RECORD OF DECISION

Riverside Industrial Park Superfund Site
EPA ID# NJSFN0204232

Operable Unit One

Newark, Essex County, New Jersey

United States Environmental Protection Agency
Region 2
New York, New York
September 2021

630397

DECLARATION STATEMENT

RECORD OF DECISION

SITE NAME AND LOCATION

Riverside Industrial Park Superfund Site (EPA ID# NJSFN0204232)
Newark, Essex County, New Jersey
Operable Unit 1 – Entire Site

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for Operable Unit 1 (OU1) of the Riverside Industrial Park Superfund Site (Site or Riverside Industrial Park), in Newark, Essex County, New Jersey, which addresses contaminated sewer water, soil gas, soil/fill material, and groundwater. The selected remedy also addresses various wastes found across the Site. OU1 includes the entire Site and this remedy is expected to be the final action for the Site. The remedy was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§ 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedy. The attached index (see Appendix III) identifies the items that comprise the administrative record upon which the selected remedy is based.

The New Jersey Department of Environmental Protection (NJDEP) was consulted, in accordance with Section 121(f) of CERCLA, 42 U.S.C. § 9621(f). NJDEP concurs with EPA's selection of Waste Alternative 2, Sewer Water Alternative 2, Soil/Fill Alternative 4, and Groundwater Alternative 4. NJDEP does not concur with EPA's selection of Soil Gas Alternative 2 (see Appendix IV).

SITE ASSESSMENT

Actual or threatened releases of hazardous substances from the Site, if not addressed by the implementation of the response action selected in this ROD, may present an imminent and substantial endangerment to public health and welfare and to the environment.

DESCRIPTION OF SELECTED REMEDY

The selected remedy addresses five media which include: waste material, sewer water, soil gas, soil/fill material, and groundwater. Lead was found to be the primary contaminant of concern (COC) in soils at the Site. In addition to lead, copper, arsenic, polychlorinated biphenyls (PCBs), volatile organic contaminants (VOCs), and semi-volatile organic contaminants (SVOCs) were found to be of concern in soils. Lead, VOCs, and SVOCs were found to be contaminants of concern

for groundwater. VOCs were found to be COCs for soil gas. VOCs were also found to be a contaminant of concern in the settled solids in an inactive sewer manhole. Non-aqueous phase liquid (NAPL) and various other wastes containing hazardous constituents were found across the Site. The various other wastes are currently contained; however, there is potential for contaminants to be released into the environment.

The major components of the selected remedy are:

Waste Alternative 2 - Removal and Off-Site Disposal

- Removal and off-site disposal of the underground storage tanks (USTs), the aqueous and solid waste and/or light non-aqueous phase liquid (LNAPL) within the USTs, non-aqueous phase liquid (NAPL)-impacted soil/fill material surrounding the USTs, the LNAPL in the pooled water in Building #15A, the white chalky talc-looking substance in a hopper in Building #7, a plastic 55-gallon drum in Building #12 containing liquid waste, and a five-gallon bucket in Building #17 containing solid waste. The LNAPLs in the UST and in Building #15A are considered principal threat wastes, and the removal and disposal of these wastes will address this concern.
- Following removal of USTs and their contents, confirmation sampling of soil/fill (including underneath the tank) and groundwater will occur.

Sewer Water Alternative 2 – Removal and Off-Site Disposal

- Transfer of the sewer water and solids from the inactive sewer line into appropriate containers or transport vehicles for off-site treatment and/or disposal.
- The associated sewer line and manhole will be cleaned, and then closed in place by plugging/filling to prevent future buildup of water and solids in the manhole.

Soil Gas Alternative 2 - Institutional Controls, Air Monitoring and, if needed, Engineering Controls (existing occupied buildings), and Site-Wide Engineering Controls (future buildings)[1]

- Institutional controls (ICs) will be established in the form of deed notices and Classification Exception Areas (CEAs)/Well Restriction Areas (WRAs) site-wide to provide notice of certain restrictions upon the use of the property in relation to soil gas. This requirement will be implemented in conjunction with the deed notice requirement for the soil/fill remedy and the CEA/WRA requirement for the groundwater remedy.
- A building-specific assessment of sub-slab soil gas and/or indoor air quality will be required for any of the currently occupied existing buildings on the Site, and for existing buildings that will be occupied in the future, and, if the assessment identifies unacceptable risks/hazards, engineering controls will be implemented to protect the occupants of such existing buildings from unacceptable vapor intrusion risks/hazards. The assessment will evaluate vapor intrusion COCs in soil (trichloroethylene [TCE], total xylenes, and naphthalene), and, for buildings within 100 feet of groundwater contