	4.50	2,248
1994	7,120	5.35	2,674
1995	4,708	3.54	1,768
1996	7,591	5.70	2,851
1997	6,435	4.83	2,417
1998	7,048	5.29	2,647
1999	5,503	4.13	2,067
2000	6,028	4.53	2,264
2001	4,760	3.58	1,788
2002	4,263	3.20	1,601
2003	8,025	6.03	3,014
2004	7,178	5.39	2,696
2005	4,152	3.08	1,542
2006	7,693	5.65	2,825
2007	8,590	6.24	3,119
2008	6,663	4.78	2,391
2009	6,382	4.53	2,264
2010	6,756	4.74	2,368
2011	9,432	6.53	3,267
2012	5,674	3.88	1,941
2013	6,422	4.34	2,171
2014	6,314	4.22	2,108
2015	6,148	4.10	2,052
2016	4,899	3.27	1,635

*Total overflow volume calculated from rainfall data for all years except 1975.
1975 overflows derived from value reported in Killam (1976).

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EXHIBIT 3
NON-PARTICIPATING POTENTIAL PCB PARTIES

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	Company	Street Address	City	Company Information	SIC	Industry Basis/Allegation	URL or Other Source
1	1515 Broad Street, LLC (Hampshire Real Estate, Blim Limited Partnership, Parkway Technical Center)	1515 Broad St.	Bloomfield			Parkway Technical Center listed as a large quantity generator of PCB wastes (1988)	EDR p.28681/31947 4330766.1s.pdf
2	260 Schuyler Avenue Realty Company, LLC (Aquatek)	236-262 Schuyler Ave.	Kearny			Multiple large shipments of PCB wastes to landfill (2005)	EDR p.15238/44205 4326287.1s.pdf
3	297 Getty Avenue Associates	297 Getty Ave.	Paterson			TSCA federal PCB inspection (2003)	EDR p.16158/66158 4319330.2s.pdf
4	3M Company	150-154 Raymond Blvd.	Newark	11 companies including 3M consent to cleaning up Bayonne Barrel site. COCs include PCBs.		electrical insulation materials/wire coatings (Insulation Wires, Inc. (IWI), Newark); chemicals (Cardolite Corp., 500 Doremus Ave, Newark)	"EPA Reaches Agreement with 11 Firms over Superfund Site, 3/22/2005; New Jersey Wood Finishing v. Minnesota Mining Mfg., (D.N.J. 1963); 1974 New Jersey State Industrial Directory, p. G-157
5	A&L DYERS	36 Seabury St.	Newark	Textile dyeing	2399	dyes/inks	EPA, Preliminary Study of the Textile Mills Category, July 1996
6	A-1 Tank Cleaning Service	3 Washington St.	West Orange	Storage tank cleaning		tank cleaning and waste disposal	
7	A. Capone Sanitation, Inc.	178 River St.	Paterson	Categorized under garbage collecting, destroying, and processing.	4953	waste collection/disposal	http://www.whereorg.com/a-capone-sanitation-service-10113309#General-information
8	A.J. & J.O. Pilar Inc.	145 Chapel St.	Newark	Transports and handles hazardous wastes. Receives, recycles, and handles hazardous waste.	2869	waste collection/disposal (including hazardous waste)	http://www.usa.com/frs/aj-jo-pilar-inc.html
9	ABB Lummus Global, Inc.	1550 Broad St.	Bloomfield	Turbines and turbine generator sets.	3511	heat exchanger fluids	http://new-jersey.uskeep.com/company/a-b-b-lummus-global-inc-1.html
10	Abbott Industries	1 Morris St.	Paterson	Industrial supplies, wholesale bottles.	5085	plasticizers	https://www.manta.com/c/mmzb7kj/abbott-industries-inc
11	ABCO Diecasters, Inc.	39 Tomkins Point Rd.	Newark	Founded in 1971, a small zinc diecasting and powder coating company, supplying castings to a varied group of industries that includes architectural hardware, automotive lighting and fuel systems, display items, window hardware, and numerous others.	3479	waxes; hydraulic fluids	http://www.abcodiecasters.com/products.htm; https://www.manta.com/c/mm29300/abco-die-casters-inc
12	Accurate Box Company, Inc.	86 5th Ave.	Paterson	Paperbox manufacturer.	2754	adhesives: listed as historical large quantity generator of wastes including PCBs (1980)	EDR p.7842/66158 3419330.2s.pdf
13	Accurate Tool & Die Co.	55 Porete Ave.	North Arlington	Manufactures vehicle parts and services vehicles for transmission repair.		waxes for casting; hydraulic fluids	https://www.mechanicadvisor.com/nj/north-arlington/accurate-tool-and-die-co; https://www.macraesbluebook.com/search/company.cfm?company=300573
14	Ace Rubber Stamp	14 E. Park St.	Newark	Rubber stamps for stationary stores.		plasticizers	https://www.yelp.com/biz/ace-rubber-stamp-works-newark; https://www.hotfrog.com/business/nj/newark/ace-rubber-stamp-works
15	Ace Tool & Manufacturing Company	532 Mulberry St.	Newark	Plastics/mold manufacturer; custom injection molding		waxes for casting; plasticizers; hydraulic fluids	www.macraesbluebook.com/search/company.cfm?coompany=300615
16	Acme Plastics	220 Browertown Rd.	West Paterson	Plastics company started in 1943.		plasticizers	www.acmeplastics.com/about-us
17	Acme Tool & Machine	580 Davis Ave.	Kearny	Machine shop		lubricants/hydraulic fluids	
18	Active Oil Service, Inc. (JM Properties)	101-110 Riverside Ave.	Newark	Installs/removes oil storage tanks/ cleans up oil and hazardous waste spills		shipped PCB oils offsite for incineration (1997)	EDR p.11901/44205 4326287.1s.pdf
19	Adco Chemical Co.	Rutherford & Delancy St.	Newark	Plastics/chemicals	2821	plasticizers; TSCA PCB inspection (1993)	EDR p.38248/44205 4326287.1s.pdf
20	Aircraft Engineering Products, Inc. (Tenant) a/k/a Nell-Joy Industries, Inc./Dundee Mills	2 Ackerman Ave.	Clifton	Starting 1940, manufactured metal components for aircraft (helicopters)	3728	metalworking/manufacturing: lubricants and hydraulic fluids	Weston, Site Contamination Screening Report: Route 21 Freeway Extension Project, July 1990
21	Alben Metal Parts	11 Iowa Ave.	Paterson	Metalworking		hydraulic fluids/lubricants	
22	Albert Steel Drum	324-398 Wilson Ave.	Newark	1974-1977: drum recycling		drum reconditioning	NJIT/NJTPA Brownfield Redevelopment Study: Albert Steel Drum Site
23	Alfred Heller Heat Treating Co.	5 Wellington St.	Clifton	Commercial heat treating	3471	heat transfer fluids	
24	Allied Plastic Molds	139 Tenth St.	Saddle Brook	Plastic molds		plasticizers; heat transfer fluids; lubricants	1974 New Jersey State Industrial Director, p. G-140
25	Allstate Paper Box Co.	223 Raymond Blvd.	Newark	Established in 1966: packaging company supplies; custom made set-up boxes for greeting cards, leather goods, etc. Also printing, silk screening, hotstamping, and embossing.	6512	inks; adhesives	https://www.manta.com/c/mmfjjwt/allstate-paper-box-co; http://allstatepaperbox.com/
26	Alpha Chemical & Plastics/Alpha Gary	1 Jabez St.	Newark	A manufacturer of resins established in 1953 and closed in 2012. Products included epoxy resins, plastics, PVC compounds, and rubber.	2821	plasticizers	www.usbizs.com/NJ/Newark/AlphaGary_Corp_2WG.html; www.rubbernews.com/article/20000619/NEWS/306199996/alphagary-to-close-plant-add-capacity-to-another; 1974 New Jersey State Industrial Directory, p. G-140
27	Alpha Industries (Sigma Plastics)	600 Schuyler Ave.	Lyndhurst	polyethylene films and bags	3089	plasticizers	https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=4717171 http://www.local.com/business/details/lyndhurst-nj/alpha-industries-corp-124204985/
28	Aluminum Match Plate Co.	194 State St.	Bloomfield	Established in 1950; aluminum and brass foundry.	3365	foundry sands	
29	American Oil and Supply Co	238 Wilson Ave.	Newark	Petroleum products, lubricants, oil, lubricating oils, graphite.	3679 & 2992	lubricants	https://www.cylex.us.com/company/american-oil---supply-co--15796354.html http://www.nytimes.com/1974/06/23/archives/shore-center-on-schedule-people-and-business.html http://www.siccodes.us/searchresults_detail.asp?id=78498

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	Company	Street Address	City	Company Information	SIC	Industry Basis/Allegation	URL or Other Source
30	American Smelting & Refining	150 St. Charles St.	Newark	Non-ferrous metals	3339	PCBs found onsite; purchased PCBs.	1974 New Jersey State Industrial Director, p. G-141; Documentation of Environmental Indicator Determination: RCRA Corrective Action, Federated Metals Corporation, September 28, 2000; Monsanto PCB Sales Summaries, 1958-1959.
31	Ametek, Inc. US Gauge Division (Weston Instruments)	614 Frelinghuysen Ave.	Newark	Founded in 1904; manufactured electrical and electronic measuring and aerospace instruments	3679	PCB violations onsite	http://www.ametekusg.com/products EDR, pp. 43813,43846,43855/51539 4330768.1s-1.pdf
32	Amtrak Div. NJ Transit Rail - Oper., Inc. Penn Station	1 Penn Plaza E.	Newark	Train station; N.J. Transit Headquarters		Historical large quantity generator of wastes including PCBs	EDR, p.18151/44205 4326287.1s.pdf
33	Angelica Health Care Services Group	12 Clinton St.	Newark	Linen services for healthcare		noted for PCB violations	EDR, pp.31159,42268/51539 4330768.1s-1.pdf
34	Anhydrides & Chemicals, Inc.	2 Margaretta St.	Newark	Established in 1970: thermosetting materials	2821	plasticizers	https://www.manta.com/c/mm2r0v7/anhydrides-chemicals-inc
35	Apollo Dyeing & Finishing Co.	140 Summer St.	Paterson	Cotton and synthetics dyeing and finishing.	2262	dyeing and finishing	PVSC Industrial Inventory, August 20, 1987, p.3 [TIERRA-B-015472].
36	Aarubco Rubber	9 Troast Ct.	Clifton	Rubber products		rubber; plasticizers	www.aarubco.com
37	Atlantic Casting & Engineering Corp.	810 Bloomfield Ave.	Clifton	Non-ferrous castings; foundry; machining	3369	castings; hydraulic fluids	atlantic-cd.com/en/about-us/history
38	Atlantic Coast Fibers, LLC.	101 7th St. and 75 South St.	Passaic	Large independent processor of recyclables (for 80 years).		waste handling	www.atlanticcoastfibers.com
39	Atlantic Rubber		Little Falls	Rubber and plastic products			
40	Atlas Industrial Mfg.	81 Somerset Pl.	Clifton	Machine shop for the design and manufacture of heat exchangers.		heat transfer fluids	www.atlasindustrial.com
41	Atlas Metal Finishing, Inc.	8 Avenue B	Newark	Electroplating	3471	PCB-containing equipment	PVSC Industrial Inventory, August 20, 1987, p.3 [TIERRA-B-015472].
42	Aurachem	310 S. 3rd	Harrison	Chemicals and coatings		coatings	www.icis.com/explore/resources/news/2000/08/03/118837/us-soverign-specialty-buys-coatings-business-of-aurachem/
43	Avalon Mfg. Co. Inc.	235 River Dr.	Garfield	Screw machine products	3451	hydraulic fluids	1973 New Jersey State Industrial Directory, p. G-48.
44	B.G. Pratt Company, B.G. Pratt Div. of Gabriel Chemical, Miller Chemical and Fertilizer Corp., Pratt Gabriel	204 21st Ave.	Paterson	1965-1980: manufactured herbicides, pesticides and fertilizers.		chemical manufacturing: herbicides, pesticides, fertilizers. Dioxin and PCBs found onsite.	SRP Report 2000, Publicly Funded Cleanups Site Status Report, 8/2001, p. 246 EDR, p.14173/66158 4319330.2s.pdf
45	Bacon & Graham	324 E. 25th St.	Paterson	Founded 1939. Manufactures packaging, shipping, and janitorial products.		adhesives and tapes	www.baconandgraham.com
46	Baker Adhesives, Inc.	152 Mount Pleasant Ave.	Newark	Surface active agents and adhesives manufacturing. (wholesaler of adhesives and glues). Founded in or before 1972.		adhesives	https://www.macraesbluebook.com/search/company.cfm?company=1177301
47	Banks Brothers Corp.	24 Federal Plaza	Bloomfield	Established in 1945 to make gasket materials (rubber and miscellaneous plastic products sector).		rubber; plasticizers	https://www.manta.com/c/mmc511t/banks-bros-corporation
48	Baxter Terrace Projects Demolition	57 Sussex Ave.	Newark			Site cap and deed restriction for onsite contamination including PCBs.	EDR, p.27358/51539 4330768.1s-1.pdf
49	Bay State Milling Co.	11 Chester St.	Clifton	Milling whole grains and seeds.		Onsite PCB soil contamination	EDR, p.24253/66158 4319330.2s.pdf
50	Beisler-Weidmann Co. Inc.	233 Courtland St.	Belleville	Founded 1921. Manufactures boxes, tape, packaging supplies, sanitary supplies.		adhesives; tapes	https://businessfinder.nj.com/7530958/Beisler-Weidmann-Co-Inc-Belleville-NJ
51	Bell Container Corp.	615 Ferry St.	Newark	Founded 1919. Manufactures boxes and packaging.		adhesives	www.bellcontainer.com
52	Bellemead Development Corp.	125 Chubb Ave.	Lyndhurst			TSCA PCB inspection	EDR, p.4644/44205 4326287.1s.pdf
53	Bergen Barrel & Drum Co. Inc.	43 - 45 O'Brien St.	Kearny	Founded 1960. Wholesale barrel and drum manufacturer.	5085	TSCA PCB inspection	EDR, p.14231/44205 4326287.1s.pdf
54	Bergen Cable Technologies	170 Gregg St.	Lodi	Founded in 1942 in Lodi. Wire rope and cable assembly industry. Includes various types of cables for aviation (e.g., Boeing). Now located at 343 Kaplan Drive, Fairfield.	3542	wire/cable coatings	https://bizstanding.com/directory/NJ/BE/1435/
55	Bessemer Processing Company, Inc.		Newark	In operation prior to 1963. Drum reconditioning facility engaged in cleaning and reconditioning of used and empty drums for the petroleum and certain other chemical industries (a wholly owned subsidiary of Kingsland Drum and Barrel).		drum reconditioning	https://law.justia.com/cases/new-jersey/supreme-court/1998/a-115-97-opn.html
56	Betosia Manufacturing Corp.	44 George St.	Newark	coatings		coatings; purchased PCBs	Monsanto PCB Sales Records, 1970-1971
57	Big Apple West (Uniroyal factory)	1 Market St.	Passaic	1920s: United States Rubber Company (Uniroyal) rubber plant		Historical large quantity generator of wastes including PCBs	EDR, p.40563/66158 4319330.2s.pdf
58	Bloomfield, Township of, Department of Public Works	230 Grove St.	Bloomfield	Bloomfield Department of Public Works		Soil contamination found with PCBs.	EDR, p.10454/51539 4330768.1s-1.pdf
59	Bogue Electric Manufacturing Co.	100 Pennsylvania Ave. and 76 Iowa Ave.	Paterson	One of the oldest manufacturers of electrical power equipment in the world.	3621	transformers, capacitors, hydraulic fluids, lubricants	www.boguesystems.com
60	Bomont Plastics Corp.	64 Lackawanna Ave.	Totowa	Plastics materials, synthetic resins, and nonvulcanizable elastomers.	2821	plasticizers	
61	Bond Adhesives Co.	301 Frelinghuysen Ave.	Newark	Wholesale adhesives and glue.	5169	adhesives	https://www.manta.com/c/mbd38k6/bond-adhesives-co
62	Bontex Inc.	238 Lindbergh Pl.	Paterson	Supplier of coated, elastomer, elastomer chemistry, thermoplastic, PVC, and vinyl. Started as a leather processing operation.		plasticizers	https://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110032374099
63	Borden Chemical (Commercial Ink & Lacquer Co.)	8 - 10 22nd St.	Fair Lawn	Borden purchased the site in the 1960s (then owner Commercial Ink & Lacquer Co. had manufactured inks, lacquer, and paints since the 1940s) and manufactured solvent-based printing inks used in food and consumer product industries through the 1990s.	2893	inks; lacquer; paints	Z. Koeske, "NJDEP: State is Overseeing Toxic Site, PEER Report Was 'Misleading'," *NJ Patch* , February 20, 2012.
64	Boris Kroll Dyeing Co./ Boris Kroll Jacquard Looms, Inc.	66 Gray St., 722-735 20th Ave.	Paterson	Textiles	2269	dyes	https://www.epa.gov/sites/production/files/2019-09/documents/state_and_tribal_response_program_highlights_october-november-december_2018.pdf
65	Bradley Corrugated Box	900 S. 2nd St.	Harrison	Div of Paige Packaging Inc. which was founded in 1955.		adhesives	https://www.manta.com/c/mmb58dk/bradley-corrugated-box-co-inc
66	Brico Industrial Corp.	480 Main Ave.	Wallington Borough			Concrete cap and deed restriction to control PCBs and PAHs	EDR, p.39473/66158 4319330.2s.pdf

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	Company	Street Address	City	Company Information	SIC	Industry Basis/Allegation	URL or Other Source
67	Brooklyn Foundry	70 Pennsylvania Ave.	Kearny	Iron, semi-steel, brass & bronze castings, meal patter work, non-ferrous alloy and ferrous allow centrifugal castings.		castings	https://www.macraesbluebook.com/search/company.cfm?company=305523
68	Brown Chemical Co.	195 Keen St. and Warren St.	Paterson	Founded 1936. Became well-established in the textile trade after WW2. Entered additional markets for specialty chemical manufacturing, industrial and institutional cleaners, pigments, and dyestuffs.		dyes	www.brownchem.com
69	C.E. Lummus Co. (Lummus Corporation)	1515 Broad St.	Bloomfield	1968: machinery and replacement parts for the cotton ginning industry.		heat transfer fluids	
70	C.P.L. Industries Corp.	150 Gregg St.	Lodi			paints/coatings	
71	Cairns & Brothers Inc.		Clifton	Plastics products	3089	plasticizers	
72	Calgon Corporation/Metasol facility (Merck)	200 Wagaraw Rd.	Hawthorne	Polymers, slimicide chemicals, catalysts. Organic and inorganic mercury compounds (mercury compounds produced through 1969, non-mercury compounds through 1991).	2819	transformers	www.nj.gov/dep/newsrel/2006/06_0002.htm; PVSC Industrial Inventory, 1987, p.7.
73	Caloric Color Co.	176 Saddle River Rd.	Garfield	Founded in 1963. Manufactures inks.	2899	inks	https://www.manta.com/c/mmb5d6j/caloric-color-co-inc
74	Cambridge Industries of America, Inc.	7 - 33 Amsterdam St.	Newark	Manufacturer of specialty resinous products (Resoflex R-296 and/or Resoflex R766) and plasticizers. Founded in 1950.		plasticizers	https://us.kompass.com/c/cambridge-industries-of-america-inc/usn01804238/
75	Cambridge Pavers Inc.	4 Jerome Ave.	Lyndhurst	Paving stones.		Deed restriction for onsite cap covering PCBs (2001)	www.cambridgepavers.com; EDR, pp.3582,4980,7672,10740/44205 4326287.1s.pdf
76	Capital City Products Co.	Foot of Sanford Ave.	Kearny	Detergents and edible fat products.	2077	shipped PCBs to landfill	PVSC Industrial Inventory, 1987, p.7. EDR, p.20238/44205 432687.1s.pdf
77	Capital Container Corp.		Newark			drum reconditioning/waste handling	
78	Cardolite Corp. (3M Corporation Specialty Chemicals Div.)	500 Doremus Ave.	Newark	Manufacturer of epoxy curing agents, resins and diluents, and friction products in the coating, adhesive, and automotive markets.	2892	adhesives/coatings; onsite PCBs (onsite cover and deed restriction)	EDR p.37103/44205 4326287.1s.pdf
79	Cargille Laboratories Inc. (R.P. Cargille Laboratories)	55 Commerce Rd.	Cedar Grove	optical fluids (including PCBs)		PCBs used in optical fluids; PCB wastes shipped to landfill (1983); TSCA PCB inspection.	EDR p.23981/31947 4330766.1s.pdf
80	Casting Technologies	70 Pennsylvania Ave.	Kearny	Metal casting company, nonferrous foundry except aluminum and copper.	3369	castings	
81	Castrol Oils	254-266 Doremus Ave.	Newark	Lubricating oils and greases.	2992	Purchased PCBs	Monsanto PCB Sales Records, 1962 and 1970-1972; 1974 New Jersey State Industrial Directory, p. G-144.
82	Cat Coatings Inc.	181 McBride Ave.	Paterson	Coatings		coatings	
83	Catholic Community Service (NJ Transit Rail Operations)	Raymond Blvd.	Newark			PCB enforcement actions.	EDR, p.31967/51539 4330768.1s-1.pdf
84	CCP Inc.	25 Andrews Dr.	West Paterson	Packaging products.		adhesives	
85	Centerless Products Co.	32 Carol Pl.	Bloomfield	Steel pins, screw machining products, and grinding. (Also located at 39 Verona Avenue, Newark, NJ)		Deed restriction (cap) for wastes including PCBs	EDR, p.28563/31947 4330766.1s.pdf
86	Central Bergen Properties	141 Lanza Ave. Industrial Complex	Garfield			Historical large quantity generator of wastes including PCBs ; spill/soil contamination (1997)	EDR, p.26340/66158 4319330.2s.pdf
87	Central Railroad Co.		Newark	Formed in 1849 by consolidation of two other railroad companies in NJ. Major station in Newark known as Penn Station. Includes numerous tracks and bridges in the Newark area.		hydraulic fluids, lubricants	
88	Central Steel Drum Co.	704 Doremus Ave.	Newark	Drum reconditioning		Shipped PCB wastes to landfill (1988).	EDR, p.38549/44205 432687.1s.pdf
89	Central Waste & Mill Service	395 President St.	Saddle Brook	Waste recycling service.		waste handling	
90	Cerebral Palsey of Essex and West Hudson (First Cerebral Palsy of NJ)	7 Sanford Ave.	Belleville			TSCA PCB inspection.	EDR, p.9120/51539 4330768.1s-1.pdf
91	Certified Metals Corp.	175 Entin Rd.	Clifton	Gold wedding rings	3911	castings	
92	Chapel Estates Property	60-66 Chapel St.	Newark			Deed restrictions (caps) for wastes including PCBs.	EDR, p.22256/44205 4326287.1s.pdf
93	Chem-Fleur Inc.	200 Pulaski St.	Newark	Founded 57 years ago. Makes chemicals including perfumes, flavoring extracts and syrups, cosmetics and toiletries.	2899	Purchased PCBs; PCBs onsite (deed restriction); TSCA PCB inspection.	Monsanto PCB sales records, 1969 and 1971; EDR, p.32575/44205 4326287.1s.pdf
94	Chem Fleur Firmenich, Inc.	928-964 Doremus Ave.	Port Newark	Fragrance chemicals	2869	TSCA PCB inspection.	EDR, p.38938/44205 4326287.1s.pdf
95	CHEM Flowtronics (Chem Flow Corp.)	195 Paterson Ave.	Little Falls	Design and manufacture specialty pharmaceutical, biotech, and chemical process piping components, mixers, and process systems for over 50 years. Sight flow indicators, mixers and agitators, reflux splitters and condensers, process vessels and reactors, drain lines and process piping.		Purchased PCBs	www.chem-flowtronics.com; Monsanto PCB sales records, 1971
96	Chemical Products	125 Main Ave.	East Paterson/ Elmwood Park	Speciality manufacturing: organic chemical synthesis. Purchased by Grant Specialty Coatings in 1977.		Purchased PCBs	Monsanto PCB Sales, 1970-1972; New Jersey Industrial Directory, Elmwood Park; www.grantcoatings.com.
97	Chemos Corp.	225-235 Emmett St.	Newark	Manufactured coatings for textiles, leather, metal, wood, and plastic.	2841	paints, lacquers, coatings	PVSC Industrial Inventory, 1987, p. 8.
98	Chemplast, Inc. / Saint-Gobain Plastics	250 Goffle Rd.	Hawthorne	Plastics manufacturing. Acquired by Norton Co. in 1981 (which was subsequently acquired by Saint-Gobain Plastics).		plasticizers, coatings	"Norton Co. Will Aquire Chemplast, a Plastics Processor Based...", *UPI* , December 31, 1981.
99	Circle Rubber USA Incorporated (Global International Trading Co)	408 Frelinghuysen Ave.	Newark	Manufacturer of toy balloons.		plasticizers; deed restriction (onsite cap) for contamination including PCBs.	1974 New Jersey State Industrial Directory, p. G-145.
100	City Electric Motor Co.	184 Mulberry St.	Newark	Electric motors.		PCB violations (1981); large quantity generator PCB wastes (1985); PCB enforcement actions (1988).	EDR, p.32315/51539 4330768.1s-1.pdf
101	Clean Harbor Environmental Services	41 Tomkins Point Rd.	Newark	Hazardous waste collection, treatment and disposal company.		waste handling	
102	Closure & Seal Products	116 Glenridge Ave.	Montclair	Metal closures	3449	sealants, gaskets	1973 New Jersey State Industrial Directory, p. G-145..

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	Company	Street Address	City	Company Information	SIC	Industry Basis/Allegation	URL or Other Source
103	Cobon Plastics	90 South St., 44 Lafayette St.	Newark	A plastic tubing company.	3079	plasticizers	https://www.manta.com/c/mmbpq0f/couse-bolten-co; 1974 New Jersey State Industrial Directory, p. G-145.
104	Collegiate School Board of Trustees	22 Kent Ct.	Passaic			TSCA PCB inspection	EDR, p. 42995/66158 4319330.2s.pdf
105	Colloids Inc.	382/394 Frelinghuysen Ave.	Newark	Products for adhesives, paint, plastics, rubber, textiles, leather, paper.	2843	adhesives, paints, coatings, plasticizers; Deed restriction on property related to contaminants including PCBs	1960 Industrial Research Labs; PVSC Industrial Inventory, 1987, p.9; EDR, p.42961/51539 4330768.1s-1.pdf
106	Colorama Laminating & Printing	2 Paulison Ave.	Passaic	Finishers of textiles, coated fabrics, automotive trimmings, commercial printing and gravure, laminated plastis plate, sheet and profile shapes.	2269 2295 2754 3083	coatings	www.usa.com/frs/colorama-laminating-printing-inc.html
107	Colter & Peterson (Brush King Manufacturing Inc.)	436 448 E 16th St.	Paterson City	Founded 1932. Manufactures industrial paper cutters and handling machines.		Deed restriction (caps/fencing/signs) for onsite PCB contamination	www.papercutters.com; EDR, p.9888/66158 4319330.2s.pdf
108	Columbia Textile Service	28 Ryle Ave.	Paterson	Textile dyeing.	2261	TSCA PCB inspection; dyes	PVSC Industrial Inventory, 1987, p.9; EDR, pp.8130,13893/31947 4330766.1s.pdf
109	Comet Chemical	272 Wright St. and 410 Adams St.	Newark	In business by 1960. Industrial coatings: lacquer, thinners, leather and plastic finishes.	2851	coatings	1960 Industrial Research Labs; PVSC Industrial Inventory, 1987, p. 9.; 1974 New Jersey State Industrial Directory, p. G-146.
110	Commercial Plastics	127 Frelinghuysen Ave.	Newark	Plastics materials.		plasticizers	opencorporates.com/companies/us-ri/000022414
111	Commercial Products Company	117 Ethel Ave.	Hawthorne	Finishes and chemicals for the textile industry. Founded in 1944. Chemicals include stiffeners, softeners, and additives such as those providing flame retardancy. Products include resins, dyeing products, catalysts, softeners, and other agents.	2843	coatings, dyes	PVSC Industrial Inventory, 1987, p.9;
112	Construction Adhesive(s) Co.	969 Market St.	Paterson	Adhesives/sealants.		Purchased PCBs; TSCA PCB inspection	Monsanto PCB Sales Summaries, 1971-1972; EDR, p.15633/66158 4319330.2s.pdf
113	Continental Chemical Co.	270 Clifton Blvd.	Clifton	Detergents and emulsifiers.	2814	TSCA PCB inspection conducted	PVSC Industrial Inventory, 1987, p.10; EDR, p.36361/66158 4319330.2s.pdf
114	Cook & Dunn Paint Corp.	167 Kossuth St., 109 St. Francis St.	Newark	Manufacturer of paints, varnishes, lacquers, enamels, and allied products. Existed by late 1940s.	2851	paints, lacquers, coatings	http://www.walterjohnsonfh.com/obituary/Tessie-Pogorzelski/Linden-NJ/1639566; PVSC Industrial Inventory, 1987, p.10.
115	Couse And Bolton	42-46 Lafayette St.	Newark	Manufactures rubber, plastic hose/belting (air, water, and gas multipurpose hoses), fluoropolymer lined hoses, acid hoses, air hoses, drill hoses, marine hoses, and oil, water, material handling, and special hoses. Founded 1899.		plasticizers, rubber	New Jersey Industrial Directory, 1952-1953, p. 594.
116	Covar Corp.		Newark	Lithographic varnish powder coat, varnishes, glazes, lusters, lacquers, sealers, shellacs, stains, miscellaneous finishes, and chemicals included bio chemicals and gas materials.		lacquers, coatings	https://www.macraesbluebook.com/search/company.cfm?company=308818
117	Cross Country Box Co.	2-8 Central Ave	E. Orange	Manufacturer of custom made rigid set up boxes and folding cartons from paperboard, chipboard, or cardboard. Customization to suit any requirements. Established 1949.	2652	adhesives	https://www.manta.com/c/mmbpz2j/cross-country-box-co-inc
118	Cummins Metropower Inc. (Enrac Division, Vineland Construction Co.)	41 - 85 Doremus Ave., Routes 1 & 22	Newark	Repair and service diesel engines.	7538	hydraulic fluids; shipped PCB wastes to landfill; TSCA PCB inspection	PVSC Industrial Inventory, 1987, p. 11; EDR, pp.25358,25446/44205 4326287.1s.pdf
119	Curcio Scrap Metal, Inc./Cirello Iron and Steel Co.	416 Lanza Ave.	Saddle Brook Township	Scrap metal yard. Cut electrical transformers onsite. NPL site.		PCB spills from cutting of electrical transformers.	EDR, p.28897/66158 4319330.2s.pdf
120	Cushman & Wakefield	213 Washington St.	Newark			Historical large quantity generator of PCB wastes	EDR, p.28072/51539 4330768.1s.pdf
121	Custom Chemicals	30 Paul Kohner Pl.	East Paterson/ Elmwood Park	Inks, Coatings, Adhesives, Pigment Dispersions		Purchased PCBs; incks, coatings, adhesives	New Jersey Industrial Directory, 1975, 1977, 1985; Monsanto Sales Summaries, 1968-1971.
122	D&M Tank Cleaning Inc.	194 Fifth St.	Saddle Brook Township	Tank cleaning.		Historical large quantity generator of wastes, including PCBs	EDR, p.29686/66158 4319330.2s.pdf
123	Dai Color Pope, Inc. (also listed as Daicolor-Pope)	40 Webro Dr.	Clifton	Manufactured pigments and inks.	2865 2899	inks; TSCA PCB inspection	EDR, p.38187/66158 4319930.2s.pdf
124	Dainichiseika Color & Chemicals	Foot of Calcuta & Panama St.	Port Newark	Pigments and inks.		Large quantity generator of PCB wastes	EDR, p.381886/66158 4319330.2s.pdf
125	DCA Food Industries	931 Frelinghuysen Ave.	Newark	Bakery		Purchased PCBs (heat transfer fluid)	Monsanto PCB Sales Summaries, 1968.
126	Deere & Co	22 Passaic St. Bldg. 64E, 54 Passaic St.	Wood Ridge	John Deere Technologies International: Rotary engines		Small quantity generator of PCB wastes	"Deere Ends Effort in Rotary Engines," *The New York Times* , January 11, 1992; EDR, p.44711/66158 4319330.2s.pdf
127	Deleet Merchandising Corp.	26 Blanchard St.	Newark	Provides offset press process control equipment for water management, chemical blending, chemical recycling, and waste reduction applications. In addition, it offers coatings and adhesives, press washes and solvents, blanket cleaning clothes, plate cleaners, press maintenance products, wide format inkjet printers, DI printing products, and pre-press products. Founded in 1905.		adhesives, coatings, inks	www.sienalending.com/transaction/deleet-merchandising-corporation/
128	Diamond Head Oil Refinery Div. (PSC Resources, Ag-Met Oil Service, Newtown Refining Corporation, Mimi Urban Development Corp., Hudson Meadows Urban Land Development Corp.)	1401 Harrison Turnpike/ Harrison Ave.	Kearny	Oil reprocessing facility. Now a Superfund site.		PCBs found onsite	https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200484

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129	Dikeman Laminating Inc.	181 Sargeant Ave.	Clifton	Founded 1949. Coated and laminated paper manufacturer.		Purchased PCBs (heat transfer fluid); TSCA PCB inspection	www.manta.cm/c/mmbqf83/dikeman_laminating-corporation; Monsanto PCB Sales Summaries, 1968-1969; EDR, p.36664/66158 4319330.2s.pdf
130	Dinico Products Inc.	220 Goffle Rd.	Hawthorne	Lighting fixtures, switches and controls, relays, circuit protection devices, and electrical hardware and supplies.		Large quantity generator of PCB wastes	www.macraesbludbook.com/search/company.cfm?company=506758; EDR, p.6551/66158 4319330.2s.pdf
131	DMB Supply Co Inc. (possibly related to Big Apple West)	1 Market St.	Passaic			Large quantity generator of wastes including PCBs	EDR, p.40561/66158 4319330.2s.pdf
132	Dominion Colour Corp. (USA)	19 E. Fifth St.	Paterson	Supplier of pigment powder, colour powders, pigment ink, paint pigments & pigment products. In business 70 years.		dyes, inks	http://www.dominioncolour.com/company/about-us; New Jersey Industrial Directory, Paterson, 1994.
133	Douglas Stephen Plastics	22 Green St.	Paterson	Producer of disposable plastic food packaging and hospital packaging. In business 50 years.		plasticizers	http://douglasstephen.com/about-us/
134	Dri Print Foils		Newark	Hot stamp foils		Purchased PCBs	Monsanto PCB Sales Summaries, 1970
135	Driver Harris Co./ Driver-Harris Alloys Inc. (Harrison Alloys, Inc.)	308 Middlesex St.	Harrison	Manufactured insulated electrical wire and cable.	3356	wire cables/coatings; purchased PCBs; PCB violations	PVSC Industrial Inventory, 1987, p.11; Monsanto PCB Sales Summaries, 1968-1971; EDR, pp.17642,17678/44205 4326287.1s.pdf
136	DSM Resins US, Inc.	5 Paul Kohner Pl.	Elmwood Park	Resins		TSCA PCB inspection	EDR, p.19660/66158 4319330.2s.pdf
137	Dublin Scrap Metal	489 Frelinghuysen Ave.	Newark	Scrap yard/recycling center. Started 1960/expanded 1970.		industrial recycling	https://www.yelp.com/biz/dublin-scrap-metal-newark
138	Dux Paints	187 Garibaldi Ave.	Lodi	Paint manufactuer. Est. 1946		paints	www.duxpaint.com
139	Dyetex Corp.	2 Canal St.	Passaic	Fabric dyers.	2257	dyes	PVSC Industrial Inventory, 1987, p.11.
140	East Coast Storage LLC (IGB, Walco Linck Co./Ibg Corp.)	1234 Rte. 46	Clifton	Insecticides.		Multiple large shipments of PCB wastes to landfill; historical large quantity generator of wastes including PCBs	EDR, p.24851/31947 4330766.1s.pdf
141	Eastern Molding Co.	597 Main St.	Belleville	Designing and manufacturing natural and synthetic rubber molded products since 1948.		rubber, plasticizers	eaternmoldingcompany.com
142	EGL Company, Inc. (Engineering Glass Laboratories)		Newark	Lighting company, including electrode equipment, aspirators, gauges, mercury traps, graded seals, laboratory glasswear, neon electrodes. Processing equipment included bombarder transformers, diffusion pumps, and vacuum pumps. Founded 1927.		vacuum pumps; transformers; gaskets	www.egl-lighting.com/about/
143	Egyptian Lacquer	80 Jacobus Ave.	Kearny	Manufactured lacquers and chemical coatings.		Purchased PCBs; lacquers	Monsanto PCB Sales Summaries, 1958-1963.
144	Electric Casting Corp.	70 Pennsylvania Ave.	Kearny	Metal and die casting. Founded 1971.		castings	https://start.cortera.com/company/research/k3q9jrm3o/electric-casting-corp/
145	Electronic Component		Totowa			Purchased large volumes of PCBs	Monsanto PCB Sales Summaries, 1963-1971.
146	Elite Plastics (Intek Plastics)	150 Fifth Ave., Goffle Rd.	Hawthorne	AKA Intek Plastics. Founded 1961. Manufactures custom profile extruded plastic products.	3083	plasticizers	www.intekplastics.com/intek-news/intek-plastics-acquires-elite-plastic/
147	Energy Coatings Co. (Lukens General Indust)	38 Porete Ave.	North Arlington	Coatings		Deed restriction (caps) to control onsite contaminants including PCBs	EDR, p.10463/44205 4326287.1s.pdf
148	Engineered Shapes	113 Dewitt St.	Garfield	Specializes in casting, forging, stamping, die casting, and investment casting. Established 1966.	3363	castings	https://www.manta.com/c/mm2v90x/engineered-shapes
149	Enterprise Container LLC	575 N. Midland Ave.	Saddle Brook	AKA Enterprise Corrugated Container Corporation. Manufactures boxes, sheets, displays, and shipping cartons. Founded 1945.	2653	adhesives	https://corrugated-box-retailers.cmac.ws/enterprise-corrugated-container-corp/7449/
150	Express Container	105 Avenue L	Newark	Est. 1922. Corrugated box manufacturer.		adhesives	http://caselaw.findlaw.com/nj-superior-court-appellate-division/1426172.html
151	Fabrite Laminating	70 Passaic St.	Woodridge	Textile laminating and fabric finishing company. Established 1963.		coatings	https://www.officer.com/on-the-street/body-armor-protection/body-armor-accessories/company/10035580/fabrite-laminating-corp
152	Facile Corp.	185 Sixth Ave.	Paterson	Coats metals and fabrics with adhesive films. Founded in 1947.		coatings, plasticizers, adhesives; purchsed PCBs	Monsanto PCB Sales Summaries, 1963-1964.
153	Fairfield Textiles	2 Wood St., 34 Waite St.	Paterson	Textiles.		dyes	http://www.buzzfile.com/business/Paterson-Laundry.And.Die-Div-973-227-1656
154	Fairmont Chemical Co. Inc.	117 Blanchard. St.	Newark	Manufacture and distribution of specialty and fine organic chemicals. Founded in 1938.	2865	PCB violations; shipped PCBs to landfill	EDR p.20537/44205 4326287.1s.pdf
155	Farnow Inc.	77-81 and 89 Jacobus Ave.	South Kearny	Manufactured varnishes, alkyds, and latexes for paint manufacturers.		paints; purchased PCBs	Monsanto PCB Sales Summaries, 1969-1970; *United States v. Farber,* No. 86-3736 (D.N.J.) March 16, 1988.
156	Federal Broadcasting WMCA Radio Transmit	948 Belleville Turnpike	Kearny	Radio transmission station.		Small quantity generator of PCB wastes	EDR, p.16142/44205 4326287.1s.pdf
157	Federated Metals Corp.	150 Saint Charles St.	Newark	Smelting and refining of non-ferrous metals.		Shipped PCB wastes to landfill and incinerator	EDR, pp.26844,34269/44205 432687.1s.pdf
158	Ferrante Electric		Passaic			Purchased PCBs	Monsanto PCB Sales Summaries, 1968.
159	Fidelity Chemical Products Corp. (see also OMG Fidelity, Inc.)	470 Frelinghuysen Ave.	Newark	Produces electroplating chemicals and metal concentrates. F/K/A Auric Corp.		TSCA PCB inspection	EDR, p.43496/51539 4330768.1s-1.pdf
160	Film Capacitors	100 8th St.	Passaic	Capacitors.		Purchased PCBs (for capacitors)	Monsanto PCB Sales Summaries, 1974.
161	Finch Fuel Oil Company.	7 Linden Ave.	Kearny	Oil company.		Complaint regarding improper disposal of PCBs	EDR, p.10337/44205 432687.1s.pdf
162	Fire Station #2	109 Kearny Ave.	Kearny	Fire station.		Deed restriction (cap) for onsite PCB contamination	EDR, p.12430/44205 4326287.1s.pdf
163	Fisk Alloy Wire, Inc.	10 Thomas Rd N.	Hawthorne	Produces copper alloy wire, alloy conductors, aerospace appliance, defense electronic connectors, and plated wire for electronic components and conductors. Founded in 1973.		wire coatings	http://fiskalloy.com
164	Form Cut Industries, Inc.	197 Mt. Pleasant Ave.	Newark	Terminal pins; plastic molded plastic inserts and cold-headed parts; hinge pins and hermetic seals. Founded in 1961		plasticizers	http://www.formcut.com/
165	Friez Mfg.		Clifton			Purchased PCBs	Monsanto PCB Sales Summaries, 1968.

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166	Fruit of the Loom Inc. (Industrial Rental)	11 Jackson Rd.	Totowa	Textiles and textile products.		Historical large quantity generator of wastes including PCBs	EDR, pp.8927,10530/31947 4330766.1s.pdf
167	G&S Motor Equipment Co. (see also Transformer Lab Services Inc.)	1800 Harrison Ave.	Kearny	Expert removal, recycling, disposal and repair of transformers and other oil-filled electrical equipment. Founded 1963.	4953	transformers; TSCA PCB inspection	http://www.gstechnologies.com/ EDR, pp.27379,27386,27513/44205 4326287.1s.pdf
168	G&S Motor Equipment Co. Inc. (J. Supor & Son Co., J. Supor & Son Rigging & Trucking Co.)	2 Bergen St.	Harrison	Expert removal, recycling, disposal and repair of transformers and other oil-filled electrical equipment.	4953	transformers; TSCA PCB inspection	http://www.gstechnologies.com/ EDR, pp.17480,17495,17516/44205 4326287.1s.pdf
169	G.J. Chemical Co. Inc.	128 Doremus Ave. and 370 Adams St.	Newark	Chemical supplier, bulk tank storage, lab services.	5169	TSCA PCB inspection	http://gjchemical.com/ EDR, p.33046/44205 432687.1s.pdf
170	Gaess Environmental Service	253 River Dr.	Passaic	Waste handling.		waste handling	http://www.nj.gov/dep/passaicdocs/docs/3rd-PartyComplaintNexusPackages/3rd-PartyComplaintDNexus/ChemWasteMgmtSite-ChemWasteMgt.pdf
171	Gaeta Recycling	278 W. Railway Ave.	Paterson	Solid waste removal and recycling since 1935.		waste handling	http://gaetarecycling.com/
172	Galaxie Chemical Corp.	26 Piercy St.	Paterson	Manufactures Cyclic Crudes/Intermediates/Dyes Carbon black, Inorganic metal oxides, Titanium dioxide, Organic pigments, Pigments	2865	dyes; TSCA PCB inspections	https://www.macraesbluebook.com/search/company.cfm?company=506734; PVSC Industrial Inventory, 1987, p. 15; EDR, p.7637/31947 4330766.1s.pdf
173	Gamma Dyeing and Finishing Corp.		Paterson	Dyeing		dyes	
174	Garden State Equities, Inc.	134 Evergreen Place 5th Floor	East Orange			TSCA PCB inspection (2000).	EDR, p.15754/51539 4330768.1s-1.pdf
175	Garden State Paper Co.	950 River Dr.	Garfield	Opened 1961; closed Dec. 7, 2001 due to Enron backruptcy.	2621	recycled paper; PCB violations; PCB transformer spill	www.recyclingtoday.com/article/garden-state-closing/; EDR, p.26439/66158 4319330.2s.pdf
176	General Color Co.	24 Avenue B	Newark	Existed in 1948. Chemical pigments/dyes.	2816	dyes: deed restriction for wastes including PCBs.	1974 New Jersey State Industrial Directory, p. G-150; EDR, p. 40993/51539 4330768.1s-1.pdf
177	General Instrument Corp.	65 Gouverneur St.	Newark	Capacitor Division. Manufactured capacitors, mica, and electrolytic film.	3679	capacitors; purchased PCBs	1974 New Jersey State Industrial Directory, p. G-150; Monsanto PCB Sales Summaries, 1961-1962.
178	General Plastics Corp. (PMC Inc.)	55 La France Ave.	Bloomfield	Established in 1950. Applicator of fluoropolymer coatings and other engineered coatings.		Shipped PCB wastes to incinerator (1995); coatings	www.generalplasticscorp.com; EDR, p. 10546/51539 4330768.1s-1.pdf
179	General Services Administration	970 Broad St. Room 939A	Newark			Historical small quantity generator of wastes including PCBs.	EDR, p. 30030/51539 4330768.1s-1.pdf
180	Gerin Mfg. Co.	683 North Fifth St.	Newark	Electric heat transfer thermal liquids.	2899	heat transfer fluids; purchased PCBs.	1974 New Jersey State Industrial Directory, p. G-151; Monsanto PCB Sales Summaries, 1969.
181	Gibraltar Chemicals & Plastics Corp.	199 Garibaldi Ave.	Lodi	Chemicals.		TSCA PCB inspection	EDR, p. 30833/66158 4319330.2s.pdf
182	GlaxoSmithKline Consumer Healthcare LP	65 Industrial St. South	Clifton	Oral care products.		Large quantity generator of PCB wastes (1996).	http://www.nj.com/business/index.ssf/2013/10/glaxosmithkline_to_close_clift.html EDR, p. 50910/66158 4319330.2s.pdf
183	Global International Trading Co. (see also Circle Rubber USA)	422 - 440 Frelinghuysen Ave.	Newark	Trading company.		Deed restrictions (cap) for onsite contamination including PCBs.	EDR, p. 43369/51539 4330768.1s-1.pdf
184	GOKO Inc. (Major Goldfinger)	236-242 South St.	Newark			Large quantity generator of PCB wastes; multiple shipments of PCB wastes to landfill and incinerator.	EDR, p. 44467/51539 4330768.1s-s.pdf
185	Great Atlantic Pacific	281 Ferry St., 33 Queen St.	Newark	Bread and bakery products.	2051	heat transfer fluids; purchased PCBs.	Monsanto PCB Sales Summaries, 1969-1970; United States v. Farber, No. 86-3736 (D.N.J. March 16, 1988.
186	Greater New York Box Co.	Entin Industrial Tract	Clifton	Manufactured boxes. Existed during 1972. Sold to BRG Holdings LLC in 2003.		adhesives	http://www2.scc.rutgers.edu/ead/manuscripts/williams02f.html
187	Grewe Plastics, Inc.		Newark	Since 1947. Plastic materials and quality custom fabrication		plasticizers	http://greweco.com/
188	H&S Chemical Co.	5264 Van Dyke St.	Wallington	Founded 1944. Organic and inorganic color pigments.	2865	dyes; TSCA PCB inspection.	PVSC Industrial Inventory, 1987, p. 16; EDR, p. 57191/66158 4319330.2s.pdf
189	H. Kohnstamm & Co.	Bergen & Harrison Ave.	Kearny	Pigments; flavors. Plant in Newark as of 1959. Also P.O. Box 13, Harrison, NJ.	2087	dyes	PVSC Industrial Inventory, 1987, p.16.
190	Hap Industries		Garfield	Lighting.		light ballasts	
191	Harbor Freight	301 Craneway St.	Port Newark	Trucking, warehousing, and distribution company.		TSCA PCB inspection	www.harborusa.com; EDR, p. 42684/44205 4326287.1s.pdf
192	Hardman Inc.	47-55 Riverdale Ave.	Belleville	Rubber cements and compounds. Acquired by Royal Adhesives and Sealants in 2005.		Purchased PCBs; adhesives/rubber	Monsanto PCB Sales Summaries, 1968-1972; New Jersey Industrial Directory, 1952/53; Royal Adhesives Acquires Hardman Adhesives and Elastomers, *ASI Adhesives & Sealants Industry* , June 27, 2005.
193	Hartin PT-Filler (Hartin Paint & Filler Corp.)	590 Belleville Tnpk.	Kearny	Industrial finishes and metal fillers.		paints/coatings; purchased PCBs.	1974 New Jersey State Industrial Directory, Kearny; Monsanto PCB Sales Summaries, 1968-1972.
194	Heisler Machine & Tool Company	224 Passaic Ave.	Fairfield	Founded 1920. Started as a machining and welding company. Then built equipment for textile industry and paint industry.		hydraulic fluids; heat transfer fluids; purchased PCBs.	www.heislerind.com
195	High Vacuum Technology (High Vacuum Metals/High Vacuum Mfg.)	180 Dayton Ave.	Passaic	Metallic yarn; laminating plastic.		coatings; TSCA PCB inspection with violations; purchased PCBs.	1974 New Jersey State Industrial Directory, Passaic; Monsanto PCB Sales Summaries, 1963-1973. EDR, p. 28257/66158 4319330.2s.pdf
196	Hillside Fidelco Associates	487 Hillside Ave.	Hillside			Historical large quantity generator of wastes including PCBs.	EDR, pp. 35596,39645/51539 4330768.1s-1.pdf
197	Hoboken Paints, Inc.	40 Industrial Rd.	Lodi	Paints.	2851	paints	http://www.hudsonreporter.com/view/full_story/1913139/article-15th-and-Adams-Corner-where-my-father-s--Hoboken-Paints--stood--then-and-now-?instance=search_results; PVSC Industrial Inventory, 1987, p. 17.
198	Honig Chemical & Processing Corp.	414 Wilson Ave.	Newark	Industrial organic chemicals since 1970, GNL recipient.	2818	TSCA PCB inspection	PVSC Industrial Inventory, 1987, p. 17; EDR, p. 363362/44205 4326287.1s.pdf
199	Hy-Test Packaging Corp.	515 E 41st St.	Paterson	Liquid cleaning products; fuel additives.		TSCA PCB inspection.	2006 New Jersey Industrial Directory, Paterson; EDR, pp. 15055, 18180/66158 4319330.2s.pdf

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	Company	Street Address	City	Company Information	SIC	Industry Basis/Allegation	URL or Other Source
200	IGI Adhesives, Inc.	Page Ave. & Orient Way	Lyndhurst	Adhesives.		adhesives	bizstanding.com/directory/NJ/NI/235/
201	Imperial Container	141 North 13th St.	Newark	Existed by at least 1965. Corrugated boxes/cartons.	2653	adhesives	1974 New Jersey State Industrial Directory, p. G-153.
202	INDOL Color Die-of Magruder Color Cosmetic Resource Manufacturing L.L.C.		Belleville	Dyes; pigments. Est. 1927.		dyes, coatings	https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=4289772
203	INDOL Color Div.-of Magruder Color Cosmetic Resource Manufacturing L.L.C.		Harrison	Pigments and resins.		dyes, coatings	
204	INDOL Color Div.-of Magruder Color Cosmetic Resource Manufacturing L.L.C.	1029 Newark Ave., 1 Virginia St.	Newark	Pigments and resins. (See also Ad-Co-Color, 66 Lister Ave., Newark, purchased in 1964).	2865	dyes, coatings	PVSC Industrial Inventory, 1987, p. 18; U.S. Tarriff Commission, Synthetic Organic Chemicals, 1950, p. 147.
205	INDOL Color Div.-of Magruder Color Cosmetic Resource Manufacturing L.L.C.		Paterson	Pigments and resins.		dyes, coatings	
206	INDOL Color Div-of Magruder Color Cosmetic Resource Manufacturing L.L.C.		Clifton	Pigments and resins.		dyes, coatings	
207	Industrial Latex Corp.	350 Mt. Pleasant Ave.	Wallington	1951-1983: manufactured adhesives and natrual/synthetic rubber compounds. NPL site in March 1989.		PCBs used as a flame retardant for rubber and adhesives. Purchased PCBs. PCBs found onsite.	http://www.northjersey.com/story/news/2017/09/07/wallington-contractor-odds-over-rental-former-superfund-site/634882001/; https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0201073#bkground; Monsanto PCB Sales Summaries, 1968-1972; EDR, p. 45798/66158 4319330.2s.pdf
208	International Central Corp.		Caldwell/Fairfield			Purchased PCBs.	Monsanto PCB Sales Summaries, 1970.
209	International Veiling Corp.	244 Hazel St.	Clifton	Since 1904. Dyeing and finishing.	2213	dyes	https://www.internationalveiling.com/; PVSC Industrial Inventory, 1987, p. 18.
210	Jencraft Corp.	1 Taft Rd.	Totowa	Manufactured window blinds.		plasticizers; coatings; Historical small quantity generator of PCB wastes.	www.businessinsurance.com/article/19980920/STORY/10006025?templat-printart; EDR p. 9233/31947 4330766.1s.pdf
211	Jersey State Chemical Corp.	59 Lee Ave.	Haledon	Makes polymer and copolymer emulsions for use in water-based paints, floor polishes, flexible adhesives, and for use as pigment binders, sizing, and fillers. (Current address of MRL Manufacturing Corporation.)		paints, adhesives, floor wax	1973 New Jersey State Industrial Directory, Haledon.
212	Jiffy Mfg.	360 Florence Ave.	Hillside	Bags and containers.		Purchased PCBs	Monsanto PCB Sales Summaries, 1964-1971.
213	John L. Armitage Co.	245 Thomas St.	Newark	Chemical coatings business started in 1876. Currently located in Gallatin, TN.	7391	Purchased PCBs; coatings	PVSC Industrial Inventory, 1987, p. 19; Monsanto PCB Sales Summaries, 1965 and 1971.
214	Johnson & Taylor Excavation (Hawk Repossessions)	1173 Goffle Rd.	Hawthorne	Excavator.		Suspected PCB contamination at site (1992); waste handling.	EDR, p. 3313/66158 4319330.2s.pdf
215	Johnson Forging	294-306 Thomas St.	Newark	Iron & steel forgings. Established in 1941.	3392	castings	1974 New Jersey State Industrial Directory, p. G-154.
216	Kearny Twp. of Harrison Ave. Landfill	Harrison & Bergen Ave. S.	Kearny	Landfill.		Multiple shipments of PCB wastes to landfill.	EDR, p. 19996/44205 432687.1s.pdf
217	Keith Industries, Inc.	248 Aster St.	Newark	Distributes drums and containers. Offers new and reconditioned plastic, steel, and fiber drums; triple tight and oblong cans; steel and plastic pails; and totes. Founded in 1961.		drum reconditioning/waste handling	http://www.keithindustries.com/
218	Kikuchi Color & Chemical Corp.	19 East Fifth St.	Paterson	AKA Dominion Colour (subsidiary spun off/sold 2008). Pigments/dyes.	2816	dyes, inks	https://www.highbeam.com/doc/1G1-179533039.html; PVSC Industrial Inventory, 1987, p. 19.
219	Kingsland Drum & Barrel Co., Inc.	308 Miller St.	Newark	Drum reconditioning.	5085	waste handling	PVSC Industrial Inventory, 1987, p. 19.
220	Kohnstamm & Co.	Harrison Ave.	Kearny	Food colors; flavors; dyes.		dyes; heat transfer fluids.	http://www.colorantshistory.org/HKohnstamm.html; 1974 New Jersey State Industrial Directory, Kearny.
221	Kolb Sheet Metal	172 Pennsylvania Ave. and 30 Orange St.	Newark	Founded 1947. Sheet metal products, ventilating systems, heavy and welded sheet metal work.		hydraulic fluids	New Jersey Industrial Directory, 1952-53, p. 609; The Metal Industry, Vol. 19, No. 12, p. 500.
222	Kramer Chemicals	109 Fifth Ave.	Paterson/Clifton	Chemicals	5161	Purchased PCBs	PVSC Industrial Inventory, 1987, p. 20; Monsanto PCB Sales Summaries, 1966.
223	Krementz & Co. (Elrica Urban Renewal Association)	375 McCarter Hwy.	Newark	Jewelry. Founded 1866. Operations scaled down, ceasing gold overlay operations, and relocated, in the 1990s.	3911	PCB transformers; shipped PCBs to landfill	PVSC Industrial Inventory, 1987, p. 20; EDR, p. 41208/51539 4330768.1s-1.pdf
224	Lamart Corp.	16 Richmond St.	Clifton	Pressure sensitive tapes and EMI/RFI shielding laminates. Established in 1956.		adhesives	http://lamartcorp.com/
225	Landover Warehouse	360 Bergen Ave.	Kearny	Warehouse.		PCB spill (1986); illegal dumping (1990).	EDR, p. 15315/44205 432687.1s.pdf
226	Laurel Rubber/Laurel Co.	129 Grand St.	Garfield	Rubber.		rubber; purchased PCBs	1956/57 and 1973 New Jersey Industrial Directories, Garfield; Monsanto PCB Sales Summaries, 1970.
227	Lawter Chemicals	24 Jacobus Ave.	South Kearny	Colors/dyes. (Also a site in Newark.)		purchased PCBs	Monsanto PCB Sales Summaries, 1966; Ad in *Flying Magazine* , August 1958, p. 71.
228	Lazon Paints (Landzettel & Sons)	17-12 River Rd.	Fair Lawn	Established 1932. Paint and coating manufacturing. Moved in 1949 to current location.		paints	www.landzettelandsons.com/our-story
229	Leader Dyeing & Finishing Co., Inc.	94 Madison Ave.	Paterson	Textile processing; dyeing.	2261	dyes	PVSC Industrial Inventory, 1987, p. 20.
230	Liberty Machine Co., Inc.	275 4th Ave.	Paterson	Vinyl printing equipment, embossers, laminators, coaters, and polishing units.		Purchased PCBs; TSCA enforcement action (1985/86); small quantity generator of PCB wastes.	Monsanto PCB Sales Summaries, 1964-1972; New Jersey Industrial Directories, Paterson, 1955, 1960, 1965, 1970, and 1975; EDR, p. 8467/66158 4319330.2s.pdf
231	Liquid Carbonic Corp.	630 Washington Ave.	Belleville	Established 1946. Manufactured liquid carbon dioxide and dry ice.		heat transfer fluids	"lindustriall News," *Chemical Engineering News* , Vol. 24, No. 10, May 25, 1946, pp. 1388-1404.
232	Liquid Carbonic Corp. (Liquid Carbonic Specialty Gas Corp.)	603 Bergen St.	Harrison	Industrial gases. (Note there was an additional industrial gas plant in Kearny, NJ.)	2813	Shipped PCB wastes to landfill (1997).	EDR, p. 17438/44205 4326287.1s.pdf

	Company	Street Address	City	Company Information	SIC	Industry Basis/Allegation	URL or Other Source
233	Litton Industries (Monroe Systems for Business, Monroe Calculating Machine, Munroe Calculator)	555 Mitchell St. and 550 Central Ave.	Orange	Established 1913 in Orange as the Monroe Calculating Machine Company. Manufactured adding calculators. Acquired by Litton Industries in 1958. Now owned by Arlington Industries.		Purchased PCBs.	Monsanto PCB Sales Summaries, 1969; New Jersey Industrial Directories, Orange, 1952/53 and 1974.
234	Lonza, Inc.	22-10 Rt. 208	Fair Lawn	Chemicals: Niacin, Sorbitol, Tertiary Amines, Surfactants, Organic Intermediates.		PCB violations (1987 and 1998).	New Jersey Industrial Directory, Fair Lawn, 1975; EDR, pp. 5689, 10413/66158 4319330.2s.pdf
235	Louis A. Nelson, Inc.	224 Glenwood Ave.	Bloomfield	Plastics/mold maker. Est. 1947. Lodi Monument Works. Cast Bronze and Aluminum plaques, Civic Memorials, Granite Signs, Markers to Headstones, Urns, Pet Markers, Mausoleums, and Custom Memorials. Established in 1979.		heat transfer fluids; casting molds; plasticizers	https://www.manta.com/c/mmbpd0r/louis-a-nelson-inc
236	Lubrizol Advanced Materials, Inc.	1 Styertown Rd.	Clifton	Plastic Materials and Resins, Molding Compounds, Plastics. Founded 1947	2821	plasticizers, adhesives, lubricants	http://www.lanelson.com/
237	Lummus Co. (Lummus Crest Inc.)	1515 Broad St.	Bloomfield	Chemical engineering services; engineering pilot plant work.	8911	Purchased PCBs	http://www.usbizs.com/NJ/Bloomfield/ABB_Lummus_Crest_1AnX.html; PVSC Industrial Inventory, 1987, p. 21; Monsanto PCB Sales Summaries, 1971.
238	Maas & Waldstein	437 Riverside Ave.	Newark	Paints, varnish, lacquers.	2551	Purchased PCBs; paints/varnish/lacquers	Monsanto PCB Sales Summaries, 1964-1971; 1974 New Jersey State Industrial Directory, p. G-155.
239	MAC Products, Inc.	60 Pennsylvania Ave.	Kearny	Electric utility/transit products since the 1960s. Design and manufacture electro-mechanical products and equipment.		gaskets, wire cables, lubricants, hydraulic fluids, gasket sealants, coatings, vacuum pumps	http://www.macproducts.net/; 1974 New Jersey State Industrial Directory, Kearny.
240	Macys - Newark	131 Market St.	Newark	Department store.		Historical large quantity generator of PCB wastes; TXCA PCB inspection, with violations found.	EDR, pp. 28193, 28199/51539 4330768.1s-1.pdf
241	Magna Tran Inc. (Magnatran Inc.)	248 Schuyler Ave.	Kearny	Transformers.		Purchased PCBs; transformers	New Jersey Industrial Directories, 1952/53 and 1974; Monsanto PCB Sales Summaries, 1968-1971.
242	Magnetic Engineering	1940 Van Houten Ave.	Clifton	Electro-magnets for industrial and road sweeing applications.		Purchased PCBs	Monsanto PCB Sales Summaries, 1969; Budocks Technical Digest, Issue 8, February-March, 1950, p. 18.
243	Magruder Color Company, Inc. (EC Pigments)	1 Virginia St.	Newark	Manufacturer and marketer of specialty organic pigments and pigment preparations for coatings, graphic arts, and plastics industries since 1940s.	2865	dyes	1974 New Jersey Industrial Directory; PVSC Industrial Inventory, 1987, p. 21.
244	Main Trucking & Rigging Co., Inc.	Wallace St. - Extension	Elmwood Park	Rigging, trucking, hauling, warehousing.		Historical large quantity generator of PCB wastes	www.maintrucking.com; EDR, p. 18690/66158 4319330.2s.pdf
245	Malcolm Nicol	37 Cutter Ave.	Hawthorne	Chemicals.		Purchased PCBs	Monsanto PCB Sales Summaries, 1969-1971; New Jersey Industrial Directories, Hawthorne, 1956 and 1974.
246	Manchester Metals Inc.	600 Cape May St.	Harrison	Metal fabrication/decorative metals.		castings; coatings	us-business.info/directory/harrison-nj/part2/#M
247	Manhattan Printing Works	South St.	Passaic	Textile printing.		dyes	New Jersey Industrial Directory, Passaic, 1952/53.
248	Manner Textile Processing Corp. (Manner Dyeing & Finishing)	293 Morrissee Ave.	Haledon	Textile piece goods.	2261	dyes	PVSC Industrial Inventory, 1987, p. 21.
249	Mannkraft Corp.	1000 U.S. Highway #1	Newark	Founded 1945. Corrugated box/carton manufacturing.	2649	adhesives	https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=6516318; PVSC Industrial Inventory, 1987, p. 21.
250	Marcal Manufacturing, LLC (a/k/a Marcal Paper Mills Inc.).	1 Market St.	Elmwood Park	Household paper products.	2611	TSCA PCB inspection; PCB violation	PVSC Industrial Inventory, 1987, p. 22; EDR, p. 19279/66158 4319330.2s.pdf
251	Marchem (Marcem Dublon Inc.)	84 Waydell St.	Newark	Plastic materials, synthetic resins, anti-friction materials, self-lubricating bushings, plastic assemblies.		plasticizers	www.macraesbluebook.com/search/company.cfm?coompany=320878
252	May National Corp. (May National Associates)	Forbrighten Rd., 1700 Route 3	Clifton	caulking, adhesives, sealants. Founded 1910.		caulking, adhesives, sealants	start.cortera.com/company/research/k3q6mts7o/may-national-associates-inc/
253	Mebane Packaging	300 Hoyt St.	Kearny	Est. 1969. Now a division of WESTVACO (2000). Makes paper cartons, displays, litholamination.		adhesives	www.icis.com/explore/resources/news/1999/11/29/99723/us-westvaco-to-buy-mebane-packaging/
254	Metro Hydraulic Jack Co. of N.J. (subs. Of MS Hydraulic Equipment Corp.)	141 N.J. Railroad Ave.	Newark	Est. 1941. Hydraulic jacks.		hydraulic fluids	1974 New Jersey State Industrial Directory, p. G-157.
255	Midland Color Div. of Sakata Inx (Inx International Ink Co.)	481 River Rd.	Clifton	Inks/coatings producer.		inks	
256	Midwest Piping		Clifton	Pipes and fittings.		Purchased PCBs	Monsanto PCB Sales Summaries, 1960.
257	Minor Rubber	122 Ackerman St.	Bloomfield	Est. 1914. Rubber specialty products and hardware for industrial market.		rubber plasticizers	1974 New Jersey State Industrial Directory, Bloomfield.
258	Miracle Manufacturing	86 Lackawanna Ave.	West Paterson/ Little Falls	plastics fabricating/plastics decor		plasticizers	
259	Monsey Products Co.	425 Central Ave.	East Rutherford	Paints		Large quantity generator of wastes including PCBs	www.leagle.com/decision/1995625279njsuper3461596; EDR, p. 58330/66158 4319330.2s.pdf
260	Montclair Community Hospital	120 Harrison Ave.	Montclair	Hospital.		TSCA PCB inspection	EDR, p. 3078/51539 4330768.1s-1.pdf
261	Morlot Color & Chemical Co.	111 Ethel Ave.	Hawthorne	Dyes for textile industry. Est. 1965.		dyes	New Jersey Industrial Directory, Hawthorne, 1990.
262	Morningstar Paisley	1153 Bloomfield Ave.	Clifton	Adhesives for the packing industry. (Changed names to Industrial Coatings, Division of International Latex & Chemical Corporation.)		Purchased PCBs	Monsanto PCB Sales Summaries, 1963-1966.
263	Morningstar Paisley		Newark	Adhesives for the packing industry.		Purchased PCBs	Monsanto PCB Sales Summaries, 1963-1965.
264	Morris Paper Board Co.	177 Third Ave.	Paterson	Paperboard and packaging.		adhesives	https://www.nrc.gov/docs/ML0201/ML020150483.pdf; New Jersey Industrial Directory, Paterson, 1960.
265	Motiva Enterprises Newark Terminal #13055 (Star Enterprise)	909 Delancey St.	Newark	Fuel storage/distribution.		Deed restriction (caps/fencing) for onsite contamination including PCBs.	www.motiva.com; EDR, p. 38645/44205 4326287.1s.pdf
266	MSM Properties Corp.	1 Lisbon St.	Clifton	Site is a warehouse built in 1955, recently occupied by HomeCare Industries.		Large quantity generator of wastes including PCBs	www.loopnet.com/Listing/17957527/1_Lisbon-St-Clifton-NJ/; EDR, p. 36943/66158 4319330.2s.pdf
267	National Electric	296 Broadway	Passaic	Electrical distributors.		Purchased PCBs.	Monsanto PCB Sales Summaries, 1970.

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268	National Machinery Exchange	72 Roanoke Ave., 158 Paris St.	Newark	Used ferrous and nonferrous metalworking equipment.		hydraulic fluids	www.nationalmachy.com
269	New Jersey Galvanizing & Tinning Work	139 Haynes Ave.	Newark	Hot dip galvanizing since 1902.	3479	TSCA PCB inspection	New Jersey Industrial Directory, Newark, 1952/53; EDR, p. 43745/51539 4330768.1s-1.pdf
270	New York Corrugated Box Co.	239 Lindbergh Pl.	Paterson	Corrugated boxes and packing supplies. Est. 1943.		adhesives	businessfinder.silive.com/new-york-corugated-box-co-paterson-nj-1.html
271	New York Folding Box	129 Christie St.	Newark	Est. 1918. Manufacturer of folding and gift boxes	5999	adhesives	www.nyfoldingbox.com
272	Newark Industrial Spraying	12 Amsterdam St.	Newark	Painting, Spraying & Enameling, Powder Coating, Metal Finishing, and Screen Printing since 1942		paints, coatings	www.newarkindustrialspray.com
273	Newark Land -P19 (WHC Five Real Estate Ltd Partnership)	562-584 Haynes Ave.	Newark			Shipped PCB wastes to landfill	EDR, p. 43699/51539 433078.1s-1.pdf
274	Newark Paraffine Paper Co. (Norpak Corp.)	70 Blanchard Ave.	Newark	Est. 1952. Manufactures paper products and converting services for use in its customers' production, packaging, distribution, and end use operations		inks; TSCA PCB inspection; inks/dye/solvents/waste liquids dumped in rear of facility (1992).	EDR, p. 21637/44205 432687.1s.pdf
275	Newark Public Schools	2 Cedar St.	Newark			TSCA PCB inspection.	EDR, pp. 28039, 31922/51539 4330768.1s-1.pdf
276	Newspring Packaging (Newspring Industrial Corp.)	35 O'Brien St.	Kearny	Food packaging.		TSCA PCB inspection	www.joshen.com/Pactiv/Newspring.pdf; EDR, p. 14252/44205 432687.1s.pdf
277	Nimco Shredding Co.	254 Doremus Ave.	Newark	Shredding service	7389	PCB violation; TSCA PCB inspection.	EDR, pp. 26923, 34333/44205 4326287.1s.pdf
278	NJ Institute of Technology	323 High St.	Newark	School		TSCA PCB inspection (1986).	EDR, p. 5270/66158 4319330.2s.pdf
279	NJ Institute of Technology, Dept. of Physics (Hazardous Substance Management Research Center)	161 Warren St.	Newark	School research center		Enforcement action related to PCBs (1993); TSCA PCB inspection (19980.	EDR, pp. 28467, 28501/51539 4330768.1s-1.pdf
280	NJ Schools Development Auth North Ward Park School (Liberty Optical Manufacturing)	360 - 380 Verona Ave.	Newark	Liberty Optical Manufacturing made optical frames.	3851	Deed restriction (caps) for contamination including PCBs.	PVSC Industrial Inventory, 1987, p. 20; EDR, p. 11486/51539 4330768.1s-1.pdf
281	NJ Transit - Meadows Maint. Complex	5710 Newark-New Jersey City Tnpk., 1148 Newark Tnpk.	Kearny	Bus, light rail, railroad maintenance facility.		lubricants.hydraulic fluids; TSCA PCB inspection/violation found.	EDR, pp. 27561, 27649/44205 4326287.1s.pdf
282	NJ Transit - NWK Central Maint. Facility	1 Penn Plaza E.	Newark	Bus, light rail, commuter rail maintenance facility		Historical generator of PCB wastes	EDR, p. 18151/44205 4326287.1s.pdf
283	NJ Transit Authority/Rail Operations (see also Catholic Community Service)	1160 Raymond Blvd.	Newark	Rail operations.		PCB enforcement actions.	EDR, p.31967/51539 4330768.1s-1.pdf
284	NJ Turpike Authority (see also Bayonne Barrel & Drum)	140-166 Raymond Blvd.	Newark	Drum reconditioning/disposal.		Small quantity generator of PCB wastes	EDR, p. 24460/44205 4326287.1s.pdf
285	Noellar Industries Inc.	400 Maltese Dr.	Totowa			Deed restriction (caps/fence) for wastes including PCBs.	EDR, p. 9773/31947 4330766.1s.pdf
286	Norpak Corp.	70 Blanchard. St. and 96-126 Roanoke Ave.	Newark	Paper and packaging		inks, dyes; PCBs found onsite; TSCA PCB inspection	EDR, p. 21637/44205 4326287.1s.pdf
287	North Jersey Skein Dye Co. Inc.	152 Putnam St.	Paterson	AKA Hoof Fe Dye Works. Dyeing of manmade fiber & silk broadwoven fabric.	2269	dyes	New Jersey Industrial Directory, Paterson, 1955; PVSC Industrial Inventory, 1987, p. 24.
288	Nyloc Aerospace (Nylok)	11 Thomas Rd. S	Hawthorne	Founded in 1942. Provider of resin, adhesive and lubricant coatings for threaded fastener applications. Now a Marmon/Berkshire Hathaway Company.	3452	adhesives, coatings, plasticizers	www.nylok.com
289	O.C. Adhesives	125 5th Ave.	Paterson	Adhesive and sealant company. Est. 1962. (May now be part of Spectrachem/A.K. Technologies Inc.)	2891	adhesives, sealants	www.manta.com/c/mmflftk/oc-adhesives-corporation
290	OMG Fidelity, Inc. (OMG Electronic Chemicals LLC, OMG Group Inc.)	470 Frelinghuysen Ave.	Newark	Produces electroplating chemicals and metal concentrates. Formerly known as Auric Corp.		TSCA PCB inspection/violations found.	EDR, p. 43570/51539 4330768.1s-1.pdf
291	O'Neil Color & Compounding Corp.	61 River Dr.	Garfield	NKA Primex. Colorants and compounds for a variety of plastics		TSCA PCB inspection	EDR, p. 44924/66158 4319330.2s.pdf
292	Orient Chemical Corp.	121 Tyler St.	Newark	Manufacturer of Nigrosine Dye. Moved facilities to Seaford, DE in 1991.	2269	dyes	PVSC Industrial Inventory, 1987, p.25.
293	Owens Corning	1249 Newark-Jersey City Tnpk.	Kearny	Insulation and roofing materials. Company founded in 1930s.	2952	insulation, building materials, caulk/joint sealant; purchased PCBs	Monsanto PCB Sales Summaries, 1968.
294	Pacquet Oneida	10 Clifton Blvd.	Clifton	Coated and laminated paper. (Bought by Lawson-Mardon, 1998.)		adhesives, coatings	http://www.usa.com/frs/pacquet-oneida-inc.html; https://www.plasticsnews.com/article/19980713/NEWS/307139973/lawson-mardon-buys-pacquet
295	Paisley Pro-Div.		Clifton			Purchased PCBs	Monsanto PCB Sales Summaries, 1967-1970.
296	Pan Chemical	1 Washington Ave.	Hawthorne	Manufacture of industrial coatings, color dispersions, inks and nail polish. Est. 1940s.		coatings, dyes, inks; leaking underground storage tanks contaminated property	caselaw.findlaw.com/nj-superior-court-appellate-division/1486966.html
297	Pantasote (Panasote Co., Panasote Leather Co., and Pantasote Polymers, Inc.)	126 Jefferson St.	Passaic	Plastics manufacturer.	2821	plasticizers, coatings; PCB violations	PVSC Industrial Inventory, 1987, p. 26; EDR, p. 41001/66158 4319330.2s.pdf
298	Paperboard Specialist, Inc.	177 3rd. Ave.	Paterson	Paperboard		PCB transformer area of concern onsite	EDR, p. 7119/66158 4319330.2s.pdf
299	Paragon Household Products, Inc.	233 Clifton Blvd.	Clifton	Deoderants.		TSCA PCB inspection	www.manta.com/c/mm59zqy/paragon-household-products-inc; EDR p. 36355/66158 4319330.2s.pdf
300	Pass Recovery Systems	1500 Main Ave.	Clifton	Battery/lead recycler.		Shipped PCB oil offsite.	EDR, p. 24341/66158 4319330.2s.pdf
301	Passaic Engraving Co.	41 Brook St.	Passaic	commercial printer	2759	TSCA PCB inspection	EDR, p. 54628/66158 4319330.2s.pdf
302	Passaic Valley Sewerage Commission (PVSC)	600 Wilson Ave.	Newark	Sewage treatment.		Historical large quantity generator of wastes including PCBs. Shipped PCB wastes to incinerator and landfill (1985).	EDR, pp. 37530, 37534/44205 4326287.1s.pdf

	Company	Street Address	City	Company Information	SIC	Industry Basis/Allegation	URL or Other Source
303	Paterson Housing Authority - Brooks-Sloate Development	9 Christina Pl.	Paterson			Historical small quantity generator of wastes including PCBs.	EDR, p. 5758/31947 4330766.1s.pdf
304	Paterson Public Schools - International HS/Don Bosco Tech	202 Union Ave.	Paterson			TSCA PCB inspection	EDR, p. 12456/31947 4330766.1s.pdf
305	Paterson Rubber Co.	104 North 2nd St.	Paterson	Tank and barrel lining.		plasticizers, rubber, coatings	New Jersey Industrial Directories, Paterson, 1965, 1970, and 1975.
306	Paul Dyeing Co.	One Main St.	East Orange	Est. 1934. Dyeing cotton broadwoven fabrics.	2258	dyes	PVSC Industrial Inventory, 1987, p. 26.
307	Paxall Circle Machinery	161 Harrison Rd.	Glen Rock	Packaging machinery.		Large quantity generator of PCB wastes.	New Jersey Industrial Directory, Glen Rock, 1985; EDR, p. 4617/66158 4319930.2s.pdf
308	Peerless Tube Co.	58-76 Locust Ave.	Bloomfield	Manufactured metal tubes and aluminum aerosol containers.	3496	TSCA PCB inspection/violations found.	PVSC Industrial Inventory, 1987, p. 26; EDR, 9181/51539 4319330.2s.pdf
309	Penn Color	30 Paul Kohner Pl.	Elmwood Park	Formerly Custom Colors. Manufactures pigment dispersions for the ink and coatings industry.		dyes, inks, coatings	www.penncolor.com
310	Penn-Jersey Paint & Varnish	304 Ogden St.	Newark	Paints, varnishes, enamels.	2842	paints; purchased PCBs	Monsanto PCB Sales Summaries, 1969; New Jersey Industrial Directory, 1952/53, p. 619.
311	Permanent Label	801 Bloomfield Ave.	Clifton	Decorating and printing labels for plastic products.	3069	inks, adhesives	www.usa.com/frs/permanent-label-corp-110001528703.html
312	Pershing Rubber Roller Co.	135 Orange St.	Bloomfield	Rubber rolls, solids, or covered rubber.	8999	rubber	www.manta.com/c/mm2mhxm/pershing-rubber-roller-corporation
313	Petri Paint Co. Inc.	198 Pacific St.	Newark	Manufactures varnish, stains, powder coat, glazes, lusters, lacquers, sealers, shellacs, and miscellaneous finishes. Est. 1962.		paints, coatings, sealants	https://www.macraesbluebook.com/search/company.cfm?company=506397
314	Peugeot Motors of America Inc.	1 Peugeot Plaza	Lyndhurst	Former U.S. headquarters for Peugeot America.		Large quantity generator of wastes including PCBs	apnews.com/1e7227688aede9a13140684544221324; EDR, p. 4183/44205 432687.1s.pdf
315	PH Buildings	130 8th St.	Passaic City	Brownfield.		Deed restriction (asphalt/foundations) to control PCBs	EDR, p. 41856/66158 4319330.2s.pdf
316	Plextone Corporation of America	2141 McCarter Hwy.	Newark	Paint manufacturer. Part of Maas & Waldstein.	2851	paints; Maas & Waldsteing purchased PCBs	Monsanto PCB Sales Summaries, 1964-1971; 1974 New Jersey State Industrial Directory, p. G-161.
317	PMC Inc., Dura-Bond Division	1875 McCarter Hwy.	Newark			Large quantity generator of wastes including PCBs	EDR, p. 11881/44205 4326287.1s.pdf
318	Podell Industries	296 Midland Ave.	Garfield	clothing manufacture		dyes; discharged dye to Schroeders Brook from floor drains (1969).	PVSC, Pollutions Corrected During 1969, March 31, 1970, p. 8.
319	Pope Chemical Co.	33 Sixth Ave.	Paterson	Paste pigment and vehicles for printing inks. Became part of Daicolor-Pope in 1987.	2893	inks, coatings	New Jersey Industrial Directory, 1955; PVSC Industrial Inventory, 1987, p. 27.
320	Popola Drum & Barrel	228 Lyons Ave.	Newark	AKA Thomas Popola & Sons. New and reconditioned drums. Est. 1963.	3412	drum reconditioning	https://www.manta.com/c/mmc50yl/thomas-popola-sons-inc
321	Port Authority of NY & NJ - Metcalf & Eddy	141 Suez & Marsh St.	Port Newark			Historical large quantity generator of wastes including PCBs	EDR, p. 42946/44205 4326287.1s.pdf
322	Pratt Gabriel (B.G. Pratt Company, Miller Chemical and Fertilizer Company)	204 21st St.	Paterson	Insecticides, fungicides, herbicides.		State-lead cleanup of site. Found dioxin and PCBs.	EDR, p. 14173/66158 4319330.2s.pdf
323	Precision Manufacturing Group, LLC	82 Industrial St. E.	Clifton	dba Servometer LLC. Electrodeposited metal bellows, flexible shaft couplings, electrical contacts, and rigid electroforms. Est. 1962.		cutting oils, lubricants	servometer.com/about-us/history/
324	Prudential Insurance Co.	153 Halsey St.	Newark			TSCA PCB inspection/violations found.	EDR, p. 28107/51539 4330768.1s-1.pdf
325	Prudential Insurance Co.	Two Gateway Center, McCarter Hwy.	Newark			Large quantity generator of PCB wastes.	EDR, p. 32043/51539 4330768.1s-1.pdf
326	Pyrolac Corp.	55 Schoon Ave.	Hawthorne	Produced primers, lacquers, enamels, coatings, solvent reducers, and cleaners. Prior owners were Fair Lawn Finishing Company (1940-1946), New Jersey Lacquer Company (1947-1966), and Vulcan Lacquer & Coatings (1966), which changed its name to Pyrolac Corporation in 1967.		paints; PCBs found onsite; purchased PCBs	Dewberry-Goodkind, Preliminary Assessment Report: Former Pyrolac Corporation Facility, November 2009; Monsanto PCB Sales Summaries, 1968.
327	Quality Machine Company Inc.	183 Autumn St.	Passaic	Fabricated metal products by forging, stamping, bending, forming, welding, machining, and assembly.		TSCA PCB inspection; hydraulic fluids, lubricants	www.bloomberg.com/profile/company/1043768D:US EDR, p. 40774/66158 4319330.2s.pdf
328	R & R Dyeing, L.L.C.	3 E. 26th St.	Paterson	Dyeing		dyes	www.nj.gov/dep/bulletin/bu2004_1006.pdf
329	Radial Casting Corp.	70 Pennsylvania Ave.	Kearny	brass foundry and aluminum diecasting		TSCA PCB inspection	EDR, p. 28038/44205 432687.1s.pdf
330	Radio Station WEVD (Forward Assn Inc.)	Rte. 3W & 120N (Intersection of)	East Rutherford	Radio transmission station.		Small quantity generator of PCB wastes	EDR, p. 5608/44205 432687.1s.pdf
331	Radio Station WPAT	1396 Broad St.	Clifton	Radio transmission station.		Large quantity generator of PCB wastes.	EDR, pp. 25444, 26096/31947 4330766.1s.pdf
332	Rainbow Dye & Finishing, Inc. (Rainbow Piece Dye Works, Inc.)	20-21 Wagaraw Rd. #31B	Fair Lawn	Dyeing and finishing of textiles.	2261	dyes	New Jersey Industrial Directory, Fair Lawn, 1982; PVSC Industrial Inventory, 1987, p. 28.
333	Raybestos-Manhattan, Inc.	Willet St.	Passaic	Fabricated rubber products.		rubber; purchased PCBs	New Jersey Industrial Directory, Passaic, 1974; Monsanto PCB Sales Summaries, 1967 and 1969.
334	RCR Management LLC Property	Summer St. Lot & Central	Passaic			Multiple shipments of PCB wastes to landfill.	EDR, p. 40219/66158 4319330.2s.pdf
335	Reardon Corp. (Reardon Company)		South Kearny	Paints.		paints; Purchased PCBs	Monsanto Sales Summaries, 1958-1959.
336	Refined Prod DV	624 Schuyler Ave.	Lyndhurst	Detergents and finishing compounds (including mildewproofing compounds) for the textile industry.		coatings; purchased PCBs	New Jersey Industrial Directory, Lyndhurst, 1952/53; Monsanto PCB Sales Summaries, 1971.
337	Rempac Foam Corp.	61 Kuller Rd.	Clifton	Flexible foam plastic products.	3086	TSCA PCB inspection/violations found.	EDR, p. 22486/31947 4330287.1s.pdf
338	Renco Finishing Corp.	20-21 Wagaraw Rd. #31B	Fair Lawn	Dyeing cotton broadwoven fabric; manmade, fiber & silk textile finishing plant	2261	dyes	PVSC Industrial Inventory, 1987, p. 28.
339	Research Organics Inorganics	507 Main St.	Belleville Township	Specialty chemicals (1972-1983).		Multiple shipments of PCB wastes to landfill.	EDR, p. 8140/44205 432687.1s.pdf
340	Reusche & Co. (L. Reusche & Company, TWS Inc.)	2 Lister Ave.	Newark	Paints, varnishes, pigments.	2816	paints; TSCA PCB inspection/violations found (disposal)	https://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002090781; EDR, p. 21530/44205 4326287.1s.pdf

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341	Riverside Ford	144 Passaic Ave.	Kearny	Automobile repair.		Historical large quantity generator of wastes including PCBs	EDR, p. 12793/66158 4326287.1s.pdf
342	Rochelle Park Velvet, Co.*	Main St.	Lodi	Dyeing and finishing of velvet. Est. 1896.		dyes	Industrial Directory of New Jersey, 1912, p. 258.
343	Rockwell Standard		Newark			Purchased PCBs	Monsanto PCB Sales Summaries, 1959.
344	Rollins Environmental Services FS Inc. (Scientific Chemical Processing Inc.)	411 Wilson Ave.	Newark	Scientific Chemical Processing main office. Collection/processing/recycling of hazardous wastes.		Historical large quantity generator of wastes including PCBs	Hazardous Waste Management Facilities in the United States, 1977, p. 27; EDR, p. 36407/44205 432687.1s.pdf
345	Roman Adhesives, Inc.	5 Lawrence St.	Bloomfield	Manufactured the adhesive used in the installation of the vinyl wallcovering.		adhesives	http://query.nytimes.com/gst/fullpage.html?res=9C07E5DD163AF936A25757C0A9669D8B63
346	Ronald Mark Associates Inc. (DME Co.)	1217 Central Ave.	Hillside Township			Deed restriction (caps, fence, signage) for contamination including PCBs.	EDR, p. 47093/51539 4330768.1s-1.pdf
347	Ronson Metals Corp.	55 Manufacturers Pl.	Newark	Cigarette lighters and related products	3356	Purchased PCBs	Monsanto PCB Sales Summaries, 1968-1973; 1974 New Jersey State Industrial Directory, p. G-163.
348	Rose Color Inc.	170 Blanchard St.	Newark	Manufactures dyes, pigments, and chemicals for the petroleum and plastics industries. May now be owned by International Imaging.		TSCA PCB inspection	Nextech Enterprises International Inc., 8-K/A [Amend] - Current Report, 1997; EDR, p. 20457/44205 4326287.1s.pdf
349	Royal Aluminum	600 Cortlandt St., 218 Jefferson St.	Newark	Est. 1957. Window manufacturer.	3442	adhesives, caulks	1974 New Jersey State Industrial Directory, p. G-163.
350	Royal Lite Mfg. Corp.	43 Montgomery St.	Belleville	Lighting.		Historical generator of PCB wastes	EDR, p. 8135/51539 4330768.1s-1.pdf
351	R.P. Cargille (Cargille Labs, Cargille & Sons, Cargill-Sacher Laboratories, Cargille Scientific)	55 Commerce Rd, 33 Village Park Rd.	Cedar Grove	Optical products. Located on Peckman River (tributary to Passaic River) which is impared by PCBs measured in fish tissues. (Also has addresses at 194 Second Ave. and 9 Railroad Ave. in Little Falls, NJ.)		Purchased PCBs; optical fluids with PCBs; PCBs in site soils	www.cargille.com; Monsanto Sales Summaries, 1968-1970; New Jersey Industrial Directories, 1960/61, 1964, and 1974; Cargille letter to NJDEP, July 14, 2016.
352	Rubber & Silicone Products Co.	17 Montesano Rd.	Fairfield/West Caldwell	Est. 1954. Molded rubber products.		rubber; purchased PCBs	Monsanto PCB Sales Summaries, 1968 and 1970; www.manta.com/c/mmbp0nz/rubber-silicone-products-co-inc
353	Rutgers University - Newark Campus	360 Martin Luther King, Jr. Blvd.	Newark	School.		Historical large quantity generator of wastes including PCBs	EDR, p. 28753/51539 4330768.1s-1.pdf
354	Samuel Schmidt Chemical Co.		Newark			Purchased PCBs	Monsanto PCB Sales Summaries, 1968.
355	Sandvik Steel	17-02 Nevin Rd.	Fair Lawn	Hand tools.		Purchased PCBs	Monsanto PCB Sales Summaries, 1970-1971; New Jersey Industrial Directory, 1960, 1965, and 1970.
356	Sanitrol Chemical	302 Jelliff Ave.	Newark	Adhesives. Est. 1970.		adhesives	www.usbizs.com/NJ/Newark/Sanitrol_Chemical_Co_Inc_6RI.html
357	Scher Chemicals, Inc.	1 Industrial Way & Styertowne Rd.	Clifton	Detergents and industrial chemical specialties.	2869	TSCA PCB inspection	PVSC Industrial Inventory, 1987, p. 30; EDR, p. 50835/66158 4319330.2s.pdf
358	Sealed Air Corp.	19-01 State Hwy. 208	Fair Lawn	Air cellular cushioning products; plastic foam packaging products.	3086	adhesives, coatings, heat exchanger fluids	New Jersey Industrial Directory, Fair Lawn, 1975.
359	Seidler Chemical & Supply Co., Inc.	537 Raymond Blvd.	Newark	Supplier, distributor, blender and re-packager of chemicals and ingredients.		TSCA PCB inspection/violations found.	EDR, p. 24915/51539 4330768.1s.pdf
360	Shell Oil Co (Motiva Enterprises LLC)	368 Franklin Ave.	Belleville	Gas station.		Small quantity generator of PCB wastes	EDR, p. 4485/51539 4330768.1s-1.pdf
361	Shell Oil Co. (Motiva Enterprises LLC)	10 18th Ave.	Paterson	Gas station.		Small quantity generator of PCB wastes	EDR, p. 14149/66158 4319330.2s.pdf
362	Shell Oil Co. (Motiva Enterprises LLC)	111 Franklin St.	Bloomfield	Gas station.		Small quantity generator of PCB wastes	EDR, p. 9020/51539 4330768.1s-1.pdf
363	Shell Oil Co. (Motiva Enterprises LLC)	115 Bloomfield Ave.	Montclair	Gas station.		Small quantity generator of PCB wastes	EDR, p. 2769/51539 4330768.1s-1.pdf
364	Shell Oil Co. (Motiva Enterprises LLC)	1434 McCarter Hwy.	Newark	Gas station.		Small quantity generator of PCB wastes	EDR, p. 20496/51539 4330768.1s-1.pdf
365	Shell Oil Co. (Motiva Enterprises LLC)	165 Paterson Ave.	Wallington	Gas station.		Small quantity generator of PCB wastes	EDR, p. 43270/66158 4319330.2s.pdf
366	Shell Oil Co. (Motiva Enterprises LLC)	180 Central Ave.	East Orange	Gas station.		Small quantity generator of PCB wastes	EDR, p. 16152/51539 4330768.1s-1.pdf
367	Shell Oil Co. (Motiva Enterprises LLC)	2 Ridge Rd.	Lyndhurst	Gas station.		Small quantity generator of PCB wastes	EDR, pp. 56300, 60680/66158 4319330.2s.pdf
368	Shell Oil Co. (Motiva Enterprises LLC)	205 Darling	Nutley	Gas station.		Small quantity generator of PCB wastes	EDR, p. 51525/66158 4319330.2s.pdf
369	Shell Oil Co. (Motiva Enterprises LLC)	211 Watchung Ave.	Bloomfield	Gas station.		Small quantity generator of PCB wastes	EDR, pp. 29788, 30429/31947 4330766.1s.pdf
370	Shell Oil Co. (Motiva Enterprises LLC)	214 High Mountain Rd.	Haledon	Gas station.		Small quantity generator of PCB wastes	EDR, pp. 2729, 4167/31947 4330766.1s.pdf
371	Shell Oil Co. (Motiva Enterprises LLC)	268-274 Heller Pkwy.	Newark	Gas station.		Small quantity generator of PCB wastes	EDR, p. 10401/51539 4330768.1s-1.pdf
372	Shell Oil Co. (Motiva Enterprises LLC)	299 Rte. 3 Eastbound	Clifton	Gas station.		Small quantity generator of PCB wastes	EDR, p. 56213/66158 4319330.2s.pdf
373	Shell Oil Co. (Motiva Enterprises LLC)	300 Rte. 3 Westbound	Clifton	Gas station.		Small quantity generator of PCB wastes	EDR, p. 56204/66158 4319330.2s.pdf
374	Shell Oil Co. (Motiva Enterprises LLC)	496 Central Ave.	Orange	Gas station.		Small quantity generator of PCB wastes	EDR, p. 12180/51539 4330768.1s-1.pdf
375	Shell Oil Co. (Motiva Enterprises LLC)	499 Paget Ave. & Rte. 46 EB	Clifton	Gas station.		Small quantity generator of PCB wastes	EDR, p. 25038/66158 4319330.2s.pdf
376	Shell Oil Co. (Motiva Enterprises LLC)	526 Bloomfield Ave. & 12th	Newark	Gas station.		Small quantity generator of PCB wastes	EDR, pp. 10901, 17285/51539 4330768.1s-1.pdf
377	Shell Oil Co. (Motiva Enterprises LLC)	528 Main St.	Orange	Gas station.		Small quantity generator of PCB wastes	EDR, pp. 4877, 7045/51539 4330768.1s-1.pdf
378	Shell Oil Co. (Motiva Enterprises LLC)	725 - 735 S. Orange Ave.	Newark	Gas station.		Small quantity generator of PCB wastes	EDR, p. 24074/51539 4330768.1s-1.pdf
379	Shell Oil Co. (Motiva Enterprises LLC)	735 Belleville Ave.	Belleville	Gas station.		Small quantity generator of PCB wastes	EDR, p. 7838/51539 4330768.1s-1.pdf
380	Shell Oil Co. (Motiva Enterprises LLC)	74 E Passaic Ave.	Nutley	Gas station.		Small quantity generator of PCB wastes	EDR, p. 1220/44205 4326287.1s.pdf
381	Shell Oil Co. (Motiva Enterprises LLC)	81 1st. Ave.	Paterson	Gas station.		Small quantity generator of PCB wastes	EDR, p. 6786/66158 4319330.2s.pdf
382	Shell Oil Co. (Motiva Enterprises LLC)	902 Goffle Rd. & Watchung	Hawthorne	Gas station.		Small quantity generator of PCB wastes	EDR, p. 3747/66158 4319330.2s.pdf
383	Shell Oil Co. (Motiva Enterprises LLC)	92 Lafayette & Wagaraw	Hawthorne	Gas station.		Small quantity generator of PCB wastes	EDR, p. 6632/66158 4319330.2s.pdf
384	Shell Oil Co. (Motiva Enterprises LLC)	99 - 111 Midland & River	Garfield	Gas station.		Small quantity generator of PCB wastes	EDR, pp. 41307, 44887/66158 4319330.2s.pdf
385	Shell Oil Co. (Motiva Enterprises LLC)	Rte. 23 & 2nd St.	Little Falls	Gas station.		Small quantity generator of PCB wastes	EDR, pp. 17370, 19495/31947 4330766.1s.pdf

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386	Shell Oil Co. (Motiva Enterprises LLC)	Rte. 46 WB	West Paterson	Gas station.		Large quantity generator wastes including PCBs	EDR, pp. 22050, 22052/31947 4330766.1s.pdf
387	Shell Oil Co. Motiva Enterprises LLC (Montclair State University/MSU Parking Garage)	100 Clove Rd.	Little Falls	Gas station.		Small quantity generator of PCB wastes	EDR, pp. 22261, 24690/31947 4330766.1s.pdf
388	Sher Plastics Co., Inc.	90 Dayton Ave.	Passaic	Plastic fabrications including buttons, hardware, embellishments, lables, hangtags, and packaging. Est. 1942.		plasticizers	www.sherplastics.net
389	Signature Cloth Company, Inc.	200 Clifton Blvd.	Clifton	Textile finishing.		coatings; TSCA PCB inspection	PVSC Industrial Inventory, 1987, p. 30; EDR, p. 36428/66158 4319330.2s.pdf
390	Sika Corp.	201 Polito Ave., 875 Valleybrook Ave.	Lyndhurst	Waterproofing compounds, sealants, adhesives. Est. 1937.		adhesives, sealants; TSCA PCB inspection/violations found.	New Jersey Industrial Directory, Lyndhurst, 1973; usa.sika.com; EDR, p. 4612/44205 4326287.1s.pdf
391	Silva & Son	139 Ave. L	Newark	Metal working.	5051	coatings	us-business.info/directory/newark-nj/part58/
392	Sims Metal Management	Hawkins St.	Newark	Processes scrap metal and electronics.		Electronics recycling; multiple shipments of PCB wastes to landfill.	www.simsmm.com; EDR, p. 24884/44205 432687.1s.pdf
393	Singer Kearfott (Kearfott Corporation)	165 Lackawanna Ave., 1225 McBride Ave.	West Paterson	Defense equipment manufacturer including guidance and navigation systems. Currently located at 1150 McBride Ave., Little Falls/Woodland Park, NJ.		lubricants, adhesives, coatings, paints, heat transfer fluids	www.kearfott.com
394	Social Security Bldg.	44 - 66 Van Houten Ave.	Paterson	Office building. (Prior industrial operations include Paterson Carbonic Gas and Paterson Hat.)		Soil samples show high levels of PCBs.	EDR, p. 15032/31947 4330766.1s.pdf
395	Solid Waste Transfer & Recycling Inc.	540 Doremus Ave., 442 Frelinghuysen Ave.	Newark	Garbage: collecting, destroying, and processing business.		waste handling	https://www.bloomberg.com/profile/company/0956193D:US
396	Sommers Plastic Product Co. Inc.	835 Bloomfield Ave.	Clifton	Synthetic leather/fur. Est. 1947.	3081	plasticizers, coatings; dyes	www.sommers.com
397	Sonneborn Co. (Sonneborn Build, L. Sonneborn Sons)	Hancox Ave.	Belleville	Petroleum products, lubricants, oil, waxes.		Purchased large amounts of PCBs	Monsanto PCB Sales Summaries, 1968-1971.
398	Sovereign Chem	1225 W. Market St.	Paterson			Purchased PCBs	Monsanto PCB Sales Summaries, 1971.
399	Spectrachem - Div. of AK Technologies	10 Dell Glen Ave.	Lodi	Textile printing inks, pigment dispersions, specialty adhesives.		inks, dyes	www.spectrachem.net
400	Spectrachem Corp.	200 Sheridan Ave.	Paterson	Textile printing inks/pigment dispersions.		inks, dyes; Purchased PCBs	PVSC Industrial Inventory, 1987, p. 31; Monsanto PCB Sales Summaries, 1970.
401	St. Joseph's Regional Medical Center (St. Joseph's Hospital)	703 Main St.	Paterson	Hospital.	8062	TSCA PCB inspection/ violations found.	EDR, pp. 16028, 16044/31947 4330766.1s.pdf
402	St. Mary School	95 Sherman Ave.	Paterson	School.		TSCA PCB inspection.	EDR, p. 12016/31947 4330766.1s.pdf
403	Standard Chlorine Chemical Co. Inc.	1035 Belleville Tnpk.	Kearny	From 1916-1993 production, storage and packaging of moth balls and flakes, manufacture of lead-acid batteries, formulation of drain cleaners, production of dye carriers, and distillation and purification of chlorinated benzenes. Listed on NPL 2007.		PCBs found onsite	EDR, pp. 5828, 7580, 7582, 28140/44205 4326287.1s.pdf
404	Standard Tallow Corp. (B&L Oil Corp., Vineland Construction Co.)	1215 Harrison Ave.	Kearny	Animal and marine fats and oils.	2077	Large quantity generator of wastes including PCBs; shipped PCB wastes to landfill.	www.usa.com/frs/the-standard-tallow-corporation.html; EDR, pp. 15731, 19510/44205 4326287.1s.pdf
405	Star Warehouse	90-110 Maltese Dr.	Totowa	Warehouse. (May be related to Star Stainless Screw Co.)		Deed restriction (caps, lining, soil) for wastes including PCBs.	EDR, pp. 9678, 11083/31947 4330766.1s.pdf
406	Star-Glow Rubber (Star Glo Rubber Manufacturing)	2 Carlton Ave.	East Rutherford	Est. 1950. Swiss screw machining, rubber, and rubber-to-metal components and assemblies.		rubber, plasticizers; purchased PCBs	Monsanto PCB Sales Summaries, 1970; www.starglo.com/company
407	Steel Craft Industries, Inc. (Steel Craft Fluorescent & Stamping Co.)	191 Murray St.	Newark	Est. 1946. Metal stampings, paint spraying, fluorescent fixture bodies and accessories.		light ballasts, paints, hydraulic fluids	New Jersey Industrial Directory, 1952/53, p. 626; "Steel Craft Industries Unveils High-Tech Production Capabilities," NJMEP, April 2, 2013.
408	Stevens Products Inc.	201 4th St., 128 N. Park St.	East Orange	Electric/electronic insulation materials and thermoset tubing. In business over 70 years.	5063	Electrical insulation	www.stevensproducts.net
409	Strauss Plastic Co.	111 Gotthart St.	Newark	Custom injection molding of thermoplastic resins, ultrasonic welding, and mechanical assemblies.		plasticizers; heat transfer fluids; lubricants	Department of Defense, Minority Business Directory, September 1978, p. 50.
410	Sunrise Industries Inc.	465 Hillside Ave.	Hillside			Deed restriction (caps, soil, fence) for contamination including PCBs.	EDR, pp. 35570, 39619/51539 4330768.1s-1.pdf
411	Superior Cloth Co. Inc. (may be related to Signature Cloth)	200 Clifton Blvd.	Clifton			TSCA PCB inspection.	EDR, p. 36428/66158 4319330.2s.pdf
412	Survivor Technology, Inc.	1441 Chestnut Ave.	Hillside			TSCA PCB inspection/ violations found; shipped PCB oils to landfill.	EDR, p. 39192/51539 4330768.1s-1.pdf
413	Sybron Chemicals Inc. (Caribe International)	255 Belmont Ave.	Haledon	Polymers and specialty chemicals.		Shipped PCB wastes to landfill	EDR, p. 5281/31947 4330766.1s.pdf
414	Syncon Resins Inc.	77 Jacobus Ave.	Kearny	Manufactured paints, varnishes and resins. Added to NPL in 1983. PCBs were a major contaminant.		PCBs found onsite.	EDR, pp. 19309, 27151/44205 4326287.1s.pdf
415	Talon Adhesives	160 Passaic Ave.	Kearny	Adhesives, cements, and film adhesives.		adhesives; Purchased PCBs	Monsanto PCB Sales Summaries,1966, 1968, and 1970; New Jersey Industrial Directory, Kearny, 1974.
416	Technical Rubber & Plastic	180 Getty Ave.	Clifton	Est. 1955. Manufactured rubber and plastic products.	5085	rubber, plasticizers, gaskets; purchased PCBs	Monsanto PCB Sales Summaries, 1970; New Jersey Industrial Directory, Clifton, 1970.
417	Technical Processing Inc.	81 Dale Ave., 106 Railroad Ave.	Paterson	Instruments used in rubber processing.		hydraulic fluids; heat transfer fluids.	New Jersey Industrial Directory, Paterson, 1955.
418	Temperature Processing Co.	228 River Rd.	North Arlington	Est. 1956. Heat treating.	3398	heat exchange fluids	New Jersey Industrial Directory, North Arlington, 1974.
419	Tenax Finishing Products Co.	390 Adams St.	Newark	Industrial coatings, lacquers, synthetics.	2851	coatings; TSCA PCB inspection; PCB manifesting violation	1974 New Jersey State Industrial Directory, p. G-165; EDR, p. 33060/44205 4326287.1s.pdf
420	Tex-Chem	20 Wagaraw Rd.	Fairlawn	Intermediate dyes; color lakes.		dyes; Purchased PCBs	Monsanto PCB Sales Summaries, 1962; New Jersey Industrial Directories, Fairlawn, 1960 and 1975.
421	Titan Adhesives	25 Lake St.	Paterson	Water based, hot melt adhesives	2891	adhesives	New Jersey Industrial Directory, Paterson,
422	Toch Bros.		Kearny	Protective coatings and compounds.		paints, coatings; purchased PCBs	Monsanto PCB Sales Summaries, 1962.
423	Toch Bros.	250 Vreeland Ave.	Paterson	Protective coatings and compounds.		paints, coatings; purchased PCBs	Monsanto PCB Sales Summaries, 1962-1963 New Jersey Industrial Directory, Paterson, 1965.

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424	Tomkins Tidewater Terminal	1 Jacobus Ave.	South Kearny			Historical large quantity generator of PCB wastes.	EDR, p. 30012/44205 4326287.1s.pdf
425	Tony Pallet Inc.	338 Wilson Ave.	Newark	Wood pallet recycling.		Multiple shipments of PCB wastes to landfill.	C.A. Boyles, "N.J. Recycler Seeks a Greener, Profitable Future: Tony Pallet Uses Trace Equipment to Pursue a Green Mission, Pallet Enterprise, August 1, 2008; EDR, p. 35606/44205 4326287.1s.pdf
426	Transco Pipeline	E. Rutherford Metering Station, Block 107A Lot 59F	East Rutherford	Pipeline.		PCBs and mercury reported spilled from historical discharge.	EDR, pp. 5537, 17928/44205 4326287.1s.pdf
427	Transformer Lab Services Inc. (may be part of G&S Motor Equipment)	1800 Harrison Ave.	Kearny	Transformers.		transformers; Historical small quantity generator of wastes including PCBs; TSCA PCB inspection/ violation found.	EDR, pp. 27470, 27485/44205 4326287.1s.pdf
428	Trio Dyeing & Finishing Co. Inc.	440 E. 22nd St.	Paterson	Dye and finish textile goods.	2261	dyes	PVSC Industrial Inventory, 1987, p. 34.
429	U.S. Rubber	Market St. & Passaic St.	Passaic	Rubber goods		rubber; purchased PCBs	Monsanto PCB Sales Summaries, 1962-1964; New Jersey Industrial Directory, Passaic, 1952/53.
430	Unimatic Manufacturing Corp.	25 Sherwood Ave.	Fairfield	Die casting facility. PCB contamination found inside the building and outside in soil and groundwater. NPL site.		onsite soil contamination in building, soils, and groundwater	EDR, p. 17759/31947 4330766.1s.pdf
431	Union Camp Corp., Folding Carton Div.	800 State Hwy. 3	Clifton	Box paper/carton plant.		adhesives	https://www.homefacts.com/environmentalhazards/New-Jersey/Passaic-County/Clifton/Polluter-Union-Camp-Corp-Folding-Carton-Div-07012nncmp800st.html
432	United Airlines, Inc.	Hangar 14 Newark Airport	Newark	Airline.		Purchased PCBs	Monsanto PCB Sales Summaries, 1966 and 1970.
433	United Label	65 Chambers St.	Newark	Est. 1965. Manufacturers custom printed pressure sensitive labels for commercial use.	2269	adhesives	1974 New Jersey State Industrial Directory, p. G-166.
434	United States Box Corp.	1296 Mccarter Hwy.	Newark	Paperboard boxes, corrugated boxes, acetate containers, plastic boxes.	2653	adhesives	1974 New Jersey State Industrial Directory, p. G-166.
435	United Tool & Stamping Co. Inc.	6 Andrews Dr.	West Paterson/ Woodland Park	Est. 1950. Metal stamping.		hydraulic fluids; lubricants	www.manta.com/c/mmbqfcf/contact-united-tool-stamping-co
436	United Wool Piece Dye & Finishing (United Wool Dying and United Wool Piece Dye)	1 Canal St. and 8th Ave.	Passaic	Dyeing and finishing textiles.		dyes	New Jersey Industrial Directory, Passaic, 1952/53 and 1974.
437	Universal Bonding & Processing Corp.	400 Maltese Dr.	Totowa	Adhesives; bonding of fabrics.		adhesives; Purchased PCBs	Monsanto PCB Sales Summaries, 1968.
438	Universal Manufacturing Corp. (Magnetek Universal Manufacturing)	11 Jackson Road	Totowa	Formerly Universal Manufacturing Inc. Manufacturerd fluorescent transformers, capacitors, and ballasts during 1947-1989.		Purchased large amounts of PCBs	Monsanto PCB Sales Summaries, 1971-1975.
439	Universal Manufacturing Corp. (Magnetek Universal Manufacturing)	29-51 East 6th St.	Paterson	Formerly Universal Manufacturing Inc. Manufacturerd fluorescent transformers, capacitors, and ballasts during 1947-1989.	3351	light ballasts, transformers, capacitors; purchased PCBs at nearby Totowa facility	New Jersey Industrial Directory, 1960/61, p. B-419; New Jersey State Industrial Directory, 1970, p. G-361; New Jersey State Industrial Directory, 1980, p. G-367; Monsanto PCB Sales Summaries, 1971-1975.
440	Universal Pigments	352 Doremus Ave.	Newark	Color pigments.		dyes	New Jersey Industrial Directory, 1952/53, p. 629.
441	Upsala College	339 Prospect St.	East Orange	School.		TSCA PCB inspection/violations found.	EDR, p. 7393/51539 4330768.1s-1.pdf
442	US Veterans Admin Medical Center (NJ Health Care System, East Orange)	Tremont Ave.	East Orange	Medical center.		Small quantity generator of PCB wastes	EDR, p. 16827/51539 4330768.1s-1.pdf
443	USCG	Last Rd. on Right Next to Bridge Bradford Arms & Grove	Cedar Grove			4/7/1997: "Suspected PCB contamination in area. Buildings used to store material for Gulf War. Dead animals around & warning signs posted."	EDR, pp. 23460, 24553/31947 4330766.1s.pdf
444	V. Ottilio & Sons, Inc.	Ottilio Landfill Site	Newark	Landfill and junk yard.	1794	PCBs found onsite	SMC Environmental Services Group, Revised Final Remedial Investigation Report, Ottilio Landfill, Newark, NJ, Volume 1, September 15, 1995.
445	Van Ness Plastic Molding Co.	400 Brighton Ave., 11 Railroad Pl.	Belleville	Est. 1945. Plastic pet products.	3089	plasticizers	PVSC Industrial Inventory, 1987, p. 35.
446	Vance Steel		Belleville			heat transfer fluids; purchased PCBs.	Monsanto PCB Sales Summaries, 1970.
447	W. J. Sutcliffe Co.	Curle Ave. and Lucia Pl.	Wallington	Paints and varnishes.		paints; varnishes; purchased PCBs	Monsanto PCB Sales Summaries, 1969; New Jersey Industrial Directory, Wallington, 1954/55.
448	Wal Sello Products Inc.	132 Beckwith Ave.	Paterson	Celophane tapes, laminated products.		adhesives; Purchased PCBs	Monsanto PCB Sales Summaries, 1968-1970; New Jersey Industrial Directories, Paterson, 1960, 1965, 1970, 1975, 1980, and 1985.
449	Walmart Supercenter #5752 (Vornado Inc.)	174 Passaic St.	Garfield	Vornado: Electric fans, air conditioners, dehumidifiers. (Related to O.A. Sutton Corporation and Two Guys from Harrison.)		Small quantity generator of PCB wastes	EDR, p. 44392/66158 4319330.2s.pdf
450	Walter G. Alexander Housing Development	128-130 Parrow St.	Orange	Brownfield.		Deed restriction (caps, soil) for contamination including PCBs.	EDR, pp. 14641, 15413/51539 4430768.1s-1.pdf
451	Ward Food Inc. (Ward Property Partnership, Ward Bakery Building)	1 Fourth Ave. and 13th St.	East Orange	Bread and other bakery products.		heat transfer fluids; Historical large quantity generator of wastes including PCBs; shipped PCB oils to incinerator and PCB wastes to landfill. Multiple shipments of PCB wastes.	Monsanto PCB Sales Summaries, 1968-1970; New Jersey Industrial Directory, East Orange, 1954/55.
452	Warehouse 1250 Valley Brook Ave (1250 Valley Brook Corp.)	1250 Valley Brook Ave.	Lyndhurst	Brownfield. (May be related to Kingsland Clay Products.)		Deed restriction (caps, soil) for contamination including PCBs.	EDR, p. 4910/44205 4326287.1s.pdf
453	Waste Management, Inc.	150 St. Charles St.	Newark	Municipal waste collection/disposal; recycling.	4953	waste handling	www.wm.com
454	Watson Machinery International	74 Railroad Ave.	Paterson	In business for 150 years. Started as turbine water wheel maker, then moved to iron-bridge and automobile manufacturer, then shifted to wire and cable machinery, and finally shifted to making fiber-optic cables.		wire coatings; hydraulic fluids; lubricants	https://njbiz.com/watson-machinery-international/

	Company	Street Address	City	Company Information	SIC	Industry Basis/Allegation	URL or Other Source
455	Watts-Campbell Co.	1270 Mccarter Hwy.	Newark	Heavy machining and special machinery.		hydraulic fluids; lubricants; heat transfer fluids	1974 New Jersey State Industrial Directory, p. G-167.
456	Wayne Machine & Die Co.	100 Furler St.	Totowa	Extruders, screws for injection molders and extruders, barrels, and complete production lines for blown film, sheet, compounding, and tubing. Also offers coatings/laminanting equipment.		lubricants; hydraulic fluids; heat transfer fluids; coatings	https://www.packagingimpressions.com/whoswho/company/24149/
457	Weber & Scher Mfg.	1231 U.S. 22, 263 Sussex St.	Newark	Cable and wire production. Tool and die shop. Produced coil winding machines and composite cable sheathing/taping machines.		wire/cable coatings; hydraulic fluids; lubricants	New Jersey Industrial Directory, 1952.53, p. 630; www.webscher.com
458	Welco Acetylene Corp., Welding Rent/Repair Div. (Welco Gases Corp.)	49 St. Charles St.	Newark	Welding and soldering supply.	5085	Deed restriction (caps) for contamination including PCBs.	EDR, p. 25975/44205 4326287.1s.pdf
459	Weldotron Corp.	909 Freilinghuysen Ave.	Newark	Shrink-packaging equipment.		heat transfer fluids, hydraulic fluids, lubricants; Purchased PCBs	Monsanto PCB Sales Summaries, 1969-1970.
460	West Hudson Hospital	206 Bergen Ave.	Kearny	Hospital.	8062	Historical small quantity generator of wastes including PCBs.	PVSC Industrial Inventory, 1987, p. 35; EDR, pp. 12745, 15161/44205 4326287.1s.pdf
461	Weston Instruments, Div. Sangamo Weston (Sub. of Schlumberger, Ltd.)	73 W. Ave.	Newark	Produced electrical capacitors. Plant closed 1974.		capacitors; PCBs found onsite	www.westonmeter.or.uk/the company.html
462	Weston USA Div. Solartron Transducers (Sub. of Schlumberger, Ltd.)	614 Frelinghuysen Ave.	Newark	Thermometers, aerospace indicators.	3611	TSCA PCB inspection/ violations found.	PVSC Industrial Inventory, 1987, p. 35; 1974 New Jersey State Industrial Directory, p. G-168; EDR, pp. 43813, 43846, 43855/51539 4330768.1s-1.pdf
463	Wheal Grace Corp.	300 Ralph St.	Belleville	Est. 1967. Printing business.	2732	inks	https://www.manta.com/c/mmf87td/wheal-grace-corporation
464	White Chemical Corp.	660 Frelinghuysen Ave.	Newark	Now a Superfund site. Made acid chlorides and fire retardant compounds from 1983 -1990		TSCA PCB inspection; PCBs found onsite.	EDR, pp. 43939, 48686/51538 4330768.1s-1.pdf
465	Wilbur B. Driver (Sub. Of GTE Sylvania, Inc.)	1875 McCarter Hwy.	Newark	Rod, wire, special nickel alloys.	3356	Purchased PCBs.	Monsanto PCB Sales Summaries, 1958-1964; 1974 New Jersey State Industrial Directory, p. G-147.
466	William Van Kruiningen and Sons Landfill	508 Main Ave.	Wallington	Landfill.		Deed restriction (caps, soil) for contamination including PCBs.	EDR, p. 45460/66158 4319330.2s.pdf
467	William Wilhelm Co.	222 Passaic St.	Passaic	Dyes; inks.		dyes	
468	Wilpet Tool	244 Dukes St.	Kearny	Injection molded plastics.		heat transfer fluids; plasticizers	1974 New Jersey State Industrial Directory, Kearny.
469	Wilson Imperial Co.	115 Chestnut St.	Newark	Est. 1928. Products include surface preps, cleaners, bonding liquid, paint additives and paint removers.	2851	paints/coatings; Historical small quantity generator of PCB wastes.	1974 New Jersey State Industrial Directory, p. G-168; EDR, pp. 31019, 32803/51539 4330768.1s-1.pdf
470	Wire Recycling, Inc.		Newark	Scrap Metal Facility, possibly known as H&C Metals		wire coatings	
471	WLIB-AM Transmitter (Inner City Broadcast)	1400 Valleybrook Ave.	Lyndhurst	Radio transmission station.		Large quantity generator of PCB wastes.	EDR, p. 10882/44205 4326287.1s.pdf
472	Woburn Chemical Co. (W.C. Industries, Woburn Chem NJ)	1200 Harrison Ave.	Kearny/Harrison	Agricultural chemicals. (Street address remains constant, although town address changes from Harrison to Kearny.)	3089	plasticizers; purchased PCBs	Monsanto PCB Sales Summaries, 1968; 1974 New Jersey State Industrial Directory, Kearny.
473	WOR Transmitter Facility (RKO General Inc.)	1535 Valley Brook Ave.	Lyndhurst	Radio transmission station.		Historical large quantity generator of wastes including PCBs.	EDR, P. 10890/44205 4326287.1s.pdf
474	XL Plastics	220 Clifton Blvd.	Clifton	Est. 1973. X-L Plastics™ is a manufacturer and distributor of polyethylene film, liners, bags.	2673	plasticizers	x-lplastics.com
475	Zenith Dyeing and Finishing Corp., Inc.	53 E. 23rd. St.	Paterson	Est. 1952. The company's line of business includes finishing purchased manmade fiber and silk broadwoven fabrics.	2269	dyes	https://www.manta.com/c/mbsqznr/zenith-dyeing-finishing-corporation
476	Zumtobel Lighting Co.	141 Lanza Ave., #16D	Garfield	Est. 1950 Commercial, Industrial, and Institutional Electric Lighting Fixtures.	3646	light ballasts	https://www.manta.com/c/mm4x279/zumtobel-lighting-inc

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APPENDIX A
DOCUMENTS CONSIDERED

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Document	Document I.D. Number(s)	Date
The Monstrous Pollution of the Water Supply of Jersey City and Newark		1887
Annual Report of the State Geologist of New Jersey for the Year 1893		1894
Annual Report of the State Geologist of New Jersey for the Year 1894		1895
New Jersey Supreme Court Van Cleve v. PVSC.pdf		7/23/1904
Report of Allen Hazen	MAXUS0008009	6/30/1906
The People of the State of NY v. the State of NJ and Passaic Valley Sewerage Commissioners. Stipulation	LPRSA0193782	10/1/1909
Statement by Herman Blank Chairman of Passaic Valley Sewerage Commissioners of the State of NJ for Public Works Committee House of Representatives in Connection with its Consideration of H. R. 9540	LPRSA0193853	4/8/1910
Original Contract between Passaic Valley Sewerage District and Passaic Valley Sewerage Commissioners	LPRSA0192930	5/15/1911
NJ Industrial Directories - Paterson\NJ Industrial Directory-Paterson-1912.pdf		1912
Secretary of State - Corporation of New Jersey: List of Certificates to December 31, 1911		1914
Municipal Journal Construction Features on the Passaic Valley Sewer.pdf		1/21/1915
Construction Passaic Valley Sewer.pdf		2/18/1915
Municipal Journal Constructing Passaic Valley Pumping Station.pdf		3/18/1915
State of NJ Passaic Sewerage Commissioners Brief Description of Passaic Valley Sewerage Works	LPRSA0191369	10/1/1916
Iron Age, p. 1375		12/14/1916
Distribution List of the Chemical Engineering Catalog		1917
Possible Causes of the Decline of Oil Wells and Suggested Methods of Prolonging Yield		10/26/1917
NJ Industrial Directories - Paterson\NJ Industrial Directory-Paterson-1918.pdf		1918
Bureau of Industrial Statistics Dept of Labor	LPRSA0017781	1/1/1918
The Industrial Directory of NJ	LPRSA0013736; LPRSA0047242	1/1/1918
Engineering and Cement World, pp. 21 and 25		1/1/1918
Reports of Cases Argued and Determined in the Supreme Court and, at Law, in the Court of Errors and Appeals of the State of New Jersey, The Egyptian Lacquer Manufacturing Company, Plaintiff, v. Chemical Company of America, Defendant, submitted October 17, 1919, decided October 29, 1919, Vol. VII, p. 305		1920
Brass World and Platers' Guide, Vol. XVII, No. 5		5/1921
Maier, E.J., "A 'Chemical' Analysis of the Jersey Meadows," *Chemical Age* , pp. 376-378		9/1921
Black, G.F. - "The Belleville Copper-Mine," Newark Mineralogical Society		1922
Drug & Chemical Markets, pp. 1447 and 1511		1922
Scott, W.W. History of Passaic and Its Environs, Vol.I		1922
[Order Noted and Filed]	LPRSA0004800	6/28/1922
Letter to PVSC re sources of pollution.pdf		4/30/1923
Minutes of the Town Council of the Town of Kearny		7/11/1923
[Supplemental Agreement]	LPRSA0004866	8/1/1923
Drug & Chemical Markets Guide-Book		1924
Minutes of Meetings of the Board of Commissioners of Newark NJ	LPRSA0014495	1/1/1924
Minutes of Meetings of the Board of Commissioners of Newark NJ	LPRSA0015477	1/1/1924
Minutes of Meetings of the Board of Commissioners	LPRSA0014521	9/1/1924
Minutes of Meetings of the Board of Commissioners	LPRSA0015463	9/1/1924
[Subtracted from Meter Readings]	LPRSA0194367	9/8/1924
Letter to PVSC re Manhole samples.pdf		9/19/1924
[Study of the Flow of our Sewers]	LPRSA0194363	9/25/1924
[Main Intercepting Sewer as Computed from the Charts]	LPRSA0194360	9/30/1924
[Flow of Towns in Order of Interception 09/22/0000 - 09/29/0000]	LPRSA0194357	10/15/1924
Table II. Record of Venturi Meters Showing Flow in Mgd	LPRSA0194354	10/15/1924
Table III. Flow of Towns in Order of Interception Week of 09/29/1924 to 10/06/1924	LPRSA0194355	10/15/1924

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Document	Document I.D. Number(s)	Date
Table III. Daily Record of Venturi Meters Showing Flow in Mgd	LPRSA0194347	10/21/1924
Table I. Weekly Record of Weirs Showing Flow in Mgd. Week 11/03/1924 to 11/10/1924	LPRSA0194316	11/3/1924
Table I. Record of Weirs Showing Flow in Mgd	LPRSA0194331	11/10/1924
Table No. 5. Flow of Municipalities Week of 11/17/1924 - 11/24/1924	LPRSA0194302	11/17/1924
[Paterson City Sewer Dept Reports]	LPRSA0189187	11/20/1924
Main Line	LPRSA0194303	11/26/1924
Table III. Week of 12/08/1924 - 12/15/1924	LPRSA0194268	12/8/1924
Main Line	LPRSA0194263	12/15/1924
Table V. Flow of Municipalities Week of 12/22/1924 - 12/29/1924	LPRSA0194252	12/22/1924
U.S. Tariff Commission - Census of Dyes and Other Synthetic Organic Chemicals		1925
Minutes of Meetings of the Board of Commissioners of Newark NJ	LPRSA0014535	1/1/1925
Storm Overflows	LPRSA0189149	3/1/1925
[Sewage Material Deposited]	LPRSA0189224	3/30/1925
Important	LPRSA0189223	4/5/1925
rept on invest poll nav waters and trib 2nd n y District (2)		4/29/1925
PVSC letter to City of Newark.pdf		6/1/1925
Annual Reports War Dept Fiscal Year Ended 06/30/1925 Report of the Chief of Engineers U.S. Army 01/01/1925 in Two Parts Part I	LPRSA0015351	6/30/1925
1926 Report.pdf		1926
U.S. Tariff Commission - Census of Dyes and Other Synthetic Organic Chemicals		1927
NJ Industrial Directories - Paterson\NJ Industrial Directory-Paterson-1927.pdf		1927
Letter of Director Petterson Passaic NJ with Reference to by-Pass on Clifton Sewer	LPRSA0189113	10/31/1927
By-Passing of Crude Sewage from Municipal Disposal Plant	LPRSA0188881	7/26/1928
[Formula Details]	LPRSA0191377	1/1/1930
Dundee Canal Water	LPRSA0189244	10/29/1930
NJ Industrial Directories - Paterson\NJ Industrial Directory-Paterson-1931.pdf		1931
Exhibit # 2 Chart Showing Ave. Daily Sewage Flow-00/01/1924 to 01/01/1931	LPRSA0192818	10/1/1932
Bypassing of Lodi Sewage	LPRSA0188769	4/19/1933
[Report on City Engineer of Passaic on Operating Costs]	LPRSA0191385	10/4/1933
Average Daily Sewage Flow by Years	LPRSA0193748	7/19/1934
Table II Allocation of $724556.98 Expended for Maintenance and Operation of Passaic Valley Sewerage System for the Year 01/01/1935 among the Contracting Municipalities According to Sewage Flow Contributed by Each Municipality	LPRSA0193188	1/1/1935
A Brief History of Blast-furnace Lead Smelting in America		12/15/1936
Interstate Sanitation Commission Annual Report.pdf		1937
1937 ISC Annual Report.pdf		1937
1938 ISC Annual Report.pdf		1938
NJ Industrial Directories - Paterson\NJ Industrial Directory-Paterson-1938.pdf		1938
Lacquer, U.S. Patent No. 2,120,236		6/14/1938
Lacquer Enamel, U.S. Patent No. 2,141,911		12/27/1938
Table II Allocation of $910057.85 Expended for Maintenance and Operation of the Passaic Valley Sewerage system for the Year 01/01/1939 among the Contracting Municipalities and Lessees According to the Sewerage Flow Contributed by Each	LPRSA0191712	1/1/1939
Unsigned letter re: 1-AP-47873 Passaic Valley Sewerage Comm. [vs] the Essex County Park Commission	LPRSA0198283	9/19/1939
Table V Net Amounts Due to the Passaic Valley Sewerage Commissioners by Each Municipality for the Year 01/01/1940	LPRSA0191715	1/1/1940
Woodward, H.P. Copper Mines and Mining in New Jersey, New Jersey Department of Conservation and Development		1944
Bulletin 57 Copper Mines and Mining in New Jersey		1944
Synthetic Organic Chemicals US Production and Sales 01/01/1944	LPRSA0054053	1/1/1944

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Document	Document I.D. Number(s)	Date
River Inspection	LPRSA0193244	12/15/1944
Pages from Bogert Childs Report on Repairs, Replacements, and Improvements at Newark Bay Pumping Station.pdf		5/1/1945
The Industrial Directory of NJ 01/01/1946	LPRSA0046025	1/1/1946
U.S. Department of Agriculture,Instructions on Processing for Community Frozen-Food Locker Plants		3/1946
Roark, R.C., and McIndoo, N.E., U.S. Department of Agriculture, A Second Digest of the Literature on DDT (May 1, 1944 to December 31, 1944)		5/1946
"Industrial News," Liquid Carbonic Corp., *Chemical Engineering News*, Vo. 24, No. 10, pp. 1388-1404		5/25/1946
1947 ISC Report.pdf		1947
The Stipulation in its Sanitation Phases and Passaic Valley Sewage	LPRSA0198628	2/17/1947
Letter to PVSC.pdf		2/20/1947
Sanborn map: The Egyptian Lacquer Mfg. Col, Jacobus Avenue, Kearny, p. 85		3/1947
Roark, R.C., and McIndoo, N.E., U.S. Department of Agriculture, A Third Digest of the Literature on DDT (Janurary through June 1945)		6/1947
Seventieth Annual Report	LPRSA0022066	6/30/1947
Modification Agreement of 07/01/1947	844070015	7/16/1947
Chisholm, R.D., U.S. Department of Agriculture, A Review of DDT Formulations		2/1948
U.S. Patent Office - Jiffy Manufacturing Company, Hillside, NJ, Trade-Mark 441,647		12/21/1948
New Jersey Industrial Directory 01/01/1949	LPRSA0048649	1/1/1949
Appendix A. Order Concerning Discharge of Sewage or Other Polluting Matters from the City of Jersey City into the Water of the Interstate Sanitation District	LPRSA0070414	7/7/1949
Report of Woodbridge, NJ Survery, 9-13-49.pdf	LPRSA0079167	9/13/1949
J. Smith Memo to L.A. Kolker: Preparation of 2,4,5-Trichlorophenol		11/22/1949
1950 ISC Report.pdf		1950
Grindley_1950.pdf		1950
Report of Interstate Sanitation Commission 01/01/1949	LPRSA0023078	1/20/1950
Budocks Technical Digest: Construction, Maintenance & Operation of the Navy's Shore Establishments		2/3/1950
P/S at Glen Cove	LPRSA0115616	2/23/1950
Passaic Valley Sewerage Commissioners Average Daily Sewage Flow 01/01/1950	LPRSA0192116	3/31/1950
Passaic Valley Sewerage Commissioners Average Daily Sewage Flow 10/01/1950 10/01/1951 10/01/1952	LPRSA0192046	10/1/1950
Report on Improving Sedimentation and Dispersal Facilities by Bogert-Chiles Engineering Associates.pdf		1951
Table IX Net Amounts Due to the Passaic Valley Sewerage Commissioners for the Year 01/01/1951	LPRSA0191201	1/1/1951
Table VII Charges for Excess Flow (Above Allotted Capacity for the Year 01/01/1951)	LPRSA0191258	1/1/1951
Table VIII Allocation of $25545.00 Rental and Excess Use Charges Credited to Each Contracting Municipality in Proportion with Their Unused Capacity in 01/01/1951	LPRSA0191259	1/1/1951
High Density, Free-Flowing Pigment Bases, U.S. Patent No. 2,544,636		3/6/1951
Barne, T. 2,4,5-Trichlorphenol: Operating Instructions #1		3/20/1951
Direct Discharges by Industry into the Interstate Sanitation District (1) Industrial Distribution	LPRSA0122915	7/19/1951
Memo to Board of Directors (Diamond/Kolker)		7/30/1951
Notes: TCP/Tetrachlorbenzene Process		8/22/1951
New Jersey Industrial Directory 01/01/1952 - 01/01/1953	LPRSA0048763; LPRSA0018915	1/1/1952
Table III Allocation of $1831818.00 Estimated Expenditures for Maintenance and Operation of the Passaic Valley Sewerage System for the Year 01/01/1952	LPRSA0191254	1/1/1952
Isopropyl Esters of 2,4-D & 245-T		3/15/1952

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Document	Document I.D. Number(s)	Date
Operating Insturctions: Isopropyl Esters of 2,4-D and 2,4,5-T		3/19/1952
Meeting with Representatives of the Passaic Valley Sewerage Commissioners Wednesday 03/26/1952	LPRSA0094378	3/26/1952
Passaic Valley Sewerage Commissioners Average Daily Sewage Flow 01/01/1952	LPRSA0192113	3/31/1952
[Regarding Industrial Waste Inventory No 1]	LPRSA0104847	11/19/1952
Insurance Expirations - 01/01/1953	LPRSA0191300	1/1/1953
Interstate Sanitation Commission Report 01/01/1952	LPRSA0023235	1/19/1953
Science News Letter, Vol. 63, No. 4, p. 63		1/24/1953
Passaic Valley Outfall Survey 02/03/1953	LPRSA0064432	2/5/1953
Passaic Valley Sewage Treatment Plant	LPRSA0064438	2/9/1953
Bogert Childs Supplemental Report on Improvements.pdf		2/20/1953
[Passaic Valley Sewerage Commissioners Bypassing Report]	LPRSA0189662	3/13/1953
06/01/0000 Supplement Report	LPRSA0189677	6/22/1953
[Passaic Valley Sewerage Commissioners Bypassing Report]	LPRSA0189685	8/10/1953
Jiffy Manufacturing Company advertisement		10/1953
U.S. Patent Office - Manufacture of DDT		10/6/1953
Passaic Valley Sewerage Commissioners vs. City of Newark et als. Civil Action Pretrial Order. Docket No. L-970-53	LPRSA0172008; LPRSA0224908	12/18/1953
[Passaic Valley Sewerage Commissioners Bypassing Report]	LPRSA0189646	12/28/1953
R.P. Cargille Laboratories, Inc. - Practical Refractometry by Means of the Microscope		1954
1954 Report on Repairs, Replacements and Improvements.pdf		1954
Aspinwall, K. Operating Insturctions: BEP Esters of 2,4-D and 2,4,5-T Acids		1/15/1954
Passaic Valley Sewerage Commissioners vs. City of Newark et als. Civil Action Judgment. Docket No L-970.53	LPRSA0172020	3/6/1954
Bogert Childs Report on Repairs, Replacements, and Improvements at Newark Bay Pumping Station.pdf		5/1/1954
Survey of Sewage Transmitted Across Municipal and District Lines	LPRSA0194137	6/3/1954
[Sewage Emanates from Outside the Passaic Valley Sewerage Commissioners]	LPRSA0194191	7/14/1954
Tab 47 - Chemical Week - Buyer's Guide	LPRSA0239872	9/18/1954
Letter attaching "Kearny Sells Sewer Bonds," *The Newark Evening News*		9/30/1954
[Survey of Passaic Valley Trunk Sewer]	LPRSA0194135	10/6/1954
Schoffman, M. Memorandum: 2,4,5-Trichlorophenol		11/2/1954
[Passaic Valley Sewerage Commissioners Bypassing Report]	LPRSA0189585	12/29/1954
Newark Directory 01/01/1955	LPRSA0165604	1/1/1955
Bureau Engineer's Report of Analysis of Data Municipal Sewage Treatment Works.pdf		5/24/1955
[Passaic Valley Sewerage Commissioners Bypassing Report]	LPRSA0189558	11/16/1955
"Corporate Profile… Diamond Alkali," *Journal of Agricultural and Food Chemistry*		1956
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APPENDIX B
SOURCES OF COCS TO THE LPRSA

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Sources of COCs to the LPRSA

Available data on the historical sources for each COC in the New York/New Jersey Harbor area and the watershed including the LPRSA are summarized below. This analysis does not examine discharges from specific facilities, other than EPA conclusions regarding the Diamond Alkali facility.

Dioxins and Furans[1]

Dioxins and furans are a family of compounds with similar structure and chemical characteristics.[2] They are insoluble in water, and tend to attach to organic particles that can be transported through air, water, and land emissions. At the request of EPA, the New York Academy of Sciences ("NYAS") examined *current* sources of dioxin and furan releases in the New York/New Jersey Harbor watershed, including the Passaic River. The report was issued in 2006.[3] They concluded that a major current source of dioxin atmospheric deposition in the New York/New Jersey watershed is combustion of materials containing carbon and a chlorine source, from activities such as:

- Uncontrolled burning such as structural/building fires, open burning (*e.g.,* agricultural, residential, garbage), vehicle and tire fires, and fires at waste management facilities and dumpsters,
- Controlled combustion at incinerators such as municipal solid waste, hazardous waste, sewage sludge, crematoria, and medical waste incinerators,

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1 The NYAS study used the term "dioxins" as shorthand for the suite of 210 polychlorinated dibenzo-p-dioxin and polychlorinated dibenzofuran compounds (PCDDs/PCDFs), including 2,3,7,8-TCDD and "dioxin-like compounds" such as coplanar PCBs, polychlorinated naphthalenes, and brominated and chlorinated/brominated dioxins. Of these, the compound 2,3,7,8-TCDD is the most toxic. The report also used "dioxins" to refer to data sets where fewer than the 210 compounds were measured. This report follows the NYAS convention and uses "dioxins" to mean 2,3,7,8-TCDD, TCDD toxic equivalents ("TEQs"), or PCDDs/PCDFs, unless otherwise noted. Source: G.R. Munoz and M.A. Panero, New York Academy of Sciences, Pollution Prevention and Management Strategies for Dioxins in the New York/New Jersey Harbor, August 2006, pp.33-34.

2 Centers for Disease Control and Prevention, "Dioxins, Furans and Dioxin-Like Polychlorinated Biphenyls," retrieved from https://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html.

3 G.R. Munoz and M.A. Panero, New York Academy of Sciences, Pollution Prevention and Management Strategies for Dioxins in the New York/New Jersey Harbor, August 2006.

- Landfill gas flares, and
- Combustion of contaminated/treated/painted wood.

NYAS identified the Diamond Alkali facility as a major historical contributor of dioxins to the New York/New Jersey Harbor watershed.[4] While the focus of the NYAS study was to examine present mass flows into and out of the New York/New Jersey Harbor rather than just the Passaic River, additional research has focused more narrowly on inputs to the LPRSA. One study reconstructed historical discharges from the 2,4,5-tricholorphenol purification process at the Diamond Alkali facility, finding that the 2,3,7,8-TCDD mass discharged from this process could account for the mass of 2,3,7,8-TCDD found in the LPRSA. This finding was further supported by sediment core dating from nearby sediments.[5]

A fingerprinting study by Anchor QEA concluded that the Diamond Alkali facility was the "dominant source" of 2,3,7,8-TCDD (2,3,7,8-tetrachlorodibenzodioxin) located in River sediments in the lower 14-mile stretch of the LPRSA.[6] In the Anchor QEA study, 1,2,3,4,6,7,8-HpCDD (1,2,3,4,6,7,8-heptachlorodibenzodioxin) and OCDD (octachlorodibenzodioxin), both commonly emitted by vehicle exhaust and wood fires, with OCDD also a weathering component of pentachlorophenol, were each noted as a major component of contamination above Dundee Dam and occurring at similar levels below Dundee Dam, and were thus determined to be emissions from regional background sources. Peak 2,3,7,8-TCDD concentrations from sediment cores were found to date from the 1950s, the peak period of discharging from the Diamond Alkali facility. Secondary concentration peaks were found to coincide with a 1960 trichlorophenol autoclave explosion that occurred at the Diamond Alkali facility. Additionally, concentration

[4] G.R. Munoz and M.A. Panero, New York Academy of Sciences, Pollution Prevention and Management Strategies for Dioxins in the New York/New Jersey Harbor, August 2006, pp. 107-109 and Figure 3, p. 28.

[5] R. Parette, D.J. Velinsky, and W.N. Pearson, "Reconstruction of Historical 2,3,7,8-tetrachlorodibenzo-*p*-dioxin Discharges from a Former Pesticide Manufacturing Plant to the Lower Passaic River," *Chemosphere*, Vol. 212, 2018, pp. 1125-1132.

[6] J.D. Quadrini, W. Ku, J.P. Connolly, D.A. Chiavelli, and P.H. Israelsson, Anchor QEA, "Fingerprinting 2,3,7,8-Tetrachlorodibenzodioxin Contamination Within the Lower Passaic River, *Environmental Toxicology and Chemistry*, Vo. 34, No. 7, 2015, pp. 1485-1498.

ratios of 2,3,7,8-TCDD to total TCDD were highly correlated, with ratios from samples from the Diamond Alkali facility closely matching those found in Passaic River sediments.

The Anchor QEA researchers again found PCDD/F (polychlorinated dibenzodioxin/ polychlorinated dibenzofuran) congener composition patterns in the samples at the Diamond Alkali facility and the sediment samples from River Mile ("RM") 0 to RM 10.9 to be highly similar.[7] In the area of RM 14 to RM 17.4, the PCDD/F congener fingerprinting closely matches that from above Dundee Dam. The ratios of 2,3,7,8-TCDD to total TCDD were found to support a similarity in sources for RM 0 to RM 14, with a shift in concentration ratios from RM 14 to the Dundee Dam as more consistent with upstream sources with some tidal intrusions from below.

The findings of the Anchor QEA research (and prior research reviewed by the study) are consistent with EPA's determination in its 2014 Remedial Investigation ("Remedial Investigation") of Operable Unit 2 ("OU-2") that the measured ratios of 2,3,7,8-TCDD to Total TCDD indicates the source is "almost exclusively industrial in nature since the early 1950s."[8] EPA selected 2,3,7,8-TCDD as the indicator chemical for dioxins/furans because it comprised the largest component (about 70%) of these compounds.[9] EPA data indicate the source of 2,3,7,8-TCDD is almost completely from legacy contamination, with data linking this contamination largely to the Diamond Alkali facility for RM 0 to RM 14 of the LPRSA. Contributions to total TCDD include only a minor contribution (3 percent) from above Dundee Dam. In addition, a small contribution (3-5 percent) enters the LPRSA from tidal flow from Newark Bay, determined by EPA

[7] Anchor QEA notes that other authors identified another potential PCDD/F source at approximately RM 11 (near the Third River), but Anchor QEA determined that the Diamond Alkali facility fingerprint was the dominant source to the Passaic River from RM 0 to 14 and that the other source could not be confirmed in the sediments.

[8] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 4-38.

[9] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 4-6 and Table 4-11, Summary of Indicator Chemicals.

as likely having originated from the LPRSA.[10] **Therefore, data indicate that the major source for this COC, at least for RM 0 to RM 14, was the Diamond Alkali facility.**

DDX

DDX, including DDT and metabolites DDD and DDE, were developed as organochlorine pesticides. They tend to adsorb onto organic matter or suspended particles.[11] While NYAS did not conduct a study of DDX contamination in the New York/New Jersey Harbor, another research study examined DDX in sediment samples for Newark Bay and its tributaries, including the Passaic River. The study noted that the highest concentrations of DDX occurred in the lower Passaic River, and at depths dating from peak periods of manufacture and use of DDT, 1940 to 1970.[12]

In the Remedial Investigation, EPA examined dated sediment core profiles, using DDE as an indicator of DDX. EPA found that DDE maximum values occurred over a longer period as compared to PCBs and 2,3,7,8-TCDD, with high values in 1970, and a slow decrease of the last 25 years.[13] The Remedial Investigation estimated that 86 percent of the total DDX mass was located in the Tierra Removal (Diamond Alkali facility) area, with only 4,000 kg (out of a total of 29,000 kg) located outside of the removal area.[14]

The Remedial Investigation also noted an ongoing contribution of DDE (as a surrogate for DDX) from upstream, finding that 10 percent of DDE emanates from the Upper Passaic River, 8 percent

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[10] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 4-7.

[11] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 5-6.

[12] C.A. Gillis, N.L. Bonnevie, S.H. Su, J.G. Ducey, S.L. Huntley, and R.J. Wenning, ChemRisk, "DDT, DDD, and DDE Contamination of Sediment in the Newark Bay Estuary, New Jersey," *Environmental Contamination and Toxicology*, Vol. 28, 1995, pp. 85-92.

[13] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, Appendix A, Data Evaluation Report No. 3: "Contaminant History as Recorded in the Sediments," pp. 3-15 to 3-16.

[14] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 4-27.

from Newark Bay, 3 percent each from tributaries and 1 percent from CSOs and stormwater, leaving 78 percent from historical legacy contamination in the lower Passaic River.[15] As discussed above, it is likely that at least 86 percent of this legacy contamination was related to the Diamond Alkali facility's historical operations.

PCBs

PCBs consist of a group of 209 compounds, known as congeners, with various chlorination patterns on a structure of two attached carbon (benzene) rings.[16] Commercial production of PCBs began in 1929. In 1971, there was a voluntary restriction of PCB sales to closed system applications. Regulations passed in 1976 under the Toxic Substances Control Act ("TSCA"), regulated PCB use and handling, subsequently prohibiting most uses except in a limited set of enclosed applications by 1977.[17]

While approximately 77 percent of PCBs were used in the production of transformers and capacitors in the U.S., PCBs were also employed in a wide variety of applications and products such as circuit breakers, heat transfer equipment, compressors, vacuum pumps, hydraulic fluids, lubricants, plastics/resins, paints and coatings, rubber, adhesives, sealants/caulks, flame-retardant materials, insulating materials, siding, shingles, flooring, dye carriers in carbonless copying paper, inks, waxes, wood preservatives, and pesticides. PCBs were also included in dust control sprays for roads, railroad yard, and utility work areas.[18] PCBs can also be generated

[15] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. 8-8 to 8-9.

[16] M. Panero, S. Boehme, and G. Munoz, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor, February 2005, p. 23.

[17] M. Panero, S. Boehme, and G. Munoz, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor, February 2005, pp. 30 and 44.

[18] M. Panero, S. Boehme, and G. Munoz, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor, February 2005, pp. 22, 29-30, 44-45, and 65.

inadvertently as part of manufacturing processes that combine carbon and chlorine at high temperature such as the production of dyes, pigments, titanium dioxide, and ferric chloride.[19]

In 2005, at the request of EPA, NYAS completed a study of the release of PCBs to the New York/New Jersey Harbor watershed.[20] This study estimated 1929-1975 PCB sales to the watershed at 33,034 metric tons.[21] The report noted that emissions of PCBs are continuing decades after production and sales ended, as products containing PCBs continue to be used, recycled, combusted, and disposed. The report concluded that, at present, most of the PCBs enter the Harbor through runoff, tributary inputs, volatilization, and deposition as well as remobilization from previously contaminated sites.[22]

The NYAS study looked broadly at the New York/New Jersey Harbor watershed, rather than more narrowly focusing on the Passaic River. In the Remedial Investigation, EPA attributed current PCB contamination in the LPRSA mostly to resuspension of historical contributions of PCBs (estimated at 81 percent of the current source), with contributions from the Upper Passaic River (11 percent), tidal flow from Newark Bay (7 percent), and tributary flows (1 percent) accounting for the remaining sources.[23] This finding is consistent with PCB testing conducted by the U.S. Geological Survey of PCB concentrations in tributaries to the Passaic River, where the Upper Passaic River and Pompton River (which enters the Passaic River above Dundee Dam) and

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[19] M. Panero, S. Boehme, and G. Munoz, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor, February 2005, pp. 65-67.

[20] M. Panero, S. Boehme, and G. Munoz, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor, February 2005.

/[21] M. Panero, S. Boehme, and G. Munoz, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor, February 2005, p. 31.

/[22] M. Panero, S. Boehme, and G. Munoz, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey Harbor, February 2005, p. 39.

[23] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. 5-22 to 5-23 and 8-8 to 8-9.

tributaries (particularly Saddle River) were found to contribute significant PCB loads (see Table PCB1).[24]

Table PCB1. PCB Loads (g/yr) in Passaic River Tributaries (collected 2003-2004)

Tributary	Dissolved PCB Load (g/yr)	Suspended Sediment-Bound PCB Load (g/yr)
Upper Passaic River (above confluence with Pompton River)	549	644
Pompton River	349	352
Saddle River	212	2,320
Third River	47	132
Second River	9.2	37
Comparison: Passaic River head-of-tide at Little Falls, NJ	**1,600**	**5,600**

Sediment core analyses indicate that peak PCB discharges into the Passaic River likely occurred in the late 1950s and early 1960s, with highest deposition in the 1955 to 1975 time-frame, and slowly declining thereafter.[25] Overall, the data support historical sources of PCBs consistent with the peak sales period for PCBs, with a significant portion entering the system from the Upper Passaic River, and some from tributaries.

[24] T.P. Wilson and J.L. Bonin, U.S. Geological Survey, Occurrence of Organic Compounds and Trace Elements in the Upper Passaic and Elizabeth Rivers and Their Tributaries in New Jersey, July 2003 to February 2004: Phase II of the New Jersey Toxics Reduction Workplan for New York - New Jersey Harbor, prepared in cooperation with NJDEP, Scientific Investigations Report 2007-5136, 2008, Table 10, p. 24.

[25] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 8-4, Figure 4-75a, and Appendix A, Data Evaluation Report No. 3: "Contaminant History as Recorded in the Sediments," p. 3-19.

Mercury

Mercury is another COC in the LPRSA that has had numerous historical and ongoing sources, both naturally-occurring and anthropogenic. At EPA's request, NYAS also used regional and national data to study sources of mercury to the New York/New Jersey Harbor watershed, examining air, land, and water routes as sources. This study found air discharges of mercury account for approximately 13 percent of total releases, including, for example: (1) combustion by utilities, industrial/commercial furnaces, residential furnaces, automobiles, and crematoria and (2) volatilization from fluorescent lamps, hospitals, residential thermometers, and laboratories. Wastewater disposal of mercury was found to account for 24 percent of discharges, largely caused by dental facilities and hospitals, with additional contributions by laboratories, and residential waste including thermometers. Finally, solid waste accounted for 63 percent of mercury discharges, with almost half contributed by dental facilities, followed by switches, hospital waste, thermostats, fluorescent lamps, residential thermometers, laboratory waste, and batteries.[26] While these sources account for the initial releases of mercury, the contaminant may then be redistributed through water treatment which separates the contaminant into effluent or sludge, with the sludge redistributing the contaminant through incineration, fertilizer application, or landfilling.[27]

The NYAS study largely omits historical industrial discharges of mercury. Columbia University researchers contributing to the NYAS study investigated historical sources of mercury to the Hudson-Raritan basin during 1880-2000 in their examination of mercury inputs into the New York/New Jersey Harbor.[28] They found that sediment dating of mercury showed a rapid decrease in mercury deposition at the end of the 20th century due to reduced mercury use overall, the

[26] A.L.C. de Cerreno, M. Panero, and S. Boehme, New York Academy of Sciences, Pollution Prevention and Management Strategies for Mercury in the New York/New Jersey Harbor, May 14, 2002, Table 11, p. 64.

[27] A.L.C. de Cerreno, M. Panero, and S. Boehme, New York Academy of Sciences, Pollution Prevention and Management Strategies for Mercury in the New York/New Jersey Harbor, May 14, 2002, Table 12, p. 64.

[28] N.J. Themelis and A.F. Gregory, Columbia University, Sources and Material Balance of Mercury in the New York – New Jersey Harbor, Report to the New York Academy of Sciences, October 3, 2001.

change from coal to gas as a fuel, and the change from historical incinerators to controlled waste-to-energy combustion plants.

Both production and consumption of mercury rapidly declined starting in the 1980s as regulations were implemented controlling mercury in batteries and fungicides in paints, and as producers reduced mercury use in products such as thermometers, switches, and thermostats. By the 1990s, mercury recycling regulations further reduced releases to the environment.[29] Research examining mean concentrations of mercury in Newark Bay sediments indicates some concentrations dating from before 1940, with higher concentrations dating to the 1940-1980 period (peaking in 1940) and declining significantly thereafter.[30] In the late 1980s, an EPA study of mercury releases into the New York/New Jersey Harbor estimated relative contributions of mercury at that time from the following source categories (see Table M1):[31]

Table M1. Sources of Mercury to the NY/NJ Harbor

Source	Contribution (%)
Municipal	39.59%
Industrial	0%
CSO	6.71%
Stormwater	2.69%
Tributaries	50.78%
Leachate	0.28%
Atmospheric	NA

NA = Not Available

[29] N.J. Themelis and A.F. Gregory, Columbia University, Sources and Material Balance of Mercury in the New York – New Jersey Harbor, Report to the New York Academy of Sciences, October 3, 2001, p.10.

[30] T.J. Iannuzzi and R.J. Wenning, "Distribution and Possible Sources of Total Mercury in Sediments from the Newark Bay Estuary, New Jersey," *Bulletin of Environmental Contamination and Toxicology*, Vol. 55, 1995, pp. 901-908, Figure 2.

[31] HydroQual, Inc., Task 7.1: Assessment of Pollutant Loadings to New York – New Jersey Harbor, prepared for EPA Region II, January 1991, Table 2-3, p. 8, and Figure 2-9, p. 18.

While industrial sources are not identified as contributors as of the 1980s, it is likely that a portion of the tributary (and possibly stormwater and CSO) sources are comprised of historical legacy contamination from industrial and other sources.

Looking at data more closely related to potential discharges to the LPRSA, data on mercury in the PVSC effluent shows a significant decrease in mercury concentrations over recent years, estimated at 800 kg/year in 1987 and declining to approximately 50 kg/year in 1998.[32] Likewise, influent concentrations of mercury to the PVSC showed a decline in the 1980s, from 48.0 µg/l during 1979-1980 to 5.59 µg/l during 1987/1988.[33] Analysis of sediment cores in the Passaic River dates peak concentrations of mercury to the 1950s and 1960s.

As with sediment concentrations of most other metals (with the exception of lead), the maximum concentrations for mercury were higher in the upper portion of the LPRSA (RM 11 and RM 12.6) as compared to the lower portion of the River (RM 1.4 to RM 7.8).[34] Sampling has shown elevated concentrations of mercury both above and below Dundee Dam, as shown in Table M2 below, indicating the likelihood of upstream contributions to contamination in the LPRSA.[35]

[32] N.J. Themelis and A.F. Gregory, Columbia University, Sources and Material Balance of Mercury in the New York – New Jersey Harbor, Report to the New York Academy of Sciences, October 3, 2001, p.25.

[33] HydroQual, Inc., Task 7.1: Assessment of Pollutant Loadings to New York – New Jersey Harbor, prepared for EPA Region II, January 1991, Table 4-8, p. 48.

[34] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, Appendix A, Data Evaluation Report No. 3: "Contaminant History as Recorded in the Sediments," p. 3-18.

[35] T.J. Iannuzzi and R.J. Wenning, "Distribution and Possible Sources of Total Mercury in Sediments from the Newark Bay Estuary, New Jersey," *Bulletin of Environmental Contamination and Toxicology*, Vol. 55, 1995, pp. 901-908, Table 1.

Table M2. Mercury Sediment Mean Concentrations (mg/kg) (collected 1991-1993)

Depth (cm)	Upper Passaic River (mg/kg)	Lower Passaic River (mg/kg)
Surface	2.6	3.5
20 – 80	2.8	7.5
90 – 140	3.5	7.2
> 150		5.2

The Remedial Investigation noted an ongoing contribution of mercury from upstream, finding that 11 percent of mercury still emanates from the Upper Passaic River.[36] This contribution from upstream is consistent with testing conducted by the U.S. Geological Survey of mercury concentrations in tributaries to the Passaic River, which shows that the Upper Passaic River and Pompton River (which enters the Passaic River above Dundee Dam) and other tributaries contribute significant mercury amounts both above and below Dundee Dam (see Table M3).[37]

[36] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. 8-8 to 8-9.

[37] T.P. Wilson and J.L. Bonin, U.S. Geological Survey, Occurrence of Organic Compounds and Trace Elements in the Upper Passaic and Elizabeth Rivers and Their Tributaries in New Jersey, July 2003 to February 2004: Phase II of the New Jersey Toxics Reduction Workplan for New York - New Jersey Harbor, prepared in cooperation with NJDEP, Scientific Investigations Report 2007-5136, 2008, Table 10, p. 24.

Table M3. Mercury Loads (g/yr) in Passaic River Tributaries (collected 2003-2004)

Tributary	Dissolved Mercury Load (g/yr)	Suspended Sediment Mercury Load (g/yr)
Upper Passaic River (above confluence with Pompton River)	*--	*6,500
Pompton River	*--	*3,400
Saddle River	120	4,200
Third River	46	130
Second River	*--	*1,200
Comparison: Passaic River head-of-tide at Little Falls, NJ	**1,030**	**15,000**

*Note: Dissolved concentrations were removed through blank elimination. Therefore, suspended sediment mercury load may be higher (representing both dissolved and suspended loads).

Municipality contributions of mercury to the LPRSA are also documented by mercury measurements in samples of municipality drinking water.[38]

Overall, there were significant historical contributions of mercury from municipal sources, combustion deposition, and industrial sources both above and below Dundee Dam.

Copper

Unlike some of the other COCs, NYAS did not conduct a study of copper sources to the New York/New Jersey Harbor. However, Hydroqual conducted a study for EPA examining the percentage mass flow of copper into the New York/New Jersey Harbor in the late 1980s, estimating the sources as shown in Table C1.[39]

[38] Water distribution system sampling data provided by 16 municipal water systems in the PVSC service district show varying levels of copper, lead and mercury at various times since 1983, the earliest data provided in response to New Jersey Open Public Record Act requests made in 2019.

[39] HydroQual, Inc., Task 7.1: Assessment of Pollutant Loadings to New York – New Jersey Harbor, prepared for EPA Region II, January 1991, Table 2-3, p. 8, and Figure 2-8, p. 17.

Table C1. Sources of Copper to the NY/NJ Harbor

Source	Contribution (%)
Municipal	56.97%
Industrial	0.46%
CSO	7.93%
Stormwater	7.04%
Tributaries	22.12%
Leachate	0.25%
Atmospheric	5.23%

The overwhelming current contributor is municipal wastewater discharges, followed by tributary sources. Legacy sources of copper would be a component of tributary sources, and to some extent, stormwater and CSO sources.

The 2014 Remedial Investigation evaluated dated sediment core samples for copper, finding peak concentrations during the 1950s and 1960s. Related to this time period, the Remedial Investigation also found concentrations at RM 11 and RM 12.6 that were higher than the concentrations found downstream at RM 1.4 to RM 7.7, indicating a potential upstream source during this time.[40] The Remedial Investigation also noted ongoing contributions of copper from upstream, finding that 14 percent of copper still emanates from the Upper Passaic River, with 12 percent sourced from Newark Bay, and 1 percent each from tributaries and CSOs, as shown in Table 2.[41] Municipality contributions of copper to the LPRSA are also documented by copper measurements in samples of municipality drinking water.[42] Overall, it appears that historical copper releases would have emanated largely from municipal wastewater sources, with some contribution from historical industrial sources both above and below Dundee Dam.

[40] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, Appendix A, Data Evaluation Report No. 3: "Contaminant History as Recorded in the Sediments," pp. 3-15 to 3-17.

[41] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. 8-8 to 8-9.

[42] Water distribution system sampling data provided by 16 municipal water systems in the PVSC service district show varying levels of copper, lead and mercury at various times since 1983, the earliest data provided in response to New Jersey Open Public Record Act requests made in 2019.

Lead

NYAS did not conduct a study of lead sources to the New York/New Jersey Harbor. However, Hydroqual conducted a study for EPA examining the percentage mass flow of lead into the New York/New Jersey Harbor in the late 1980s, estimating the sources shown in Table L1.[43]

Table L1. Sources of Lead to the NY/NJ Harbor

Source	Contribution (%)
Municipal	27.40%
Industrial	0.24%
CSO	14.20%
Stormwater	5.86%
Tributaries	37.98%
Leachate	0.36%
Atmospheric	13.96%

The major sources of lead to the harbor are tributaries, municipal inputs, and atmospheric deposition.

The 2014 Remedial Investigation evaluated dated sediment core samples for lead, finding peak concentrations during the 1950s and 1960s. Related to this time period, the Remedial Investigation found the highest peak concentration at RM 7.8 followed by concentrations at RM 11 and RM 12.6, unlike the other metal COCs (which observed maximum concentration at RM 11 and RM 12.6), indicating a possibility of different sources for lead versus other metals. Lead concentrations were also different in that the peaks downstream (RM 1.4 and RM 2.2) occurred in the mid-1950s, whereas peak concentrations upstream (RM 12.6) occurred in the mid-1960s. Lead concentrations declined in sediments deposited after this time.[44]

[43] HydroQual, Inc., Task 7.1: Assessment of Pollutant Loadings to New York – New Jersey Harbor, prepared for EPA Region II, January 1991, Table 2-3, p. 8, and Figure 2-8, p. 17.

[44] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, Appendix A, Data Evaluation Report No. 3: "Contaminant History as Recorded in the Sediments," p. 3-18.

The Remedial Investigation also noted an ongoing contribution of lead from upstream, finding that 19 percent of lead still emanates from the Upper Passaic River; an additional 7 percent comes from New Bay, and 4 percent comes from tributaries and CSOs. Only 71 percent comes from legacy contamination in the lower Passaic River.[45] This contribution from upstream is consistent with testing conducted by the U.S. Geological Survey of lead concentrations in tributaries to the Passaic River, where the Upper Passaic River and Pompton River (which enters the Passaic River above Dundee Dam) and other tributaries contribute significant lead amounts (see Table L2).[46]

Table L2. Lead Loads (g/yr) in Passaic River Tributaries (collected 2003-2004)

Tributary	Dissolved Lead Load (g/yr)	Suspended Sediment Lead Load (g/yr)
Upper Passaic River (above confluence with Pompton River)	*--	*1,040
Pompton River	*--	*310
Saddle River	*--	*1,140
Third River	2.8	89
Second River	2.1	56
Comparison: Passaic River head-of-tide at Little Falls, NJ	**320**	**2,700**

*Note: Dissolved concentrations were removed through blank elimination. Therefore, suspended sediment mercury load may be higher (representing both dissolved and suspended loads).

[45] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. 8-8 to 8-9.

[46] T.P. Wilson and J.L. Bonin, U.S. Geological Survey, Occurrence of Organic Compounds and Trace Elements in the Upper Passaic and Elizabeth Rivers and Their Tributaries in New Jersey, July 2003 to February 2004: Phase II of the New Jersey Toxics Reduction Workplan for New York - New Jersey Harbor, prepared in cooperation with NJDEP, Scientific Investigations Report 2007-5136, 2008, Table 10, p. 24.

Municipality contributions of lead to the LPRSA are also documented by lead measurements in samples of municipality drinking water.[47]

Overall, it appears that lead contamination in the LPRSA had numerous sources, including significant municipal and aerial deposition sources, as well as industrial inputs both above and below Dundee Dam.

Dieldrin

Dieldrin is an organochlorine pesticide as well as a metabolite (particularly when sunlight and bacteria are present) of the pesticide aldrin. Like DDX contaminants, dieldrin will tend to adsorb to organic matter or suspended particles.[48]

The 2014 Remedial Investigation analyzed dated sediment core samples for dieldrin, finding peak concentrations during the 1960s. Related to this time period, the Remedial Investigation also found concentrations at RM 11 and RM 12.6 that were five times the concentrations found downstream, indicating an upstream source during this time. While dieldrin concentrations declined somewhat after the 1960s, the concentrations then increased by a factor of five during the 1985 to 2007 time-frame. Further testing indicates "substantive" ongoing dieldrin sources from the Upper Passaic River, estimated to be the largest source, as well as the tributary Saddle River and Third River.[49] The Remedial Investigation concludes, "Dieldrin concentrations have been rising since reaching a minimum in the mid-1980s, and much of the dieldrin likely originates from the Upper Passaic River, with minor contributions from tributaries to the Lower Passaic

[47] Water distribution system sampling data provided by 16 municipal water systems in the PVSC service district show varying levels of copper, lead and mercury at various times since 1983, the earliest data provided in response to New Jersey Open Public Record Act requests made in 2019.

[48] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, pp. 5-6 to 5-7.

[49] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, Appendix A, Data Evaluation Report No. 3: "Contaminant History as Recorded in the Sediments," pp. 3-15 to 3-17.

River."[50] For recently deposited sediments, the Remedial Investigation identifies the Upper Passaic River as the major source for this COC.[51]

PAHs

PAHs (polycyclic or polynuclear aromatic hydrocarbons) represent hundreds of low-to-high molecular weight compounds comprised of two or more connected aromatic rings of carbon and hydrogen. PAHs form during incomplete combustion of organic material. PAHs are hydrophobic, and tend to sorb onto organic carbon or other particles, with about two-thirds associated with particles (sediments or suspended particles) in a water system and one-third in dissolved state.[52]

In cooperation with EPA, NYAS investigated sources of PAHs to the New York/New Jersey Harbor watershed. The finding was that the vast majority of PAHs in the watershed result from aerial deposition (814,000 kg/yr or 82 percent), followed by land discharges (11,400 kg/yr or 18 percent) and water discharges (1,800 kg/yr or less than 1 percent). Results of the analysis are summarized in Figure 1 below.[53] Quantities of PAHs released to the watershed by major source are shown below in table PAH1.[54]

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[50] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 4-39.

[51] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 4-58.

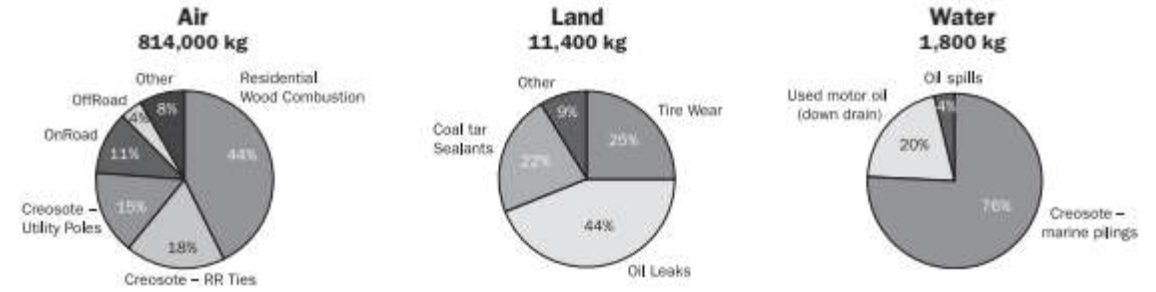
[52] S. Valle, M.A. Panero, and L. Shor, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polycyclic Aromatic Hydrocarbons in the New York/New Jersey Harbor, September 2007, pp. 39-41 ;The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, Appendix A, Data Evaluation Report No. 3: "Contaminant History as Recorded in the Sediments," pp. 3-13 to 3-15.

[53] S. Valle, M.A. Panero, and L. Shor, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polycyclic Aromatic Hydrocarbons in the New York/New Jersey Harbor, September 2007, pp.21 and Figure 2, p. 27.

[54] S. Valle, M.A. Panero, and L. Shor, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polycyclic Aromatic Hydrocarbons in the New York/New Jersey Harbor, September 2007, Figure 1, p. 21.

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Figure PAH1. Relative Releases of PAHs by Primary Medium of Release



"Other" air and land releases refer to sources that individually contribute 2% or less to total releases to the respective medium. These include industrial sources, residential and commercial fossil fuel combustion, open burning of household waste and tires, other transportation-related sources (e.g., vessel and personal boats, locomotive, airplane), and PAHs in ash residue that is sequestered in a landfill.

*Average of the estimated range of releases.

Table PAH1. Estimated Ongoing PAH Releases to NY/NJ Harbor Watershed (kg/yr)[55]

Source	Mass Released (kg/yr)
Residential Fuel Combustion	341,200
Materials Containing PAHs:	
Creosote: utility poles	122,200
Creosote: railway ties	291,600
Creosote: marine pilings	1,600
Refined coal tar sealant	900-5,800
Transportation:	
Vehicle exhaust	2,800
Tire wear	91,500
Oil leaks	5,000
Improper disposal of used motor oil (down drain)	400
Nonroad internal combustion	32,500
Oil Spills and Dumping	70

[55] S. Valle, M.A. Panero, and L. Shor, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polycyclic Aromatic Hydrocarbons in the New York/New Jersey Harbor, September 2007, Table 2, p.26.

Additional sources of PAHs that were not quantified in the above table include structural and vehicle fires, asphalt pavement and roofs, leaking underground storage tanks, commercial char-broilers, fireworks, and campfires.[56]

Some PAHs are the result of intentional industrial manufacture. One example is the industrial production of naphthalene, which is used in mothballs, paint thinners, solvents for metal surface preparations, as well as in processes in pharmaceuticals, photographic, soap, pigment and dye, insecticide, fungicide, plastics, and food industries. Other smaller PAH industrial products include acenaphthene (pigments), anthracene (dyes, wood preservatives), fluorene (oxidizing agent), phenanthrene (pesticides, resins), and pyrene (dyes).[57]

While NYAS examined PAH sources to the larger New York/New Jersey Watershed, EPA has examined PAH sources to the LPRSA. By examining sediment cores from the LPRSA, the 2014 Remedial Investigation determined that PAHs were present in almost all samples at all depths. While PAH concentrations increased slightly at depth, there was no decline for the deepest sediments, suggesting a fairly continuous sourcing of PAHs over time. Depth measurements of PAHs concentrations in sediment cores indicate that maximum discharges occurred prior to 1950. Heavy-molecular-weight PAHs (*e.g.,* benzo[a]pyrene, fluoranthene) comprised about 80 percent of Total PAHs, with low-molecular-weight PAHs (*e.g.*, phenanthrene) accounting for the rest.[58]

The 2014 Remedial Investigation for the LPRSA also identifies continuing loads of PAHs to the LPRSA, with sources coming from the Upper Passaic River: "PAHs contamination showed no decline with time since about 1970 and appears to be controlled by external loads originating in

[56] S. Valle, M.A. Panero, and L. Shor, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polycyclic Aromatic Hydrocarbons in the New York/New Jersey Harbor, September 2007, Table 2, p.88.

[57] S. Valle, M.A. Panero, and L. Shor, New York Academy of Sciences, Pollution Prevention and Management Strategies for Polycyclic Aromatic Hydrocarbons in the New York/New Jersey Harbor, September 2007, Table 2, p.47.

[58] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 5-8.

the Upper Passaic River."[59] For recently deposited sediments, the Remedial Investigation identifies the Upper Passaic River as a major source for this COC.[60] The Remedial Investigation concludes: "[T]he sources of PAH contamination to the Lower Passaic River are not abating." [61]

Overall, it appears that PAH contamination in LPRSA sediments are largely from non-industrial sources. The Upper Passaic River also continues to serve as a major ongoing source of this COC.

[59] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 4-39.

[60] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, p. 4-58.

[61] The Louis Berger Group, Battelle, and HDR/HydroQual, *Lower Eight Miles of the Lower Passaic River: Remedial Investigation Report for the Focused Feasibility Study*, prepared for EPA, 2014, Appendix A, Data Evaluation Report No. 3: "Contaminant History as Recorded in the Sediments," pp. 3-13 to 3-15.

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APPENDIX C
EXAMPLES OF NON-PARTICIPATING COMPANIES THAT LIKELY DISCHARGED PCBS

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Examples of Non-Participating PCB Parties in the Allocation

Examples of potentially major PCB-discharging facilities that are not a part of this allocation effort include (but are not limited to):

- ***Cargille Laboratories*** (aka Cargille Labs, R.P. Cargille Laboratories, Cargille & Sons, Cargille-Sacher Laboratories, Cargille Scientific) started operations in 1924 to manufacture optical fluids and immersion oils and provide products to the laboratory science industry. Operations included four facilities in Little Falls (194 Second Avenue, 9 Railroad Avenue) and Cedar Grove (33 Village Park Road, 55 Commerce Road), New Jersey, with operations presently continuing at 55 Commerce Road in Cedar Grove, New Jersey.[1] The four facilities were located in areas serviced by the Passaic Valley Sewerage Commission ("PVSC") and were located near the Passaic River or its tributaries (for example, Peckman River in Cedar Grove). Untreated wastes from these facilities would have been discharged to the Passaic River whenever the Yantacaw Bypass was opened to the river, *i.e.,* during heavy rains and maintenance/repair activities. R.P. Cargille Laboratories used PCBs as a major component of its immersion oils. When it filed for an immersion oil formulation patent in 1974, the company stated that "the vast majority of such prior art oils contain polychlorinated biphenyls (PCBs)…The prior art formulations typically contained a polychlorinated biphenyl which was blended or mixed with a mineral oil and viscosity adjusting agents to provide a good operating characteristic immersion oil…"[2] Cargille is documented as having purchased 66,662 pounds of PCBs during 1968-1972.[3] The company continues to store PCBs at its current location under a storage-and-use exemption from EPA.[4] PCBs, metals, and PAHs have been identified in site soils at

[1] *New Jersey Industrial Directory*, 1960-61, p. B-378; *New Jersey State Industrial Directory,* 1964, p. B-104; Deed, Cargille Sons, Inc., October 29, 1974; Cargille Laboratories response to EPA Request for Information regarding the Lower Passaic River Study Area, September 30, 2008.

[2] Immersion Oil Formulations for Use in Microscopy and Similar Fields, United States Patent No. 3,929,667, December 30, 1976

[3] Monsanto Sales Summaries, RP Cargille, 1968-1972.

[4] Cargille Laboratories response to EPA Request for Information regarding the Lower Passaic River Study Area, September 30, 2008; 40 CFR Ch. I, §761.80, July 1, 2005.

the current facility at levels exceeding New Jersey Soil Remediation Standards.[5] The facility is upgradient and adjacent to the Peckman River (tributary to the Passaic River), which has also been noted as contaminated with PCBs.[6]

- ***Hardman Inc.,*** a company that has manufactured adhesives in Belleville, New Jersey since the late 1800s, should be considered a potentially responsible party ("PRP") for PCBs in the LPRSA. By the mid-1950s, the company was located on Cortlandt Street in Belleville, and is documented at its present location of 600 Cortlandt Street by 1967. Available sales records show that the facility purchased 32,100 pounds of PCBs during 1968 to 1972. The facility is located near the Passaic River, so there was a potential for direct discharge to the river. The facility is also served by the Passaic Valley Sewer Commission ("PVSC"), which routinely discharged untreated waste directly to the river. Hardman continues to operate its facility at 600 Cortlandt Street in Belleville, and is owned by Royal Adhesives and Sealants LLC.
- ***Universal Manufacturing***, a manufacturer of fluorescent transformers, capacitors, and ballasts, operated at two facilities: (1) from 1951 to 1989 in Paterson, New Jersey (29-51 East 6th Street) near the Passaic River and the East Fifth Street and Fifth Avenue CSO, and (2) from approximately 1971 to 1989 in Totowa, New Jersey (111 Jackson Road).[7] Available PCB sales records show that Universal Manufacturing's Totowa facility received over 6 million pounds of PCB products during 1971 to 1977.[8] EPA documented that Universal Manufacturing used PCBs in its capacitors, ranking the company as the third highest user of PCBs for this purpose.[9] Universal Manufacturing's patents also indicate the use of metals throughout its operations, including solder which could be a source of lead.[10]

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5 NJDEP Receptor Evaluation (RE) Form, Cargille Sons, 2016; Cargille Laboratories letter to NJDEP, July 14, 2016.

6 EPA, Water Quality Assessment Report, 2014 Waterbody Report for Peckman River; EPA, 303(d) Impaired Waterbody History Report, Peckman River, 2014.

7 *New Jersey Industrial Directory plus the New Jersey Industrial Market* Place, 1960-1961, p. B-419; *1970 New Jersey State Industrial Directory*, p. G-361; *1974 New Jersey State Industrial Directory*, p. G-350; *1980 New Jersey State Industrial Directory*, p. G-367; W.M. Adler, "A Job on the Line," *Mother Jones*, March/April 2000.

8 Monsanto Sales Summaries, Univ Mfg Corp, 1971-1977.

9 EPA, PCBs in the United States Industrial Use and Environmental Distribution, Task I, February 25, 1976, Table 3.1.1-1, p. 69.

10 Thermal Protective Arrangement for Inductive Devices, U.S. Patent 3,275,774, September 27 1966; Feed Through Insulator, U.S. Patent 3,329,762, July 4, 1967; Ballast Apparatus Using Leakage Reactance of Split Primary

The company's Paterson facility was located near the Passaic River and on the East Fifth Street and Fifth Avenue CSO, which had a projection of 60-65 overflows per year in 1975.[11] According to the PVSC's 1977 Industrial Waste Survey, with a discharge of 50,000 gallons per day or more, Universal Manufacturing was classified as a major contributor of industrial waste to the sewers.[12] In addition to routine overflows of waste into the Passaic River through the CSO, Universal Manufacturing's untreated waste would have been directed to the river when (1) the City of Paterson bypassed untreated waste to the river during maintenance and storm bypass events, and (2) the PVSC bypassed untreated waste to the river during maintenance and storm bypass events, both at the Fifth Avenue CSO and at the Yantacaw Bypass. Universal Manufacturing's Paterson facility was also identified by the PVSC as having a pollution violation to the Passaic River (or its tributaries) in 1978.[13]

The Totowa facility was located on Naachtpunkt Brook, a tributary to the Passaic River, and the sewers in Totowa discharged into the PVSC main interceptor. The facility's wastes would have been discharged untreated to the Passaic River through the Yantacaw bypass when opened by the PVSC.[14] EPA also identified the Universal Manufacturing Totowa facility as directly discharging PCBs into tributaries of the Passaic River.[15] Columbus McKinnon

Winding, U.S. Patent 3,418,527, December 24, 1968; Clamp and Laminations, U.S. Patent 3,474,371, October 21, 1969; Metallized Film Capacitor, U.S. Patent 4,897,761

[11] Elson T. Killam Associates, Report Upon Overflow Analysis to the Passaic Valley Sewerage Commissioners, Passaic River Overflows, Paterson Area, 1976; Elson T. Killam Associates, Report Upon Overflow Analysis to the Passaic Valley Sewerage Commissioners, Passaic River Overflows, East 5th St. & 5th Ave., Paterson, 1976.

[12] PVSC, Semi-Annual Report, Industrial Waste Survey, September 30, 1977.

[13] PVSC, Annual Report of the PVSC for the Year 1978, Report of River Inspection Department, p. 20.

[14] Map of 111 Jackson Road, Totowa, NJ, Google Maps, retrieved from https://www.google.com/maps/place/111+Jackson+Rd,+Totowa,+NJ+07512/@40.9011749,74.2487913,15z/data=!4m5!3m4!1s0x89c3018afdd5684f:0x974c98600e6523fa!8m2!3d40.9085053!4d-74.2440706; Totowa Sewer Department, retrieved from http://www.totowanj.org/sewer.html.

[15] R. Severo, "E.P.A. Aide Warns of Toxic Leakage," *The New York Times*, November 20, 1975. Retrieved from https://www.nytimes.com/1975/11/20/archives/epa-aide-warns-of-toxic-leakage-says-10-million-pounds-of-pcb.html.

Corporation of Getzville, New York, appears to be the viable successor to Universal Manufacturing via its acquisition of Magnetek.[16]

Prior research indicates that there are numerous insolvent PRPs that handled PCBs in the areas served by the PVSC system, whose bypasses and CSOs discharged untreated waste to the Passaic River. Examples of such insolvent PRPs, for which the PVSC serves as the last viable allocable party through its arranger/transporter roles, include (but are not limited to) the following entities, whose PCB usage is described below:

- *Atlantic Chemical Corp.* was located at 153 Prospect Street, Passaic, N.J. (with a laboratory located at 10 Kingsland Road, Nutley, N.J.). This company researched and produced coal tar dyestuffs, organic intermediates, and fine organics.[17] The facility in Passaic purchased 24,000 pounds of PCBs (Aroclor 1248) between 1962 and 1965.[18] The Passaic and Nutley facilities were located in municipalities that joined the PVSC in 1911 and whose waste would have flowed through the Yantacaw Bypass when the PVSC bypassed untreated waste to the Passaic. Atlantic Chemical Corp. eventually became part of Chemtura (via Crompton & Knowles, Witco Corporation, Crompton Corporation, and Great Lakes Chemical Corporation), which filed for bankruptcy in 2009.[19]
- *Garden State Paper* was located at 950 River Drive in Garfield, N.J., where it recycled paper. PCBs are a common contaminant in historical paper recycling operations.[20] A

[16] Columbus McKinnon Corporation, 2016 Annual Report and 10-K; Attachment 2 - Columbus McKinnon Corp, Form 10-K, 2017.

[17] *Industrial Research Laboratories of the United States*, Washington, D.C.: National Academy of Sciences - National Research Council, eleventh edition, 1960, p. 44.

[18] Monsanto PCB Sales records [LPCPG0000640 and 0000649].

[19] "Chemtura Files for Bankruptcy," *The New York Times*, March 19, 2009.

[20] EPA, *PCBs in the United States Industrial Use and Environmental Distribution: Task* I, February 25, 1976, pp. 129-139.

PVSC diagram identifies Garden State Paper as linked to the PVSC's Yantacaw bypass.[21] Garden State Paper filed for bankruptcy in 2001.[22]

- *Maas & Waldstein*, located at 437 Riverside Avenue, Newark, N.J. which later became 2121 McCarter Highway, in the area serviced by the Verona Avenue, Newark bypass operated by the PVSC. The company manufactured coatings, lacquers, colors, flavors, and explosives.[23] Available PCB sales records show that the facility purchased 9,380 pounds of PCBs (Aroclors 1221, 1254 and 5460 Hi Sol) between 1964 and 1971.[24] The company was dissolved in 1993.[25]
- *Marcal Paper Mills* was located at 1 Market Street in Elmwood Park, N.J., starting in 1932 as the largest paper recycler in the state. PCBs are a common contaminant in historical paper recycling operations.[26] A PVSC diagram identifies Marcal Paper as linked to the PVSC's Yantacaw bypass.[27] Marcal was the recipient of regulatory enforcement actions in 1991 and 1994 as a result of its handling of PCBs.[28] The company completed bankruptcy proceedings in 2007, committing the reorganized company to clean up onsite contamination but releasing it from contamination of the Passaic River.[29]

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[21] Manganaro, Martin and Lincoln, Schematic Diagram of Existing Metering System [LPRSA0046087; LPRSA 0239267].

[22] Rosenberg, J. "Enron N.J. Mill Files for Chap. 11," *Editor & Publisher,* December 18, 2001, accessed at http://www.editorandpublisher.com/news/enron-n-j-mill-files-for-chap-11/.

[23] *Industrial Research Laboratories of the United States*, Washington, D.C.: National Academy of Sciences - National Research Council, eleventh edition, 1960, p. 300; Baptista, R.J., "Maas & Waldstein Company, Newark, New Jersey," April 5, 2011, accessed at http://www.colorantshistory.org/MaasWaldstein.html.

[24] Monsanto PCB sales records [LPRSA0041661, 0041661, 0041710, 0041723, and 0041810 and LPCPG0000417, 437, 457, 481, and 540].

[25] "Maas & Waldstein Company," Company-detail.com, accessed at https://www.company-detail.com/company-maas-amp-waldstein-company-26396.

[26] EPA, *PCBs in the United States Industrial Use and Environmental Distribution: Task* I, February 25, 1976, pp. 129-139.

[27] Manganaro, Martin and Lincoln, Schematic Diagram of Existing Metering System [LPRSA0046087; LPRSA 0239267].

[28] EDR, DataMap Environmental Atlas, June 18, 2015, Inquiry Number 4139330.2s, p. 19279/66158.

[29] "Marcal Paper Mills, Inc. Settles Claim with Environmental Protection Agency: Company Remains on Target for September Emergence from Chapter 11," *PR Newswire*, July 26, 2007, accessed at http://www.prnewswire.com/news-releases/marcal-paper-mills-inc-settles-claim-with-environmental-

- *Sonneborn Chemical and Refining Corporation* was located in Belleville, N.J.,[30] a municipality that contracted to join the PVSC system in 1911. The facility purchased 975,900 pounds of PCBs (Aroclors 1242, 1248, 1254, 1260, 1262, 1268, 1268, and 5460 Hi Sol) during 1968-1971.[31] Sonneborn merged into Witco Corporation, which ultimately became part of Chemtura.[32] Chemtura filed for bankruptcy in 2009.[33]
- *U.S. Rubber* produced rubber at a facility located on Passaic and Market Streets in Passaic, N.J,[34] a municipality that joined the PVSC in 1911 and whose waste would have been discharged through the Yantacaw Bypass when the PVSC opened it. The facility purchased 20,050 pounds of PCBs (Aroclors 1232 and 1242 and Therminol FR-2) during 1962-1964.[35] U.S. Rubber changed its name to Uniroyal,[36] which sold the Passaic facility in 1977[37] and filed for bankruptcy in 2002.[38]

protection-agency-52777102.html; Term Sheet -- NJDEP & NEWCO, November 5, 2007, accessed at http://www.state.nj.us/dep/srp/legal/marcal200804summary.pdf.

30 *Industrial Research Laboratories of the United States*, Washington, D.C.: National Academy of Sciences - National Research Council, eleventh edition, 1960, p. 431.

31 Monsanto PCB sales records [LPRSA0041666, 0041667, 0041680, 0041697, 0041713, and 0041816 and LPCPG0000016, 017, 020, 021, 022, 023, 027, 018, 029, 031, and 033].

32 W. Saxon, "Rudolf Sonneborn Dies at 87," *The New York Times*, June 4, 1986; Witco Corporation, *NNDB*, 2012, accessed at http://www.nndb.com/company/844/000126466/.

33 "Chemtura Files for Bankruptcy," *The New York Times*, March 19, 2009.

34 DePalma, A., "New Life for Old Uniroyal Complex," *The New York Times*, March 4, 1984, accessed at http://www.nytimes.com/1984/03/04/realestate/new-life-for-old-uniroyal-complex.html.

35 Monsanto PCB sales records [LPCPG0000638, 639, 642, and 645].

36 S. Yacob, *The United States and the Malaysian Economy*, 2008, New York: Routledge, p. 159.

37 DePalma, A., "New Life for Old Uniroyal Complex, *The New York Times*, March 4, 1984, accessed at http://www.nytimes.com/1984/03/04/realestate/new-life-for-old-uniroyal-complex.html.

38 "Uniroyal Technology Corp. Files Voluntary Petitions for Reorganization, Receives Commitment for up to $15 Million in Financing," *PR Newswire*, August 26, 2002, accessed at http://www.prnewswire.com/news-releases/uniroyal-technology-corp-files-voluntary-petitions-for-reorganization-receives-commitment-for-up-to-15-million-in-financing-76838592.html.

ATTACHMENT P

BYPASS VALVE WORKSHEETS

Diamond Alkali-Lower Passaic River Allocation

SUMMARY			
Documented PVSC Bypasses Outlets	**Total Time of Bypasses**	**Total Time Observed**	**Bypass % total time**
Union	14346:34:00	115597:50:00	12.41%
Verona	8484:45:00	106697:00:00	7.95%
4th Avenue	13470:30:00	115604:30:00	11.65%
Clay Street	14505:04:12	114845:10:00	12.63%
City Dock	8695:55:00	87155:30:00	9.98%
Polk	13647:55:00	115069:30:00	11.86%
Yantacaw	2465:40:00	106063:15:00	2.32%

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

Allocation Report			
	Time of bypasses	Time observed	% of Total Time
1950-1962	13749:54:00	107269:50:00	12.82%
1974-1975	596:40:00	8328:00:00	7.16%
Total	14346:34:00	115597:50:00	12.41%

Koch report 1950-1962 (PAP-00488396 - PAP-00488405)					
Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	AlterEcho Bates Number (throw-out logs)	Comments
10/4/1950 22:00	10/5/1950 11:30	13:30:00	LPRSA0188654	PAP-00456047-048; PAP-00456399	
10/10/1950 2:30	10/10/1950 8:30	6:00:00	LPRSA0188652	PAP-00456397	
10/12/1950 13:30	10/13/1950 9:30	20:00:00	LPRSA0188650	PAP-00456049; PAP-00456395	
10/23/1950 13:30	10/24/1950 9:00	19:30:00	LPRSA0188648	PAP-00456393	
11/20/1950 18:00	11/21/1950 9:00	15:00:00	LPRSA0188646	PAP-00456051; PAP-00456391	
11/25/1950 9:00	11/25/1950 13:00	4:00:00	LPRSA0188643	PAP-00456053; PAP-00456388	
12/4/1950 12:30	12/4/1950 21:00	8:30:00	LPRSA0188641	PAP-00456056; PAP-00456386	
12/7/1950 16:00	12/8/1950 11:30	19:30:00	LPRSA0188637	PAP-00456058; PAP-00456382	
12/15/1950 22:30	12/16/1950 9:00	10:30:00	LPRSA0188639	PAP-00456060; PAP-00456384	
12/29/1950 12:30	12/30/1950 11:30	23:00:00	LPRSA0188635	PAP-00456062; PAP-00456380	
1/7/1951 17:00	1/8/1951 9:00	16:00:00	LPRSA0188633	PAP-00456074; PAP-00456378	
1/11/1951 17:30	1/12/1951 8:30	15:00:00	LPRSA0188619	PAP-00456076; PAP-00456364	
1/14/1951 18:00	1/15/1951 12:00	18:00:00	LPRSA0188631	PAP-00456078; PAP-00456376	
1/23/1951 2:00	1/24/1951 14:00	36:00:00	LPRSA0188621	PAP-00456080; PAP-00456366	
1/25/1951 16:00	1/25/1951 19:00	3:00:00	LPRSA0188623	PAP-00456072; PAP-00456368	
1/28/1951 17:00	1/29/1951 8:30	15:30:00	LPRSA0188625	PAP-00456370	
1/29/1951 19:30	1/30/1951 10:00	14:30:00	LPRSA0188625	PAP-00456370	
1/31/1951 16:00	2/1/1951 15:00	23:00:00	LPRSA0188628	PAP-00456082; PAP-00456373	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

2/7/1951 11:00	2/7/1951 19:30	8:30:00	LPRSA0188585	PAP-00456085: PAP-00456330	
2/10/1951 5:30	2/10/1951 12:00	6:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/11/1951 18:00	2/13/1951 8:30	38:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/13/1951 19:45	2/14/1951 10:00	14:15:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/14/1951 17:45	2/15/1951 9:30	15:45:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/17/1951 4:00	2/17/1951 22:00	18:00:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/19/1951 17:00	2/20/1951 9:30	16:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/20/1951 16:00	2/21/1951 17:30	25:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/22/1951 10:30	2/22/1951 11:45	1:15:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/23/1951 8:30	2/23/1951 10:00	1:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/23/1951 15:00	2/23/1951 15:30	0:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
	2/24/1951 9:30		LPRSA0188596	PAP-00456064; PAP-00456341	
3/1/1951 14:30	3/2/1951 10:00	19:30:00	LPRSA0188604	PAP-00456349	
3/3/1951 15:00	3/5/1951 10:30	43:30:00	LPRSA0188606	PAP-00456351	
3/13/1951 16:30	3/14/1951 15:00	22:30:00	LPRSA0188609	PAP-00456354	
3/16/1951 16:00	3/19/1951 9:30	65:30:00	LPRSA0188612	PAP-00456357	
3/19/1951 17:00	3/20/1951 12:00	19:00:00	LPRSA0188616	PAP-00456361	
3/22/1951 0:00	12/31/1951 23:59				
2/17/1952 2:00	2/18/1952 9:00	31:00:00	LPRSA0189755	PAP-00456150	
2/20/1952 16:00	2/21/1952 8:00	16:00:00	LPRSA0189754	PAP-00456149	
2/29/1952 18:00	3/1/1952 9:00	15:00:00	LPRSA0189753	PAP-00456148	
3/1/1952 11:00	3/3/1952 9:00	46:00:00	LPRSA0189753	PAP-00456148	
3/3/1952 16:30	3/4/1952 8:00	15:30:00	LPRSA0189753	PAP-00456148	
3/4/1952 16:00	3/5/1952 8:30	16:30:00	LPRSA0189753	PAP-00456148	
3/5/1952 16:00	3/6/1952 8:00	16:00:00	LPRSA0189753	PAP-00456148	
3/11/1952 2:00	3/17/1952 13:00	155:00:00	LPRSA0189752	PAP-00456147	
3/19/1952 9:00	3/19/1952 18:30	9:30:00	LPRSA0189751	PAP-00456146	
3/22/1952 15:00	3/24/1952 9:00	42:00:00	LPRSA0189750	PAP-00456145	
3/24/1952 18:00	3/25/1952 9:00	15:00:00	LPRSA0189750	PAP-00456145	
4/4/1952 16:30	4/6/1952 8:30	40:00:00	LPRSA0189749	PAP-00456144	
4/14/1952 1:00	4/14/1952 10:00	9:00:00	LPRSA0189748	PAP-00456143	
4/14/1952 14:00	4/14/1952 15:30	1:30:00	LPRSA0189748	PAP-00456143	
4/23/1952 16:30	4/24/1952 8:30	16:00:00	LPRSA0189747	PAP-00456142	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

4/25/1952 8:00	4/25/1952 19:00	11:00:00	LPRSA0189744	PAP-00456139	
4/26/1952 10:00	4/28/1952 10:30	48:30:00	LPRSA0189744	PAP-00456139	
4/29/1952 16:15	4/30/1952 9:00	16:45:00	LPRSA0189745	PAP-00456140	
5/5/1952 9:00	5/5/1952 16:30	7:30:00	LPRSA0189745	PAP-00456140	
5/6/1952 15:00	5/6/1952 21:30	6:30:00	LPRSA0189745	PAP-00456140	
5/11/1952 21:00	5/12/1952 9:00	12:00:00	LPRSA0189743	PAP-00456138	
5/12/1952 15:00	5/12/1952 16:15	1:15:00	LPRSA0189743	PAP-00456138	
5/13/1952 14:00	5/14/1952 8:00	18:00:00	LPRSA0189743	PAP-00456138	
5/18/1952 7:00	5/19/1952 9:00	26:00:00	LPRSA0189741	PAP-00456136	
5/19/1952 18:00	5/20/1952 14:30	20:30:00	LPRSA0189741	PAP-00456136	
5/21/1952 15:15	5/22/1952 9:00	17:45:00	LPRSA0189741	PAP-00456136	
5/22/1952 15:30	5/23/1952 13:30	22:00:00	LPRSA0189742	PAP-00456137	
5/25/1952 8:00	5/25/1952 13:30	5:30:00	LPRSA0189740	PAP-00456135	Start time difficult to read on throw out log. Defaulted to Koch report
5/26/1952 10:00	5/27/1952 8:00	22:00:00	LPRSA0189740	PAP-00456135	
5/31/1952 3:30	5/31/1952 8:00	4:30:00	LPRSA0189738	PAP-00456133	
6/2/1952 14:30	6/3/1952 9:00	18:30:00	LPRSA0189738	PAP-00456133	
6/4/1952 20:00	6/6/1952 9:00	37:00:00	LPRSA0189736	PAP-00456131	
6/9/1952 8:00	6/10/1952 16:30	32:30:00	LPRSA0189736	PAP-00456131	
6/11/1952 13:45	6/11/1952 16:45	3:00:00	LPRSA0189737	PAP-00456132	
6/17/1952 16:30	6/17/1952 20:45	4:15:00	LPRSA0189735	PAP-00456130	
6/19/1952 16:15	6/20/1952 10:45	18:30:00	LPRSA0189734	PAP-00456129	
6/27/1952 15:30	6/28/1952 8:00	16:30:00	LPRSA0189729	PAP-00456124	
6/29/1952 0:01	6/30/1952 9:00	32:59:00	LPRSA0189728	PAP-00456123	
7/8/1952 15:30	7/10/1952 9:00	41:30:00	LPRSA0189730	PAP-00456125	
7/21/1952 15:30	7/22/1952 9:30	18:00:00	LPRSA0189726	PAP-00456121	
7/31/1952 16:00	8/1/1952 9:00	17:00:00	LPRSA0189724	PAP-00456119	
8/2/1952 15:30	8/3/1952 8:30	17:00:00	LPRSA0189725	PAP-00456120	
8/6/1952 14:00	8/6/1952 19:30	5:30:00	LPRSA0189715	PAP-00456110	
8/8/1952 13:00	8/9/1952 14:00	25:00:00	LPRSA0189715	PAP-00456110	
8/10/1952 8:30	8/11/1952 8:00	23:30:00	LPRSA0189716	PAP-00456112-113	
8/11/1952 16:30	8/12/1952 8:00	15:30:00	LPRSA0189719	PAP-00456114-115	
8/12/1952 16:00	8/13/1952 8:00	16:00:00	LPRSA0189721	PAP-00456116-117	
8/13/1952 16:00	8/14/1952 8:00	16:00:00	LPRSA0189720	PAP-00456117-118	
8/15/1952 16:00	8/17/1952 8:00	40:00:00	LPRSA0189714	PAP-00456109	
8/21/1952 15:30	8/22/1952 9:00	17:30:00	LPRSA0189713	PAP-00456108	
8/30/1952 9:00	9/2/1952 8:00	71:00:00	LPRSA0189712	PAP-00456107	
9/2/1952 16:00	9/3/1952 13:00	21:00:00	LPRSA0189711	PAP-00456106	
9/15/1952 15:00	9/17/1952 16:00	49:00:00	LPRSA0189709	PAP-00456104	
9/18/1952 12:00	9/20/1952 8:00	44:00:00	LPRSA0189710	PAP-00456105	
9/23/1952 9:30	9/23/1952 13:00	3:30:00	LPRSA0189708	PAP-00456103	
10/2/1952 18:00	10/2/1952 21:30	3:30:00	LPRSA0189707	PAP-00456102	
10/28/1952 16:30	10/29/1952 8:00	15:30:00	LPRSA0189706	PAP-00456101	
11/2/1952 8:15	11/2/1952 13:15	5:00:00	LPRSA0189705	PAP-00456100	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

11/3/1952 13:00	11/4/1952 8:00	19:00:00	LPRSA0189703	PAP-00456098	
11/10/1952 15:30	11/11/1952 8:00	16:30:00	LPRSA0189704	PAP-00456099	
11/14/1952 15:15	12/1/1952 12:45	405:30:00	LPRSA0189701	PAP-00456096	
12/2/1952 13:00	12/5/1952 17:00	76:00:00	LPRSA0189702	PAP-00456097	
12/9/1952 10:30	1/18/1953 16:15	965:45:00	LPRSA0189655	PAP-00456556	
1/21/1953 14:00	1/22/1953 8:00	18:00:00	LPRSA0189656	PAP-00456557	
1/24/1953 9:00	1/24/1953 15:00	6:00:00	LPRSA0189657	PAP-00456558	
2/11/1953 16:30	2/13/1953 9:30	41:00:00	LPRSA0189658	PAP-00456559	
2/15/1953 10:00	2/15/1953 15:30	5:30:00	LPRSA0189659	PAP-00456560	
2/21/1953 8:00	2/21/1953 13:30	5:30:00	LPRSA0189660	PAP-00456561	
2/25/1953 8:00	3/10/1953 19:00	323:00:00	LPRSA0189661	PAP-00456562	
3/14/1953 12:00	3/15/1953 14:30	26:30:00	LPRSA0189663	PAP-00456154	Throw out log difficult to decipher. Used data in Koch report
3/16/1953 0:00	3/23/1953 13:00	181:00:00	LPRSA0189663	PAP-00456154	Unable to verify start time on throw out log. Used data in Koch report
3/24/1953 8:45	3/24/1953 16:00	7:15:00	LPRSA0189663	PAP-00456154	
3/25/1953 13:30	3/25/1953 19:30	6:00:00	LPRSA0189663	PAP-00456154	
3/27/1953 13:00	3/28/1953 19:00	30:00:00	LPRSA0189663	PAP-00456154	
3/30/1953 13:45	3/31/1953 9:00	19:15:00	LPRSA0189663	PAP-00456154	
3/31/1953 16:30	4/6/1953 9:00	136:30:00	LPRSA0189663	PAP-00456154	
4/6/1953 16:30	4/10/1953 13:30	93:00:00	LPRSA0189663	PAP-00456154	
4/11/1953 11:30	4/13/1953 9:30	46:00:00	LPRSA0189663	PAP-00456154	
4/13/1953 14:15	4/14/1953 8:30	18:15:00	LPRSA0189663	PAP-00456154	
4/14/1953 11:30	4/15/1953 9:00	21:30:00	LPRSA0189663	PAP-00456154	
4/15/1953 11:30	4/16/1953 14:30	27:00:00	LPRSA0189663	PAP-00456154	
4/16/1953 16:00	4/17/1953 8:00	16:00:00	LPRSA0189663	PAP-00456154	
4/17/1953 13:00	4/23/1953 13:00	144:00:00	LPRSA0189663	PAP-00456154	
4/29/1953 15:30	4/30/1953 8:00	16:30:00	LPRSA0189663	PAP-00456154	
4/30/1953 15:30	5/1/1953 11:30	20:00:00	LPRSA0189663	PAP-00456154	
5/1/1953 14:45	5/4/1953 8:30	65:45:00	LPRSA0189663	PAP-00456154	
5/5/1953 13:00	5/8/1953 9:00	68:00:00	LPRSA0189663	PAP-00456154	
5/8/1953 21:00	5/9/1953 8:00	11:00:00	LPRSA0189663	PAP-00456154	
5/13/1953 21:30	5/14/1953 9:00	11:30:00	LPRSA0189663	PAP-00456154	
5/14/1953 15:00	5/15/1953 9:45	18:45:00	LPRSA0189663	PAP-00456154	
5/15/1953 15:30	5/16/1953 8:00	16:30:00	LPRSA0189663	PAP-00456154	
5/18/1953 8:30	5/22/1953 17:45	105:15:00	LPRSA0189663	PAP-00456154	
5/25/1953 9:30	5/25/1953 15:30	6:00:00	LPRSA0189663	PAP-00456154	
5/27/1953 11:00	5/27/1953 13:00	2:00:00	LPRSA0189663	PAP-00456154	
6/1/1953 12:00	6/6/1953 8:00	116:00:00	LPRSA0189663	PAP-00456154	
6/8/1953 13:30	6/11/1953 11:30	70:00:00	LPRSA0189663	PAP-00456154	
6/13/1953 16:30	6/14/1953 13:30	21:00:00	LPRSA0189674	PAP-00456563	
6/18/1953 16:00	6/19/1953 9:00	17:00:00	LPRSA0189676	PAP-00456565	
6/22/1953 9:30	6/22/1953 18:15	8:45:00	LPRSA0189677	PAP-00456566	
6/23/1953 9:30	7/2/1953 13:30	220:00:00	LPRSA0189678	PAP-00456567	
7/6/1953 19:30	7/7/1953 8:00	12:30:00	LPRSA0189681	PAP-00456570	
7/20/1953 21:00	7/21/1953 8:15	11:15:00	LPRSA0189682	PAP-00456571	
7/23/1953 8:30	7/23/1953 15:00	6:30:00	LPRSA0189684	PAP-00456573	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

8/10/1953 0:45	8/10/1953 8:30	7:45:00	LPRSA0189685	PAP-00456574	
8/14/1953 13:00	8/14/1953 19:30	6:30:00	LPRSA0189686	PAP-00456575	
9/16/1953 1:30	9/16/1953 8:00	6:30:00	LPRSA0189688	PAP-00456576	
10/6/1953 18:00	10/7/1953 8:30	14:30:00	LPRSA0189689	PAP-00456578	
10/22/1953 13:00	10/28/1953 13:45	144:45:00	LPRSA0189691	PAP-00456580	
10/29/1953 13:30	10/30/1953 8:30	19:00:00	LPRSA0189693	PAP-00456582	
11/7/1953 6:30	11/8/1953 14:00	31:30:00	LPRSA0189695	PAP-00456584	
11/16/1953 14:00	11/20/1953 11:30	93:30:00	LPRSA0189696	PAP-00456585	
11/23/1953 9:30	11/23/1953 16:15	6:45:00	LPRSA0189698	PAP-00456587	
11/25/1953 9:30	11/26/1953 8:30	23:00:00	LPRSA0189652	PAP-00456553	
11/30/1953 9:30	12/4/1953 10:30	97:00:00	LPRSA0189651	PAP-00456552	
12/6/1953 9:00	12/7/1953 8:40	23:40:00	LPRSA0189650	PAP-00456551	
12/9/1953 15:20	12/10/1953 11:30	20:10:00	LPRSA0189649	PAP-00456550	
12/12/1953 17:00	12/13/1953 8:00	15:00:00	LPRSA0189648	PAP-00456549	
12/14/1953 5:30	12/14/1953 12:00	6:30:00	LPRSA0189647	PAP-00456548	
12/28/1953 16:15	12/29/1953 9:00	16:45:00	LPRSA0189646	PAP-00456547	
1/14/1954 16:00	1/18/1954 9:00	89:00:00	LPRSA0189592	PAP-00456493	
1/18/1954 14:00	1/21/1954 9:00	67:00:00	LPRSA0189591	PAP-00456492	
1/22/1954 15:30	1/25/1954 9:15	65:45:00	LPRSA0189590	PAP-00456491	
1/25/1954 14:30	1/27/1954 16:00	49:30:00	LPRSA0189590	PAP-00456491	
2/3/1954 12:45	2/4/1954 8:30	19:45:00	LPRSA0189589	PAP-00456490	
2/8/1954 17:00	2/9/1954 9:00	16:00:00	LPRSA0189588	PAP-00456489	
2/16/1954 16:30	2/17/1954 13:15	20:45:00	LPRSA0189587	PAP-00456488	
2/21/1954 16:45	2/22/1954 8:15	15:30:00	LPRSA0189586	PAP-00456487	
2/23/1954 11:15	2/27/1954 8:15	93:00:00	LPRSA0189621	PAP-00456522	
3/1/1954 10:15	3/5/1954 13:00	98:45:00	LPRSA0189619	PAP-00456520	
3/13/1954 14:30	3/15/1954 8:30	42:00:00	LPRSA0189618	PAP-00456519	
3/19/1954 16:00	3/20/1954 8:30	16:30:00	LPRSA0189617	PAP-00456518	
3/25/1954 9:45	3/26/1954 7:45	22:00:00	LPRSA0189616	PAP-00456517	
4/8/1954 13:30	4/8/1954 15:45	2:15:00	LPRSA0189613	PAP-00456514	
4/13/1954 12:00	4/13/1954 16:00	4:00:00	LPRSA0189623	PAP-00456524	
4/16/1954 12:50	4/18/1954 9:45	44:55:00	LPRSA0189632	PAP-00456533	
4/19/1954 17:45	4/21/1954 16:30	46:45:00	LPRSA0189615	PAP-00456516	
4/23/1954 13:00	4/23/1954 16:00	3:00:00	LPRSA0189614	PAP-00456515	
4/28/1954 15:00	4/28/1954 16:45	1:45:00	LPRSA0189612	PAP-00456513	
5/3/1954 10:30	5/22/1954 8:30	454:00:00	LPRSA0189631	PAP-00456532	
6/3/1954 17:00	6/8/1954 16:00	119:00:00	LPRSA0189630	PAP-00456531	
6/23/1954 16:00	6/24/1954 8:00	16:00:00	LPRSA0189628	PAP-00456529	
7/7/1954 16:00	7/8/1954 9:00	17:00:00	LPRSA0189624	PAP-00456525	
7/14/1954 16:00	7/15/1954 8:30	16:30:00	LPRSA0189634	PAP-00456535	
7/22/1954 15:30	7/23/1954 8:30	17:00:00	LPRSA0189633	PAP-00456534	
8/3/1954 8:45	8/4/1954 8:45	24:00:00	LPRSA0189620	PAP-00456521	
8/9/1954 8:30	8/9/1954 13:30	5:00:00	LPRSA0189622	PAP-00456523	
8/19/1954 22:30	8/20/1954 9:00	10:30:00	LPRSA0189611	PAP-00456512	
8/20/1954 16:00	8/22/1954 8:00	40:00:00	LPRSA0189610	PAP-00456511	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

8/25/1954 16:15	8/26/1954 8:45	16:30:00	LPRSA0189609	PAP-00456510	
8/30/1954 16:15	8/31/1954 4:30	12:15:00	LPRSA0189608	PAP-00456509	
8/31/1954 3:30	9/1/1954 8:00	28:30:00	LPRSA0189608	PAP-00456509	
9/8/1954 14:00	9/9/1954 8:00	18:00:00	LPRSA0189607	PAP-00456508	
9/10/1954 16:00	9/12/1954 13:30	45:30:00	LPRSA0189606	PAP-00456507	
9/14/1954 16:15	9/18/1954 8:00	87:45:00	LPRSA0189605	PAP-00456506	
10/4/1954 8:30	10/8/1954 16:00	103:30:00	LPRSA0189604	PAP-00456505	
10/15/1954 14:10	10/15/1954 23:00	8:50:00	LPRSA0189603	PAP-00456504	
10/27/1954 16:00	10/28/1954 9:00	17:00:00	LPRSA0189602	PAP-00456503	
10/29/1954 9:00	11/1/1954 8:00	71:00:00	LPRSA0189601	PAP-00456502	
11/2/1954 12:30	11/2/1954 17:30	5:00:00	LPRSA0189600	PAP-00456501	
11/15/1954 9:15	11/15/1954 15:00	5:45:00	LPRSA0189597	PAP-00456498	
11/17/1954 16:00	11/18/1954 10:00	18:00:00	LPRSA0189597	PAP-00456498	
11/18/1954 15:10	11/20/1954 6:00	38:50:00	LPRSA0189597	PAP-00456498	
11/25/1954 9:50	11/29/1954 9:15	95:25:00	LPRSA0189597	PAP-00456498	
11/29/1954 15:30	11/30/1954 12:30	21:00:00	LPRSA0189597	PAP-00456498	
12/9/1954 13:30	12/9/1954 17:30	4:00:00	LPRSA0189596	PAP-00456497	
12/14/1954 9:00	12/14/1954 15:30	6:30:00	LPRSA0189595	PAP-00456496	
12/16/1954 13:45	12/16/1954 19:45	6:00:00	LPRSA0189594	PAP-00456495	
12/18/1954 10:00	12/19/1954 8:00	22:00:00	LPRSA0189593	PAP-00456494	
12/29/1954 12:30	12/30/1954 15:15	26:45:00	LPRSA0189585	PAP-00456486	
1/6/1955 13:30	1/6/1955 15:30	2:00:00	LPRSA0189582	PAP-00456485	
1/28/1955 15:30	1/31/1955 13:00	69:30:00	LPRSA0189580	PAP-00456483	
2/1/1955 14:45	2/2/1955 10:30	19:45:00	LPRSA0189580	PAP-00456483	
2/4/1955 23:50	2/7/1955 0:55	49:05:00	LPRSA0189580	PAP-00456483	
2/7/1955 14:30	2/8/1955 9:00	18:30:00	LPRSA0189580	PAP-00456483	
2/8/1955 12:15	2/12/1955 12:00	95:45:00	LPRSA0189580	PAP-00456483	
2/15/1955 14:45	2/15/1955 17:45	3:00:00	LPRSA0189580	PAP-00456483	
2/16/1955 15:30	2/16/1955 18:30	3:00:00	LPRSA0189580	PAP-00456483	
2/17/1955 10:45	2/18/1955 9:00	22:15:00	LPRSA0189580	PAP-00456483	
2/18/1955 16:00	2/19/1955 8:45	16:45:00	LPRSA0189579	PAP-00456482	
2/21/1955 14:30	2/23/1955 13:00	46:30:00	LPRSA0189579	PAP-00456482	
2/23/1955 15:45	2/24/1955 9:45	18:00:00	LPRSA0189579	PAP-00456482	
2/24/1955 15:30	2/25/1955 9:00	17:30:00	LPRSA0189579	PAP-00456482	
2/25/1955 15:15	2/26/1955 8:45	17:30:00	LPRSA0189579	PAP-00456482	
2/28/1955 13:15	3/2/1955 9:00	43:45:00	LPRSA0189579	PAP-00456482	
3/2/1955 14:00	3/3/1955 13:00	23:00:00	LPRSA0189579	PAP-00456482	
3/3/1955 16:00	3/4/1955 10:15	18:15:00	LPRSA0189579	PAP-00456482	
3/4/1955 12:30	3/6/1955 17:15	52:45:00	LPRSA0189579	PAP-00456482	
3/7/1955 13:00	3/7/1955 15:45	2:45:00	LPRSA0189578	PAP-00456481	
3/21/1955 14:30	3/22/1955 15:00	24:30:00	LPRSA0189577	PAP-00456480	
3/28/1955 13:00	3/29/1955 10:00	21:00:00	LPRSA0189576	PAP-00456479	
4/6/1955 11:00	4/7/1955 9:00	22:00:00	LPRSA0189575	PAP-00456478	
4/12/1955 14:00	4/13/1955 12:45	22:45:00	LPRSA0189574	PAP-00456477	
4/26/1955 12:45	4/27/1955 8:45	20:00:00	LPRSA0189573	PAP-00456476	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

5/31/1955 12:45	6/1/1955 7:45	19:00:00	LPRSA0189572	PAP-00456475	
6/21/1955 22:45	6/22/1955 8:00	9:15:00	LPRSA0189571	PAP-00456474	
8/7/1955 23:00	8/8/1955 2:15	3:15:00	LPRSA0189570	PAP-00456473	
8/11/1955 19:00	8/12/1955 15:15	20:15:00	LPRSA0189569	PAP-00456472	
8/13/1955 8:00	8/13/1955 12:30	4:30:00	LPRSA0189569	PAP-00456472	
8/15/1955 16:30	8/16/1955 8:30	16:00:00	LPRSA0189568	PAP-00456471	
8/18/1955 15:30	8/19/1955 2:30	11:00:00	LPRSA0189567	PAP-00456470	
8/19/1955 14:15	8/20/1955 8:50	18:35:00	LPRSA0189567	PAP-00456470	
8/21/1955 21:30	8/22/1955 8:45	11:15:00	LPRSA0189566	PAP-00456469	
8/24/1955 14:45	8/25/1955 8:45	18:00:00	LPRSA0189565	PAP-00456468	
8/25/1955 15:45	8/26/1955 8:45	17:00:00	LPRSA0189564	PAP-00456467	
9/24/1955 5:00	9/26/1955 8:00	51:00:00	LPRSA0189563	PAP-00456466	
10/6/1955 8:00	10/6/1955 12:30	4:30:00	LPRSA0189562	PAP-00456465	
10/6/1955 18:00	10/7/1955 9:45	15:45:00	LPRSA0189562	PAP-00456465	
10/7/1955 15:45	10/10/1955 7:30	63:45:00	LPRSA0189562	PAP-00456465	
10/14/1955 12:45	10/16/1955 20:40	55:55:00	LPRSA0189561	PAP-00456464	
10/17/1955 14:30	10/19/1955 9:30	43:00:00	LPRSA0189561	PAP-00456464	
10/19/1955 15:03	10/20/1955 16:00	24:57:00	LPRSA0189561	PAP-00456464	
10/30/1955 9:30	10/30/1955 13:30	4:00:00	LPRSA0189560	PAP-00456463	
11/10/1955 15:30	11/11/1955 3:30	12:00:00	LPRSA0189559	PAP-00456462	
11/11/1955 11:15	11/12/1955 8:15	21:00:00	LPRSA0189559	PAP-00456462	
11/16/1955 9:00	11/16/1955 14:00	5:00:00	LPRSA0189558	PAP-00456461	
11/17/1955 10:30	11/18/1955 9:30	23:00:00	LPRSA0189558	PAP-00456461	
1/30/1956 12:45	1/31/1956 7:30	18:45:00	LPRSA0189556	PAP-00456460	
2/2/1956 11:30	2/3/1956 7:30	20:00:00	LPRSA0189555	PAP-00456459	
2/6/1956 15:30	2/7/1956 8:15	16:45:00	LPRSA0189554	PAP-00456458	
2/18/1956 8:15	2/18/1956 15:15	7:00:00	LPRSA0189553	PAP-00456457	
3/8/1956 1:30	3/9/1956 8:15	30:45:00	LPRSA0189552	PAP-00456456	
3/14/1956 9:00	3/15/1956 8:30	23:30:00	LPRSA0189551	PAP-00456455	
3/16/1956 15:00	3/17/1956 9:30	18:30:00	LPRSA0189550	PAP-00456454	
3/21/1956 14:45	3/22/1956 9:45	19:00:00	LPRSA0189549	PAP-00456453	
3/23/1956 15:30	3/25/1956 9:00	41:30:00	LPRSA0189548	PAP-00456452	
3/29/1956 16:05	3/30/1956 8:50	16:45:00	LPRSA0189547	PAP-00456451	
4/7/1956 2:15	4/7/1956 9:15	7:00:00	LPRSA0189546	PAP-00456450	
4/8/1956 12:45	4/9/1956 9:00	20:15:00	LPRSA0189546	PAP-00456450	
4/11/1956 15:30	4/12/1956 8:05	16:35:00	LPRSA0189545	PAP-00456449	
5/2/1956 21:05	5/3/1956 8:45	11:40:00	LPRSA0189544	PAP-00456448	
6/2/1956 14:30	6/3/1956 11:40	21:10:00	LPRSA0189543	PAP-00456447	
6/27/1956 15:20	6/27/1956 18:00	2:40:00	LPRSA0189542	PAP-00456446	
7/16/1956 14:15	7/17/1956 8:45	18:30:00	LPRSA0189541	PAP-00456445	
7/21/1956 9:10	7/21/1956 14:45	5:35:00	LPRSA0189540	PAP-00456444	
7/27/1956 9:30	7/27/1956 15:00	5:30:00	LPRSA0189539	PAP-00456443	
8/6/1956 16:15	8/7/1956 8:00	15:45:00	LPRSA0189538	PAP-00456442	
8/21/1956 4:00	8/21/1956 15:45	11:45:00	LPRSA0189537	PAP-00456441	
9/6/1956 18:00	9/6/1956 22:20	4:20:00	LPRSA0189536	PAP-00456440	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

9/7/1956 9:30	9/7/1956 16:15	6:45:00	LPRSA0189535	PAP-00456439	
10/22/1956 21:30	10/23/1956 10:45	13:15:00	LPRSA0189533	PAP-00456437	
10/23/1956 12:00	10/23/1956 14:15	2:15:00	LPRSA0189533	PAP-00456437	
10/31/1956 11:30	10/31/1956 19:15	7:45:00	LPRSA0189532	PAP-00456436	
11/1/1956 10:00	11/4/1956 11:00	73:00:00	LPRSA0189532	PAP-00456436	
11/18/1956 2:00	11/18/1956 10:45	8:45:00	LPRSA0189531	PAP-00456435	
11/22/1956 0:15	11/22/1956 7:45	7:30:00	LPRSA0189530	PAP-00456434	
12/9/1956 14:45	12/10/1956 8:15	17:30:00	LPRSA0189529	PAP-00456433	
12/14/1956 8:00	12/14/1956 15:45	7:45:00	LPRSA0189528	PAP-00456432	
12/22/1956 22:00	12/23/1956 9:45	11:45:00	LPRSA0189527	PAP-00456431	
1/23/1957 3:30	1/23/1957 11:45	8:15:00	LPRSA0189498	PAP-00456403	
2/9/1957 13:45	2/10/1957 8:30	18:45:00	LPRSA0189497	PAP-00456402	
2/26/1957 15:30	2/26/1957 22:15	6:45:00	LPRSA0189496	PAP-00456401	
3/1/1957 15:00	3/2/1957 10:15	19:15:00	LPRSA0189524	PAP-00456429	
3/8/1957 9:15	3/10/1957 9:45	48:30:00	LPRSA0189523	PAP-00456428	
3/15/1957 20:15	3/16/1957 0:15	4:00:00	LPRSA0189522	PAP-00456427	
3/19/1957 21:15	3/20/1957 14:00	16:45:00	LPRSA0189521	PAP-00456426	
4/2/1957 7:30	4/2/1957 13:30	6:00:00	LPRSA0189520	PAP-00456425	
4/4/1957 20:55	4/5/1957 10:30	13:35:00	LPRSA0189519	PAP-00456424	
4/5/1957 14:00	4/6/1957 13:00	23:00:00	LPRSA0189518	PAP-00456423	
4/8/1957 15:50	4/9/1957 8:15	16:25:00	LPRSA0189517	PAP-00456422	
4/9/1957 8:45	4/10/1957 15:30	30:45:00	LPRSA0189516	PAP-00456421	
4/10/1957 8:45	4/10/1957 15:30	6:45:00	LPRSA0189515	PAP-00456420	
4/11/1957 8:00	4/11/1957 15:30	7:30:00	LPRSA0189514	PAP-00456419	
4/12/1957 8:00	4/12/1957 15:45	7:45:00	LPRSA0189513	PAP-00456418	
4/18/1957 21:45	4/19/1957 13:15	15:30:00	LPRSA0189512	PAP-00456417	
4/23/1957 6:40	4/23/1957 13:45	7:05:00	LPRSA0189511	PAP-00456416	
4/25/1957 15:45	4/26/1957 9:15	17:30:00	LPRSA0189510	PAP-00456415	
4/29/1957 13:00	4/29/1957 15:30	2:30:00	LPRSA0189509	PAP-00456414	
5/14/1957 20:45	5/15/1957 0:30	3:45:00	LPRSA0189508	PAP-00456413	
5/16/1957 0:00	8/25/1957 23:59	0:00:00			data missing
8/26/1957 0:45	8/26/1957 9:00	8:15:00	LPRSA0189507	PAP-00456412	
9/10/1957 22:30	9/11/1957 8:30	10:00:00	LPRSA0189506	PAP-00456411	
9/16/1957 23:30	9/17/1957 9:00	9:30:00	LPRSA0189505	PAP-00456410	
9/18/1957 0:00	12/19/1957 23:59	0:00:00			data missing
12/20/1957 14:45	12/21/1957 10:05	19:20:00	LPRSA0189501	PAP-00456406	
12/26/1957 11:00	12/26/1957 16:00	5:00:00	LPRSA0189500	PAP-00456405	
12/26/1957 16:40	12/26/1957 18:30	1:50:00	LPRSA0189500	PAP-00456405	
1/14/1958 14:00	1/15/1958 8:30	18:30:00	LPRSA0189494	PAP-00456195	Year not provided on throw out log. Assumption made in Koch report was used. Day and time correct
1/21/1958 21:15	1/22/1958 11:45	14:30:00	LPRSA0189492	PAP-00456193-94	
1/22/1958 16:00	1/22/1958 22:15	6:15:00	LPRSA0189491	PAP-00456192	
1/24/1958 16:30	1/26/1958 10:35	42:05:00	LPRSA0189490	PAP-00456191	
2/7/1958 14:30	2/8/1958 8:20	17:50:00	LPRSA0189489	PAP-00456190	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

2/27/1958 11:00	2/28/1958 15:45	28:45:00	LPRSA0189488	PAP-00456189	
3/3/1958 21:15	3/4/1958 8:15	11:00:00	LPRSA0189487	PAP-00456188	
3/14/1958 14:30	3/15/1958 15:00	24:30:00	LPRSA0189486	PAP-00456187	
3/20/1958 1:45	3/22/1958 9:00	55:15:00	LPRSA0189485	PAP-00456186	
3/31/1958 15:15	3/31/1958 22:35	7:20:00	LPRSA0189484	PAP-00456185	
4/6/1958 13:00	4/7/1958 21:00	32:00:00	LPRSA0189483	PAP-00456184	
4/11/1958 8:00	4/12/1958 10:30	26:30:00	LPRSA0189482	PAP-00456183	
4/23/1958 1:25	4/23/1958 4:40	3:15:00	LPRSA0189481	PAP-00456182	
4/28/1958 8:30	4/28/1958 15:45	7:15:00	LPRSA0189480	PAP-00456181	
4/29/1958 18:30	4/30/1958 8:00	13:30:00	LPRSA0189479	PAP-00456180	
5/6/1958 18:45	5/7/1958 4:35	9:50:00	LPRSA0189478	PAP-00456179	
5/7/1958 11:15	5/7/1958 18:00	6:45:00	LPRSA0189478	PAP-00456179	
5/15/1958 15:45	5/15/1958 17:10	1:25:00	LPRSA0189477	PAP-00456178	
5/25/1958 12:25	5/26/1958 17:25	29:00:00	LPRSA0189476	PAP-00456177	
6/9/1958 7:10	6/9/1958 8:00	0:50:00	LPRSA0189475	PAP-00456176	
6/26/1958 16:00	6/27/1958 5:45	13:45:00	LPRSA0189474	PAP-00456175	
7/31/1958 18:50	8/1/1958 8:15	13:25:00	LPRSA0189473	PAP-00456174	
8/25/1958 13:30	8/26/1958 8:00	18:30:00	LPRSA0189472	PAP-00456173	
9/18/1958 1:45	9/18/1958 8:30	6:45:00	LPRSA0189471	PAP-00456172	
10/1/1958 10:30	10/1/1958 17:15	6:45:00	LPRSA0189470	PAP-00456171	Moved from Yantacaw.
10/22/1958 18:00	10/23/1958 18:10	24:10:00	LPRSA0189469	PAP-00456170	
10/25/1958 15:25	10/27/1958 6:00	38:35:00	LPRSA0189468	PAP-00456169	
10/27/1958 16:00	10/28/1958 2:25	10:25:00	LPRSA0189467	PAP-00456168	
11/28/1958 18:45	11/29/1958 9:40	14:55:00	LPRSA0189466	PAP-00456167	
12/29/1958 19:50	12/30/1958 4:15	8:25:00	LPRSA0189465	PAP-00456166	
1/20/1959 16:00	1/21/1959 8:00	16:00:00	LPRSA0189463	PAP-00456232	
1/21/1959 15:15	1/22/1959 4:35	13:20:00	LPRSA0189462	PAP-00456231	
2/10/1959 11:45	2/10/1959 23:55	12:10:00	LPRSA0189461	PAP-00456230	
3/6/1959 6:45	3/7/1959 9:15	26:30:00	LPRSA0189458	PAP-00456227	
3/12/1959 16:25	3/13/1959 7:00	14:35:00	LPRSA0189459	PAP-00456228	
3/30/1959 16:00	3/31/1959 9:00	17:00:00	LPRSA0189460	PAP-00456229	
4/2/1959 13:50	4/3/1959 8:00	18:10:00	LPRSA0189457	PAP-00456226	
4/27/1959 15:15	4/28/1959 8:30	17:15:00	LPRSA0189456	PAP-00456225	
4/28/1959 23:15	4/29/1959 8:25	9:10:00	LPRSA0189455	PAP-00456224	
5/13/1959 17:15	5/13/1959 20:45	3:30:00	LPRSA0189438	PAP-00456207	
5/22/1959 16:45	5/22/1959 20:00	3:15:00	LPRSA0189439	PAP-00456208	Entry missed in Koch report
6/2/1959 15:25	6/3/1959 7:30	16:05:00	LPRSA0189454	PAP-00456223	
6/25/1959 10:15	6/25/1959 12:30	2:15:00	LPRSA0189453	PAP-00456222	
7/20/1959 16:15	7/20/1959 17:15	1:00:00	LPRSA0189452	PAP-00456221	
7/20/1959 19:45	7/20/1959 23:20	3:35:00	LPRSA0189452	PAP-00456221	
7/23/1959 16:00	7/23/1959 18:35	2:35:00	LPRSA0189451	PAP-00456220	
7/23/1959 20:15	7/23/1959 23:05	2:50:00	LPRSA0189451	PAP-00456220	
7/24/1959 15:30	7/24/1959 17:45	2:15:00	LPRSA0189450	PAP-00456219	
8/5/1959 10:05	8/6/1959 8:00	21:55:00	LPRSA0189448	PAP-00456217	
8/9/1959 4:45	8/9/1959 12:00	7:15:00	LPRSA0189447	PAP-00456216	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

8/31/1959 13:15	9/1/1959 8:45	19:30:00	LPRSA0189445	PAP-00456214	
9/1/1959 16:00	9/1/1959 23:40	7:40:00	LPRSA0189445	PAP-00456214	
9/3/1959 14:15	9/3/1959 23:10	8:55:00	LPRSA0189444	PAP-00456213	
10/1/1959 12:45	10/1/1959 15:30	2:45:00	LPRSA0189443	PAP-00456212	
10/7/1959 17:15	10/8/1959 8:15	15:00:00	LPRSA0189442	PAP-00456211	Moved from Herbert.
10/9/1959 4:30	10/9/1959 9:15	4:45:00	LPRSA0189441	PAP-00456210	Moved from Herbert.
10/9/1959 11:00	10/10/1959 13:45	26:45:00	LPRSA0189440	PAP-00456209	
10/22/1959 13:45	10/22/1959 18:05	4:20:00	LPRSA0189436	PAP-00456205	
10/24/1959 10:15	10/25/1959 10:30	24:15:00	LPRSA0189435	PAP-00456204	
11/6/1959 18:00	11/7/1959 17:00	23:00:00	LPRSA0189434	PAP-00456203	
11/24/1959 16:15	11/25/1959 8:25	16:10:00	LPRSA0189432	PAP-00456201	Moved from Verona.
12/6/1959 23:40	12/8/1959 8:45	33:05:00	LPRSA0189431	PAP-00456200	
12/12/1959 18:45	12/13/1959 9:00	14:15:00	LPRSA0189430	PAP-00456199	
12/28/1959 21:20	12/29/1959 13:15	15:55:00	LPRSA0189429	PAP-00456198	
12/29/1959 16:35	12/30/1959 8:15	15:40:00	LPRSA0189428	PAP-00456197	
1/3/1960 9:30	1/4/1960 8:10	22:40:00	LPRSA0189427	PAP-00456270	
1/13/1960 11:15	1/14/1960 8:25	21:10:00	LPRSA0189426	PAP-00456269	
1/15/1960 0:45	1/16/1960 13:10	36:25:00	LPRSA0189425	PAP-00456268	
1/18/1960 22:30	1/19/1960 8:10	9:40:00	LPRSA0189424	PAP-00456267	
2/6/1960 6:00	2/6/1960 12:30	6:30:00	LPRSA0189423	PAP-00456266	
2/11/1960 5:30	2/11/1960 17:50	12:20:00	LPRSA0189422	PAP-00456265	
2/18/1960 20:30	2/19/1960 21:50	25:20:00	LPRSA0189421	PAP-00456264	
2/25/1960 22:30	2/26/1960 15:10	16:40:00	LPRSA0189420	PAP-00456263	
3/3/1960 17:50	3/4/1960 9:30	15:40:00	LPRSA0189419	PAP-00456262	
3/17/1960 13:40	3/17/1960 23:20	9:40:00	LPRSA0189418	PAP-00456261	
3/31/1960 14:55	4/1/1960 8:10	17:15:00	LPRSA0189417	PAP-00456260	
4/3/1960 21:20	4/4/1960 10:55	13:35:00	LPRSA0189416	PAP-00456259	
4/4/1960 22:20	4/6/1960 9:40	35:20:00	LPRSA0189415	PAP-00456258	
4/7/1960 11:30	4/8/1960 16:25	28:55:00	LPRSA0189414	PAP-00456257	
4/11/1960 23:20	4/12/1960 8:02	8:42:00	LPRSA0189413	PAP-00456256	
4/18/1960 10:14	4/18/1960 17:30	7:16:00	LPRSA0189412	PAP-00456255	
4/26/1960 21:00	4/27/1960 12:00	15:00:00	LPRSA0189411	PAP-00456254	
5/9/1960 8:00	5/9/1960 17:55	9:55:00	LPRSA0189410	PAP-00456253	
5/12/1960 19:30	5/13/1960 17:30	22:00:00	LPRSA0189409	PAP-00456252	
5/23/1960 12:40	5/24/1960 8:45	20:05:00	LPRSA0189408	PAP-00456250	
6/3/1960 17:45	6/4/1960 20:00	26:15:00	LPRSA0189407	PAP-00456250	
7/1/1960 18:10	7/1/1960 21:20	3:10:00	LPRSA0189406	PAP-00456249	
7/12/1960 20:50	7/13/1960 8:20	11:30:00	LPRSA0189405	PAP-00456248	
7/14/1960 12:50	7/14/1960 21:20	8:30:00	LPRSA0189404	PAP-00456247	
7/27/1960 13:20	7/28/1960 8:20	19:00:00	LPRSA0189403	PAP-00456246	
7/30/1960 9:00	7/31/1960 8:15	23:15:00	LPRSA0189402	PAP-00456245	
8/10/1960 8:20	8/10/1960 12:22	4:02:00	LPRSA0189401	PAP-00456244	
8/10/1960 21:30	8/11/1960 8:10	10:40:00	LPRSA0189400	PAP-00456243	
8/19/1960 7:20	8/20/1960 9:00	25:40:00	LPRSA0189399	PAP-00456242	
8/30/1960 18:25	8/30/1960 20:15	1:50:00	LPRSA0189398	PAP-00456241	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

8/31/1960 19:15	9/1/1960 8:15	13:00:00	LPRSA0189398	PAP-00456241	
9/11/1960 23:00	9/13/1960 8:15	33:15:00	LPRSA0189397	PAP-00456240	
9/19/1960 10:25	9/19/1960 16:30	6:05:00	LPRSA0189396	PAP-00456239	
10/20/1960 6:45	10/20/1960 18:05	11:20:00	LPRSA0189395	PAP-00456238	
11/10/1960 7:15	11/10/1960 18:15	11:00:00	LPRSA0189394	PAP-00456237	
11/29/1960 15:55	11/29/1960 23:30	7:35:00	LPRSA0189393	PAP-00456236	
12/12/1960 11:20	12/13/1960 10:15	22:55:00	LPRSA0189392	PAP-00456235	
12/21/1960 7:35	12/21/1960 21:35	14:00:00	LPRSA0189391	PAP-00456234	
1/1/1961 9:00	1/2/1961 8:10	23:10:00	LPRSA0189389	PAP-00456730	
2/20/1961 15:40	2/20/1961 21:50	6:10:00	LPRSA0189388	PAP-00456729	
2/22/1961 23:30	2/24/1961 8:30	33:00:00	LPRSA0189387	PAP-00456728	
2/24/1961 15:15	2/27/1961 8:15	65:00:00	LPRSA0189386	PAP-00456727	
2/28/1961 15:30	2/28/1961 22:30	7:00:00	LPRSA0189385	PAP-00456726	
3/1/1961 16:00	3/2/1961 8:05	16:05:00	LPRSA0189378	PAP-00456719	
3/6/1961 12:00	3/7/1961 8:10	20:10:00	LPRSA0189379	PAP-00456720	
3/8/1961 12:15	3/9/1961 8:25	20:10:00	LPRSA0189380	PAP-00456721	
3/9/1961 12:30	3/10/1961 11:55	23:25:00	LPRSA0189381	PAP-00456722	
3/13/1961 22:30	3/15/1961 8:15	33:45:00	LPRSA0189382	PAP-00456723	
3/23/1961 11:00	3/24/1961 12:30	25:30:00	LPRSA0189383	PAP-00456724	
3/28/1961 23:20	3/29/1961 8:10	8:50:00	LPRSA0189384	PAP-00456725	
4/1/1961 12:05	4/2/1961 9:15	21:10:00	LPRSA0189377	PAP-00456718	
4/10/1961 8:15	4/10/1961 15:30	7:15:00	LPRSA0189376	PAP-00456717	
4/12/1961 22:15	4/13/1961 23:05	24:50:00	LPRSA0189375	PAP-00456716	
4/14/1961 15:00	4/14/1961 16:00	1:00:00	LPRSA0189374	PAP-00456715	
4/16/1961 11:20	4/17/1961 8:00	20:40:00	LPRSA0189373	PAP-00456714	
4/17/1961 15:05	4/17/1961 22:50	7:45:00	LPRSA0189372	PAP-00456713	
4/18/1961 8:05	4/18/1961 23:05	15:00:00	LPRSA0189371	PAP-00456712	
4/24/1961 8:30	4/25/1961 8:10	23:40:00	LPRSA0189370	PAP-00456711	
4/25/1961 16:55	4/28/1961 8:30	63:35:00	LPRSA0189368	PAP-00456709	
4/28/1961 20:10	4/29/1961 10:30	14:20:00	LPRSA0189367	PAP-00456708	
5/16/1961 13:15	5/16/1961 21:55	8:40:00	LPRSA0189365	PAP-00456706	
5/26/1961 15:15	5/26/1961 21:20	6:05:00	LPRSA0189364	PAP-00456705	
6/14/1961 15:35	6/14/1961 19:40	4:05:00	LPRSA0189362	PAP-00456703	
6/14/1961 23:40	6/15/1961 8:20	8:40:00	LPRSA0189361	PAP-00456702	
6/20/1961 20:55	6/21/1961 23:30	26:35:00	LPRSA0189360	PAP-00456701	
7/15/1961 19:45	7/17/1961 8:20	36:35:00	LPRSA0189358	PAP-00456699	
7/20/1961 7:30	7/20/1961 15:45	8:15:00	LPRSA0189357	PAP-00456698	
7/24/1961 15:45	7/25/1961 8:20	16:35:00	LPRSA0189356	PAP-00456697	
7/31/1961 19:00	8/1/1961 8:45	13:45:00	LPRSA0189355	PAP-00456696	
8/3/1961 10:50	8/3/1961 15:35	4:45:00	LPRSA0189354	PAP-00456695	
8/21/1961 14:10	8/22/1961 8:00	17:50:00	LPRSA0189353	PAP-00456694	
8/23/1961 10:20	8/24/1961 8:20	22:00:00	LPRSA0189352	PAP-00456693	
8/24/1961 13:10	8/24/1961 15:35	2:25:00	LPRSA0189351	PAP-00456690	
9/15/1961 9:30	9/15/1961 20:45	11:15:00	LPRSA0189349	PAP-00456690	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

9/19/1961 20:00	9/21/1961 18:30	46:30:00	LPRSA0189348	PAP-00456689	
10/3/1961 6:50	10/4/1961 11:15	28:25:00	LPRSA0189347	PAP-00456688	
10/4/1961 21:15	10/6/1961 12:05	38:50:00	LPRSA0189346	PAP-00456687	
10/30/1961 17:20	10/30/1961 23:25	6:05:00	LPRSA0189344	PAP-00456685	
11/14/1961 12:55	11/14/1961 23:15	10:20:00	LPRSA0189343	PAP-00456684	
11/16/1961 19:10	11/17/1961 8:20	13:10:00	LPRSA0189342	PAP-00456683	
11/24/1961 9:00	11/25/1961 8:30	23:30:00	LPRSA0189341	PAP-00456682	
12/12/1961 9:20	12/13/1961 9:25	24:05:00	LPRSA0189339	PAP-00456680	
12/18/1961 8:30	12/18/1961 23:15	14:45:00	LPRSA0189338	PAP-00456679	
12/28/1961 9:55	12/28/1961 23:00	13:05:00	LPRSA0189337	PAP-00456678	
1/6/1962 11:20	1/7/1962 9:40	22:20:00	LPRSA0189336	PAP-00456328	
1/15/1962 15:15	1/15/1962 21:00	5:45:00	LPRSA0189335	PAP-00456327	
2/5/1962 18:20	2/6/1962 8:25	14:05:00	LPRSA0189333	PAP-00456325	
2/14/1962 12:30	2/14/1962 20:55	8:25:00	LPRSA0189332	PAP-00456324	
2/19/1962 14:10	2/20/1962 7:00	16:50:00	LPRSA0189331	PAP-00456323	
2/24/1962 5:40	2/25/1962 11:10	29:30:00	LPRSA0189330	PAP-00456322	
2/26/1962 10:45	3/1/1962 8:00	69:15:00	LPRSA0189329	PAP-00456321	
3/6/1962 10:25	3/7/1962 8:15	21:50:00	LPRSA0189328	PAP-00456320	
3/12/1962 6:18	3/13/1962 22:45	40:27:00	LPRSA0189327	PAP-00456319	
3/21/1962 14:55	3/22/1962 8:15	17:20:00	LPRSA0189326	PAP-00456318	
4/1/1962 5:30	4/2/1962 9:00	27:30:00	LPRSA0189325	PAP-00456317	
4/7/1962 14:00	4/9/1962 8:15	42:15:00	LPRSA0189324	PAP-00456316	
4/9/1962 15:30	4/10/1962 8:10	16:40:00	LPRSA0189323	PAP-00456315	
4/11/1962 22:35	4/12/1962 7:05	8:30:00	LPRSA0189322	PAP-00456314	
4/12/1962 21:35	4/13/1962 23:30	25:55:00	LPRSA0189321	PAP-00456313	
4/27/1962 18:40	4/28/1962 3:00	8:20:00	LPRSA0189320	PAP-00456312	
4/30/1962 15:50	5/1/1962 8:00	16:10:00	LPRSA0189311	PAP-00456303	
5/3/1962 0:20	5/3/1962 7:10	6:50:00	LPRSA0189319	PAP-00456311	
5/8/1962 22:30	5/9/1962 8:10	9:40:00	LPRSA0189318	PAP-00456310	
5/24/1962 21:40	5/25/1962 8:20	10:40:00	LPRSA0189317	PAP-00456309	
5/31/1962 22:35	6/1/1962 7:03	8:28:00	LPRSA0189316	PAP-00456308	
6/5/1962 18:40	6/6/1962 8:15	13:35:00	LPRSA0189315	PAP-00456307	
6/12/1962 12:00	6/14/1962 15:30	51:30:00	LPRSA0189314	PAP-00456306	Entry missed in Koch report
6/19/1962 22:50	6/20/1962 8:10	9:20:00	LPRSA0189313	PAP-00456305	
6/26/1962 16:15	6/27/1962 8:15	16:00:00	LPRSA0189312	PAP-00456304	
7/18/1962 13:30	7/18/1962 16:55	3:25:00	LPRSA0189310	PAP-00456302	
7/23/1962 17:15	7/24/1962 8:20	15:05:00	LPRSA0189309	PAP-00456301	
8/7/1962 13:30	8/8/1962 8:15	18:45:00	LPRSA0189308	PAP-00456300	
8/9/1962 13:10	8/10/1962 8:55	19:45:00	LPRSA0189307	PAP-00456299	
8/10/1962 15:45	8/11/1962 12:45	21:00:00	LPRSA0189306	PAP-00456298	
8/17/1962 17:15	8/18/1962 9:20	16:05:00	LPRSA0189305	PAP-00456297	
8/21/1962 4:04	8/21/1962 14:40	10:36:00	LPRSA0189304	PAP-00456296	
8/28/1962 5:00	8/29/1962 15:15	34:15:00	LPRSA0189303	PAP-00456295	
8/29/1962 16:05	8/29/1962 21:30	5:25:00	LPRSA0189302	PAP-00456294	
9/5/1962 9:15	9/5/1962 23:00	13:45:00	LPRSA0189301	PAP-00456293	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

9/14/1962 16:15	9/14/1962 18:25	2:10:00	LPRSA0189300	PAP-00456292	
9/17/1962 16:00	9/18/1962 8:10	16:10:00	LPRSA0189299	PAP-00456291	
9/19/1962 18:00	9/20/1962 14:05	20:05:00	LPRSA0189298	PAP-00456290	
9/25/1962 23:15	9/26/1962 10:45	11:30:00	LPRSA0189297	PAP-00456289	
9/26/1962 23:00	9/28/1962 19:50	44:50:00	LPRSA0189296	PAP-00456288	
10/4/1962 22:25	10/7/1962 9:25	59:00:00	LPRSA0189295	PAP-00456287	
10/9/1962 9:40	10/10/1962 12:50	27:10:00	LPRSA0189294	PAP-00456286	
10/11/1962 23:10	10/12/1962 8:30	9:20:00	LPRSA0189293	PAP-00456285	
10/17/1962 8:08	10/17/1962 12:15	4:07:00	LPRSA0189292	PAP-00456284	
10/23/1962 10:55	10/24/1962 8:30	21:35:00	LPRSA0189291	PAP-00456283	
10/25/1962 20:15	10/26/1962 23:05	26:50:00	LPRSA0189290	PAP-00456282	
10/30/1962 12:30	11/2/1962 13:35	73:05:00	LPRSA0189289	PAP-00456281	
11/3/1962 9:55	11/5/1962 8:00	46:05:00	LPRSA0189288	PAP-00456280	
11/9/1962 16:25	11/11/1962 10:00	41:35:00	LPRSA0189287	PAP-00456279	
11/13/1962 15:00	11/14/1962 8:10	17:10:00	LPRSA0189286	PAP-00456278	
11/18/1962 22:15	11/19/1962 21:30	23:15:00	LPRSA0189285	PAP-00456277	
11/21/1962 20:15	11/23/1962 9:00	36:45:00	LPRSA0189284	PAP-00456276	
12/5/1962 8:15	12/8/1962 11:15	75:00:00	LPRSA0189283	PAP-00456275	
12/22/1962 11:30	12/24/1962 9:00	45:30:00	LPRSA0189282	PAP-00456274	
12/26/1962 13:30	12/27/1962 11:55	22:25:00	LPRSA0189281	PAP-00456273	
12/29/1962 15:30	12/30/1962 11:50	20:20:00	LPRSA0189280	PAP-00456272	
Subtotal 1950-1962 Koch Report		**13691:59:00**			
Subtotal 1950-1962 Throw out Logs		**13749:54:00**			

Koch report 1974-1975 (PAP-00488406)					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**	**AlterEcho Bates Number (throw-out logs)**	**Comments**
10/15/1974	10/16/1974	42:45:00	LPRSA0232953	PAP-00456761	
11/12/1974	11/13/1974	5:50:00	LPRSA0232953	PAP-00456761	
12/1/1974	12/2/1974	15:13:00	LPRSA0232953	PAP-00456761	
12/7/1974	12/8/1974	18:45:00	LPRSA0232953	PAP-00456761	
12/16/1974	12/16/1974	20:55:00	LPRSA0232953	PAP-00456761	
1/6/1975	1/7/1975	3:25:00	LPRSA0232953	PAP-00456761	
1/8/1975	1/9/1975	12:55:00	LPRSA0232953	PAP-00456761	
1/13/1975	1/13/1975	22:40:00	LPRSA0232953	PAP-00456761	
1/18/1975	1/18/1975	14:45:00	LPRSA0232953	PAP-00456761	
1/19/1975	1/20/1975	10:11:00	LPRSA0232953	PAP-00456761	
1/29/1975	1/29/1975	22:00:00	LPRSA0232953	PAP-00456761	
1/31/1975	2/2/1975	49:20:00	LPRSA0232953	PAP-00456761	
2/17/1975	2/18/1975	4:45:00	LPRSA0232953	PAP-00456761	
2/24/1975	2/24/1975	24:45:00	LPRSA0232953	PAP-00456761	
3/12/1975	3/12/1975	14:30:00	LPRSA0232953	PAP-00456761	
3/19/1975	3/20/1975	19:55:00	LPRSA0232953	PAP-00456761	
4/3/1975	4/3/1975	12:50:00	LPRSA0232953	PAP-00456761	

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1a. Documented PVSC Bypasses at Union Outlet
(Montclair, Bloomfield, Orange, Belleville, Glen Ridge, East Orange, Newark,West Orange, Little Falls)

4/23/1975	4/24/1975	4:15:00	LPRSA0232954	PAP-00456762	
4/24/1975	4/25/1975	9:00:00	LPRSA0232954	PAP-00456762	
4/25/1975	4/26/1975	8:50:00	LPRSA0232954	PAP-00456762	
5/4/1975	5/5/1975	13:10:00	LPRSA0232954	PAP-00456762	
5/13/1975	5/13/1975	4:45:00	LPRSA0232954	PAP-00456762	
6/1/1975	6/1/1975	6:05:00	LPRSA0232954	PAP-00456762	
6/5/1975	6/6/1975	12:20:00	LPRSA0232954	PAP-00456762	
6/6/1975	6/6/1975	8:45:00	LPRSA0232954	PAP-00456762	
6/12/1975	6/13/1975	22:21:00	LPRSA0232954	PAP-00456762	
6/28/1975	6/28/1975	2:00:00	LPRSA0232954	PAP-00456762	
7/7/1975	7/7/1975	13:05:00	LPRSA0232954	PAP-00456762	
7/9/1975	7/9/1975	4:30:00	LPRSA0232954	PAP-00456762	
7/13/1975	7/13/1975	13:25:00	LPRSA0232954	PAP-00456762	
7/14/1975	7/14/1975	12:15:00	LPRSA0232954	PAP-00456762	
7/15/1975	7/15/1975	9:35:00	LPRSA0232954	PAP-00456762	
7/20/1975	7/21/1975	13:25:00	LPRSA0232954	PAP-00456762	
7/24/1975	7/25/1975	13:25:00	LPRSA0232954	PAP-00456762	
8/24/1975	8/25/1975	7:35:00	LPRSA0232954	PAP-00456762	
9/22/1975	9/27/1975	102:25:00	LPRSA0232955	PAP-00456763	
Subtotal 1974-1975 Koch Report		**596:40:00**			

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1b. Documented PVSC Bypasses at Verona Avenue (Newark)

Allocation Report			
	Time of bypasses	Time observed	% of Total Time
1950-1962	8484:45:00	106697:00:00	7.95%
1974-1975	0:00:00	0:00:00	0.00%
Total	8484:45:00	106697:00:00	7.95%

Koch report 1950-1962 (PAP-00488407 - PAP-00488412)					
Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	AlterEcho Bates Number (throw-out logs)	Comments
10/4/1950 22:00	10/5/1950 11:30	13:30:00	LPRSA0188654	PAP-00456399	
10/10/1950 2:30	10/10/1950 8:30	6:00:00	LPRSA0188652	PAP-00456397	
10/12/1950 13:30	10/13/1950 9:30	20:00:00	LPRSA0188650	PAP-00456395	
10/23/1950 13:30	10/24/1950 9:00	19:30:00	LPRSA0188648	PAP-00456393	
11/20/1950 18:00	11/21/1950 9:00	15:00:00	LPRSA0188646	PAP-00456391	
11/25/1950 9:00	11/25/1950 13:00	4:00:00	LPRSA0188643	PAP-00456388	
12/4/1950 12:30	12/4/1950 21:00	8:30:00	LPRSA0188641	PAP-00456386	
12/7/1950 16:00	12/8/1950 11:30	19:30:00	LPRSA0188637	PAP-00456382	
12/15/1950 22:30	12/16/1950 9:00	10:30:00	LPRSA0188639	PAP-00456384	
12/29/1950 12:30	12/30/1950 11:30	23:00:00	LPRSA0188635	PAP-00456380	
1/7/1951 17:00	1/8/1951 9:00	16:00:00	LPRSA0188633	PAP-00456378	
1/11/1951 17:30	1/12/1951 8:30	15:00:00	LPRSA0188619	PAP-00456364	
1/14/1951 18:00	1/15/1951 12:00	18:00:00	LPRSA0188631	PAP-00456376	
1/23/1951 2:00	1/24/1951 14:00	36:00:00	LPRSA0188621	PAP-00456366	
1/25/1951 16:00	1/25/1951 19:00	3:00:00	LPRSA0188623	PAP-00456368	
1/28/1951 17:00	1/29/1951 8:30	15:30:00	LPRSA0188625	PAP-00456370	
1/29/1951 19:30	1/30/1951 10:00	14:30:00	LPRSA0188625	PAP-00456370	
1/31/1951 16:00	2/1/1951 15:00	23:00:00	LPRSA0188628	PAP-00456373	
2/7/1951 11:00	2/7/1951 19:30	8:30:00	LPRSA0188585	PAP-00456085; PAP-00456330	
2/10/1951 5:30	2/10/1951 12:00	6:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/11/1951 18:00	2/13/1951 9:30	39:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/13/1951 19:45	2/14/1951 10:00	14:15:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/14/1951 17:45	2/15/1951 9:30	15:45:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/17/1951 4:00	2/17/1951 22:00	18:00:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/19/1951 17:00	2/20/1951 9:30	16:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/20/1951 16:00	2/21/1951 17:30	25:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	

Exhibit 1b. Documented PVSC Bypasses at Verona Avenue (Newark)

2/22/1951 10:30	2/22/1951 11:45	1:15:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/23/1951 8:30	2/23/1951 10:00	1:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
3/1/1951 14:30	3/2/1951 10:00	19:30:00	LPRSA0188604	PAP-00456349	
3/3/1951 15:00	3/5/1951 10:30	43:30:00	LPRSA0188606	PAP-00456351	
3/13/1951 16:30	3/15/1951 9:30	41:00:00	LPRSA0188609	PAP-00456354	
3/16/1951 16:00	3/19/1951 9:30	65:30:00	LPRSA0188612	PAP-00456357	
3/19/1951 17:00	3/20/1951 12:00	19:00:00	LPRSA0188616	PAP-00456361	
3/22/1951 0:00	12/31/1951 23:59				data missing
2/17/1952 3:30	2/18/1952 9:00	29:30:00	LPRSA0189755	PAP-00456150	
2/20/1952 18:00	2/21/1952 9:00	15:00:00	LPRSA0189754	PAP-00456149	
2/29/1952 21:00	3/1/1952 9:30	12:30:00	LPRSA0189753	PAP-00456148	
3/3/1952 17:30	3/5/1952 14:30	45:00:00	LPRSA0189753	PAP-00456148	
3/11/1952 5:00	3/17/1952 14:00	153:00:00	LPRSA0189752	PAP-00456147	
3/19/1952 10:30	3/19/1952 19:00	8:30:00	LPRSA0189751	PAP-00456146	
3/22/1952 17:00	3/24/1952 9:30	40:30:00	LPRSA0189750	PAP-00456145	
3/24/1952 18:15	3/25/1952 9:30	15:15:00	LPRSA0189750	PAP-00456145	
4/4/1952 16:45	4/6/1952 9:00	40:15:00	LPRSA0189749	PAP-00456144	
4/14/1952 1:15	4/14/1952 10:30	9:15:00	LPRSA0189748	PAP-00456143	
4/14/1952 14:30	4/15/1952 13:00	22:30:00	LPRSA0189748	PAP-00456143	
4/23/1952 16:30	4/24/1952 9:00	16:30:00	LPRSA0189747	PAP-00456142	
4/25/1952 9:00	4/25/1952 19:15	10:15:00	LPRSA0189744	PAP-00456139	
4/26/1952 10:30	4/28/1952 16:00	53:30:00	LPRSA0189744	PAP-00456139	
4/29/1952 15:45	5/3/1952 9:30	89:45:00	LPRSA0189745	PAP-00456140	
5/5/1952 9:30	5/5/1952 16:45	7:15:00	LPRSA0189745	PAP-00456140	
5/6/1952 15:15	5/6/1952 22:00	6:45:00	LPRSA0189745	PAP-00456140	
5/12/1952 14:00	5/12/1952 16:00	2:00:00	LPRSA0189743	PAP-00456138	Throw out log confusing. Defaulted to Koch report
5/13/1952 14:30	5/14/1952 8:30	18:00:00	LPRSA0189743	PAP-00456138	
5/18/1952 7:15	5/19/1952 9:30	26:15:00	LPRSA0189741	PAP-00456136	
5/19/1952 18:30	5/20/1952 14:45	20:15:00	LPRSA0189741	PAP-00456136	
5/21/1952 15:30	5/22/1952 9:30	18:00:00	LPRSA0189741	PAP-00456136	
5/22/1952 16:00	5/23/1952 13:45	21:45:00	LPRSA0189742	PAP-00456137	
5/25/1952 8:45	5/25/1952 13:45	5:00:00	LPRSA0189740	PAP-00456135	
5/26/1952 10:15	5/27/1952 8:30	22:15:00	LPRSA0189740	PAP-00456135	
6/2/1952 14:45	6/3/1952 9:30	18:45:00	LPRSA0189738	PAP-00456133	
6/9/1952 8:30	6/10/1952 17:00	32:30:00	LPRSA0189736	PAP-00456131	
6/11/1952 14:00	6/11/1952 17:00	3:00:00	LPRSA0189737	PAP-00456132	
6/17/1952 16:40	6/17/1952 20:50	4:10:00	LPRSA0189735	PAP-00456130	
6/19/1952 16:00	6/20/1952 10:30	18:30:00	LPRSA0189734	PAP-00456129	
6/27/1952 15:40	6/28/1952 8:10	16:30:00	LPRSA0189729	PAP-00456124	
6/29/1952 0:15	6/30/1952 9:15	33:00:00	LPRSA0189728	PAP-00456123	
7/8/1952 15:45	7/10/1952 9:15	41:30:00	LPRSA0189730	PAP-00456125	
7/21/1952 15:45	7/22/1952 9:45	18:00:00	LPRSA0189726	PAP-00456121	

Exhibit 1b. Documented PVSC Bypasses at Verona Avenue (Newark)

7/31/1952 16:15	8/1/1952 9:15	17:00:00	LPRSA0189724	PAP-00456119	
8/2/1952 15:40	8/3/1952 8:45	17:05:00	LPRSA0189725	PAP-00456120	
8/6/1952 14:15	8/6/1952 19:45	5:30:00	LPRSA0189715	PAP-00456110	
8/8/1952 13:15	8/9/1952 14:15	25:00:00	LPRSA0189715	PAP-00456110	
8/10/1952 8:45	8/11/1952 8:15	23:30:00	LPRSA0189716	PAP-00456112-113	
8/11/1952 16:45	8/12/1952 8:15	15:30:00	LPRSA0189719	PAP-00456114-115	
8/12/1952 16:15	8/13/1952 8:15	16:00:00	LPRSA0189721	PAP-00456116-117	
8/13/1952 16:45	8/14/1952 8:15	15:30:00	LPRSA0189720	PAP-00456117-118	
8/15/1952 16:15	8/17/1952 8:15	40:00:00	LPRSA0189714	PAP-00456109	
8/21/1952 15:45	8/22/1952 9:15	17:30:00	LPRSA0189713	PAP-00456108	
8/30/1952 9:15	9/2/1952 8:15	71:00:00	LPRSA0189712	PAP-00456107	
9/2/1952 16:15	9/3/1952 13:15	21:00:00	LPRSA0189711	PAP-00456106	
9/15/1952 15:15	9/17/1952 16:15	49:00:00	LPRSA0189709	PAP-00456104	
9/18/1952 12:15	9/20/1952 8:15	44:00:00	LPRSA0189710	PAP-00456105	
9/23/1952 9:45	9/23/1952 13:15	3:30:00	LPRSA0189708	PAP-00456103	
10/2/1952 18:15	10/2/1952 22:00	3:45:00	LPRSA0189707	PAP-00456102	
10/28/1952 16:45	10/29/1952 8:15	15:30:00	LPRSA0189706	PAP-00456101	
11/2/1952 8:30	11/2/1952 13:30	5:00:00	LPRSA0189705	PAP-00456100	
11/3/1952 13:15	11/4/1952 8:15	19:00:00	LPRSA0189703	PAP-00456098	
11/10/1952 15:45	11/11/1952 8:15	16:30:00	LPRSA0189704	PAP-00456099	
12/2/1952 13:15	12/5/1952 17:15	76:00:00	LPRSA0189702	PAP-00456097	
12/9/1952 10:45	1/18/1953 16:30	965:45:00	LPRSA0189655	PAP-00456556	
1/21/1953 14:15	1/22/1953 8:15	18:00:00	LPRSA0189656	PAP-00456557	
1/24/1953 9:15	1/24/1953 15:15	6:00:00	LPRSA0189657	PAP-00456558	
2/11/1953 16:45	2/13/1953 9:45	41:00:00	LPRSA0189658	PAP-00456559	
2/15/1953 10:15	2/15/1953 15:45	5:30:00	LPRSA0189659	PAP-00456560	
2/21/1953 8:15	2/22/1953 20:30	36:15:00	LPRSA0189660	PAP-00456561	
2/25/1953 8:15	3/10/1953 18:45	322:30:00	LPRSA0189661	PAP-00456562	
3/15/1953 0:15	3/23/1953 13:15	205:00:00	LPRSA0189664	PAP-00456155	
3/24/1953 9:00	3/25/1953 19:45	34:45:00	LPRSA0189664	PAP-00456155	
3/30/1953 14:15	3/31/1953 9:30	19:15:00	LPRSA0189664	PAP-00456155	
5/5/1953 16:30	5/6/1953 11:30	19:00:00	LPRSA0189664	PAP-00456155	
5/8/1953 10:00	5/9/1953 9:15	23:15:00	LPRSA0189664	PAP-00456155	
5/13/1953 9:45	5/14/1953 9:30	23:45:00	LPRSA0189664	PAP-00456155	
5/14/1953 15:00	5/15/1953 11:30	20:30:00	LPRSA0189664	PAP-00456155	
5/24/1953 12:00	5/25/1953 10:00	22:00:00	LPRSA0189664	PAP-00456155	
7/6/1953 19:45	7/7/1953 8:15	12:30:00	LPRSA0189681	PAP-00456570	
7/20/1953 21:10	7/21/1953 8:30	11:20:00	LPRSA0189682	PAP-00456571	
10/27/1953 16:30	10/28/1953 14:15	21:45:00	LPRSA0189692	PAP-00456581	
10/29/1953 13:45	10/29/1953 16:00	2:15:00	LPRSA0189693	PAP-00456582	
11/7/1953 6:45	11/8/1953 14:15	31:30:00	LPRSA0189695	PAP-00456584	
12/6/1953 11:30	12/7/1953 8:20	20:50:00	LPRSA0189650	PAP-00456551	
12/14/1953 5:45	12/14/1953 12:15	6:30:00	LPRSA0189647	PAP-00456548	
12/28/1953 16:30	12/29/1953 9:15	16:45:00	LPRSA0189646	PAP-00456547	
1/14/1954 16:15	1/18/1954 9:15	89:00:00	LPRSA0189592	PAP-00456493	

Exhibit 1b. Documented PVSC Bypasses at Verona Avenue (Newark)

1/18/1954 14:15	1/21/1954 9:30	67:15:00	LPRSA0189591	PAP-00456492	
1/22/1954 15:15	1/25/1954 9:30	66:15:00	LPRSA0189590	PAP-00456491	
1/25/1954 14:15	2/2/1954 9:45	187:30:00	LPRSA0189590	PAP-00456491	
2/3/1954 13:00	2/4/1954 9:00	20:00:00	LPRSA0189589	PAP-00456490	
2/8/1954 17:15	2/9/1954 9:15	16:00:00	LPRSA0189588	PAP-00456489	
2/16/1954 16:45	2/17/1954 13:30	20:45:00	LPRSA0189587	PAP-00456488	
2/21/1954 17:00	2/22/1954 8:30	15:30:00	LPRSA0189586	PAP-00456487	
2/23/1954 11:45	2/24/1954 13:00	25:15:00	LPRSA0189621	PAP-00456522	
3/19/1954 16:15	3/20/1954 14:30	22:15:00	LPRSA0189617	PAP-00456518	
4/13/1954 12:15	4/13/1954 15:30	3:15:00	LPRSA0189623	PAP-00456524	
4/16/1954 13:00	4/18/1954 10:00	45:00:00	LPRSA0189632	PAP-00456533	
4/23/1954 13:15	4/25/1954 9:15	44:00:00	LPRSA0189614	PAP-00456515	
5/7/1954 10:30	5/14/1954 16:00	173:30:00	LPRSA0189631	PAP-00456532	
6/3/1954 16:45	6/9/1954 9:30	136:45:00	LPRSA0189630	PAP-00456531	
7/7/1954 16:15	7/8/1954 9:15	17:00:00	LPRSA0189624	PAP-00456525	
8/3/1954 9:00	8/4/1954 9:00	24:00:00	LPRSA0189620	PAP-00456521	
8/9/1954 8:45	8/9/1954 13:45	5:00:00	LPRSA0189622	PAP-00456523	
8/20/1954 16:15	8/22/1954 8:15	40:00:00	LPRSA0189610	PAP-00456511	
8/25/1954 16:30	8/26/1954 9:00	16:30:00	LPRSA0189609	PAP-00456510	
8/30/1954 16:30	9/1/1954 9:15	40:45:00	LPRSA0189608	PAP-00456509	
9/8/1954 14:15	9/9/1954 9:00	18:45:00	LPRSA0189607	PAP-00456508	
9/10/1954 13:15	9/12/1954 9:00	43:45:00	LPRSA0189606	PAP-00456507	
9/14/1954 15:45	9/18/1954 9:00	89:15:00	LPRSA0189605	PAP-00456506	
10/4/1954 8:45	10/8/1954 15:45	103:00:00	LPRSA0189604	PAP-00456505	
10/27/1954 16:15	10/28/1954 9:15	17:00:00	LPRSA0189602	PAP-00456503	
10/29/1954 9:15	10/30/1954 8:45	23:30:00	LPRSA0189601	PAP-00456502	
11/2/1954 12:45	11/4/1954 9:00	44:15:00	LPRSA0189600	PAP-00456501	
11/8/1954 13:00	11/9/1954 13:00	24:00:00	LPRSA0189599	PAP-00456500	
11/15/1954 9:30	11/29/1954 9:30	336:00:00	LPRSA0189597	PAP-00456498	
12/9/1954 13:45	12/9/1954 17:45	4:00:00	LPRSA0189596	PAP-00456497	
12/14/1954 9:15	12/14/1954 15:45	6:30:00	LPRSA0189595	PAP-00456496	
12/16/1954 14:00	12/16/1954 20:00	6:00:00	LPRSA0189594	PAP-00456495	
12/18/1954 10:15	12/19/1954 8:15	22:00:00	LPRSA0189593	PAP-00456494	
12/29/1954 12:45	12/30/1954 15:00	26:15:00	LPRSA0189585	PAP-00456486	
1/6/1955 13:45	1/7/1955 9:00	19:15:00	LPRSA0189582	PAP-00456485	
1/28/1955 9:30	2/4/1955 10:00	168:30:00	LPRSA0189580	PAP-00456483	
2/14/1955 15:00	2/18/1955 16:15	97:15:00	LPRSA0189580	PAP-00456483	
2/21/1955 13:15	3/7/1955 9:30	332:15:00	LPRSA0189579	PAP-00456482	
3/7/1955 13:30	3/7/1955 16:00	2:30:00	LPRSA0189578	PAP-00456481	
3/21/1955 14:45	3/23/1955 13:30	46:45:00	LPRSA0189577	PAP-00456480	
3/28/1955 13:15	3/30/1955 16:15	51:00:00	LPRSA0189576	PAP-00456479	
4/6/1955 14:45	4/7/1955 16:00	25:15:00	LPRSA0189575	PAP-00456478	
4/12/1955 14:15	4/14/1955 13:15	47:00:00	LPRSA0189574	PAP-00456477	
5/31/1955 13:00	5/31/1955 18:00	5:00:00	LPRSA0189572	PAP-00456475	
6/21/1955 23:00	6/22/1955 8:15	9:15:00	LPRSA0189571	PAP-00456474	

Exhibit 1b. Documented PVSC Bypasses at Verona Avenue (Newark)

8/7/1955 23:15	8/8/1955 2:30	3:15:00	LPRSA0189570	PAP-00456473	
8/11/1955 19:15	8/14/1955 8:30	61:15:00	LPRSA0189569	PAP-00456472	
8/15/1955 16:45	8/16/1955 14:30	21:45:00	LPRSA0189568	PAP-00456471	
8/18/1955 16:00	8/19/1955 2:45	10:45:00	LPRSA0189567	PAP-00456470	
8/21/1955 21:45	8/22/1955 9:15	11:30:00	LPRSA0189566	PAP-00456469	
8/24/1955 15:00	8/25/1955 9:00	18:00:00	LPRSA0189565	PAP-00456468	
8/25/1955 16:00	8/26/1955 9:30	17:30:00	LPRSA0189564	PAP-00456467	
9/24/1955 5:15	9/26/1955 8:15	51:00:00	LPRSA0189563	PAP-00456466	
10/6/1955 8:15	10/7/1955 11:00	26:45:00	LPRSA0189562	PAP-00456465	
10/14/1955 11:15	10/15/1955 14:45	27:30:00	LPRSA0189561	PAP-00456464	
10/16/1955 14:50	10/16/1955 20:30	5:40:00	LPRSA0189561	PAP-00456464	
10/17/1955 15:45	10/21/1955 13:30	93:45:00	LPRSA0189561	PAP-00456464	
10/30/1955 9:45	10/30/1955 16:25	6:40:00	LPRSA0189560	PAP-00456463	
11/10/1955 15:45	11/11/1955 1:15	9:30:00	LPRSA0189559	PAP-00456462	
11/11/1955 11:00	11/12/1955 8:30	21:30:00	LPRSA0189559	PAP-00456462	
11/16/1955 9:15	11/16/1955 14:15	5:00:00	LPRSA0189558	PAP-00456461	
1/30/1956 13:00	1/31/1956 8:15	19:15:00	LPRSA0189556	PAP-00456460	
2/2/1956 11:45	2/3/1956 8:15	20:30:00	LPRSA0189555	PAP-00456459	
2/6/1956 15:45	2/7/1956 12:30	20:45:00	LPRSA0189554	PAP-00456458	
2/18/1956 8:30	2/19/1956 8:00	23:30:00	LPRSA0189553	PAP-00456457	
3/8/1956 1:45	3/9/1956 8:30	30:45:00	LPRSA0189552	PAP-00456456	
3/14/1956 9:15	3/15/1956 9:00	23:45:00	LPRSA0189551	PAP-00456455	
3/21/1956 15:20	3/23/1956 14:00	46:40:00	LPRSA0189549	PAP-00456453	
3/29/1956 16:30	3/30/1956 9:00	16:30:00	LPRSA0189547	PAP-00456451	
4/7/1956 2:25	4/9/1956 13:15	58:50:00	LPRSA0189546	PAP-00456450	
4/11/1956 18:00	4/12/1956 8:20	14:20:00	LPRSA0189545	PAP-00456449	
5/2/1956 21:20	5/3/1956 9:00	11:40:00	LPRSA0189544	PAP-00456448	
6/2/1956 15:10	6/3/1956 12:00	20:50:00	LPRSA0189543	PAP-00456447	
6/27/1956 17:00	6/27/1956 18:10	1:10:00	LPRSA0189542	PAP-00456446	
7/16/1956 14:30	7/17/1956 9:00	18:30:00	LPRSA0189541	PAP-00456445	
7/21/1956 9:45	7/21/1956 21:50	12:05:00	LPRSA0189540	PAP-00456444	
7/27/1956 9:45	7/27/1956 15:15	5:30:00	LPRSA0189539	PAP-00456443	
8/6/1956 16:30	8/7/1956 8:15	15:45:00	LPRSA0189538	PAP-00456442	
8/21/1956 4:15	8/21/1956 16:00	11:45:00	LPRSA0189537	PAP-00456441	
9/6/1956 18:15	9/7/1956 8:00	13:45:00	LPRSA0189536	PAP-00456440	
9/7/1956 10:00	9/7/1956 16:30	6:30:00	LPRSA0189535	PAP-00456439	
9/27/1956 16:00	9/28/1956 8:15	16:15:00	LPRSA0189534	PAP-00456438	
10/22/1956 21:45	10/23/1956 8:15	10:30:00	LPRSA0189533	PAP-00456437	
10/31/1956 11:45	10/31/1956 19:30	7:45:00	LPRSA0189532	PAP-00456436	
11/1/1956 10:15	11/1/1956 16:00	5:45:00	LPRSA0189532	PAP-00456436	
11/18/1956 2:15	11/18/1956 11:00	8:45:00	LPRSA0189531	PAP-00456435	
11/22/1956 0:30	11/22/1956 8:00	7:30:00	LPRSA0189530	PAP-00456434	
12/9/1956 15:00	12/10/1956 8:30	17:30:00	LPRSA0189529	PAP-00456433	
12/14/1956 8:15	12/14/1956 16:00	7:45:00	LPRSA0189528	PAP-00456432	
12/22/1956 22:15	12/23/1956 10:00	11:45:00	LPRSA0189527	PAP-00456431	

Exhibit 1b. Documented PVSC Bypasses at Verona Avenue (Newark)

1/23/1957 3:45	1/23/1957 12:00	8:15:00	LPRSA0189498	PAP-00456403	
2/9/1957 14:00	2/10/1957 8:45	18:45:00	LPRSA0189497	PAP-00456402	
2/26/1957 15:45	2/26/1957 22:30	6:45:00	LPRSA0189496	PAP-00456401	
3/1/1957 15:15	3/2/1957 10:30	19:15:00	LPRSA0189524	PAP-00456429	
3/8/1957 9:30	3/10/1957 9:50	48:20:00	LPRSA0189523	PAP-00456428	
3/15/1957 20:35	3/16/1957 9:35	13:00:00	LPRSA0189522	PAP-00456427	
3/19/1957 21:30	3/20/1957 15:30	18:00:00	LPRSA0189521	PAP-00456426	
4/2/1957 7:45	4/2/1957 13:45	6:00:00	LPRSA0189520	PAP-00456425	
4/4/1957 21:10	4/5/1957 10:45	13:35:00	LPRSA0189519	PAP-00456424	
4/5/1957 14:15	4/6/1957 13:20	23:05:00	LPRSA0189518	PAP-00456423	
4/9/1957 9:00	4/9/1957 15:45	6:45:00	LPRSA0189516	PAP-00456421	
4/10/1957 9:00	4/10/1957 15:45	6:45:00	LPRSA0189515	PAP-00456420	
4/11/1957 8:15	4/11/1957 15:45	7:30:00	LPRSA0189514	PAP-00456419	
4/12/1957 8:15	4/12/1957 16:00	7:45:00	LPRSA0189513	PAP-00456418	
4/18/1957 22:00	4/19/1957 13:30	15:30:00	LPRSA0189512	PAP-00456417	
4/23/1957 6:55	4/23/1957 14:00	7:05:00	LPRSA0189511	PAP-00456416	
4/25/1957 16:00	4/26/1957 9:30	17:30:00	LPRSA0189510	PAP-00456415	
4/29/1957 13:15	4/29/1957 15:45	2:30:00	LPRSA0189509	PAP-00456414	
5/14/1957 21:00	5/15/1957 10:45	13:45:00	LPRSA0189508	PAP-00456413	
5/16/1957 0:00	8/25/1957 23:59				data missing
8/26/1957 1:30	8/26/1957 19:00	17:30:00	LPRSA0189507	PAP-00456412	
9/10/1957 22:45	9/11/1957 8:45	10:00:00	LPRSA0189506	PAP-00456411	
9/17/1957 0:00	9/17/1957 9:15	9:15:00	LPRSA0189505	PAP-00456410	
9/18/1957 0:00	12/19/1957 23:59				data missing
10/23/1958 2:15	10/23/1958 15:20	13:05:00	LPRSA0189469	PAP-00456170	
10/25/1958 19:00	10/27/1958 13:30	42:30:00	LPRSA0189468	PAP-00456169	
3/6/1959 2:15	3/6/1959 16:15	14:00:00	LPRSA0189458	PAP-00456227	
6/2/1959 18:30	6/3/1959 8:00	13:30:00	LPRSA0189454	PAP-00456223	
9/1/1959 18:30	9/2/1959 8:00	13:30:00	LPRSA0189445	PAP-00456214	
11/24/1959 16:15	11/25/1959 8:25		LPRSA0189432	PAP-00456201	Moved to Union tab
12/7/1959 2:30	12/7/1959 10:00	7:30:00	LPRSA0189431	PAP-00456200	
2/19/1960 1:40	2/19/1960 10:15	8:35:00	LPRSA0189421	PAP-00456264	
4/3/1960 22:00	4/4/1960 8:30	10:30:00	LPRSA0189416	PAP-00456259	
7/30/1960 9:45	7/31/1960 9:00	23:15:00	LPRSA0189402	PAP-00456245	
8/19/1960 15:45	8/20/1960 9:05	17:20:00	LPRSA0189399	PAP-00456242	
9/12/1960 9:45	9/13/1960 8:30	22:45:00	LPRSA0189397	PAP-00456240	
9/19/1960 10:30	9/19/1960 15:45	5:15:00	LPRSA0189396	PAP-00456239	
12/21/1960 11:35	12/22/1960 9:30	21:55:00	LPRSA0189391	PAP-00456234	
1/1/1961 9:15	1/2/1961 9:00	23:45:00	LPRSA0189389	PAP-00456730	
3/14/1961 8:15	3/14/1961 13:00	4:45:00	LPRSA0189382	PAP-00456723	
3/23/1961 13:45	3/24/1961 10:30	20:45:00	LPRSA0189383	PAP-00456724	
4/10/1961 10:50	4/10/1961 15:15	4:25:00	LPRSA0189376	PAP-00456717	
4/13/1961 6:05	4/13/1961 15:15	9:10:00	LPRSA0189375	PAP-00456716	
4/16/1961 12:05	4/17/1961 8:15	20:10:00	LPRSA0189373	PAP-00456714	
4/24/1961 10:00	4/24/1961 14:30	4:30:00	LPRSA0189370	PAP-00456711	

Exhibit 1b. Documented PVSC Bypasses at Verona Avenue (Newark)

9/20/1961 15:30	9/21/1961 15:00	23:30:00	LPRSA0189348	PAP-00456689	
12/18/1961 11:15	12/20/1961 8:30	45:15:00	LPRSA0189338	PAP-00456679	
2/26/1962 15:30	2/27/1962 8:15	16:45:00	LPRSA0189329	PAP-00456321	
2/27/1962 13:30	2/28/1962 15:15	25:45:00	LPRSA0189329	PAP-00456321	
3/12/1962 10:05	3/13/1962 8:20	22:15:00	LPRSA0189327	PAP-00456319	
3/21/1962 15:05	3/22/1962 8:30	17:25:00	LPRSA0189326	PAP-00456318	
4/7/1962 14:50	4/9/1962 8:30	41:40:00	LPRSA0189324	PAP-00456316	
4/9/1962 15:40	4/10/1962 8:20	16:40:00	LPRSA0189323	PAP-00456315	
9/27/1962 14:15	9/28/1962 13:30	23:15:00	LPRSA0189296	PAP-00456288	
10/5/1962 9:20	10/7/1962 9:35	48:15:00	LPRSA0189295	PAP-00456287	
10/23/1962 11:20	10/23/1962 15:45	4:25:00	LPRSA0189291	PAP-00456283	
10/25/1962 22:45	10/26/1962 15:00	16:15:00	LPRSA0189290	PAP-00456282	
10/30/1962 15:00	10/31/1962 10:30	19:30:00	LPRSA0189289	PAP-00456281	
11/3/1962 10:00	11/5/1962 8:10	46:10:00	LPRSA0189288	PAP-00456280	
11/18/1962 12:45	11/19/1962 8:15	19:30:00	LPRSA0189285	PAP-00456277	
11/21/1962 22:10	11/23/1962 9:15	35:05:00	LPRSA0189284	PAP-00456276	
12/5/1962 8:30	12/6/1962 15:00	30:30:00	LPRSA0189283	PAP-00456275	
Subtotal 1950-1962 Koch Report		8516:55:00			
Subtotal 1950-1962 Throw out logs		8484:45:00			
Koch report 1975 (PAP-00488413)					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**	**AlterEcho Bates number**	**Comments**
1/1/1975	1/1/1975	0:00:00	LPRSA0196644	PAP-00456743	data missing
6/29/1975	6/29/1975	0:00:00	LPRSA0196645	PAP-00456744	data missing
6/30/1975	12/31/2004	0:00:00			data missing

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1c. Documented PVSC Bypasses at 4th Avenue (Newark)

Allocation Report			
	Time of bypasses	Time observed	% of Total Time
1950-1962	12912:05:00	107270:30:00	12.04%
1974-1975	558:25:00	8334:00:00	6.70%
Total	13470:30:00	115604:30:00	11.65%

Koch report 1950-1962 (PAP-00488422 - PAP-00488428)					
Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	AlterEcho Bates Number (throw-out logs)	Comments
10/4/1950 22:00	10/5/1950 11:30	13:30:00	LPRSA0188654	PAP-00456399	
10/10/1950 2:30	10/10/1950 8:30	6:00:00	LPRSA0188652	PAP-00456397	
10/12/1950 13:30	10/13/1950 9:30	20:00:00	LPRSA0188650	PAP-00456395	
10/23/1950 13:30	10/24/1950 9:00	19:30:00	LPRSA0188648	PAP-00456393	
11/20/1950 18:00	11/21/1950 9:00	15:00:00	LPRSA0188646	PAP-00456391	
11/25/1950 9:00	11/25/1950 13:00	4:00:00	LPRSA0188643	PAP-00456388	
12/4/1950 12:30	12/4/1950 21:00	8:30:00	LPRSA0188641	PAP-00456386	
12/7/1950 16:00	12/8/1950 11:30	19:30:00	LPRSA0188637	PAP-00456382	
12/15/1950 22:30	12/16/1950 9:00	10:30:00	LPRSA0188639	PAP-00456384	
12/29/1950 12:30	12/30/1950 11:30	23:00:00	LPRSA0188635	PAP-00456380	
1/7/1951 17:00	1/8/1951 9:00	16:00:00	LPRSA0188633	PAP-00456378	
1/11/1951 17:30	1/12/1951 8:30	15:00:00	LPRSA0188619	PAP-00456364	
1/14/1951 18:00	1/15/1951 12:00	18:00:00	LPRSA0188631	PAP-00456376	
1/23/1951 2:00	1/24/1951 14:00	36:00:00	LPRSA0188621	PAP-00456366	
1/25/1951 16:00	1/25/1951 19:00	3:00:00	LPRSA0188623	PAP-00456368	
1/28/1951 17:00	1/29/1951 8:30	15:30:00	LPRSA0188625	PAP-00456370	
1/29/1951 19:30	1/30/1951 10:00	14:30:00	LPRSA0188625	PAP-00456370	
1/31/1951 16:00	2/2/1951 10:00	42:00:00	LPRSA0188628	PAP-00456373	
2/7/1951 11:00	2/8/1951 14:30	27:30:00	LPRSA0188585	PAP-00456085; PAP-00456330	
2/10/1951 5:30	2/10/1951 12:00	6:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/11/1951 18:00	2/13/1951 13:30	43:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/13/1951 19:45	2/14/1951 10:00	14:15:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/14/1951 17:45	2/15/1951 9:30	15:45:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/17/1951 4:00	2/18/1951 11:30	31:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/19/1951 17:00	2/20/1951 14:30	21:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/22/1951 10:30	2/22/1951 11:45	1:15:00	LPRSA0188596	PAP-00456064; PAP-00456341	

2/23/1951 8:30	2/23/1951 10:00	1:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
3/1/1951 15:00	3/2/1951 10:00	19:00:00	LPRSA0188604	PAP-00456349	
3/3/1951 15:00	3/5/1951 10:30	43:30:00	LPRSA0188606	PAP-00456351	
3/13/1951 16:30	3/15/1951 9:30	41:00:00	LPRSA0188609	PAP-00456354	
3/16/1951 16:00	3/19/1951 9:30	65:30:00	LPRSA0188612	PAP-00456357	
3/19/1951 17:00	3/20/1951 12:00	19:00:00	LPRSA0188616	PAP-00456361	
3/22/1951 0:00	12/31/1951 23:59				data missing
2/17/1952 3:30	2/18/1952 9:00	29:30:00	LPRSA0189755	PAP-00456150	
2/20/1952 18:00	2/21/1952 13:30	19:30:00	LPRSA0189754	PAP-00456149	
2/29/1952 21:00	3/3/1952 11:00	62:00:00	LPRSA0189753	PAP-00456148	
3/3/1952 17:30	3/5/1952 14:30	45:00:00	LPRSA0189753	PAP-00456148	
3/11/1952 5:00	3/17/1952 14:00	153:00:00	LPRSA0189752	PAP-00456147	
3/19/1952 10:30	3/21/1952 11:00	48:30:00	LPRSA0189751	PAP-00456146	
3/22/1952 17:00	3/25/1952 10:30	65:30:00	LPRSA0189750	PAP-00456145	
4/4/1952 16:45	4/6/1952 9:00	40:15:00	LPRSA0189749	PAP-00456144	
4/14/1952 4:00	4/16/1952 11:00	55:00:00	LPRSA0189748	PAP-00456143	
4/23/1952 16:30	4/24/1952 10:30	18:00:00	LPRSA0189747	PAP-00456142	
4/25/1952 11:00	4/28/1952 17:00	78:00:00	LPRSA0189744	PAP-00456139	
4/29/1952 15:15	5/7/1952 14:30	191:15:00	LPRSA0189744	PAP-00456139-40	
5/11/1952 22:00	5/13/1952 11:00	37:00:00	LPRSA0189743	PAP-00456138	
5/18/1952 7:45	5/23/1952 14:15	126:30:00	LPRSA0189741	PAP-00456136	
5/25/1952 9:15	5/27/1952 9:00	47:45:00	LPRSA0189740	PAP-00456135	
5/29/1952 18:15	5/30/1952 9:30	15:15:00	LPRSA0189738	PAP-00456133	
6/3/1952 12:15	6/6/1952 9:45	69:30:00	LPRSA0189736	PAP-00456131	
6/9/1952 9:00	6/14/1952 9:30	120:30:00	LPRSA0189737	PAP-00456132	
6/17/1952 17:15	6/18/1952 11:00	17:45:00	LPRSA0189735	PAP-00456130	
6/19/1952 15:30	6/20/1952 10:00	18:30:00	LPRSA0189734	PAP-00456129	
6/27/1952 16:00	6/28/1952 8:30	16:30:00	LPRSA0189729	PAP-00456124	
6/29/1952 0:45	6/30/1952 9:45	33:00:00	LPRSA0189728	PAP-00456123	
7/8/1952 16:00	7/10/1952 9:40	41:40:00	LPRSA0189730	PAP-00456125	
7/21/1952 16:15	7/22/1952 10:15	18:00:00	LPRSA0189726	PAP-00456121	
7/31/1952 16:45	8/1/1952 9:45	17:00:00	LPRSA0189724	PAP-00456119	
8/2/1952 16:00	8/3/1952 9:15	17:15:00	LPRSA0189725	PAP-00456120	
8/6/1952 15:00	8/7/1952 14:00	23:00:00	LPRSA0189715	PAP-00456110	
8/8/1952 14:00	8/11/1952 9:00	67:00:00	LPRSA0189715	PAP-00456110	
8/11/1952 17:15	8/12/1952 8:45	15:30:00	LPRSA0189719	PAP-00456114-115	
8/12/1952 17:00	8/13/1952 8:45	15:45:00	LPRSA0189721	PAP-00456116-117	
8/13/1952 16:45	8/14/1952 8:45	16:00:00	LPRSA0189720	PAP-00456117-118	
8/15/1952 16:45	8/17/1952 8:45	40:00:00	LPRSA0189714	PAP-00456109	
8/21/1952 16:15	8/22/1952 9:45	17:30:00	LPRSA0189713	PAP-00456108	
8/30/1952 9:45	9/2/1952 8:45	71:00:00	LPRSA0189712	PAP-00456107	
9/2/1952 16:45	9/3/1952 13:45	21:00:00	LPRSA0189711	PAP-00456106	
9/15/1952 16:00	9/17/1952 16:45	48:45:00	LPRSA0189709	PAP-00456104	
9/18/1952 12:45	9/20/1952 8:45	44:00:00	LPRSA0189710	PAP-00456105	
9/23/1952 10:15	9/23/1952 13:45	3:30:00	LPRSA0189708	PAP-00456103	
10/2/1952 18:45	10/3/1952 13:15	18:30:00	LPRSA0189707	PAP-00456102	

10/28/1952 17:15	10/29/1952 8:45	15:30:00	LPRSA0189706	PAP-00456101	
11/2/1952 9:00	11/2/1952 14:00	5:00:00	LPRSA0189705	PAP-00456100	
11/3/1952 13:45	11/4/1952 8:45	19:00:00	LPRSA0189703	PAP-00456098	
11/10/1952 16:15	11/11/1952 8:45	16:30:00	LPRSA0189704	PAP-00456099	
11/14/1952 13:15	12/1/1952 13:15	408:00:00	LPRSA0189701	PAP-00456096	
12/2/1952 13:45	12/5/1952 17:45	76:00:00	LPRSA0189702	PAP-00456097	
1/21/1953 14:45	1/22/1953 8:45	18:00:00	LPRSA0189656	PAP-00456557	
1/24/1953 9:45	1/24/1953 15:45	6:00:00	LPRSA0189657	PAP-00456558	
2/11/1953 17:15	2/13/1953 10:15	41:00:00	LPRSA0189658	PAP-00456559	
2/15/1953 10:45	2/15/1953 16:15	5:30:00	LPRSA0189659	PAP-00456560	
2/21/1953 8:45	2/22/1953 21:00	36:15:00	LPRSA0189660	PAP-00456561	
2/25/1953 8:45	3/10/1953 18:15	321:30:00	LPRSA0189661	PAP-00456562	
3/15/1953 13:00	3/23/1953 14:00	193:00:00	LPRSA0189666	PAP-00456157	
3/24/1953 9:45	3/25/1953 10:00	24:15:00	LPRSA0189666	PAP-00456157	
3/25/1953 15:45	3/26/1953 9:45	18:00:00	LPRSA0189666	PAP-00456157	
3/30/1953 14:45	4/29/1953 9:30	714:45:00	LPRSA0189666	PAP-00456157	
4/30/1953 16:30	5/1/1953 14:00	21:30:00	LPRSA0189666	PAP-00456157	
5/1/1953 16:45	5/5/1953 16:00	95:15:00	LPRSA0189666	PAP-00456157	
5/8/1953 22:15	5/9/1953 9:30	11:15:00	LPRSA0189666	PAP-00456157	
5/13/1953 23:00	5/22/1953 18:45	211:45:00	LPRSA0189666	PAP-00456157	
5/25/1953 10:00	5/25/1953 15:15	5:15:00	LPRSA0189666	PAP-00456157	
5/27/1953 10:45	5/28/1953 13:45	27:00:00	LPRSA0189666	PAP-00456157	
6/13/1953 17:00	6/14/1953 14:00	21:00:00	LPRSA0189674	PAP-00456563	
6/18/1953 16:30	6/19/1953 9:30	17:00:00	LPRSA0189676	PAP-00456565	
6/22/1953 10:00	6/22/1953 18:45	8:45:00	LPRSA0189677	PAP-00456566	
6/23/1953 10:00	7/2/1953 14:00	220:00:00	LPRSA0189678	PAP-00456567	
7/6/1953 20:00	7/7/1953 8:30	12:30:00	LPRSA0189681	PAP-00456570	
7/20/1953 21:25	7/21/1953 8:55	11:30:00	LPRSA0189682	PAP-00456571	
7/23/1953 8:45	7/23/1953 15:15	6:30:00	LPRSA0189684	PAP-00456573	
8/10/1953 1:00	8/10/1953 10:30	9:30:00	LPRSA0189685	PAP-00456574	
8/14/1953 13:15	8/15/1953 8:30	19:15:00	LPRSA0189686	PAP-00456575	
9/16/1953 1:45	9/16/1953 8:15	6:30:00	LPRSA0189688	PAP-00456576	
10/6/1953 18:15	10/7/1953 9:30	15:15:00	LPRSA0189689	PAP-00456578	
10/27/1953 16:50	10/28/1953 14:00	21:10:00	LPRSA0189692	PAP-00456581	
10/29/1953 14:15	10/29/1953 16:30	2:15:00	LPRSA0189693	PAP-00456582	
10/29/1953 19:00	10/30/1953 9:30	14:30:00	LPRSA0189694	PAP-00456583	
11/7/1953 7:15	11/8/1953 10:45	27:30:00	LPRSA0189695	PAP-00456584	
11/16/1953 9:45			LPRSA0189653	PAP-00456554	data missing
11/23/1953 10:00	11/24/1953 1:45	27:45:00	LPRSA0189698	PAP-00456587	
11/25/1953 10:00	11/26/1953 9:00	23:00:00	LPRSA0189652	PAP-00456553	
11/30/1953 10:00	12/4/1953 11:00	97:00:00	LPRSA0189651	PAP-00456552	
12/6/1953 9:30	12/7/1953 9:45	24:15:00	LPRSA0189650	PAP-00456551	
12/9/1953 16:30	12/10/1953 16:30	24:00:00	LPRSA0189649	PAP-00456550	
12/12/1953 16:30	12/13/1953 8:30	16:00:00	LPRSA0189648	PAP-00456549	
12/14/1953 6:15	12/14/1953 15:30	9:15:00	LPRSA0189647	PAP-00456548	
12/28/1953 17:00	12/29/1953 13:30	20:30:00	LPRSA0189646	PAP-00456547	
1/14/1954 16:45	1/18/1954 9:45	89:00:00	LPRSA0189592	PAP-00456493	

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1/18/1954 14:45	1/22/1954 9:45	91:00:00	LPRSA0189591	PAP-00456492	
1/22/1954 14:45	1/25/1954 10:00	67:15:00	LPRSA0189590	PAP-00456491	
1/25/1954 13:45	2/2/1954 10:00	188:15:00	LPRSA0189590	PAP-00456491	
2/3/1954 13:30	2/4/1954 9:30	20:00:00	LPRSA0189589	PAP-00456490	
2/8/1954 17:30	2/9/1954 9:30	16:00:00	LPRSA0189588	PAP-00456489	
2/16/1954 17:00	2/17/1954 14:00	21:00:00	LPRSA0189587	PAP-00456488	
2/21/1954 17:15	2/22/1954 8:45	15:30:00	LPRSA0189586	PAP-00456487	
2/23/1954 12:00	2/27/1954 8:45	92:45:00	LPRSA0189621	PAP-00456522	
3/1/1954 11:00	3/5/1954 13:45	98:45:00	LPRSA0189619	PAP-00456520	
3/13/1954 15:00	3/15/1954 9:30	42:30:00	LPRSA0189618	PAP-00456519	
3/19/1954 16:30	3/20/1954 9:05	16:35:00	LPRSA0189617	PAP-00456518	
3/25/1954 10:00	3/26/1954 8:15	22:15:00	LPRSA0189616	PAP-00456517	
4/8/1954 13:45	4/9/1954 9:30	19:45:00	LPRSA0189613	PAP-00456514	
4/13/1954 12:30	4/13/1954 15:40	3:10:00	LPRSA0189623	PAP-00456524	
4/16/1954 13:10	4/18/1954 10:10	45:00:00	LPRSA0189632	PAP-00456533	
4/19/1954 15:45	4/21/1954 16:20	48:35:00	LPRSA0189615	PAP-00456516	
4/23/1954 13:30	4/25/1954 9:30	44:00:00	LPRSA0189614	PAP-00456515	
4/28/1954 15:15	4/29/1954 9:30	18:15:00	LPRSA0189612	PAP-00456513	
5/3/1954 10:45	5/26/1954 10:45	552:00:00	LPRSA0189631	PAP-00456532	
6/1/1954 11:45	6/9/1954 10:00	190:15:00	LPRSA0189630	PAP-00456531	
7/7/1954 16:45	7/8/1954 9:45	17:00:00	LPRSA0189624	PAP-00456525	
8/3/1954 9:30	8/4/1954 9:30	24:00:00	LPRSA0189620	PAP-00456521	
8/9/1954 9:15	8/11/1954 9:45	48:30:00	LPRSA0189622	PAP-00456523	
8/19/1954 23:00	8/20/1954 10:15	11:15:00	LPRSA0189611	PAP-00456512	
8/20/1954 16:45	8/22/1954 8:45	40:00:00	LPRSA0189610	PAP-00456511	
8/25/1954 17:00	8/26/1954 9:30	16:30:00	LPRSA0189609	PAP-00456510	
8/30/1954 17:00	9/1/1954 9:45	40:45:00	LPRSA0189608	PAP-00456509	
9/8/1954 14:45	9/9/1954 9:30	18:45:00	LPRSA0189607	PAP-00456508	
9/10/1954 13:45	9/12/1954 9:30	43:45:00	LPRSA0189606	PAP-00456507	
9/14/1954 16:45	9/18/1954 13:15	92:30:00	LPRSA0189605	PAP-00456506	
10/4/1954 9:15	10/8/1954 15:15	102:00:00	LPRSA0189604	PAP-00456505	
10/15/1954 11:30	10/16/1954 7:00	19:30:00	LPRSA0189603	PAP-00456504	
10/27/1954 16:45	10/28/1954 9:45	17:00:00	LPRSA0189602	PAP-00456503	
10/29/1954 9:45	10/30/1954 9:15	23:30:00	LPRSA0189601	PAP-00456502	
11/2/1954 13:15	11/4/1954 9:30	44:15:00	LPRSA0189600	PAP-00456501	
11/8/1954 13:30	11/9/1954 13:30	24:00:00	LPRSA0189599	PAP-00456500	
11/15/1954 10:00	12/2/1954 2:45	400:45:00	LPRSA0189597	PAP-00456498	
12/9/1954 14:15	12/10/1954 13:30	23:15:00	LPRSA0189596	PAP-00456497	
12/14/1954 9:45	12/15/1954 13:15	27:30:00	LPRSA0189595	PAP-00456496	
12/16/1954 15:15	12/16/1954 20:30	5:15:00	LPRSA0189594	PAP-00456495	
12/18/1954 10:45	12/19/1954 8:45	22:00:00	LPRSA0189593	PAP-00456494	
12/29/1954 13:15	12/30/1954 14:30	25:15:00	LPRSA0189585	PAP-00456486	
1/6/1955 14:15	1/7/1955 9:30	19:15:00	LPRSA0189582	PAP-00456485	
1/28/1955 10:00	2/4/1955 10:30	168:30:00	LPRSA0189580	PAP-00456483	
2/14/1955 15:30	2/18/1955 16:45	97:15:00	LPRSA0189580	PAP-00456483	
2/21/1955 13:45	3/7/1955 10:00	332:15:00	LPRSA0189579	PAP-00456482	
3/7/1955 14:00	3/7/1955 16:30	2:30:00	LPRSA0189578	PAP-00456481	

3/21/1955 15:15	3/23/1955 14:00	46:45:00	LPRSA0189577	PAP-00456480	
3/28/1955 13:45	3/30/1955 16:45	51:00:00	LPRSA0189576	PAP-00456479	
4/6/1955 14:15	4/7/1955 16:30	26:15:00	LPRSA0189575	PAP-00456478	
4/12/1955 14:45	4/14/1955 13:45	47:00:00	LPRSA0189574	PAP-00456477	
5/31/1955 13:30	5/31/1955 18:30	5:00:00	LPRSA0189572	PAP-00456475	
6/21/1955 23:30	6/22/1955 8:45	9:15:00	LPRSA0189571	PAP-00456474	
8/7/1955 23:45	8/8/1955 8:30	8:45:00	LPRSA0189570	PAP-00456473	
8/11/1955 19:45	8/14/1955 9:00	61:15:00	LPRSA0189569	PAP-00456472	
8/15/1955 17:15	8/16/1955 15:00	21:45:00	LPRSA0189568	PAP-00456471	
8/18/1955 16:30	8/20/1955 9:30	41:00:00	LPRSA0189567	PAP-00456470	
8/21/1955 22:15	8/24/1955 13:00	62:45:00	LPRSA0189566	PAP-00456469	
8/24/1955 15:30	8/25/1955 9:30	18:00:00	LPRSA0189565	PAP-00456468	
8/25/1955 16:30	8/26/1955 10:00	17:30:00	LPRSA0189564	PAP-00456467	
9/24/1955 5:45	9/26/1955 8:45	51:00:00	LPRSA0189563	PAP-00456466	
10/6/1955 8:45	10/7/1955 13:30	28:45:00	LPRSA0189562	PAP-00456465	
10/14/1955 13:15	10/15/1955 15:15	26:00:00	LPRSA0189561	PAP-00456464	
10/16/1955 15:15	10/25/1955 10:15	211:00:00	LPRSA0189561	PAP-00456464	
10/30/1955 10:15	11/1/1955 13:45	51:30:00	LPRSA0189560	PAP-00456463	
11/10/1955 16:15	11/12/1955 9:00	40:45:00	LPRSA0189559	PAP-00456462	
11/16/1955 9:45	11/18/1955 10:00	48:15:00	LPRSA0189558	PAP-00456461	
1/30/1956 13:30	1/31/1956 8:45	19:15:00	LPRSA0189556	PAP-00456460	
2/2/1956 12:15	2/3/1956 8:45	20:30:00	LPRSA0189555	PAP-00456459	
2/6/1956 16:15	2/7/1956 13:00	20:45:00	LPRSA0189554	PAP-00456458	
2/18/1956 9:00	2/19/1956 8:30	23:30:00	LPRSA0189553	PAP-00456457	
3/8/1956 2:15	3/9/1956 9:00	30:45:00	LPRSA0189552	PAP-00456456	
3/21/1956 15:50	3/23/1956 14:30	46:40:00	LPRSA0189549	PAP-00456453	
3/29/1956 17:15	3/30/1956 9:45	16:30:00	LPRSA0189547	PAP-00456451	
4/7/1956 3:10	4/9/1956 13:45	58:35:00	LPRSA0189546	PAP-00456450	
4/11/1956 17:10	4/12/1956 10:20	17:10:00	LPRSA0189545	PAP-00456449	
5/2/1956 22:55	5/3/1956 10:45	11:50:00	LPRSA0189544	PAP-00456448	
6/2/1956 16:45	6/4/1956 11:30	42:45:00	LPRSA0189543	PAP-00456447	
6/27/1956 16:35	6/27/1956 18:15	1:40:00	LPRSA0189542	PAP-00456446	
7/16/1956 16:00	7/17/1956 10:30	18:30:00	LPRSA0189541	PAP-00456445	
7/21/1956 11:15	7/21/1956 23:20	12:05:00	LPRSA0189540	PAP-00456444	
7/27/1956 10:15	7/28/1956 9:35	23:20:00	LPRSA0189539	PAP-00456443	
8/6/1956 18:00	8/7/1956 9:45	15:45:00	LPRSA0189538	PAP-00456442	
8/21/1956 4:30	8/22/1956 9:25	28:55:00	LPRSA0189537	PAP-00456441	
9/6/1956 18:45	9/7/1956 8:30	13:45:00	LPRSA0189536	PAP-00456440	
9/7/1956 10:30	9/8/1956 12:45	26:15:00	LPRSA0189535	PAP-00456439	
9/27/1956 17:30	9/28/1956 9:45	16:15:00	LPRSA0189534	PAP-00456438	
10/22/1956 22:15	10/23/1956 8:45	10:30:00	LPRSA0189533	PAP-00456437	
10/31/1956 13:15	10/31/1956 20:00	6:45:00	LPRSA0189532	PAP-00456436	
11/1/1956 10:45	11/4/1956 11:45	73:00:00	LPRSA0189532	PAP-00456436	
11/18/1956 3:45	11/18/1956 12:30	8:45:00	LPRSA0189531	PAP-00456435	
11/22/1956 2:00	11/22/1956 9:30	7:30:00	LPRSA0189530	PAP-00456434	
12/9/1956 16:30	12/10/1956 10:00	17:30:00	LPRSA0189529	PAP-00456433	
12/14/1956 9:45	12/17/1956 9:15	71:30:00	LPRSA0189528	PAP-00456432	

Diamond Alkali-Lower Passaic River Allocation

12/22/1956 23:30	12/23/1956 11:30	12:00:00	LPRSA0189527	PAP-00456431	
1/23/1957 5:15	1/23/1957 15:30	10:15:00	LPRSA0189498	PAP-00456403	
2/9/1957 15:30	2/10/1957 10:15	18:45:00	LPRSA0189497	PAP-00456402	
2/26/1957 17:15	2/27/1957 14:15	21:00:00	LPRSA0189496	PAP-00456401	
3/1/1957 15:45	3/2/1957 12:00	20:15:00	LPRSA0189524	PAP-00456429	
3/8/1957 10:45	3/10/1957 10:40	47:55:00	LPRSA0189523	PAP-00456428	
3/19/1957 22:45	3/21/1957 10:00	35:15:00	LPRSA0189521	PAP-00456426	
4/2/1957 9:00	4/2/1957 15:45	6:45:00	LPRSA0189520	PAP-00456425	
4/4/1957 21:40	4/5/1957 11:15	13:35:00	LPRSA0189519	PAP-00456424	
4/5/1957 14:45	4/6/1957 13:50	23:05:00	LPRSA0189518	PAP-00456423	
4/9/1957 10:45	4/9/1957 17:30	6:45:00	LPRSA0189516	PAP-00456421	
4/10/1957 10:45	4/10/1957 17:30	6:45:00	LPRSA0189515	PAP-00456420	
4/11/1957 10:00	4/11/1957 17:30	7:30:00	LPRSA0189514	PAP-00456419	
4/12/1957 10:00	4/12/1957 17:45	7:45:00	LPRSA0189513	PAP-00456418	
4/18/1957 22:30	4/19/1957 14:15	15:45:00	LPRSA0189512	PAP-00456417	
4/23/1957 8:30	4/23/1957 15:30	7:00:00	LPRSA0189511	PAP-00456416	
4/29/1957 13:45	4/29/1957 16:15	2:30:00	LPRSA0189509	PAP-00456414	
5/14/1957 22:30	5/15/1957 12:15	13:45:00	LPRSA0189508	PAP-00456413	
5/16/1957 0:00	8/25/1957 23:59				data missing
8/26/1957 2:00	8/26/1957 18:45	16:45:00	LPRSA0189507	PAP-00456412	
9/10/1957 23:30	9/11/1957 9:30	10:00:00	LPRSA0189506	PAP-00456411	
9/17/1957 0:30	9/17/1957 10:45	10:15:00	LPRSA0189505	PAP-00456410	
9/18/1957 0:00	12/19/1957 23:59				data missing
12/26/1957 12:30	12/26/1957 14:45	2:15:00	LPRSA0189500	PAP-00456405	
1/22/1958 3:20	1/22/1958 8:30	5:10:00	LPRSA0189492	PAP-00456193-94	
2/28/1958 3:45	2/28/1958 13:45	10:00:00	LPRSA0189488	PAP-00456189	
4/28/1958 10:15	4/28/1958 14:15	4:00:00	LPRSA0189480	PAP-00456181	
4/29/1958 21:00	4/30/1958 8:45	11:45:00	LPRSA0189479	PAP-00456180	
5/7/1958 13:00	5/8/1958 8:30	19:30:00	LPRSA0189478	PAP-00456179	
10/22/1958 19:30	10/24/1958 10:30	39:00:00	LPRSA0189469	PAP-00456170	
10/25/1958 18:30	10/27/1958 14:00	43:30:00	LPRSA0189468	PAP-00456169	
11/28/1958 22:15	11/29/1958 12:15	14:00:00	LPRSA0189466	PAP-00456167	
3/6/1959 9:15	3/7/1959 10:30	25:15:00	LPRSA0189458	PAP-00456227	
5/13/1959 19:30	5/14/1959 8:45	13:15:00	LPRSA0189438	PAP-00456207	
6/2/1959 18:00	6/3/1959 9:45	15:45:00	LPRSA0189454	PAP-00456223	
8/5/1959 11:15	8/6/1959 9:30	22:15:00	LPRSA0189448	PAP-00456217	
8/9/1959 5:15	8/9/1959 6:45	1:30:00	LPRSA0189447	PAP-00456216	
8/31/1959 13:45	9/3/1959 9:45	68:00:00	LPRSA0189445	PAP-00456214	
10/1/1959 13:30	10/2/1959 8:30	19:00:00	LPRSA0189443	PAP-00456212	
10/9/1959 12:00	10/10/1959 14:30	26:30:00	LPRSA0189440	PAP-00456209	
10/24/1959 10:45	10/25/1959 11:00	24:15:00	LPRSA0189435	PAP-00456204	
11/24/1959 16:45	11/25/1959 10:40	17:55:00	LPRSA0189432	PAP-00456201	
12/7/1959 1:00	12/7/1959 8:45	7:45:00	LPRSA0189431	PAP-00456200	
12/12/1959 19:15	12/13/1959 9:45	14:30:00	LPRSA0189430	PAP-00456199	
12/29/1959 0:20	12/29/1959 8:45	8:25:00	LPRSA0189429	PAP-00456198	
2/6/1960 6:30	2/6/1960 13:45	7:15:00	LPRSA0189423	PAP-00456266	
2/11/1960 6:00	2/11/1960 12:45	6:45:00	LPRSA0189422	PAP-00456265	

2/18/1960 23:15	2/19/1960 15:30	16:15:00	LPRSA0189421	PAP-00456264	
2/26/1960 0:10	2/26/1960 14:10	14:00:00	LPRSA0189420	PAP-00456263	
4/3/1960 22:30	4/4/1960 11:40	13:10:00	LPRSA0189416	PAP-00456259	
7/14/1960 13:15	7/15/1960 10:15	21:00:00	LPRSA0189404	PAP-00456247	
10/20/1960 8:50	10/20/1960 15:30	6:40:00	LPRSA0189395	PAP-00456238	
11/10/1960 8:45	11/10/1960 15:45	7:00:00	LPRSA0189394	PAP-00456237	
12/12/1960 14:00	12/14/1960 13:30	47:30:00	LPRSA0189392	PAP-00456235	
12/21/1960 8:50	12/22/1960 9:15	24:25:00	LPRSA0189391	PAP-00456234	
1/1/1961 10:00	1/2/1961 10:00	24:00:00	LPRSA0189389	PAP-00456730	
3/9/1961 12:45	3/10/1961 8:40	19:55:00	LPRSA0189381	PAP-00456722	
3/14/1961 4:15	3/15/1961 13:20	33:05:00	LPRSA0189382	PAP-00456723	
3/23/1961 13:05	3/24/1961 13:50	24:45:00	LPRSA0189383	PAP-00456724	
4/10/1961 10:10	4/11/1961 14:20	28:10:00	LPRSA0189376	PAP-00456717	
4/13/1961 6:40	4/14/1961 14:35	31:55:00	LPRSA0189375	PAP-00456716	
4/16/1961 12:40	4/17/1961 13:20	24:40:00	LPRSA0189373	PAP-00456714	
4/18/1961 15:05	4/20/1961 13:45	46:40:00	LPRSA0189371	PAP-00456712	
4/24/1961 9:30	4/27/1961 8:30	71:00:00	LPRSA0189370	PAP-00456711	
7/15/1961 20:20	7/17/1961 8:40	36:20:00	LPRSA0189358	PAP-00456699	
7/20/1961 8:30	7/21/1961 8:35	24:05:00	LPRSA0189357	PAP-00456698	
8/3/1961 12:20	8/4/1961 10:50	22:30:00	LPRSA0189354	PAP-00456695	
8/21/1961 14:45	8/22/1961 8:40	17:55:00	LPRSA0189353	PAP-00456694	
8/23/1961 10:55	8/24/1961 13:45	26:50:00	LPRSA0189352	PAP-00456693	
9/19/1961 16:00	9/22/1961 11:05	67:05:00	LPRSA0189348	PAP-00456689	
11/24/1961 10:15	11/25/1961 10:25	24:10:00	LPRSA0189341	PAP-00456682	
12/18/1961 9:20	12/20/1961 13:20	52:00:00	LPRSA0189338	PAP-00456679	
12/28/1961 10:20	12/29/1961 8:30	22:10:00	LPRSA0189337	PAP-00456678	
1/6/1962 12:20	1/8/1962 13:35	49:15:00	LPRSA0189336	PAP-00456328	
1/15/1962 16:35	1/16/1962 8:30	15:55:00	LPRSA0189335	PAP-00456327	
1/26/1962 15:30	1/27/1962 10:10	18:40:00	LPRSA0189334	PAP-00456326	
2/24/1962 6:20	2/25/1962 11:45	29:25:00	LPRSA0189330	PAP-00456322	
2/26/1962 11:10	3/1/1962 15:00	75:50:00	LPRSA0189329	PAP-00456321	
3/6/1962 10:45	3/7/1962 9:05	22:20:00	LPRSA0189328	PAP-00456320	
3/12/1962 8:05	3/13/1962 13:20	29:15:00	LPRSA0189327	PAP-00456319	
3/21/1962 13:35	3/22/1962 9:10	19:35:00	LPRSA0189326	PAP-00456318	
4/1/1962 6:00	4/2/1962 10:50	28:50:00	LPRSA0189325	PAP-00456317	
4/7/1962 15:20	4/9/1962 9:05	41:45:00	LPRSA0189324	PAP-00456316	
4/9/1962 16:05	4/10/1962 8:50	16:45:00	LPRSA0189323	PAP-00456315	
6/5/1962 22:30	6/6/1962 8:40	10:10:00	LPRSA0189315	PAP-00456307	
6/13/1962 14:05	6/14/1962 8:40	18:35:00	LPRSA0189314	PAP-00456306	
6/26/1962 17:40	6/27/1962 8:50	15:10:00	LPRSA0189312	PAP-00456304	
7/18/1962 14:25	7/19/1962 8:30	18:05:00	LPRSA0189310	PAP-00456302	
8/7/1962 14:20	8/8/1962 8:45	18:25:00	LPRSA0189308	PAP-00456300	
8/9/1962 20:00	8/10/1962 15:20	19:20:00	LPRSA0189307	PAP-00456299	
8/10/1962 22:55	8/11/1962 13:30	14:35:00	LPRSA0189306	PAP-00456298	
8/17/1962 18:30	8/18/1962 9:55	15:25:00	LPRSA0189305	PAP-00456297	
8/21/1962 11:40	8/22/1962 13:30	25:50:00	LPRSA0189304	PAP-00456296	
8/28/1962 5:40	8/29/1962 13:35	31:55:00	LPRSA0189303	PAP-00456295	

Diamond Alkali-Lower Passaic River Allocation

9/5/1962 11:20	9/6/1962 8:30	21:10:00	LPRSA0189301	PAP-00456293	
9/17/1962 18:25	9/18/1962 8:40	14:15:00	LPRSA0189299	PAP-00456291	
9/27/1962 9:45	9/29/1962 11:00	49:15:00	LPRSA0189296	PAP-00456288	
10/5/1962 5:00	10/7/1962 10:10	53:10:00	LPRSA0189295	PAP-00456287	
10/23/1962 11:45	10/24/1962 10:40	22:55:00	LPRSA0189291	PAP-00456283	
10/25/1962 23:15	10/27/1962 10:15	35:00:00	LPRSA0189290	PAP-00456282	
10/30/1962 14:30	11/1/1962 14:45	48:15:00	LPRSA0189289	PAP-00456281	
11/3/1962 10:20	11/5/1962 8:40	46:20:00	LPRSA0189288	PAP-00456280	
11/9/1962 14:45	11/11/1962 10:15	43:30:00	LPRSA0189287	PAP-00456279	
11/13/1962 15:35	11/14/1962 8:40	17:05:00	LPRSA0189286	PAP-00456278	
11/18/1962 13:15	11/19/1962 15:15	26:00:00	LPRSA0189285	PAP-00456277	
11/21/1962 22:30	11/23/1962 9:35	35:05:00	LPRSA0189284	PAP-00456276	
12/5/1962 8:50	12/8/1962 9:30	72:40:00	LPRSA0189283	PAP-00456275	
12/22/1962 11:05	12/24/1962 9:15	46:10:00	LPRSA0189282	PAP-00456274	
12/29/1962 20:20	12/30/1962 12:30	16:10:00	LPRSA0189280	PAP-00456272	
1/1/1963 0:00	9/30/1974 23:59				data missing
Subtotal 1950-1962 Koch Report		**12868:35:00**			
Subtotal 1950-1962 Throw out Logs		**12912:05:00**			
Koch report 1974-1975 (PAP-00488429)					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**	**AlterEcho Bates Number (throw-out logs)**	
10/16/1974 4:00	10/17/1974 20:00	40:00:00	LPRSA0195712	PAP-00456733	
12/2/1974 1:00	12/3/1974 8:00	31:00:00	LPRSA0195714	PAP-00456734	
12/8/1974 13:00	12/9/1974 8:00	19:00:00	LPRSA0195714	PAP-00456734	
12/16/1974 11:00	12/17/1974 8:00	21:00:00	LPRSA0195714	PAP-00456734	
1/1/1975	1/1/1975	0:00:00	LPRSA0196788	PAP-00456747	data missing
1/9/1975 6:00	1/9/1975 13:00	7:00:00	LPRSA0195715	PAP-00456735	
1/13/1975 10:00	1/14/1975 8:00	22:00:00	LPRSA0195715	PAP-00456735	
1/18/1975 15:00	1/19/1975 6:00	15:00:00	LPRSA0195715	PAP-00456735	
1/29/1975	1/29/1975	5:00:00	LPRSA0196788	PAP-00456747	
1/29/1975 6:00	1/29/1975 15:00	4:00:00	LPRSA0195715	PAP-00456735	
2/24/1975	2/24/1975	8:04:48	LPRSA0196788	PAP-00456747	
2/24/1975 5:00	2/25/1975 6:00	16:55:12	LPRSA0195716	PAP-00456736	
3/12/1975	3/12/1975	5:25:00	LPRSA0196788	PAP-00456747	
3/19/1975	3/20/1975	12:00:00	LPRSA0196788	PAP-00456747	
3/19/1975 16:00	3/20/1975 12:00	8:00:00	LPRSA0195717	PAP-00456737	
4/3/1975	4/3/1975	6:45:00	LPRSA0196788	PAP-00456747	
4/3/1975 8:00	4/3/1975 17:00	2:15:00	LPRSA0195718	PAP-00456738	
4/24/1975	4/24/1975	3:27:36	LPRSA0196788	PAP-00456747	
4/24/1975 4:00	4/24/1975 8:00	0:32:24	LPRSA0195718	PAP-00456738	
4/24/1975	4/25/1975	1:34:48	LPRSA0196788	PAP-00456747	
4/25/1975 2:00	4/25/1975 9:00	5:25:12	LPRSA0195718	PAP-00456738	
5/13/1975	5/13/1975	1:45:00	LPRSA0196788	PAP-00456747	
5/13/1975 22:00	5/14/1975 9:00	9:15:00	LPRSA0195719	PAP-00456739	

Diamond Alkali-Lower Passaic River Allocation

6/1/1975 7:00	6/1/1975 16:00	9:00:00	LPRSA0195720	PAP-00456740	
6/5/1975	6/6/1975	12:05:24	LPRSA0196789	PAP-00456748	
6/5/1975 20:00	6/6/1975 11:00	2:54:36	LPRSA0195720	PAP-00456740	
6/6/1975	6/6/1975	6:00:00	LPRSA0196789	PAP-00456748	
6/6/1975 15:00	6/7/1975 8:00	11:00:00	LPRSA0195720	PAP-00456740	
6/12/1975 10:00	6/13/1975 8:00	22:00:00	LPRSA0195720	PAP-00456740	
7/4/1975 4:00	7/4/1975 12:00	8:00:00	LPRSA0195721	PAP-00456741	
7/7/1975 8:00	7/7/1975 22:00	14:00:00	LPRSA0195721	PAP-00456741	
7/9/1975 18:00	7/10/1975 2:00	8:00:00	LPRSA0195721	PAP-00456741	
7/13/1975 11:00	7/16/1975 17:00	78:00:00	LPRSA0195721	PAP-00456741	
7/25/1975 2:00	7/25/1975 14:00	12:00:00	LPRSA0195721	PAP-00456741	
9/23/1975 0:00	9/28/1975 10:00	130:00:00	LPRSA0195722	PAP-00456742	
10/1/1975	12/31/2004				data missing
Subtotal Koch report (1974-1975)		**558:15:00**			
Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.					

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1e. Documented PVSC Bypasses at Clay Street (Newark)

Allocation Report			
	Time of bypasses	**Time observed**	**% of Total Time**
1950-1962	14096:36:00	107270:10:00	13.14%
1974-1975	408:28:12	7575:00:00	5.39%
Total	14505:04:12	114845:10:00	12.63%

Koch report 1950-1962 (PAP-00488431 - PAP-00488437)					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**	**AlterEcho Bates Number (throw-out logs)**	**Comments**
10/4/1950 22:00	10/5/1950 11:30	13:30:00	LPRSA0188654	PAP-00456399	
10/10/1950 2:30	10/10/1950 8:30	6:00:00	LPRSA0188652	PAP-00456397	
10/12/1950 13:30	10/13/1950 9:30	20:00:00	LPRSA0188650	PAP-00456395	
10/23/1950 13:30	10/24/1950 9:00	19:30:00	LPRSA0188648	PAP-00456393	
11/20/1950 18:00	11/21/1950 9:00	15:00:00	LPRSA0188646	PAP-00456391	
11/25/1950 9:00	11/25/1950 13:00	4:00:00	LPRSA0188643	PAP-00456388	
12/4/1950 12:30	12/4/1950 21:00	8:30:00	LPRSA0188641	PAP-00456386	
12/7/1950 16:00	12/8/1950 11:30	19:30:00	LPRSA0188637	PAP-00456382	
12/15/1950 22:30	12/16/1950 9:00	10:30:00	LPRSA0188639	PAP-00456384	
12/29/1950 12:30	12/30/1950 11:30	23:00:00	LPRSA0188635	PAP-00456380	
1/7/1951 17:00	1/8/1951 9:00	16:00:00	LPRSA0188633	PAP-00456378	
1/11/1951 17:30	1/12/1951 8:30	15:00:00	LPRSA0188619	PAP-00456364	
1/14/1951 18:00	1/15/1951 12:00	18:00:00	LPRSA0188631	PAP-00456376	
1/23/1951 2:00	1/24/1951 14:00	36:00:00	LPRSA0188621	PAP-00456366	
1/25/1951 16:00	1/25/1951 19:00	3:00:00	LPRSA0188623	PAP-00456368	
1/28/1951 17:00	1/29/1951 8:30	15:30:00	LPRSA0188625	PAP-00456370	
1/29/1951 19:30	1/30/1951 10:00	14:30:00	LPRSA0188625	PAP-00456370	
1/31/1951 16:00	2/2/1951 10:00	42:00:00	LPRSA0188628	PAP-00456373	
2/7/1951 11:00	2/8/1951 14:30	27:30:00	LPRSA0188585	PAP-00456085; PAP-00456330	
2/10/1951 5:30	2/10/1951 12:00	6:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/11/1951 18:00	2/13/1951 13:30	43:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/13/1951 19:45	2/14/1951 10:00	14:15:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/14/1951 17:45	2/15/1951 9:30	15:45:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/17/1951 4:00	2/18/1951 11:30	31:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/19/1951 17:00	2/20/1951 14:30	21:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/22/1951 10:30	2/22/1951 11:45	1:15:00	LPRSA0188596	PAP-00456064; PAP-00456341	

Diamond Alkali-Lower Passaic River Allocation

2/23/1951 8:30	2/23/1951 10:00	1:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
	2/24/1951 9:30		LPRSA0188596	PAP-00456064; PAP-00456341	No start time provided in document. Entry not included by contractor
3/1/1951 13:00	3/2/1951 10:00	21:00:00	LPRSA0188604	PAP-00456349	
3/3/1951 15:00	3/5/1951 10:30	43:30:00	LPRSA0188606	PAP-00456351	
3/13/1951 16:30	3/14/1951 15:00	22:30:00	LPRSA0188609	PAP-00456354	
3/16/1951 16:00	3/19/1951 9:30	65:30:00	LPRSA0188612	PAP-00456357	
3/19/1951 17:00	3/20/1951 12:00	19:00:00	LPRSA0188616	PAP-00456361	
3/22/1951 0:00	12/31/1951 23:59				data missing
2/17/1952 3:30	2/18/1952 9:00	29:30:00	LPRSA0189755	PAP-00456150	
2/20/1952 18:00	2/21/1952 14:00	20:00:00	LPRSA0189754	PAP-00456149	
2/29/1952 21:00	3/3/1952 11:00	62:00:00	LPRSA0189753	PAP-00456148	
3/3/1952 17:30	3/5/1952 14:30	45:00:00	LPRSA0189753	PAP-00456148	
3/11/1952 5:00	3/17/1952 14:00	153:00:00	LPRSA0189752	PAP-00456147	
3/19/1952 10:30	3/20/1952 14:00	27:30:00	LPRSA0189751	PAP-00456146	
3/22/1952 17:00	3/25/1952 10:30	65:30:00	LPRSA0189750	PAP-00456145	
4/4/1952 17:30	4/6/1952 11:00	41:30:00	LPRSA0189749	PAP-00456144	
4/14/1952 4:00	4/16/1952 11:00	55:00:00	LPRSA0189748	PAP-00456143	
4/23/1952 18:00	4/24/1952 11:00	17:00:00	LPRSA0189747	PAP-00456142	
4/25/1952 11:00	4/25/1952 20:00	9:00:00	LPRSA0189744	PAP-00456139	
4/26/1952 14:30	4/28/1952 17:30	51:00:00	LPRSA0189744	PAP-00456139	
4/29/1952 15:00	5/7/1952 14:00	191:00:00	LPRSA0189744	PAP-00456139-40	
5/11/1952 22:00	5/13/1952 11:30	37:30:00	LPRSA0189743	PAP-00456138	
5/18/1952 8:00	5/23/1952 14:30	126:30:00	LPRSA0189741	PAP-00456136	
5/13/1952 15:30	5/14/1952 10:00	18:30:00	LPRSA0189743	PAP-00456138	
5/25/1952 9:30	5/27/1952 9:30	48:00:00	LPRSA0189740	PAP-00456135	
5/29/1952 15:30	6/3/1952 10:30	115:00:00	LPRSA0189738	PAP-00456133	
6/3/1952 11:45	6/6/1952 10:00	70:15:00	LPRSA0189736	PAP-00456131	
6/9/1952 9:15	6/14/1952 9:45	120:30:00	LPRSA0189737	PAP-00456132	
6/17/1952 17:30	6/18/1952 11:30	18:00:00	LPRSA0189735	PAP-00456130	
6/19/1952 15:15	6/20/1952 9:45	18:30:00	LPRSA0189734	PAP-00456129	
6/27/1952 16:10	6/28/1952 8:45	16:35:00	LPRSA0189729	PAP-00456124	
6/29/1952 1:00	6/30/1952 10:00	33:00:00	LPRSA0189728	PAP-00456123	
7/8/1952 16:15	7/10/1952 10:00	41:45:00	LPRSA0189730	PAP-00456125	
7/21/1952 16:30	7/22/1952 10:30	18:00:00	LPRSA0189726	PAP-00456121	
7/31/1952 17:00	8/1/1952 10:00	17:00:00	LPRSA0189724	PAP-00456119	
8/2/1952 16:15	8/3/1952 9:30	17:15:00	LPRSA0189725	PAP-00456120	
8/6/1952 15:15	8/11/1952 9:15	114:00:00	LPRSA0189715	PAP-00456110, 113	
8/11/1952 17:30	8/12/1952 9:00	15:30:00	LPRSA0189719	PAP-00456114-115	
8/12/1952 17:15	8/13/1952 9:00	15:45:00	LPRSA0189721	PAP-00456116-117	
8/13/1952 17:00	8/14/1952 9:00	16:00:00	LPRSA0189720	PAP-00456110-118	
8/15/1952 17:00	8/17/1952 9:00	40:00:00	LPRSA0189714	PAP-00456109	
8/21/1952 16:30	8/22/1952 10:00	17:30:00	LPRSA0189713	PAP-00456108	
8/30/1952 10:00	9/2/1952 9:00	71:00:00	LPRSA0189712	PAP-00456107	
9/2/1952 17:00	9/3/1952 14:00	21:00:00	LPRSA0189711	PAP-00456106	
9/15/1952 16:15	9/17/1952 17:00	48:45:00	LPRSA0189709	PAP-00456104	

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9/18/1952 13:00	9/20/1952 9:00	44:00:00	LPRSA0189710	PAP-00456105	
9/23/1952 10:30	9/23/1952 14:00	3:30:00	LPRSA0189708	PAP-00456103	
10/2/1952 19:00	10/3/1952 13:30	18:30:00	LPRSA0189707	PAP-00456102	
10/28/1952 17:30	10/29/1952 9:00	15:30:00	LPRSA0189706	PAP-00456101	
11/2/1952 9:15	11/2/1952 14:15	5:00:00	LPRSA0189705	PAP-00456100	
11/3/1952 14:00	11/4/1952 9:00	19:00:00	LPRSA0189703	PAP-00456098	
11/10/1952 16:30	11/11/1952 9:00	16:30:00	LPRSA0189704	PAP-00456099	
11/14/1952 13:30	12/1/1952 13:30	408:00:00	LPRSA0189701	PAP-00456096	
12/2/1952 14:00	12/5/1952 18:00	76:00:00	LPRSA0189702	PAP-00456097	
12/9/1952 8:00	1/18/1953 14:30	966:30:00	LPRSA0189655	PAP-00456556	
1/21/1953 15:00	1/22/1953 9:00	18:00:00	LPRSA0189656	PAP-00456557	
1/24/1953 10:00	1/24/1953 16:00	6:00:00	LPRSA0189657	PAP-00456558	
2/15/1953 11:00	2/15/1953 16:30	5:30:00	LPRSA0189659	PAP-00456560	
2/21/1953 9:00	2/21/1953 14:00	5:00:00	LPRSA0189660	PAP-00456561	
2/25/1953 9:00	3/10/1953 18:00	321:00:00	LPRSA0189661	PAP-00456562* typo	
3/15/1953 14:00	3/16/1953 13:30	23:30:00	LPRSA0189667	PAP-00456158	
3/19/1953 1:30	3/19/1953 16:30	15:00:00	LPRSA0189667	PAP-00456158	
3/24/1953 10:00	3/25/1953 10:15	24:15:00	LPRSA0189667	PAP-00456158	
3/25/1953 16:00	3/25/1953 20:00	4:00:00	LPRSA0189667	PAP-00456158	
3/30/1953 15:00	3/31/1953 9:45	18:45:00	LPRSA0189667	PAP-00456158	
4/9/1953 16:30	4/10/1953 14:00	21:30:00	LPRSA0189667	PAP-00456158	
4/16/1953 10:30	4/17/1953 17:30	31:00:00	LPRSA0189667	PAP-00456158	
4/18/1953 5:30	4/20/1953 10:00	52:30:00	LPRSA0189667	PAP-00456158	
4/20/1953 17:00	5/1/1953 14:15	261:15:00	LPRSA0189667	PAP-00456158	
5/8/1953 22:15	5/9/1953 9:45	11:30:00	LPRSA0189667	PAP-00456158	
5/13/1953 23:30	5/22/1953 19:00	211:30:00	LPRSA0189667	PAP-00456158	
5/25/1953 10:30	5/25/1953 15:00	4:30:00	LPRSA0189667	PAP-00456158	
5/27/1953 10:15	5/28/1953 14:00	27:45:00	LPRSA0189667	PAP-00456158	
6/13/1953 17:15	6/14/1953 14:15	21:00:00	LPRSA0189674	PAP-00456563	
6/18/1953 17:00	6/19/1953 9:45	16:45:00	LPRSA0189676	PAP-00456565	
6/22/1953 10:15	7/2/1953 14:15	244:00:00	LPRSA0189677	PAP-00456566	
7/6/1953 20:15	7/7/1953 8:45	12:30:00	LPRSA0189681	PAP-00456570	
7/20/1953 21:40	7/21/1953 9:15	11:35:00	LPRSA0189682	PAP-00456571	
7/21/1953 16:00	7/22/1953 8:30	16:30:00	LPRSA0189683	PAP-00456572	
7/23/1953 8:55	7/23/1953 15:30	6:35:00	LPRSA0189684	PAP-00456573	
8/10/1953 1:15	8/10/1953 10:45	9:30:00	LPRSA0189685	PAP-00456574	
8/14/1953 13:30	8/15/1953 8:45	19:15:00	LPRSA0189686	PAP-00456575	
9/16/1953 2:00	9/16/1953 8:30	6:30:00	LPRSA0189688	PAP-00456576	
10/6/1953 18:30	10/7/1953 9:45	15:15:00	LPRSA0189689	PAP-00456578	
10/20/1953 8:30	10/28/1953 14:30	198:00:00	LPRSA0189690	PAP-00456579	
10/29/1953 14:30	10/29/1953 16:45	2:15:00	LPRSA0189693	PAP-00456582	
10/29/1953 19:15	10/30/1953 9:45	14:30:00	LPRSA0189694	PAP-00456583	
11/7/1953 7:30	11/8/1953 11:00	27:30:00	LPRSA0189695	PAP-00456584	
11/16/1953 10:00			LPRSA0189653	PAP-00456554	data missing
11/23/1953 10:15	11/23/1953 16:00	5:45:00	LPRSA0189698	PAP-00456587	
11/25/1953 10:15	11/26/1953 9:15	23:00:00	LPRSA0189652	PAP-00456553	
11/30/1953 10:15	12/5/1953 8:00	117:45:00	LPRSA0189651	PAP-00456552	

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12/6/1953 9:45	12/7/1953 10:00	24:15:00	LPRSA0189650	PAP-00456551	
12/9/1953 16:45	12/10/1953 16:45	24:00:00	LPRSA0189649	PAP-00456550	
12/12/1953 16:14	12/13/1953 8:45	16:31:00	LPRSA0189648	PAP-00456549	
12/14/1953 6:30	12/14/1953 15:15	8:45:00	LPRSA0189647	PAP-00456548	
12/28/1953 17:15	12/29/1953 13:45	20:30:00	LPRSA0189646	PAP-00456547	
1/14/1954 17:00	1/18/1954 10:00	89:00:00	LPRSA0189592	PAP-00456493	
1/18/1954 15:00	1/22/1954 10:00	91:00:00	LPRSA0189591	PAP-00456492	
1/22/1954 14:30	1/25/1954 10:30	68:00:00	LPRSA0189590	PAP-00456491	
1/25/1954 13:30	2/2/1954 10:15	188:45:00	LPRSA0189590	PAP-00456491	
2/3/1954 13:45	2/4/1954 9:45	20:00:00	LPRSA0189589	PAP-00456490	
2/8/1954 17:45	2/9/1954 9:45	16:00:00	LPRSA0189588	PAP-00456489	
2/15/1954 14:15	2/19/1954 13:30	95:15:00	LPRSA0189587	PAP-00456488	
2/21/1954 17:30	2/22/1954 9:00	15:30:00	LPRSA0189586	PAP-00456487	
2/23/1954 12:15	2/27/1954 9:00	92:45:00	LPRSA0189621	PAP-00456522	
3/1/1954 11:15	3/5/1954 14:00	98:45:00	LPRSA0189619	PAP-00456520	
3/13/1954 15:15	3/15/1954 9:45	42:30:00	LPRSA0189618	PAP-00456519	
3/19/1954 16:45	3/20/1954 8:55	16:10:00	LPRSA0189617	PAP-00456518	
3/25/1954 10:15	3/26/1954 8:30	22:15:00	LPRSA0189616	PAP-00456517	
4/8/1954 14:00	4/9/1954 9:45	19:45:00	LPRSA0189613	PAP-00456514	
4/13/1954 12:45	4/13/1954 15:30	2:45:00	LPRSA0189623	PAP-00456524	
4/16/1954 13:20	4/18/1954 10:20	45:00:00	LPRSA0189632	PAP-00456533	
4/19/1954 16:00	4/21/1954 16:15	48:15:00	LPRSA0189615	PAP-00456516	
4/23/1954 13:45	4/25/1954 9:45	44:00:00	LPRSA0189614	PAP-00456515	
4/28/1954 15:30	4/29/1954 9:45	18:15:00	LPRSA0189612	PAP-00456513	
5/3/1954 11:00	5/26/1954 11:00	552:00:00	LPRSA0189631	PAP-00456532	
6/1/1954 12:00	6/9/1954 10:15	190:15:00	LPRSA0189630	PAP-00456531	
6/10/1954 15:15	6/11/1954 9:30	18:15:00	LPRSA0189629	PAP-00456530	
7/4/1954 12:30	7/6/1954 9:30	45:00:00	LPRSA0189625	PAP-00456526	
7/7/1954 17:00	7/8/1954 10:00	17:00:00	LPRSA0189624	PAP-00456525	
7/14/1954 16:45	7/15/1954 12:15	19:30:00	LPRSA0189634	PAP-00456535	
7/22/1954 15:45	7/23/1954 9:15	17:30:00	LPRSA0189633	PAP-00456534	
8/3/1954 9:45	8/4/1954 9:45	24:00:00	LPRSA0189620	PAP-00456521	
8/9/1954 9:30	8/11/1954 10:00	48:30:00	LPRSA0189622	PAP-00456523	
8/19/1954 23:15	8/20/1954 10:30	11:15:00	LPRSA0189611	PAP-00456512	
8/20/1954 17:00	8/22/1954 9:00	40:00:00	LPRSA0189610	PAP-00456511	
8/25/1954 17:15	8/26/1954 9:45	16:30:00	LPRSA0189609	PAP-00456510	
8/30/1954 17:15	9/1/1954 10:00	40:45:00	LPRSA0189608	PAP-00456509	
9/8/1954 15:00	9/9/1954 9:45	18:45:00	LPRSA0189607	PAP-00456508	
9/10/1954 14:00	9/12/1954 9:45	43:45:00	LPRSA0189606	PAP-00456507	
9/14/1954 17:00	9/18/1954 13:30	92:30:00	LPRSA0189605	PAP-00456506	
10/4/1954 9:30	10/7/1954 9:30	72:00:00	LPRSA0189604	PAP-00456505	
10/15/1954 11:45	10/16/1954 7:15	19:30:00	LPRSA0189603	PAP-00456504	
10/27/1954 17:00	10/28/1954 10:00	17:00:00	LPRSA0189602	PAP-00456503	
10/29/1954 10:00	10/30/1954 9:30	23:30:00	LPRSA0189601	PAP-00456502	
11/2/1954 13:30	11/4/1954 9:45	44:15:00	LPRSA0189600	PAP-00456501	
11/8/1954 13:45	11/9/1954 13:45	24:00:00	LPRSA0189599	PAP-00456500	
11/15/1954 10:15	12/2/1954 3:00	400:45:00	LPRSA0189597	PAP-00456498	

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12/9/1954 14:30	12/10/1954 13:45	23:15:00	LPRSA0189596	PAP-00456497	
12/14/1954 10:00	12/15/1954 13:30	27:30:00	LPRSA0189595	PAP-00456496	
12/16/1954 15:30	12/16/1954 20:45	5:15:00	LPRSA0189594	PAP-00456495	
12/29/1954 13:30	12/30/1954 14:15	24:45:00	LPRSA0189585	PAP-00456486	
1/6/1955 14:30	1/7/1955 9:45	19:15:00	LPRSA0189582	PAP-00456485	
1/28/1955 10:15	2/11/1955 16:45	342:30:00	LPRSA0189580	PAP-00456483	
2/14/1955 15:45	2/15/1955 17:30	25:45:00	LPRSA0189580	PAP-00456483	
2/21/1955 14:00	2/25/1955 16:45	98:45:00	LPRSA0189579	PAP-00456482	
2/28/1955 13:15	3/9/1955 10:15	213:00:00	LPRSA0189579	PAP-00456482	
3/7/1955 14:15	3/7/1955 16:45	2:30:00	LPRSA0189578	PAP-00456481	
3/21/1955 15:30	3/22/1955 14:30	23:00:00	LPRSA0189577	PAP-00456480	
3/28/1955 14:00	3/30/1955 17:00	51:00:00	LPRSA0189576	PAP-00456479	
4/6/1955 14:00	4/7/1955 17:00	27:00:00	LPRSA0189575	PAP-00456478	
4/12/1955 15:00	4/14/1955 14:00	47:00:00	LPRSA0189574	PAP-00456477	
5/31/1955 13:45	5/31/1955 18:45	5:00:00	LPRSA0189572	PAP-00456475	
6/21/1955 23:45	6/22/1955 9:00	9:15:00	LPRSA0189571	PAP-00456474	
8/8/1955 0:00	8/8/1955 8:45	8:45:00	LPRSA0189570	PAP-00456473	
8/11/1955 20:00	8/14/1955 9:15	61:15:00	LPRSA0189569	PAP-00456472	
8/15/1955 17:30	8/16/1955 15:15	21:45:00	LPRSA0189568	PAP-00456471	
8/18/1955 16:45	8/20/1955 9:45	41:00:00	LPRSA0189567	PAP-00456470	
8/21/1955 22:30	8/24/1955 13:15	62:45:00	LPRSA0189566	PAP-00456469	
8/24/1955 15:45	8/25/1955 9:45	18:00:00	LPRSA0189565	PAP-00456468	
8/25/1955 16:45	8/26/1955 10:15	17:30:00	LPRSA0189564	PAP-00456467	
9/24/1955 6:00	9/26/1955 9:00	51:00:00	LPRSA0189563	PAP-00456466	
10/6/1955 9:00	10/7/1955 13:45	28:45:00	LPRSA0189562	PAP-00456465	
10/14/1955 9:45	10/15/1955 15:45	30:00:00	LPRSA0189561	PAP-00456464	
10/16/1955 15:30	10/25/1955 10:30	211:00:00	LPRSA0189561	PAP-00456464	
10/30/1955 10:30	11/1/1955 14:00	51:30:00	LPRSA0189560	PAP-00456463	
11/10/1955 16:30	11/12/1955 9:15	40:45:00	LPRSA0189559	PAP-00456462	
11/16/1955 10:00	11/18/1955 10:15	48:15:00	LPRSA0189558	PAP-00456461	
1/30/1956 13:45	1/31/1956 9:00	19:15:00	LPRSA0189556	PAP-00456460	
2/2/1956 12:30	2/3/1956 9:00	20:30:00	LPRSA0189555	PAP-00456459	
2/6/1956 16:30	2/7/1956 13:15	20:45:00	LPRSA0189554	PAP-00456458	
2/18/1956 9:15	2/19/1956 8:45	23:30:00	LPRSA0189553	PAP-00456457	
3/8/1956 2:30	3/9/1956 9:15	30:45:00	LPRSA0189552	PAP-00456456	
3/14/1956 9:30	3/15/1956 9:15	23:45:00	LPRSA0189551	PAP-00456455	
3/21/1956 15:35	3/23/1956 9:30	41:55:00	LPRSA0189549	PAP-00456453	
3/29/1956 17:00	3/30/1956 9:20	16:20:00	LPRSA0189547	PAP-00456451	
4/7/1956 2:50	4/9/1956 14:00	59:10:00	LPRSA0189546	PAP-00456450	
4/11/1956 16:55	4/12/1956 8:40	15:45:00	LPRSA0189545	PAP-00456449	
5/2/1956 21:50	5/3/1956 9:30	11:40:00	LPRSA0189544	PAP-00456448	
6/2/1956 15:30	6/3/1956 12:15	20:45:00	LPRSA0189543	PAP-00456447	
6/27/1956 15:15	6/27/1956 18:30	3:15:00	LPRSA0189542	PAP-00456446	
7/16/1956 14:45	7/17/1956 9:15	18:30:00	LPRSA0189541	PAP-00456445	
7/21/1956 10:00	7/21/1956 22:05	12:05:00	LPRSA0189540	PAP-00456444	
7/27/1956 10:30	7/28/1956 8:20	21:50:00	LPRSA0189539	PAP-00456443	
8/6/1956 16:45	8/7/1956 8:30	15:45:00	LPRSA0189538	PAP-00456442	

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8/21/1956 4:45	8/21/1956 16:30	11:45:00	LPRSA0189537	PAP-00456441	
9/6/1956 19:00	9/7/1956 8:45	13:45:00	LPRSA0189536	PAP-00456440	
9/7/1956 10:45	9/8/1956 12:30	25:45:00	LPRSA0189535	PAP-00456439	
9/27/1956 16:15	9/28/1956 8:30	16:15:00	LPRSA0189534	PAP-00456438	
10/22/1956 22:30	10/23/1956 9:00	10:30:00	LPRSA0189533	PAP-00456437	
10/31/1956 12:00	10/31/1956 19:45	7:45:00	LPRSA0189532	PAP-00456436	
11/1/1956 10:30	11/4/1956 12:00	73:30:00	LPRSA0189532	PAP-00456436	
11/18/1956 2:30	11/18/1956 11:15	8:45:00	LPRSA0189531	PAP-00456435	
11/22/1956 0:45	11/22/1956 8:15	7:30:00	LPRSA0189530	PAP-00456434	
12/9/1956 15:15	12/10/1956 8:45	17:30:00	LPRSA0189529	PAP-00456433	
12/14/1956 8:30	12/17/1956 8:00	71:30:00	LPRSA0189528	PAP-00456432	
12/22/1956 22:30	12/23/1956 10:15	11:45:00	LPRSA0189527	PAP-00456431	
1/23/1957 4:00	1/23/1957 14:15	10:15:00	LPRSA0189498	PAP-00456403	
2/9/1957 14:15	2/10/1957 9:00	18:45:00	LPRSA0189497	PAP-00456402	
2/26/1957 16:00	2/27/1957 13:00	21:00:00	LPRSA0189496	PAP-00456401	
3/1/1957 15:30	3/2/1957 10:45	19:15:00	LPRSA0189524	PAP-00456429	
3/8/1957 9:45	3/10/1957 10:00	48:15:00	LPRSA0189523	PAP-00456428	
3/19/1957 21:45	3/21/1957 9:00	35:15:00	LPRSA0189521	PAP-00456426	
4/2/1957 8:00	4/2/1957 15:30	7:30:00	LPRSA0189520	PAP-00456425	
4/4/1957 21:55	4/5/1957 11:30	13:35:00	LPRSA0189519	PAP-00456424	
4/5/1957 15:00	4/6/1957 13:35	22:35:00	LPRSA0189518	PAP-00456423	
4/9/1957 9:30	4/9/1957 16:15	6:45:00	LPRSA0189516	PAP-00456421	
4/10/1957 9:30	4/10/1957 16:15	6:45:00	LPRSA0189515	PAP-00456420	
4/11/1957 8:45	4/11/1957 16:15	7:30:00	LPRSA0189514	PAP-00456419	
4/12/1957 8:45	4/12/1957 16:30	7:45:00	LPRSA0189513	PAP-00456418	
4/18/1957 22:15	4/19/1957 13:45	15:30:00	LPRSA0189512	PAP-00456417	
4/23/1957 10:00	4/23/1957 15:45	5:45:00	LPRSA0189511	PAP-00456416	
5/14/1957 22:45	5/15/1957 12:30	13:45:00	LPRSA0189508	PAP-00456413	
5/16/1957 0:00	8/25/1957 23:59				
8/26/1957 1:45	8/27/1957 8:15	30:30:00	LPRSA0189507	PAP-00456412	
9/10/1957 23:00	9/11/1957 9:00	10:00:00	LPRSA0189506	PAP-00456411	
9/17/1957 0:15	9/17/1957 10:30	10:15:00	LPRSA0189505	PAP-00456410	
9/18/1957 0:00	12/19/1957 23:59				data missing
11/30/1957 13:00	11/30/1957 21:00	8:00:00	LPRSA0189503	PAP-00456408	
12/9/1957 12:00	12/9/1957 14:00	2:00:00	LPRSA0189502	PAP-00456407	
12/20/1957 16:15	12/21/1957 10:30	18:15:00	LPRSA0189501	PAP-00456406	
12/26/1957 11:20	12/26/1957 16:00	4:40:00	LPRSA0189500	PAP-00456405	
1/14/1958 19:30	1/15/1958 9:00	13:30:00	LPRSA0189494	PAP-00456195	Year not provided in throw out log. Assumption made in Gail Koch report was used.
1/22/1958 0:05	1/22/1958 10:15	10:10:00	LPRSA0189492	PAP-00456193-94	
2/7/1958 16:05	2/8/1958 9:00	16:55:00	LPRSA0189489	PAP-00456190	
2/27/1958 15:45	2/28/1958 14:00	22:15:00	LPRSA0189488	PAP-00456189	
4/6/1958 15:00	4/7/1958 9:00	18:00:00	LPRSA0189483	PAP-00456184	
4/11/1958 15:30	4/12/1958 15:30	24:00:00	LPRSA0189482	PAP-00456183	
4/28/1958 8:15	4/28/1958 15:15	7:00:00	LPRSA0189480	PAP-00456181	
4/29/1958 20:30	4/30/1958 9:00	12:30:00	LPRSA0189479	PAP-00456180	
5/6/1958 21:30	5/7/1958 8:30	11:00:00	LPRSA0189478	PAP-00456179	

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5/7/1958 11:30	5/8/1958 16:00	28:30:00	LPRSA0189478	PAP-00456179	
8/25/1958 14:00	8/26/1958 8:30	18:30:00	LPRSA0189472	PAP-00456173	
10/1/1958 14:00	10/2/1958 8:30	18:30:00	LPRSA0189470	PAP-00456171	
10/22/1958 20:00	10/24/1958 9:15	37:15:00	LPRSA0189469	PAP-00456170	
10/25/1958 17:45	10/27/1958 14:45	45:00:00	LPRSA0189468	PAP-00456169	
11/28/1958 20:45	11/29/1958 10:45	14:00:00	LPRSA0189466	PAP-00456167	
3/6/1959 9:45	3/7/1959 11:00	25:15:00	LPRSA0189458	PAP-00456227	
5/13/1959 19:45	5/14/1959 9:00	13:15:00	LPRSA0189438	PAP-00456207	
5/22/1959 16:45	5/22/1959 20:00	3:15:00	LPRSA0189439	PAP-00456208	
6/2/1959 17:45	6/3/1959 8:15	14:30:00	LPRSA0189454	PAP-00456223	
8/5/1959 10:45	8/6/1959 9:00	22:15:00	LPRSA0189448	PAP-00456217	
8/9/1959 5:30	8/10/1959 10:00	28:30:00	LPRSA0189447	PAP-00456216	
8/31/1959 13:30	9/3/1959 8:30	67:00:00	LPRSA0189445	PAP-00456214	
10/1/1959 13:15	10/1/1959 15:45	2:30:00	LPRSA0189443	PAP-00456212	
10/9/1959 12:15	10/10/1959 15:00	26:45:00	LPRSA0189440	PAP-00456209	
10/24/1959 11:30	10/25/1959 11:45	24:15:00	LPRSA0189435	PAP-00456204	
11/24/1959 16:30	11/25/1959 10:25	17:55:00	LPRSA0189432	PAP-00456201	
12/7/1959 1:15	12/8/1959 10:20	33:05:00	LPRSA0189431	PAP-00456200	
12/12/1959 19:00	12/13/1959 9:15	14:15:00	LPRSA0189430	PAP-00456199	
12/29/1959 0:00	12/29/1959 9:45	9:45:00	LPRSA0189429	PAP-00456198	
1/3/1960 10:30	1/4/1960 9:00	22:30:00	LPRSA0189427	PAP-00456270	
1/13/1960 11:30	1/14/1960 8:45	21:15:00	LPRSA0189426	PAP-00456269	
2/6/1960 6:15	2/6/1960 13:30	7:15:00	LPRSA0189423	PAP-00456266	
2/18/1960 23:00	2/19/1960 15:15	16:15:00	LPRSA0189421	PAP-00456264	
2/25/1960 23:30	2/26/1960 13:30	14:00:00	LPRSA0189420	PAP-00456263	
3/17/1960 15:45	3/18/1960 8:20	16:35:00	LPRSA0189418	PAP-00456261	
4/3/1960 22:10	4/4/1960 11:25	13:15:00	LPRSA0189416	PAP-00456259	
4/18/1960 13:00	4/18/1960 15:45	2:45:00	LPRSA0189412	PAP-00456255	
7/14/1960 13:00	7/15/1960 10:00	21:00:00	LPRSA0189404	PAP-00456247	
7/30/1960 10:10	7/31/1960 9:20	23:10:00	LPRSA0189402	PAP-00456245	
8/19/1960 8:30	8/20/1960 9:30	25:00:00	LPRSA0189399	PAP-00456242	
9/12/1960 0:30	9/13/1960 9:10	32:40:00	LPRSA0189397	PAP-00456240	
9/19/1960 10:50	9/21/1960 21:30	58:40:00	LPRSA0189396	PAP-00456239	
10/20/1960 9:15	10/21/1960 8:30	23:15:00	LPRSA0189395	PAP-00456238	
11/10/1960 8:30	11/10/1960 15:30	7:00:00	LPRSA0189394	PAP-00456237	
12/12/1960 12:20	12/14/1960 12:30	48:10:00	LPRSA0189392	PAP-00456235	
12/21/1960 9:15	12/22/1960 9:30	24:15:00	LPRSA0189391	PAP-00456234	
1/1/1961 10:30	1/2/1961 10:40	24:10:00	LPRSA0189389	PAP-00456730	
3/9/1961 12:55	3/10/1961 9:10	20:15:00	LPRSA0189381	PAP-00456722	
3/14/1961 4:45	3/15/1961 13:35	32:50:00	LPRSA0189382	PAP-00456723	
3/23/1961 12:45	3/24/1961 13:30	24:45:00	LPRSA0189383	PAP-00456724	
4/10/1961 10:30	4/11/1961 14:40	28:10:00	LPRSA0189376	PAP-00456717	
4/13/1961 6:25	4/14/1961 14:15	31:50:00	LPRSA0189375	PAP-00456716	
4/16/1961 12:25	4/17/1961 13:00	24:35:00	LPRSA0189373	PAP-00456714	
4/18/1961 14:45	4/20/1961 14:00	47:15:00	LPRSA0189371	PAP-00456712	
4/24/1961 9:15	4/27/1961 8:50	71:35:00	LPRSA0189370	PAP-00456711	
7/15/1961 20:00	7/17/1961 9:00	37:00:00	LPRSA0189358	PAP-00456699	

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7/20/1961 8:50	7/21/1961 8:50	24:00:00	LPRSA0189357	PAP-00456698	
8/3/1961 12:00	8/4/1961 10:30	22:30:00	LPRSA0189354	PAP-00456695	
8/21/1961 14:30	8/22/1961 9:00	18:30:00	LPRSA0189353	PAP-00456694	
8/23/1961 10:40	8/24/1961 13:30	26:50:00	LPRSA0189352	PAP-00456693	
9/15/1961 10:30	9/15/1961 14:45	4:15:00	LPRSA0189349	PAP-00456690	
9/19/1961 15:15	9/22/1961 10:50	67:35:00	LPRSA0189348	PAP-00456689	
11/24/1961 9:45	11/25/1961 10:10	24:25:00	LPRSA0189341	PAP-00456682	
12/18/1961 9:40	12/20/1961 13:00	51:20:00	LPRSA0189338	PAP-00456679	
12/28/1961 10:05	12/29/1961 8:50	22:45:00	LPRSA0189337	PAP-00456678	
1/6/1962 12:00	1/8/1962 13:15	49:15:00	LPRSA0189336	PAP-00456328	
1/15/1962 16:15	1/16/1962 8:45	16:30:00	LPRSA0189335	PAP-00456327	
1/26/1962 15:15	1/27/1962 9:45	18:30:00	LPRSA0189334	PAP-00456326	
2/24/1962 6:05	2/25/1962 11:30	29:25:00	LPRSA0189330	PAP-00456322	
2/26/1962 10:50	3/1/1962 8:20	69:30:00	LPRSA0189329	PAP-00456321	
3/6/1962 10:30	3/7/1962 8:45	22:15:00	LPRSA0189328	PAP-00456320	
3/12/1962 7:50	3/13/1962 13:00	29:10:00	LPRSA0189327	PAP-00456319	
3/21/1962 13:15	3/22/1962 9:30	20:15:00	LPRSA0189326	PAP-00456318	
4/1/1962 5:45	4/2/1962 11:10	29:25:00	LPRSA0189325	PAP-00456317	
4/7/1962 15:05	4/9/1962 8:50	41:45:00	LPRSA0189324	PAP-00456316	
4/9/1962 15:55	4/10/1962 8:35	16:40:00	LPRSA0189323	PAP-00456315	
6/5/1962 22:15	6/6/1962 9:00	10:45:00	LPRSA0189315	PAP-00456307	
6/13/1962 14:25	6/14/1962 9:00	18:35:00	LPRSA0189314	PAP-00456306	
6/26/1962 17:15	6/27/1962 9:10	15:55:00	LPRSA0189312	PAP-00456304	
7/18/1962 14:40	7/19/1962 8:45	18:05:00	LPRSA0189310	PAP-00456302	
8/7/1962 14:30	8/8/1962 9:00	18:30:00	LPRSA0189308	PAP-00456300	
8/9/1962 19:45	8/10/1962 15:00	19:15:00	LPRSA0189307	PAP-00456299	
8/10/1962 22:40	8/11/1962 13:00	14:20:00	LPRSA0189306	PAP-00456298	
8/17/1962 18:10	8/18/1962 9:35	15:25:00	LPRSA0189305	PAP-00456297	
8/21/1962 11:20	8/22/1962 13:10	25:50:00	LPRSA0189304	PAP-00456296	
8/28/1962 5:25	8/29/1962 13:50	32:25:00	LPRSA0189303	PAP-00456295	
9/5/1962 11:35	9/6/1962 8:45	21:10:00	LPRSA0189301	PAP-00456293	
9/17/1962 18:10	9/18/1962 9:00	14:50:00	LPRSA0189299	PAP-00456291	
9/27/1962 9:30	9/29/1962 10:45	49:15:00	LPRSA0189296	PAP-00456288	
10/5/1962 4:45	10/7/1962 9:50	53:05:00	LPRSA0189295	PAP-00456287	
10/23/1962 11:35	10/24/1962 10:30	22:55:00	LPRSA0189291	PAP-00456283	
10/25/1962 23:00	10/27/1962 9:55	34:55:00	LPRSA0189290	PAP-00456282	
10/30/1962 14:15	11/1/1962 14:30	48:15:00	LPRSA0189289	PAP-00456281	
11/3/1962 10:25	11/5/1962 9:00	46:35:00	LPRSA0189288	PAP-00456280	
11/9/1962 15:00	11/11/1962 10:30	43:30:00	LPRSA0189287	PAP-00456279	
11/13/1962 15:20	11/14/1962 8:55	17:35:00	LPRSA0189286	PAP-00456278	
11/18/1962 13:30	11/19/1962 15:00	25:30:00	LPRSA0189285	PAP-00456277	
11/21/1962 22:40	11/23/1962 9:45	35:05:00	LPRSA0189284	PAP-00456276	
12/5/1962 9:00	12/8/1962 9:45	72:45:00	LPRSA0189283	PAP-00456275	
12/22/1962 12:05	12/24/1962 9:30	45:25:00	LPRSA0189282	PAP-00456274	
12/29/1962 20:35	12/30/1962 12:10	15:35:00	LPRSA0189280	PAP-00456272	
Subtotal 1950-1962 Koch Report		**14096:36:00**			

Diamond Alkali-Lower Passaic River Allocation

Subtotal 1950-1962 Throw out Logs	**14096:36:00**			

Koch report (1974-1975) PAP-00488438 - PAP-00488439					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**	**AlterEcho Bates number**	**Comments**
9/13/1974 0:00	9/14/1974 0:00	0:00:00	LPRSA0196840	PAP-00456749	
10/16/1974 4:00	10/17/1974 21:00	41:00:00	LPRSA0195712	PAP-00456733	
12/2/1974 1:00	12/2/1974 8:00	7:00:00	LPRSA0195714	PAP-00456734	
12/8/1974 13:00	12/9/1974 8:00	19:00:00	LPRSA0195714	PAP-00456734	
12/16/1974 11:00	12/17/1974 8:00	21:00:00	LPRSA0195714	PAP-00456734	
1/9/1975 6:00	1/9/1975 13:00	7:00:00	LPRSA0195715	PAP-00456735	
1/13/1975 10:00	1/14/1975 9:00	23:00:00	LPRSA0195715	PAP-00456735	
1/18/1975 0:00	1/18/1975 0:00	15:15:00	LPRSA0196840	PAP-00456749	
1/18/1975 15:00	1/19/1975 6:00	0:00:00	LPRSA0195715	PAP-00456735	
1/29/1975 0:00	1/29/1975 0:00	9:37:48	LPRSA0196840	PAP-00456749	
1/29/1975 6:00	1/29/1975 16:00	0:22:12	LPRSA0195715	PAP-00456735	
2/24/1975	2/24/1975	10:37:12	LPRSA0196840	PAP-00456749	
2/24/1975 5:00	2/25/1975 6:00	14:22:48	LPRSA0195716	PAP-00456736	
3/12/1975 0:00	3/12/1975 0:00	5:00:00	LPRSA0196840	PAP-00456749	
3/19/1975 17:00	3/20/1975 13:00	20:00:00	LPRSA0195717	PAP-00456737	
4/3/1975	4/3/1975	3:30:00	LPRSA0196840	PAP-00456749	
4/3/1975 9:00	4/3/1975 17:00	4:30:00	LPRSA0195718	PAP-00456738	
4/24/1975 4:00	4/24/1975 9:00	5:00:00	LPRSA0195718	PAP-00456738	
4/24/1975	4/25/1975	6:55:12	LPRSA0196840	PAP-00456749	
4/25/1975 2:00	4/25/1975 9:00	0:04:48	LPRSA0195718	PAP-00456738	
5/13/1975	5/13/1975	10:13:12	LPRSA0196841	PAP-00456750	
5/13/1975 23:00	5/14/1975 9:00	0:00:00	LPRSA0195719	PAP-00456739	
6/1/1975 7:00	6/1/1975 17:00	10:00:00	LPRSA0195720	PAP-00456740	
6/5/1975 20:00	6/6/1975 11:00	15:00:00	LPRSA0195720	PAP-00456740	
6/6/1975 15:00	6/7/1975 8:00	17:00:00	LPRSA0195720	PAP-00456740	
6/12/1975 10:00	6/13/1975 9:00	23:00:00	LPRSA0195720	PAP-00456740	
7/4/1975 4:00	7/4/1975 12:00	8:00:00	LPRSA0195721	PAP-00456741	
7/7/1975 8:00	7/7/1975 22:00	14:00:00	LPRSA0195721	PAP-00456741	
7/9/1975 18:00	7/10/1975 2:00	8:00:00	LPRSA0195721	PAP-00456741	
7/13/1975 12:00	7/16/1975 17:00	77:00:00	LPRSA0195721	PAP-00456741	
7/25/1975 2:00	7/25/1975 15:00	13:00:00	LPRSA0195721	PAP-00456741	

Subtotal 1950-1962 Koch Report	**408:28:12**			
Subtotal 1950-1962 Allocation Report	**408:28:12**			

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1h. Documented PVSC Bypasses at City Dock (Newark)

Allocation Report			
	Time of bypasses	Time observed	% of Total Time
1950-1962	8695:55:00	87155:30:00	9.98%
1974-1975	0:00:00	0:00:00	0:00:00%
Total	8695:55:00	87155:30:00	9.98%

Koch report 1950-1962 (PAP-PAP-00488452 - PAP-00488454)					
Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	AlterEcho Bates Number (throw-out logs)	Comments
10/4/1950 22:00	10/5/1950 11:30	13:30:00	LPRSA0188654	PAP-00456399	
10/10/1950 2:30	10/10/1950 13:00	10:30:00	LPRSA0188652	PAP-00456397	
10/12/1950 13:30	10/13/1950 11:00	21:30:00	LPRSA0188650	PAP-00456395	
10/23/1950 13:30	10/24/1950 9:00	19:30:00	LPRSA0188648	PAP-00456393	
11/20/1950 18:00	11/21/1950 9:00	15:00:00	LPRSA0188646	PAP-00456391	
11/25/1950 9:00	11/25/1950 13:00	4:00:00	LPRSA0188643	PAP-00456388	
12/4/1950 12:30	12/5/1950 9:30	21:00:00	LPRSA0188641	PAP-00456386	
12/7/1950 16:00	12/8/1950 11:30	19:30:00	LPRSA0188637	PAP-00456382	
12/15/1950 22:30	12/16/1950 14:30	16:00:00	LPRSA0188639	PAP-00456384	
12/29/1950 12:30	12/30/1950 11:30	23:00:00	LPRSA0188635	PAP-00456380	
1/7/1951 17:00	1/8/1951 9:00	16:00:00	LPRSA0188633	PAP-00456378	
1/11/1951 17:30	1/12/1951 8:30	15:00:00	LPRSA0188619	PAP-00456364	
1/14/1951 18:00	1/15/1951 12:00	18:00:00	LPRSA0188631	PAP-00456376	
1/23/1951 2:00	1/24/1951 14:00	36:00:00	LPRSA0188621	PAP-00456366	
1/25/1951 16:00	1/26/1951 10:00	18:00:00	LPRSA0188623	PAP-00456368	
1/28/1951 17:00	1/30/1951 10:00	41:00:00	LPRSA0188625	PAP-00456370	
1/31/1951 16:00	2/2/1951 10:00	42:00:00	LPRSA0188628	PAP-00456373	
2/10/1951 5:30	2/10/1951 14:30	9:00:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/11/1951 18:00	2/15/1951 14:30	92:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/17/1951 4:00	2/18/1951 11:30	31:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/19/1951 17:00	2/20/1951 14:30	21:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/23/1951 8:30	2/23/1951 10:00	1:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
	2/25/1951 10:00		LPRSA0188596	PAP-00456064; PAP-00456341	
3/1/1951 13:00	3/2/1951 10:00	21:00:00	LPRSA0188604	PAP-00456349	
3/3/1951 15:00	3/5/1951 10:30	43:30:00	LPRSA0188606	PAP-00456351	
3/13/1951 16:30	3/15/1951 9:30	41:00:00	LPRSA0188609	PAP-00456354	
3/16/1951 16:00	3/19/1951 9:30	65:30:00	LPRSA0188612	PAP-00456357	
3/19/1951 17:00	3/21/1951 9:00	40:00:00	LPRSA0188616	PAP-00456361	

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3/22/1951 0:00	12/31/1951 23:59				data missing
2/17/1952 3:30	2/19/1952 11:00	55:30:00	LPRSA0189755	PAP-00456150	
2/20/1952 18:00	2/22/1952 10:30	40:30:00	LPRSA0189754	PAP-00456149	
2/29/1952 21:00	3/7/1952 10:30	157:30:00	LPRSA0189753	PAP-00456148	
3/11/1952 5:00	3/18/1952 10:30	173:30:00	LPRSA0189752	PAP-00456147	
3/19/1952 10:30	3/21/1952 11:00	48:30:00	LPRSA0189751	PAP-00456146	
3/22/1952 17:00	3/26/1952 11:00	90:00:00	LPRSA0189750	PAP-00456145	
4/5/1952 8:00	4/7/1952 11:00	51:00:00	LPRSA0189749	PAP-00456144	
4/14/1952 4:00	4/17/1952 11:00	79:00:00	LPRSA0189748	PAP-00456143	
4/23/1952 16:30	4/24/1952 11:30	19:00:00	LPRSA0189747	PAP-00456142	
4/25/1952 11:00	5/9/1952 16:30	341:30:00	LPRSA0189744	PAP-00456139, 141	
5/11/1952 22:00	5/14/1952 14:30	64:30:00	LPRSA0189743	PAP-00456138	
5/18/1952 8:45	5/23/1952 15:30	126:45:00	LPRSA0189741	PAP-00456136	
5/25/1952 10:15	5/27/1952 13:30	51:15:00	LPRSA0189740	PAP-00456135	
5/29/1952 16:15	6/14/1952 10:30	378:15:00	LPRSA0189736	PAP-00456131	
6/17/1952 18:15	6/18/1952 14:30	20:15:00	LPRSA0189735	PAP-00456130	
6/19/1952 14:15	6/20/1952 9:00	18:45:00	LPRSA0189734	PAP-00456129	
6/27/1952 16:40	6/28/1952 9:30	16:50:00	LPRSA0189729	PAP-00456124	
6/29/1952 2:00	6/30/1952 10:50	32:50:00	LPRSA0189728	PAP-00456123	
7/8/1952 17:00	7/10/1952 16:15	47:15:00	LPRSA0189730	PAP-00456125	
7/21/1952 17:15	7/22/1952 13:30	20:15:00	LPRSA0189726	PAP-00456121	
7/31/1952 17:25	8/1/1952 10:25	17:00:00	LPRSA0189724	PAP-00456119	
8/2/1952 17:00	8/3/1952 10:15	17:15:00	LPRSA0189725	PAP-00456120	
8/6/1952 16:00	8/11/1952 10:00	114:00:00	LPRSA0189715	PAP-00456110, 113	
8/12/1952 18:00			LPRSA0189721	PAP-00456116	data missing
8/15/1952 17:45	8/17/1952 9:45	40:00:00	LPRSA0189714	PAP-00456109	
8/21/1952 17:15	8/22/1952 13:30	20:15:00	LPRSA0189713	PAP-00456108	
8/30/1952 10:45	9/2/1952 9:45	71:00:00	LPRSA0189712	PAP-00456107	
9/2/1952 17:45	9/4/1952 9:30	39:45:00	LPRSA0189711	PAP-00456106	
9/15/1952 17:15	9/17/1952 17:45	48:30:00	LPRSA0189709	PAP-00456104	
9/18/1952 13:45	9/20/1952 9:45	44:00:00	LPRSA0189710	PAP-00456105	
9/23/1952 11:15	9/24/1952 10:00	22:45:00	LPRSA0189708	PAP-00456103	
10/2/1952 19:45	10/3/1952 14:15	18:30:00	LPRSA0189707	PAP-00456102	
10/28/1952 18:15	10/29/1952 9:45	15:30:00	LPRSA0189706	PAP-00456101	
11/3/1952 14:45	11/4/1952 9:45	19:00:00	LPRSA0189703	PAP-00456098	
11/10/1952 17:15	11/11/1952 9:45	16:30:00	LPRSA0189704	PAP-00456099	
11/14/1952 14:15	12/1/1952 14:15	408:00:00	LPRSA0189701	PAP-00456096	
12/2/1952 14:45	12/8/1952 9:30	138:45:00	LPRSA0189702	PAP-00456097	
12/9/1952 8:45	1/18/1953 15:15	966:30:00	LPRSA0189655	PAP-00456556	
1/21/1953 15:45	1/22/1953 13:30	21:45:00	LPRSA0189656	PAP-00456557	
1/24/1953 10:45	1/25/1953 10:30	23:45:00	LPRSA0189657	PAP-00456558	
2/11/1953 18:00	2/13/1953 11:00	41:00:00	LPRSA0189658	PAP-00456559	
2/15/1953 11:45	2/16/1953 14:30	26:45:00	LPRSA0189659	PAP-00456560	
2/25/1953 9:45	3/11/1953 10:00	336:15:00	LPRSA0189661	PAP-00456562	
	3/14/1953 13:15		LPRSA0189670	PAP-00456161	data missing
3/17/1953 15:15	4/28/1953 13:30	1006:15:00	LPRSA0189670	PAP-00456161	
4/29/1953 9:30	4/29/1953 15:30	6:00:00	LPRSA0189670	PAP-00456161	

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4/30/1953 17:45	5/8/1953 16:00	190:15:00	LPRSA0189670	PAP-00456161	
5/8/1953 11:30			LPRSA0189670	PAP-00456161	data missing
6/13/1953 18:00	6/15/1953 11:15	41:15:00	LPRSA0189674	PAP-00456563	
6/22/1953 11:00	7/2/1953 15:00	244:00:00	LPRSA0189677	PAP-00456566	
7/6/1953 21:00	7/7/1953 9:30	12:30:00	LPRSA0189681	PAP-00456570	
7/20/1953 22:00	7/21/1953 9:35	11:35:00	LPRSA0189682	PAP-00456571	
7/21/1953 16:45	7/22/1953 9:15	16:30:00	LPRSA0189683	PAP-00456572	
7/23/1953 9:25	7/24/1953 13:30	28:05:00	LPRSA0189684	PAP-00456573	
8/14/1953 14:15	8/15/1953 9:30	19:15:00	LPRSA0189686	PAP-00456575	
10/6/1953 19:30	10/7/1953 10:30	15:00:00	LPRSA0189689	PAP-00456578	
10/20/1953 9:15	10/29/1953 17:30	224:15:00	LPRSA0189690	PAP-00456579	
11/7/1953 8:15	11/8/1953 11:45	27:30:00	LPRSA0189695	PAP-00456584	
11/16/1953 10:45			LPRSA0189653	PAP-00456554	data missing
11/23/1953 11:00	11/23/1953 15:15	4:15:00	LPRSA0189698	PAP-00456587	
11/25/1953 13:15	11/26/1953 10:00	20:45:00	LPRSA0189652	PAP-00456553	
11/30/1953 11:00	12/5/1953 8:45	117:45:00	LPRSA0189651	PAP-00456552	
12/6/1953 10:30	12/8/1953 10:00	47:30:00	LPRSA0189650	PAP-00456551	
12/9/1953 17:30	12/11/1953 10:00	40:30:00	LPRSA0189649	PAP-00456550	
12/14/1953 7:15	12/15/1953 13:45	30:30:00	LPRSA0189647	PAP-00456548	
1/15/1954 14:00	1/18/1954 10:45	68:45:00	LPRSA0189592	PAP-00456493	
1/20/1954 15:00	1/22/1954 13:30	46:30:00	LPRSA0189591	PAP-00456492	
1/25/1954 4:00	2/2/1954 14:00	202:00:00	LPRSA0189590	PAP-00456491	
2/3/1954 14:30	2/4/1954 10:30	20:00:00	LPRSA0189589	PAP-00456490	
2/15/1954 15:00	2/19/1954 14:15	95:15:00	LPRSA0189587	PAP-00456488	
2/21/1954 18:15	2/22/1954 9:45	15:30:00	LPRSA0189586	PAP-00456487	
2/23/1954 13:00	2/27/1954 9:45	92:45:00	LPRSA0189621	PAP-00456522	
3/1/1954 12:00	3/5/1954 14:45	98:45:00	LPRSA0189619	PAP-00456520	
3/13/1954 16:00	3/15/1954 10:30	42:30:00	LPRSA0189618	PAP-00456519	
3/19/1954 17:30	3/20/1954 13:40	20:10:00	LPRSA0189617	PAP-00456518	
3/25/1954 11:00	3/26/1954 10:45	23:45:00	LPRSA0189616	PAP-00456517	
4/8/1954 14:45	4/9/1954 10:30	19:45:00	LPRSA0189613	PAP-00456514	
4/13/1954 13:30	4/13/1954 15:00	1:30:00	LPRSA0189623	PAP-00456524	
4/16/1954 13:50	4/18/1954 10:50	45:00:00	LPRSA0189632	PAP-00456533	
4/19/1954 16:45	4/21/1954 15:30	46:45:00	LPRSA0189615	PAP-00456516	
4/23/1954 14:30	4/25/1954 10:30	44:00:00	LPRSA0189614	PAP-00456515	
4/28/1954 16:15	4/29/1954 10:30	18:15:00	LPRSA0189612	PAP-00456513	
5/3/1954 11:45	5/26/1954 9:45	550:00:00	LPRSA0189631	PAP-00456532	
6/1/1954 12:45	6/3/1954 16:30	51:45:00	LPRSA0189630	PAP-00456531	
7/2/1954 10:00	7/2/1954 17:00	7:00:00	LPRSA0189626	PAP-00456527	
7/4/1954 13:15	7/4/1954 14:30	1:15:00	LPRSA0189625	PAP-00456526	
9/10/1954 14:45	9/12/1954 10:30	43:45:00	LPRSA0189606	PAP-00456507	
5/16/1957 0:00	8/25/1957 23:59				data missing
9/18/1957 0:00	12/19/1957 23:59				data missing
9/12/1960 12:20	9/13/1960 9:30	21:10:00	LPRSA0189397	PAP-00456240	
1/1/1963 0:00	12/31/1974 23:59				data missing
Subtotal 1950-1962 Koch Report		**8676:55:00**			

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Subtotal 1950-1962 Throw out Logs		**8695:55:00**			

Koch report (1974-1975) PAP-00488455					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**		
1/1/1975	1/1/1975	0:00:00	LPRSA0197075	PAP-00456754	
7/20/1975	7/20/1975	0:00:00	LPRSA0197076	PAP-00456755	
7/21/1975	12/31/2004				data missing
Subtotal 1974-1975 Koch Report		**0:00:00**			

Source: Elson T. Killam Associates, Inc., Report Upon Overflow Analysis, Newark Area, prepared for PVSC, 1976.

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Exhibit 1j. Documented PVSC Bypasses at Polk Street (Newark)

Allocation Report			
	Time of bypasses	Time observed	% of Total Time
1950-1962	13170:00:00	106740:30:00	12.34%
1974-1975	477:55:00	8329:00:00	5.74%
Total	13647:55:00	115069:30:00	11.86%

Koch report 1950-1962 (PAP-00488463 - PAP-00488467)					
Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	AlterEcho Bates Number (throw-out logs)	Comments
10/4/1950 22:00	10/5/1950 11:30	13:30:00	LPRSA0188654	PAP-00456399	
10/10/1950 2:30	10/10/1950 13:00	10:30:00	LPRSA0188652	PAP-00456397	
10/12/1950 13:30	10/13/1950 11:00	21:30:00	LPRSA0188650	PAP-00456395	
10/23/1950 13:30	10/24/1950 9:00	19:30:00	LPRSA0188648	PAP-00456393	
11/20/1950 18:00	11/21/1950 9:00	15:00:00	LPRSA0188646	PAP-00456391	
11/25/1950 9:00	11/25/1950 13:00	4:00:00	LPRSA0188643	PAP-00456388	
12/4/1950 12:30	12/5/1950 9:30	21:00:00	LPRSA0188641	PAP-00456386	
12/7/1950 16:00	12/8/1950 11:30	19:30:00	LPRSA0188637	PAP-00456382	
12/15/1950 22:30	12/16/1950 14:30	16:00:00	LPRSA0188639	PAP-00456384	
12/29/1950 12:30	12/30/1950 11:30	23:00:00	LPRSA0188635	PAP-00456380	
1/7/1951 17:00	1/8/1951 9:00	16:00:00	LPRSA0188633	PAP-00456378	
1/11/1951 17:30	1/12/1951 8:30	15:00:00	LPRSA0188621	PAP-00456364	
1/14/1951 18:00	1/15/1951 12:00	18:00:00	LPRSA0188623	PAP-00456376	
1/23/1951 2:00	1/24/1951 14:00	36:00:00	LPRSA0188625	PAP-00456366	
1/25/1951 16:00	1/26/1951 10:00	18:00:00	LPRSA0188623	PAP-00456368	
1/28/1951 17:00	1/30/1951 10:00	41:00:00	LPRSA0188625	PAP-00456370	
1/31/1951 16:00	2/2/1951 10:00	42:00:00	LPRSA0188628	PAP-00456373	
2/10/1951 5:30	2/10/1951 14:30	9:00:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/11/1951 18:00	2/15/1951 14:30	92:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/17/1951 4:00	2/18/1951 11:30	31:30:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/19/1951 17:00	2/20/1951 14:30	21:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
2/23/1951 8:30	2/23/1951 10:00	1:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
3/1/1951 13:00	3/2/1951 10:00	21:00:00	LPRSA0188604	PAP-00456349	
3/3/1951 15:00	3/5/1951 10:30	43:30:00	LPRSA0188606	PAP-00456351	

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3/13/1951 16:30	3/15/1951 9:30	41:00:00	LPRSA0188609	PAP-00456354	
3/16/1951 16:00	3/19/1951 9:30	65:30:00	LPRSA0188612	PAP-00456357	
3/19/1951 17:00	3/21/1951 9:00	40:00:00	LPRSA0188616	PAP-00456361	
3/22/1951 0:00	12/31/1951 23:59				data missing
2/17/1952 3:30	2/19/1952 11:00	55:30:00	LPRSA0189755	PAP-00456150	
2/20/1952 18:00	2/22/1952 10:30	40:30:00	LPRSA0189754	PAP-00456149	
2/29/1952 21:00	3/7/1952 10:30	157:30:00	LPRSA0189753	PAP-00456148	
3/11/1952 5:00	3/18/1952 10:30	173:30:00	LPRSA0189752	PAP-00456147	
3/19/1952 10:30	3/21/1952 11:00	48:30:00	LPRSA0189751	PAP-00456146	
3/22/1952 17:00	3/26/1952 11:00	90:00:00	LPRSA0189750	PAP-00456145	
4/5/1952 8:00	4/7/1952 11:00	51:00:00	LPRSA0189749	PAP-00456144	
4/14/1952 4:00	4/17/1952 11:00	79:00:00	LPRSA0189748	PAP-00456143	
4/25/1952 11:00	5/9/1952 16:30	341:30:00	LPRSA0189744	PAP-00456139, 141	
5/11/1952 22:00	5/14/1952 14:30	64:30:00	LPRSA0189743	PAP-00456138	
5/18/1952 9:15	5/23/1952 15:50	126:35:00	LPRSA0189741	PAP-00456136	
5/25/1952 10:45	5/27/1952 14:00	51:15:00	LPRSA0189740	PAP-00456135	
5/29/1952 17:15	6/14/1952 11:00	377:45:00	LPRSA0189736	PAP-00456131	
6/17/1952 18:45	6/18/1952 15:15	20:30:00	LPRSA0189735	PAP-00456130	
6/19/1952 13:45	6/20/1952 8:35	18:50:00	LPRSA0189734	PAP-00456129	
6/27/1952 17:00	6/28/1952 10:00	17:00:00	LPRSA0189729	PAP-00456124	
6/29/1952 2:50	6/30/1952 11:15	32:25:00	LPRSA0189728	PAP-00456123	
7/8/1952 17:30	7/10/1952 15:45	46:15:00	LPRSA0189730	PAP-00456125	
7/21/1952 17:45	7/22/1952 14:00	20:15:00	LPRSA0189726	PAP-00456121	
7/31/1952 17:40	8/1/1952 10:40	17:00:00	LPRSA0189724	PAP-00456119	
8/2/1952 17:20	8/3/1952 10:45	17:25:00	LPRSA0189725	PAP-00456120	
8/6/1952 16:30	8/11/1952 10:30	114:00:00	LPRSA0189715	PAP-00456110, 113	
8/12/1952 18:30	8/14/1952 10:00	39:30:00	LPRSA0189721	PAP-00456116, 118	
8/15/1952 18:15	8/17/1952 10:15	40:00:00	LPRSA0189714	PAP-00456109	
8/21/1952 17:45	8/22/1952 14:00	20:15:00	LPRSA0189713	PAP-00456108	
8/30/1952 11:15	9/2/1952 10:15	71:00:00	LPRSA0189712	PAP-00456107	
9/2/1952 18:15	9/4/1952 10:00	39:45:00	LPRSA0189711	PAP-00456106	
9/15/1952 17:45	9/17/1952 18:15	48:30:00	LPRSA0189709	PAP-00456104	
9/18/1952 14:15	9/20/1952 10:15	44:00:00	LPRSA0189710	PAP-00456105	
9/23/1952 11:45	9/24/1952 10:30	22:45:00	LPRSA0189708	PAP-00456103	
10/2/1952 20:15	10/3/1952 14:45	18:30:00	LPRSA0189707	PAP-00456102	
10/28/1952 18:45	10/29/1952 10:15	15:30:00	LPRSA0189706	PAP-00456101	
11/3/1952 15:15	11/4/1952 10:15	19:00:00	LPRSA0189703	PAP-00456098	
11/10/1952 17:45	11/11/1952 10:15	16:30:00	LPRSA0189704	PAP-00456099	
11/14/1952 14:45	12/1/1952 14:45	408:00:00	LPRSA0189701	PAP-00456096	
12/2/1952 15:15	12/8/1952 10:00	138:45:00	LPRSA0189702	PAP-00456097	
12/9/1952 9:15	1/18/1953 15:45	966:30:00	LPRSA0189655	PAP-00456556	
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2/11/1953 18:30	2/13/1953 11:30	41:00:00	LPRSA0189658	PAP-00456559	
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2/25/1953 10:15	3/11/1953 10:30	336:15:00	LPRSA0189661	PAP-00456562	
	3/14/1953 14:00		LPRSA0189672	PAP-00456731	data missing

3/17/1953 15:45	4/29/1953 11:30	1027:45:00	LPRSA0189672	PAP-00456731	
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5/8/1953 10:45			LPRSA0189672	PAP-00456731	data missing
6/13/1953 18:30	6/15/1953 11:45	41:15:00	LPRSA0189674	PAP-00456563	
6/22/1953 11:30	7/2/1953 15:30	244:00:00	LPRSA0189677	PAP-00456566	
7/6/1953 21:30	7/7/1953 10:00	12:30:00	LPRSA0189681	PAP-00456570	
7/20/1953 22:30	7/21/1953 10:15	11:45:00	LPRSA0189682	PAP-00456571	
7/21/1953 17:30	7/22/1953 9:45	16:15:00	LPRSA0189683	PAP-00456572	
7/23/1953 9:45	7/24/1953 14:00	28:15:00	LPRSA0189684	PAP-00456573	
8/14/1953 14:45	8/15/1953 10:00	19:15:00	LPRSA0189686	PAP-00456575	
10/20/1953 9:45	10/29/1953 18:00	224:15:00	LPRSA0189690	PAP-00456579	
11/7/1953 8:45	11/8/1953 12:15	27:30:00	LPRSA0189695	PAP-00456584	
11/16/1953 11:15			LPRSA0189653	PAP-00456554	data missing
11/23/1953 11:30	11/23/1953 14:45	3:15:00	LPRSA0189698	PAP-00456587	
11/25/1953 13:45	11/26/1953 10:30	20:45:00	LPRSA0189652	PAP-00456553	
11/30/1953 11:30	12/5/1953 9:15	117:45:00	LPRSA0189651	PAP-00456552	
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12/9/1953 18:00	12/11/1953 10:30	40:30:00	LPRSA0189649	PAP-00456550	
12/14/1953 7:45	12/15/1953 14:15	30:30:00	LPRSA0189647	PAP-00456548	
1/15/1954 14:30	1/18/1954 11:15	68:45:00	LPRSA0189592	PAP-00456493	
1/20/1954 15:30	1/22/1954 14:00	46:30:00	LPRSA0189591	PAP-00456492	
1/25/1954 4:30	2/2/1954 14:30	202:00:00	LPRSA0189590	PAP-00456491	
2/3/1954 15:00	2/4/1954 11:00	20:00:00	LPRSA0189589	PAP-00456490	
2/15/1954 15:30	2/19/1954 14:45	95:15:00	LPRSA0189587	PAP-00456488	
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2/23/1954 13:30	2/27/1954 10:15	92:45:00	LPRSA0189621	PAP-00456522	
3/1/1954 12:30	3/5/1954 15:15	98:45:00	LPRSA0189619	PAP-00456520	
3/13/1954 16:30	3/15/1954 11:00	42:30:00	LPRSA0189618	PAP-00456519	
3/19/1954 18:00	3/20/1954 13:10	19:10:00	LPRSA0189617	PAP-00456518	
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4/16/1954 14:10	4/18/1954 11:10	45:00:00	LPRSA0189632	PAP-00456533	
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4/23/1954 15:00	4/25/1954 11:00	44:00:00	LPRSA0189614	PAP-00456515	
4/28/1954 16:45	4/29/1954 11:00	18:15:00	LPRSA0189612	PAP-00456513	
5/3/1954 12:15	5/26/1954 10:15	550:00:00	LPRSA0189631	PAP-00456532	
6/1/1954 13:15	6/9/1954 11:30	190:15:00	LPRSA0189630	PAP-00456531	
6/10/1954 14:15	6/11/1954 10:30	20:15:00	LPRSA0189629	PAP-00456530	
7/2/1954 10:30	7/2/1954 17:30	7:00:00	LPRSA0189626	PAP-00456527	
7/4/1954 13:45	7/5/1954 10:15	20:30:00	LPRSA0189625	PAP-00456526	
7/7/1954 18:00	7/8/1954 14:15	20:15:00	LPRSA0189624	PAP-00456525	
7/14/1954 17:45	7/15/1954 13:15	19:30:00	LPRSA0189634	PAP-00456535	
7/22/1954 16:45	7/23/1954 10:15	17:30:00	LPRSA0189633	PAP-00456534	
8/3/1954 10:45	8/4/1954 10:45	24:00:00	LPRSA0189620	PAP-00456521	
8/9/1954 10:30	8/11/1954 11:00	48:30:00	LPRSA0189622	PAP-00456523	
8/19/1954 0:15	8/20/1954 11:30	35:15:00	LPRSA0189611	PAP-00456512	

Diamond Alkali-Lower Passaic River Allocation

8/20/1954 20:00	8/22/1954 10:00	38:00:00	LPRSA0189610	PAP-00456511	
8/25/1954 18:15	8/26/1954 14:15	20:00:00	LPRSA0189609	PAP-00456510	
9/8/1954 16:00	9/9/1954 14:15	22:15:00	LPRSA0189607	PAP-00456508	
9/10/1954 15:15	9/12/1954 11:00	43:45:00	LPRSA0189606	PAP-00456507	
10/7/1954 10:30	10/8/1954 14:45	28:15:00	LPRSA0189604	PAP-00456505	
10/15/1954 12:45	10/16/1954 8:15	19:30:00	LPRSA0189603	PAP-00456504	
10/27/1954 18:00	10/28/1954 2:15	8:15:00	LPRSA0189602	PAP-00456503	
10/29/1954 11:00	10/30/1954 10:30	23:30:00	LPRSA0189601	PAP-00456502	
11/2/1954 14:30	11/5/1954 15:30	73:00:00	LPRSA0189600	PAP-00456501	
11/8/1954 14:45	11/9/1954 14:45	24:00:00	LPRSA0189599	PAP-00456500	
11/15/1954 11:15	12/2/1954 4:00	400:45:00	LPRSA0189597	PAP-00456498	
12/9/1954 15:30	12/10/1954 14:45	23:15:00	LPRSA0189596	PAP-00456497	
12/14/1954 11:00	12/15/1954 14:30	27:30:00	LPRSA0189595	PAP-00456496	
12/18/1954 11:45	12/19/1954 9:45	22:00:00	LPRSA0189593	PAP-00456494	
12/29/1954 14:30	12/30/1954 13:15	22:45:00	LPRSA0189585	PAP-00456486	
1/6/1955 15:30	1/7/1955 10:45	19:15:00	LPRSA0189582	PAP-00456485	
1/28/1955 11:15	3/9/1955 11:15	960:00:00	LPRSA0189580	PAP-00456483	
4/6/1955 15:45	4/7/1955 10:00	18:15:00	LPRSA0189575	PAP-00456478	
4/12/1955 16:00	4/15/1955 10:30	66:30:00	LPRSA0189574	PAP-00456477	
5/31/1955 15:00	5/31/1955 17:15	2:15:00	LPRSA0189572	PAP-00456475	
6/22/1955 0:45	6/22/1955 10:00	9:15:00	LPRSA0189571	PAP-00456474	
8/8/1955 1:15	8/8/1955 9:45	8:30:00	LPRSA0189570	PAP-00456473	
8/19/1955 1:00	8/20/1955 4:45	27:45:00	LPRSA0189567	PAP-00456470	
8/22/1955 23:30	8/24/1955 14:15	38:45:00	LPRSA0189566	PAP-00456469	
9/24/1955 8:15	9/26/1955 10:00	49:45:00	LPRSA0189563	PAP-00456466	
10/6/1955 10:00	10/7/1955 14:45	28:45:00	LPRSA0189562	PAP-00456465	
10/14/1955 10:45	10/25/1955 14:15	267:30:00	LPRSA0189561	PAP-00456464	
10/30/1955 11:30	11/1/1955 15:00	51:30:00	LPRSA0189560	PAP-00456463	
11/10/1955 17:30	11/12/1955 10:15	40:45:00	LPRSA0189559	PAP-00456462	
11/16/1955 11:00	11/18/1955 11:15	48:15:00	LPRSA0189558	PAP-00456461	
1/30/1956 15:00	1/31/1956 10:00	19:00:00	LPRSA0189556	PAP-00456460	
2/2/1956 13:30	2/3/1956 10:00	20:30:00	LPRSA0189555	PAP-00456459	
2/6/1956 17:15	2/7/1956 14:00	20:45:00	LPRSA0189554	PAP-00456458	
2/18/1956 10:00	2/19/1956 9:30	23:30:00	LPRSA0189553	PAP-00456457	
3/8/1956 3:15	3/9/1956 10:00	30:45:00	LPRSA0189552	PAP-00456456	
3/14/1956 10:15	3/15/1956 10:00	23:45:00	LPRSA0189551	PAP-00456455	
3/21/1956 17:45	3/23/1956 10:15	40:30:00	LPRSA0189549	PAP-00456453	
4/11/1956 15:15	4/12/1956 9:25	18:10:00	LPRSA0189545	PAP-00456449	
5/2/1956 22:15	5/3/1956 10:00	11:45:00	LPRSA0189544	PAP-00456448	
6/2/1956 16:10	6/4/1956 10:45	42:35:00	LPRSA0189543	PAP-00456447	
6/27/1956 15:45	6/27/1956 18:50	3:05:00	LPRSA0189542	PAP-00456446	
7/16/1956 15:15	7/17/1956 9:45	18:30:00	LPRSA0189541	PAP-00456445	
7/21/1956 10:30	7/21/1956 22:35	12:05:00	LPRSA0189540	PAP-00456444	
7/27/1956 11:15	7/28/1956 8:50	21:35:00	LPRSA0189539	PAP-00456443	
8/6/1956 17:15	8/7/1956 9:00	15:45:00	LPRSA0189538	PAP-00456442	
8/21/1956 5:30	8/22/1956 8:50	27:20:00	LPRSA0189537	PAP-00456441	
9/6/1956 19:45	9/7/1956 9:15	13:30:00	LPRSA0189536	PAP-00456440	

Diamond Alkali-Lower Passaic River Allocation

9/7/1956 11:30	9/8/1956 11:45	24:15:00	LPRSA0189535	PAP-00456439	
9/27/1956 16:45	9/28/1956 9:00	16:15:00	LPRSA0189534	PAP-00456438	
10/22/1956 23:15	10/23/1956 9:45	10:30:00	LPRSA0189533	PAP-00456437	
10/31/1956 12:30	11/4/1956 13:00	96:30:00	LPRSA0189532	PAP-00456436	
11/18/1956 3:00	11/18/1956 11:45	8:45:00	LPRSA0189531	PAP-00456435	
11/22/1956 1:15	11/22/1956 8:45	7:30:00	LPRSA0189530	PAP-00456434	
12/9/1956 15:45	12/10/1956 9:15	17:30:00	LPRSA0189529	PAP-00456433	
12/14/1956 9:00	12/17/1956 8:30	71:30:00	LPRSA0189528	PAP-00456432	
12/22/1956 23:00	12/23/1956 10:45	11:45:00	LPRSA0189527	PAP-00456431	
1/23/1957 4:30	1/23/1957 14:45	10:15:00	LPRSA0189498	PAP-00456403	
2/9/1957 14:45	2/10/1957 9:30	18:45:00	LPRSA0189497	PAP-00456402	
2/26/1957 16:30	2/27/1957 13:30	21:00:00	LPRSA0189496	PAP-00456401	
3/1/1957 17:15	3/2/1957 23:15	30:00:00	LPRSA0189524	PAP-00456429	
3/8/1957 10:15	3/10/1957 10:20	48:05:00	LPRSA0189523	PAP-00456428	
3/19/1957 22:15	3/21/1957 9:30	35:15:00	LPRSA0189521	PAP-00456426	
4/2/1957 8:30	4/2/1957 14:45	6:15:00	LPRSA0189520	PAP-00456425	
4/9/1957 10:00	4/9/1957 16:45	6:45:00	LPRSA0189516	PAP-00456421	
4/10/1957 10:00	4/10/1957 16:45	6:45:00	LPRSA0189515	PAP-00456420	
4/11/1957 9:15	4/11/1957 16:45	7:30:00	LPRSA0189514	PAP-00456419	
4/12/1957 9:15	4/12/1957 17:00	7:45:00	LPRSA0189513	PAP-00456418	
4/23/1957 7:45	4/23/1957 14:45	7:00:00	LPRSA0189511	PAP-00456416	
5/14/1957 21:45	5/15/1957 11:30	13:45:00	LPRSA0189508	PAP-00456413	
5/16/1957 0:00	8/25/1957 23:59				data missing
9/18/1957 0:00	12/19/1957 23:59				data missing
2/28/1958 4:15	2/28/1958 9:45	5:30:00	LPRSA0189488	PAP-00456189	
4/28/1958 9:30	4/28/1958 14:30	5:00:00	LPRSA0189480	PAP-00456181	
4/29/1958 20:15	4/30/1958 9:15	13:00:00	LPRSA0189479	PAP-00456180	
10/23/1958 3:15	10/24/1958 10:00	30:45:00	LPRSA0189469	PAP-00456170	
11/28/1958 21:15	11/29/1958 11:15	14:00:00	LPRSA0189466	PAP-00456167	
3/6/1959 8:30	3/7/1959 9:45	25:15:00	LPRSA0189458	PAP-00456227	
6/2/1959 19:00	6/3/1959 8:45	13:45:00	LPRSA0189454	PAP-00456223	
9/1/1959 19:50	9/3/1959 10:30	38:40:00	LPRSA0189445	PAP-00456214	
12/7/1959 2:00	12/7/1959 9:30	7:30:00	LPRSA0189431	PAP-00456200	
2/19/1960 1:20	2/19/1960 13:40	12:20:00	LPRSA0189421	PAP-00456264	
2/26/1960 3:00	2/26/1960 11:10	8:10:00	LPRSA0189420	PAP-00456263	
7/14/1960 14:30	7/15/1960 9:00	18:30:00	LPRSA0189404	PAP-00456247	
7/30/1960 10:50	7/31/1960 10:20	23:30:00	LPRSA0189402	PAP-00456245	
8/19/1960 9:50	8/20/1960 10:00	24:10:00	LPRSA0189399	PAP-00456242	
9/12/1960 9:00	9/13/1960 11:00	26:00:00	LPRSA0189397	PAP-00456240	
12/21/1960 10:30	12/22/1960 10:25	23:55:00	LPRSA0189391	PAP-00456234	
3/14/1961 9:30	3/14/1961 13:45	4:15:00	LPRSA0189382	PAP-00456723	
3/23/1961 14:20	3/24/1961 11:35	21:15:00	LPRSA0189383	PAP-00456724	
4/10/1961 12:10	4/11/1961 9:20	21:10:00	LPRSA0189376	PAP-00456717	
4/13/1961 11:10	4/14/1961 9:30	22:20:00	LPRSA0189375	PAP-00456716	
4/16/1961 14:00	4/17/1961 10:15	20:15:00	LPRSA0189373	PAP-00456714	
4/25/1961 20:00	4/26/1961 9:20	13:20:00	LPRSA0189369	PAP-00456710	
7/20/1961 13:25	7/21/1961 9:55	20:30:00	LPRSA0189357	PAP-00456698	

9/19/1961 15:35	9/22/1961 21:45	78:10:00	LPRSA0189348	PAP-00456689	
12/18/1961 11:45	12/20/1961 11:00	47:15:00	LPRSA0189338	PAP-00456679	
2/26/1962 13:55	2/27/1962 9:30	19:35:00	LPRSA0189329	PAP-00456321	
2/27/1962 14:35	3/1/1962 9:45	43:10:00	LPRSA0189329	PAP-00456321	
3/12/1962 9:25	3/13/1962 15:45	30:20:00	LPRSA0189327	PAP-00456319	
9/5/1962 14:00	9/6/1962 9:25	19:25:00	LPRSA0189301	PAP-00456293	
9/27/1962 13:05	9/28/1962 14:30	25:25:00	LPRSA0189296	PAP-00456288	
10/5/1962 8:45	10/6/1962 10:25	25:40:00	LPRSA0189295	PAP-00456287	
11/3/1962 11:10	11/5/1962 10:20	47:10:00	LPRSA0189288	PAP-00456280	
11/9/1962 15:50	11/11/1962 11:25	43:35:00	LPRSA0189287	PAP-00456279	
11/21/1962 23:30	11/23/1962 10:30	35:00:00	LPRSA0189284	PAP-00456276	
12/5/1962 10:35	12/8/1962 10:30	71:55:00	LPRSA0189283	PAP-00456275	
1/1/1963 0:00	9/30/1974 23:59				data missing
Subtotal 1950-1962 Koch Report		**13170:00:00**			
Subtotal 1950-1962 Throw out Logs		**13170:00:00**			

Koch report (1974-1975) PAP-00488468					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**	**AlterEcho Bates Number (throw-out logs)**	
10/16/1974 10:00	10/17/1974 22:00	36:00:00	LPRSA0195712	PAP-00456733	
12/2/1974 6:00	12/3/1974 9:00	27:00:00	LPRSA0195714	PAP-00456734	
12/8/1974 14:00	12/9/1974 9:00	19:00:00	LPRSA0195714	PAP-00456734	
12/16/74 13:00	12/17/74 9:00	20:00:00	LPRSA0195714	PAP-00456734	
1/13/1975 11:00	1/14/1975 9:00	22:00:00	LPRSA0195715	PAP-00456735	
1/18/1975 16:00	1/19/1975 7:00	15:00:00	LPRSA0195715	PAP-00456735	
1/29/1975 7:00	1/29/1975 11:00	4:00:00	LPRSA0195715	PAP-00456735	
2/23/1975 0:00	2/23/1975 0:00	0:00:00	LPRSA0197152	PAP-00456757	
3/12/1975	3/12/1975	3:15:00	LPRSA0197152	PAP-00456757	
3/19/1975 18:00	3/20/1975 9:00	15:00:00	LPRSA0195717	PAP-00456737	
4/3/1975 10:00	4/4/1975 0.00	14:00:00	LPRSA0195718	PAP-00456738	
4/24/1975 0:00	4/25/1975 0:00	0:40:00	LPRSA0197152	PAP-00456757	
6/6/1975 1:00	6/6/1975 8:00	7:00:00	LPRSA0195720	PAP-00456740	
6/6/1975 16:00	6/7/1975 2:00	10:00:00	LPRSA0195720	PAP-00456740	Entry in Koch report was corrected. The throw out log shows start bypass at 4:00 PM
6/12/1975 10:00	6/13/1975 15:00	29:00:00	LPRSA0195720	PAP-00456740	
7/4/1975 5:00	7/4/1975 13:00	8:00:00	LPRSA0195721	PAP-00456741	
7/7/1975 9:00	7/7/1975 22:00	13:00:00	LPRSA0195721	PAP-00456741	
7/9/1975 19:00	7/10/1975 3:00	8:00:00	LPRSA0195721	PAP-00456741	
7/13/1975 14:00	7/14/1975 9:00	19:00:00	LPRSA0195721	PAP-00456741	
7/14/1975 11:00	7/17/1975 8:00	69:00:00	LPRSA0195721	PAP-00456741	
7/25/1975 3:00	7/25/1975 14:00	11:00:00	LPRSA0195721	PAP-00456741	
8/6/1975 0:00	8/7/1975 0:00	0:00:00	LPRSA0197153	PAP-00456758	
9/23/1975 3:00	9/28/1975 11:00	128:00:00	LPRSA0195722	PAP-00456742	
10/1/1975	12/31/2004				missing data
Subtotal 1974-1975 Koch Report		**479:55:00**			
Subtotal 1974-1975 Throw out Logs		**477:55:00**			

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bypass hours per Koch Table 2-2 in Exhibit 2 of her report (pdf page 58)

Diamond Alkali-Lower Passaic River Allocation

Exhibit 1l. Documented PVSC Bypasses at Yantacaw
(Paterson, Passaic, Clifton, Garfield, and upstream of 3rd River)

Allocation Report			
	Time of bypasses	Time observed	% of Total Time
1950-1962	2465:40:00	106063:15:00	2.32%
1974-1975	0:00:00	0:00:00	0.00%
Total	2465:40:00	106063:15:00	2.32%

Koch report 1950-1962 (PAP-00488477 - PAP-00488479)					
Start Bypass to River	End Bypass to River	Elapsed Time (hr:min:sec)	Source Bates Numbers	AlterEcho Bates Number (throw-out logs)	Comments
10/5/1950 2:00	10/5/1950 11:30	9:30:00	LPRSA0188654	PAP-00456399	
11/25/1950 13:00	11/26/1950 9:30	20:30:00	LPRSA0188643	PAP-00456388	
12/4/1950 20:30	12/5/1950 8:30	12:00:00	LPRSA0188641	PAP-00456386	
12/8/1950 2:00	12/8/1950 9:00	7:00:00	LPRSA0188637	PAP-00456382	
12/29/1950 12:30	12/30/1950 11:30	23:00:00	LPRSA0188635	PAP-00456380	
1/14/1951 21:00	1/15/1951 9:00	12:00:00	LPRSA0188631	PAP-00456376	
1/23/1951 4:00	1/24/1951 8:00	28:00:00	LPRSA0188621	LPRSA0188622	
2/1/1951 15:00	2/2/1951 8:00	17:00:00	LPRSA0188628	PAP-00456373	
2/7/1951 17:00	2/8/1951 8:30	15:30:00	LPRSA0188585	PAP-00456085; PAP-00456330	Start time corrected to match throw out log
2/17/1951 21:30	2/18/1951 9:30	12:00:00	LPRSA0188588	PAP-00456088; PAP-00456333	
2/21/1951 9:30	2/22/1951 9:00	23:30:00	LPRSA0188596	PAP-00456064; PAP-00456341	
3/14/1951 11:00	3/14/1951 13:30	2:30:00	LPRSA0188609	PAP-00456354	
3/20/1951 5:30	3/20/1951 9:00	3:30:00	LPRSA0188616	PAP-00456361	
3/22/1951 0:00	12/31/1951 23:59				missing data
3/11/1952 9:30	3/12/1952 9:30	24:00:00	LPRSA0189752	PAP-00456147	
3/19/1952 15:15	3/20/1952 9:00	17:45:00	LPRSA0189751	PAP-00456146	
4/25/1952 18:00	4/26/1952 9:00	15:00:00	LPRSA0189744	PAP-00456139	
4/28/1952 9:30	4/29/1952 10:00	24:30:00	LPRSA0189744	PAP-00456139	
5/5/1952 15:30	5/6/1952 14:00	22:30:00	LPRSA0189745	PAP-00456140	
5/6/1952 20:00	5/7/1952 9:00	13:00:00	LPRSA0189745	PAP-00456140	
5/11/1952 23:30	5/12/1952 13:00	13:30:00	LPRSA0189743	PAP-00456138	
5/20/1952 11:00	5/21/1952 9:30	22:30:00	LPRSA0189741	PAP-00456136	
5/25/1952 11:30	5/26/1952 9:30	22:00:00	LPRSA0189740	PAP-00456135	
6/1/1952 4:00	6/1/1952 7:00	3:00:00	LPRSA0189738	PAP-00456133	
6/1/1952 10:00	6/2/1952 9:30	23:30:00	LPRSA0189738	PAP-00456133	
6/4/1952 21:00	6/5/1952 9:00	12:00:00	LPRSA0189736	PAP-00456131	
6/9/1952 14:30	6/10/1952 8:30	18:00:00	LPRSA0189737	PAP-00456132	
6/10/1952 16:00	6/11/1952 8:30	16:30:00	LPRSA0189737	PAP-00456132	
6/11/1952 16:00	6/12/1952 8:30	16:30:00	LPRSA0189737	PAP-00456132	
6/12/1952 15:00	6/13/1952 9:00	18:00:00	LPRSA0189737	PAP-00456132	
6/17/1952 20:30	6/18/1952 8:30	12:00:00	LPRSA0189735	PAP-00456130	
6/19/1952 12:30	6/20/1952 8:15	19:45:00	LPRSA0189734	PAP-00456129	

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8/6/1952 18:30	8/7/1952 9:00	14:30:00	LPRSA0189715	PAP-00456110	
10/2/1952 21:00	10/3/1952 8:00	11:00:00	LPRSA0189707	PAP-00456102	
11/2/1952 8:00	11/2/1952 13:00	5:00:00	LPRSA0189705	PAP-00456100	
11/15/1952 18:00	11/28/1952 9:00	303:00:00	LPRSA0189701	PAP-00456096	
12/5/1952 14:00	12/6/1952 8:00	18:00:00	LPRSA0189702	PAP-00456097	
1/24/1953 14:00	1/25/1953 8:00	18:00:00	LPRSA0189657	PAP-00456558	
2/15/1953 14:00	2/16/1953 9:00	19:00:00	LPRSA0189659	PAP-00456560	
2/21/1953 10:00	2/22/1953 8:00	22:00:00	LPRSA0189660	PAP-00456561	
2/25/1953 13:00	3/10/1953 19:30	318:30:00	LPRSA0189661	PAP-00456562	
3/13/1953 14:30	3/16/1953 8:00	65:30:00	LPRSA0189662	PAP-00456153	
3/17/1953 13:30	3/18/1953 9:30	20:00:00	LPRSA0189662	PAP-00456153	
3/24/1953 12:00	3/25/1953 15:30	27:30:00	LPRSA0189662	PAP-00456153	
4/7/1953 7:15	4/8/1953 9:30	26:15:00	LPRSA0189662	PAP-00456153	
4/10/1953 10:00	4/11/1953 10:30	24:30:00	LPRSA0189662	PAP-00456153	
4/12/1953 9:00	4/13/1953 10:00	25:00:00	LPRSA0189662	PAP-00456153	
4/16/1953 9:00	4/17/1953 10:30	25:30:00	LPRSA0189662	PAP-00456153	
5/22/1953 16:30	5/25/1953 8:30	64:00:00	LPRSA0189662	PAP-00456153	
5/25/1953 14:30	5/27/1953 9:30	43:00:00	LPRSA0189662	PAP-00456153	
6/22/1953 14:30	6/23/1953 8:45	18:15:00	LPRSA0189677	PAP-00456566	
6/30/1953 16:30	6/30/1953 18:30	2:00:00	LPRSA0189679	PAP-00456568	
7/23/1953 10:30	7/24/1953 8:45	22:15:00	LPRSA0189684	PAP-00456573	
8/14/1953 18:30	8/15/1953 11:00	16:30:00	LPRSA0189687	PAP-00456576	
10/28/1953 9:15	10/28/1953 13:30	4:15:00	LPRSA0189692	PAP-00456581	
11/7/1953 11:30	11/8/1953 9:00	21:30:00	LPRSA0189695	PAP-00456584	
11/23/1953 13:00	11/24/1953 9:45	20:45:00	LPRSA0189698	PAP-00456587	
12/14/1953 8:45	12/15/1953 9:00	24:15:00	LPRSA0189647	PAP-00456548	
2/17/1954 10:30	2/17/1954 16:30	6:00:00	LPRSA0189587	PAP-00456488	
3/3/1954 13:45	3/4/1954 9:00	19:15:00	LPRSA0189619	PAP-00456520	
5/21/1954 9:30	5/21/1954 17:00	7:30:00	LPRSA0189631	PAP-00456532	
8/9/1954 12:30	8/10/1954 8:30	20:00:00	LPRSA0189622	PAP-00456523	
8/31/1954 1:30	8/31/1954 15:30	14:00:00	LPRSA0189608	PAP-00456509	
9/11/1954 2:45	9/11/1954 15:30	12:45:00	LPRSA0189606	PAP-00456507	
10/15/1954 14:30	10/15/1954 23:30	9:00:00	LPRSA0189603	PAP-00456504	
10/29/1954 12:45	10/29/1954 16:00	3:15:00	LPRSA0189601	PAP-00456502	
11/2/1954 15:00	11/3/1954 9:30	18:30:00	LPRSA0189600	PAP-00456501	
11/20/1954 4:00	11/25/1954 10:00	126:00:00	LPRSA0189597	PAP-00456498	
12/9/1954 16:30	12/10/1954 10:00	17:30:00	LPRSA0189596	PAP-00456497	
12/14/1954 12:45	12/15/1954 8:30	19:45:00	LPRSA0189595	PAP-00456496	
2/2/1955 10:00	2/4/1955 14:30	52:30:00	LPRSA0189580	PAP-00456483	
2/6/1955 19:05	2/7/1955 10:30	15:25:00	LPRSA0189580	PAP-00456483	
2/11/1955 15:30	2/12/1955 10:00	18:30:00	LPRSA0189580	PAP-00456483	
2/15/1955 17:00	2/16/1955 9:45	16:45:00	LPRSA0189580	PAP-00456483	
2/16/1955 18:00	2/17/1955 9:45	15:45:00	LPRSA0189580	PAP-00456483	
2/23/1955 10:30	2/23/1955 16:45	6:15:00	LPRSA0189579	PAP-00456482	
3/1/1955 13:00	3/1/1955 16:30	3:30:00	LPRSA0189579	PAP-00456482	
3/4/1955 3:00	3/4/1955 13:45	10:45:00	LPRSA0189579	PAP-00456482	
3/6/1955 16:35	3/7/1955 10:30	17:55:00	LPRSA0189579	PAP-00456482	

3/22/1955 10:15	3/23/1955 9:45	23:30:00	LPRSA0189577	PAP-00456480	
8/12/1955 4:45	8/12/1955 13:15	8:30:00	LPRSA0189569	PAP-00456472	
8/12/1955 14:30	8/13/1955 15:15	24:45:00	LPRSA0189569	PAP-00456472	
8/18/1955 23:30	8/19/1955 10:30	11:00:00	LPRSA0189567	PAP-00456470	
10/6/1955 11:30	10/6/1955 17:00	5:30:00	LPRSA0189562	PAP-00456465	
10/14/1955 15:15	10/15/1955 9:00	17:45:00	LPRSA0189561	PAP-00456464	
10/16/1955 16:45	10/17/1955 10:30	17:45:00	LPRSA0189561	PAP-00456464	
10/30/1955 12:00	11/1/1955 15:30	51:30:00	LPRSA0189560	PAP-00456463	
11/11/1955 0:15	11/11/1955 10:00	9:45:00	LPRSA0189559	PAP-00456462	
11/16/1955 11:45	11/17/1955 9:30	21:45:00	LPRSA0189558	PAP-00456461	
2/6/1956 21:30	2/7/1956 9:00	11:30:00	LPRSA0189554	PAP-00456458	
2/18/1956 11:00	2/18/1956 14:20	3:20:00	LPRSA0189553	PAP-00456457	
3/14/1956 11:30	3/14/1956 15:00	3:30:00	LPRSA0189551	PAP-00456455	
9/6/1956 20:45	9/6/1956 23:00	2:15:00	LPRSA0189536	PAP-00456440	
10/31/1956 15:00	11/1/1956 8:30	17:30:00	LPRSA0189532	PAP-00456436	
12/14/1956 13:30	12/15/1956 9:45	20:15:00	LPRSA0189528	PAP-00456432	
2/26/1957 19:00	2/27/1957 8:30	13:30:00	LPRSA0189496	PAP-00456401	
3/15/1957 22:50	3/16/1957 12:00	13:10:00	LPRSA0189522	PAP-00456427	
5/15/1957 23:15	5/16/1957 8:55	9:40:00	LPRSA0189508	PAP-00456413	
5/16/1957 0:00	8/25/1957 23:59				missing data
9/18/1957 0:00	12/19/1957 23:59				missing data
10/1/1958 10:30	10/1/1958 17:15		LPRSA0189470	PAP-00456171	Moved to Union
10/23/1958 5:00	10/23/1958 13:30	8:30:00	LPRSA0189469	PAP-00456170	
7/26/1959 2:30	7/26/1959 10:00	7:30:00	LPRSA0189450	PAP-00456219	
8/13/1959 19:00	8/13/1959 22:45	3:45:00	LPRSA0189446	PAP-00456215	
10/14/1959 20:00	10/15/1959 0:30	4:30:00	LPRSA0189437	PAP-00456206	End time corrected to match throw out log
11/4/1959 19:30	11/4/1959 23:00	3:30:00	LPRSA0189433	PAP-00456202	
5/3/1961 15:00	5/4/1961 0:10	9:10:00	LPRSA0189366	PAP-00456707	
6/1/1961 15:00	6/2/1961 9:15	18:15:00	LPRSA0189363	PAP-00456704	
4/27/1962 17:30	4/28/1962 5:30	12:00:00	LPRSA0189320	PAP-00456312	
11/10/1962 8:00	11/10/1962 9:15	1:15:00	LPRSA0189287	PAP-00456279	
1/1/1963 0:00	9/30/1974 23:59				
Subtotal 1950-1962 Koch Report		**2485:55:00**			
Subtotal 1950-1962 Throw out Logs		**2465:40:00**			

Koch report 1974-1975 (PAP-00488480)					
Start Bypass to River	**End Bypass to River**	**Elapsed Time (hr:min:sec)**	**Source Bates Numbers**	**AlterEcho Bates Number (throw-out logs)**	**Comments**
9/25/75	9/27/75	0:00:00	LPRSA0203966	PAP-00456760	

ATTACHMENT Q

ALLOCATION SHARE RELATIVE RANKING AND ALLOCATION TIER DESIGNATIONS

Attachment Q

Protocol Calculation			
Allocation Party	Allocation Share		Tier
Occidental Chemical Corp.	99.9396103%		1
(Remaining Shares)	(0.0603897%)	Relative Relationship	
Nokia-Lucent Technologies		46.5388134%	2
Pharmacia LLC		25.9370220%	2
PMC, Inc.		6.3107885%	3
EnPro Holdings, Inc.		4.0799154%	3
Hexcel Corp.		4.0129312%	3
Pitt Consol Chemical Company		2.1075332%	3
ISP Chemicals LLC		2.0873124%	3
Givaudan Fragrances Corp.		2.0430554%	3
Congoleum Corp.		1.6307658%	3
BASF Corporation		1.2689422%	3
Cooper Industries LLC		0.7431313%	4
PSE&G Corp.		0.7184661%	4
Seton Company, Inc. (Seton Tanning)		0.4551284%	4
Hoffman-La Roche Inc.		0.2722425%	4
Legacy Vulcan Corporation		0.2379896%	4
21st Century Fox America, Inc. (21CFA)		0.2162104%	4
Celanese Ltd./CAN Holdings LLC		0.1470196%	4
Curtiss-Wright Corporation		0.1155887%	4
Teval/Guyon		0.0998371%	4
Okonite Company		0.0886025%	4
Alliance Chemical Inc.		0.0792190%	4
Kearny Smelting & Refining		0.0791604%	4
Sherwin Williams Co.		0.0750817%	4
CBS Corporation		0.0750617%	4
Benjamin Moore & Co.		0.0573881%	4
EPEC Polymers, Inc.		0.0555862%	4
Conopco, Inc.		0.0511509%	4
Royce Associates		0.0466181%	4
SpectraServ, Inc.		0.0407659%	4
General Electric Company		0.0385437%	4
Safety Kleen Envirosystems Co./McKesson Corp.		0.0331328%	4
Chevron Environmental Management Co.		0.0319408%	4
Stanley Black & Decker, Inc.		0.0291504%	4
Schiffenhaus Packaging Corp. (Rock-Tenn Company)		0.0273822%	4
Leemilt's Petroleum, Inc.		0.0267819%	4
Tiffany and Company		0.0246104%	4
Atlantic Richfield (ARCO)		0.0207039%	4
Atlas Refining Inc.		0.0147611%	5
DII Industries, LLC		0.0144528%	5
Campbell Foundry Company		0.0105394%	5
Goody Products Inc.		0.0097449%	5
Garfield Molding Company, Inc.		0.0067139%	5
Otis Elevator Co.		0.0057359%	5
Berol Corporation		0.0040333%	5
Franklin Burlington Plastics Inc.		0.0038179%	5
BASF Catalysts LLC		0.0037037%	5

Alternative Calculation			
Allocation Party	Allocation Share		Tier
Occidental Chemical Corp.	92.9393785%		1
(Remaining Shares)	(7.0606215%)	Relative Relationship	
Nokia-Lucent Technologies		46.4497868%	2
Pharmacia LLC		25.9407032%	2
Cooper Industries LLC		5.2222787%	3
Hexcel Corp.		4.0360037%	3
Pitt Consol Chemical Company		2.5204410%	3
21st Century Fox America, Inc. (21CFA)		2.4921730%	3
PMC, Inc.		2.1505874%	3
ISP Chemicals LLC		2.0900282%	3
Congoleum Corp.		1.6573816%	3
BASF Corporation		1.3118590%	3
EnPro Holdings, Inc.		1.0109293%	3
Seton Company, Inc. (Seton Tanning)		0.5714991%	4
Sherwin Williams Co.		0.5219668%	4
Conopco, Inc.		0.3897339%	4
PSE&G Corp.		0.3264248%	4
Kearny Smelting & Refining		0.3161964%	4
CBS Corporation		0.2964852%	4
Hoffman-La Roche Inc.		0.2934307%	4
EPEC Polymers, Inc.		0.2758512%	4
Givaudan Fragrances Corp.		0.2671831%	4
Legacy Vulcan Corporation		0.2374502%	4
Curtiss-Wright Corporation		0.2197574%	4
SpectraServ, Inc.		0.2084573%	4
Schiffenhaus Packaging Corp. (Rock-Tenn Company)		0.1607304%	4
Okonite Company		0.1602333%	4
Alliance Chemical Inc.		0.1355722%	4
Celanese Ltd./CAN Holdings LLC		0.1101060%	4
Teval/Guyon		0.1086445%	4
Benjamin Moore & Co.		0.0570810%	4
DII Industries, LLC		0.0551970%	4
Safety Kleen Envirosystems Co./McKesson Corp.		0.0403431%	4
Royce Associates		0.0359439%	4
Chevron Environmental Management Co.		0.0318397%	4
Stanley Black & Decker, Inc.		0.0270416%	4
BASF Catalysts LLC		0.0269404%	4
Tiffany and Company		0.0268942%	4
Leemilt's Petroleum, Inc.		0.0266034%	4
Otis Elevator Co.		0.0236263%	4
Atlantic Richfield (ARCO)		0.0199979%	4
Textron Inc.		0.0144746%	5
Arkema Inc.		0.0133237%	5
Atlas Refining Inc.		0.0127793%	5
Newark Morning Ledger Co.		0.0120213%	5
Campbell Foundry Company		0.0115030%	5
Newark Group, Inc.		0.0104945%	5
Garfield Molding Company, Inc.		0.0096987%	5

Attachment Q

Protocol Calculation			
Allocation Party	Allocation Share		Tier
Arkema Inc.		0.0030895%	5
Goodrich Corporation		0.0023775%	5
Textron Inc.		0.0019441%	5
Newark Morning Ledger Co.		0.0018162%	5
PPG Industries Inc.		0.0017694%	5
Revere Smelting & Refining Corp.		0.0016943%	5
Newark Group, Inc.		0.0016611%	5
Quality Carriers, Inc./Quala Systems		0.0016586%	5
Sun Chemical Corporation (Foundry Street Complex)		0.0012703%	5
Coats & Clark, Inc.		0.0012252%	5
Harris Corporation		0.0010767%	5
Foundry Street Corporation (Foundry Street Complex)		0.0005978%	5
Purdue Pharma Technologies Inc.		0.0004985%	5
Ashland Inc.		0.0004383%	5
Neu Holdings (Eden Wood Corporation)		0.0004116%	5
Roman Asphalt Corporation		0.0003077%	5
Alden Leeds Inc.		0.0002650%	5
Passaic Pioneer Properties Co.		0.0002409%	5
Tate & Lyle Ingredients Americas LLC		0.0002387%	5
STWB Inc.		0.0001015%	5
Honeywell International, Inc.		0.0000803%	5
Essex Chemical Corporation		0.0000746%	5
Canning Gumm LLC		0.0000693%	5
Elan Chemical Co., Inc.		0.0000115%	5
Hartz Consumer Group, Inc.		0.0000037%	5
National Standard LLC		0.0000006%	5
Covanta Essex Company		0.0000003%	5

Alternative Calculation			
Allocation Party	Allocation Share		Tier
Revere Smelting & Refining Corp.		0.0085994%	5
Franklin Burlington Plastics Inc.		0.0079842%	5
Goodrich Corporation		0.0077880%	5
Coats & Clark, Inc.		0.0066207%	5
Harris Corporation		0.0063160%	5
Goody Products Inc.		0.0039965%	5
General Electric Company		0.0039762%	5
Purdue Pharma Technologies Inc.		0.0027557%	5
PPG Industries Inc.		0.0026514%	5
Neu Holdings (Eden Wood Corporation)		0.0024160%	5
Passaic Pioneer Properties Co.		0.0016852%	5
Quality Carriers, Inc./Quala Systems		0.0016454%	5
Tate & Lyle Ingredients Americas LLC		0.0016439%	5
Sun Chemical Corporation (Foundry Street Complex)		0.0012805%	5
Foundry Street Corporation (Foundry Street Complex)		0.0006026%	5
Honeywell International, Inc.		0.0005850%	5
STWB Inc.		0.0005345%	5
Essex Chemical Corporation		0.0005208%	5
Canning Gumm LLC		0.0004707%	5
Berol Corporation		0.0001721%	5
Ashland Inc.		0.0000189%	5
Roman Asphalt Corporation		0.0000131%	5
Alden Leeds Inc.		0.0000113%	5
National Standard LLC		0.0000054%	5
Hartz Consumer Group, Inc.		0.0000051%	5
Covanta Essex Company		0.0000027%	5
Elan Chemical Co., Inc.		0.0000005%	5

ATTACHMENT R

ADDITIONAL CONTAMINANT INVENTORY ANALYSIS FOR LOWER EIGHT MILES OF THE LOWER PASSAIC RIVER, APRIL 2019

Additional Contaminant Inventory Analysis

for

Lower Eight Miles of the Lower Passaic River

April 2019

Objective

The primary goal of this analysis is to determine the inventory of copper, lead, dieldrin, and polycyclic aromatic hydrocarbons (PAHs) in the lower 8.3 miles of the Lower Passaic River (Operable Unit 2 or OU2 of the Diamond Alkali Superfund Site). This analysis is based on the 1990-2012 data sets and statistical methods presented in Data Evaluation Report No.5 (DER No 5) of the 2014 Remedial Investigation and Focused Feasibility Study Reports (RI/FFS) (USEPA, 2014). Although the 2012 dataset is listed in Section 1.2 of the DER No 5, review of the mass inventory calculation presented in DER No 5 indicates that the 2012 data were not included in the calculation.

This analysis also updates the mass of 2,3,7,8-TCDD, Total PCBs, Total 4,4'- DDx and mercury using all data from 1990 - 2012. In addition, the updates reflect changes made for consistency with the 2016 Record of Decision (ROD) Responsiveness Summary (USEPA, 2016), as discussed below (under "Results").

Method

- Sediment chemistry data from 1990 – 2012 were used in the analysis (as listed in Section 1.2 of DER No 5 of the RI/FFS).
- PAHs and dieldrin were analyzed by both high-resolution and low-resolution methods. Comparisons of PAHs and dieldrin concentrations from high-resolution and low-resolution methods suggested that the differences were not statistically significant. Therefore, no adjustments were made to the low-resolution data. However, for sediment samples for which both high-resolution and low-resolution results were available, the high-resolution data were used.
- For PAHs, mass estimates were calculated for three different sums: high molecular weight PAHs (HMW), low molecular weight PAHs (LMW), and total PAHs (TPAH). HMW were the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene. LMW were the sum of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene and 2-methynaphthalene. And TPAH were the sum of the above 17 PAHs. The non-detect (ND) values for individual PAH were set as '0' in calculating the sums, unless all component PAHs in the sum were ND in which case half of the highest individual detection limit was used as the sum.

- For copper, lead, and dieldrin, the ND values were set as half of their reporting detection limit, consistent with how contaminants that are not sums of individual components were treated in DER No. 5.
- Average values were used for samples with field duplicates.
- Mass estimates were made for 1) the total inventory in the lower 8.3 miles of the Lower Passaic River; 2) the inventory in the Tierra Phase I removal area; and 3) the inventory that would be removed if the selected remedy were implemented as described in the 2016 ROD.

Results - Contaminant Inventory Assessment

The results obtained for the four contaminants are presented in Table 1 below. The total mass of contaminants in the fine-grained sediments of the lower 8.3 miles of the Lower Passaic River is as follows:

- Copper and lead have estimated masses of about 2,100,000 and 3,200,000 kilograms (kg), respectively, with associated relative standard errors of about 6.7 percent for copper and 6.3 percent for lead.
- Dieldrin has an estimated mass of about 390 kg, with a relative standard error of about 35 percent.
- LMW PAH and HMW PAH have estimated masses of about 170,000 kg and 240,000 kg, respectively, with associated relative standard errors of about 16 percent for LMW PAHs and 6.7 percent for HMW PAHs. The estimated mass of TPAH is about 410,000 kg, with a relative standard error of about 10 percent.

Table 1 also shows the updated mass of 2,3,7,8-TCDD, Total PCBs, Total DDx and mercury based on the 1990-2012 data sets and statistical methods presented in DER No 5. In addition, the ROD Selected Remedy mass has been updated consistent with the 2016 ROD Responsiveness Summary to reflect: 1) the final extent and depth of the navigation channel included in the ROD Selected Remedy; 2) the integration of the Tierra Removal Phase 2 area with the lower 8.3-mile remedy in a coordinated and consistent manner; and 3) the correction of an error in the PCB mass calculation performed for the Responsiveness Summary.

References

USEPA, 2014. Data Evaluation Report No. 5: Contaminant Inventory Analysis, Lower Eight Miles of the Lower Passaic River. Prepared by Louis Berger for USEPA, 2014. Available at http://passaic.sharepointspace.com/Public%20Documents/2014-01-30%20DER5%20Contaminant%20Inventory%20Analysis.pdf

USEPA, 2016. Record of Decision 8.3 Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site Essex and Hudson Counties, New Jersey. Available at https://semspub.epa.gov/work/02/396055.pdf

Table 1: Summary of Mass Estimates for RM 0 to RM 8.3. Values rounded to 2-significant figures.

Contaminant	Total Mass Prior to Phase 1 or ROD Remedy (kg)	Phase 1 Mass (kg)	ROD Selected Remedy Mass (kg)
Copper	2,100,000	12,000	570,000
Lead	3,200,000	16,000	860,000
Dieldrin	390	230	30
LMW PAH	170,000	700	64,000
HMW PAH	240,000	1,300	82,000
TPAH	410,000	2,000	150,000
2,3,7,8-TCDD	38	9.8	6.2
Total 4,4´-DDx	27,000	21,000	570
Mercury	42,000	240	11,000
Total PCB	26,000	230	7,200

ATTACHMENT S

CULPABILITY & COOPERATION FACTORS WORKSHEET

CONSIDERATIONS IN DETERMINING CULPABILITY & COOPERATION FACTORS

The following considerations were taken into account in determining how to assign factors for the culpability and cooperation of Allocation Parties.

In the conduct of a hazardous waste site allocation, consideration of a party's actions that exacerbate the scope of contamination requiring remediation or to cooperate with government in efforts to resolve the risk associated with such contamination are evaluated to provide equitable adjustments to the calculation of the party's share of responsibility. As noted in the foundational Gore Factors these considerations of culpability and cooperation are described as:

> The degree of care exercised by the party with respect to the hazardous substance concerned, taking into account the characteristics of such hazardous substance; and
>
> The degree of cooperation by the party with federal, state, or local officials to prevent any harm to the public health or the environment.

In the current matter, a range of actions were evaluated to establish the relative culpability and cooperation of the Allocation Parties.

The following types of considerations were evaluated in determining an appropriate facility Culpability Factor, based on available information. As noted below, given the limitations on conduct of an independent evaluation of facility operations regarding COCs, I am reviewing general facility operations where appropriate to consider the potential for activities leading to the release of the COCs.

- Whether the operations of a facility met industrial standards of environmental conduct for the era in which they occurred
- The persistent or recurring nature of sloppy or substandard industrial practices involving COCs
- Whether sloppy industrial practices or the nature of releases of other hazardous substances indicate a potential for or likelihood of releases of COCs
- Whether facility actions resulted in the issuance of NOVs or other administrative actions noting concern regarding facility operations
- The frequency or number of NOV issuance
- Whether actions resulted in the filing of civil or criminal actions to address facility operations or resulting contamination
- Whether actions were taken with apparent disregard of impact on human health or the environment or demonstrate an intentional violation of federal or state environmental authorities

The following types of considerations were evaluated in determining an appropriate negative or positive facility Cooperation Factor.

- Whether opportunities to cooperate with governmental/regulatory entities to address environmental or public harm were refused, taken under duress through compliance with a UAO, or voluntarily undertaken via an AOC/CD or independently in cooperation with such entities
- The level of participation in the activities and funding of actions by PRP Groups working in cooperation with governmental/regulatory entities to address environmental or public harm
- The extent to which an Allocation Party's efforts in cooperation with governmental/ regulatory entities to address environmental or public harm benefited other Allocation Parties by removing more contamination than they are individual responsible for having contributed to OU2
- The level of participation in the offered allocation process, including the voluntary submission of requested documents and information regarding facility operations and contaminating practices

History of Allocation Party Cooperation with Remedial Activities

A number of the Allocation Parties have cooperated with governmental/regulatory entities to address environmental or public harm caused by contamination of OU2 through individual action or participation in the activities of PRP Groups, the Cooperating Parties Group (CPG) and the Small Parties Group (SPG), formed, in part, for that purpose. The CPG was formed in February 2004 and the SPG was subsequently formed. The following is a summary of activities undertaken by Allocation Parties and the amounts of funding, if available, committed in support of EPA's remedial or removal activities in the Lower Passaic River and OU2.

2007 RI/FS ASAOC – In June 2007, members of the CPG entered into an Administrative Settlement Agreement and Order on Consent ("ASAOC") with EPA for a Remedial Investigation/Feasibility Study ("RI/FS"), in which the settling parties agreed to take over the performance of the 17-mile Lower Passaic River Study Area ("LPRSA") RI/FS from EPA. The CPG members' costs include costs of all activities required and approved by EPA, reimbursement of EPA's oversight costs, and costs for other activities in support of the RI/FS. Costs, through the end of April 2020, expended by the CPG members for such efforts amount to $124,882,811 as of that date. Occidental Chemical, an original member of the CPG, left the group in May 2012, and though continuing to pay its portion of EPA oversight costs has not contributed to RI/FS related cots since its departure from the group. Seton Tanning, likewise, left the CPG in May 2014 and ceased financial support for group activities.

Other RI/FS Costs – In 2004, the CPG members signed an ASAOC with EPA to fund EPA's work on the RI/FS for the 17-mile LPR. CPG members paid $12.64 million to EPA, excluding what was paid by OxyChem and its indemnitors. In addition to this § 122(h) Settlement, CPG members incurred other recoverable response costs in furtherance of EPA's RI/FS during the period from 2004 to 2007, totaling $3,142,680.

2012 Phase 1 Removal Action – In June 2008, EPA, OCC and Tierra signed an AOC for a non-time-critical removal action to remove 200,000 cy of contaminated sediment from the river (from RM 3.0 to RM 3.8) adjacent to the 80-120 Lister Avenue facility. This action is referred to as the "Tierra Removal." Sediment at depth adjacent to the facility has been found to have the highest levels of 2,3,7,8-TCDD measured in the river. Dredging, dewatering and transport off site of the first 40,000 cy of sediment (known as Phase 1 of the Tierra Removal) was completed in 2012. In 2015, Tierra, on behalf of OCC, collected additional samples in the Phase 2 area. Amount of funding committed to these efforts is unknown. The Phase 1 removal activities removed the following volumes of COCs determined by EPA to be located in the OU2 remedial area.

Contaminant of Concern	Total COC Mass Prior to Phase 1 or ROD Remedy (kg)	COC Mass Removed During Phase 1 (kg)
Copper	2,100,000	12,000
Lead	3,200,000	16,000
Dieldrin	390	230
LMW PAH	170,000	700
HMW PAH	240,000	1,300
TPAH	410,000	2,000
2,3,7,8-TCDD	38	9.8
Total 4,4´-DDx	27,000	21,000
Mercury	42,000	240
Total PCB	26,000	230

Activities by members of the CPG and SPG in support of EPA's actions to address OU2 remediation are ongoing in nature.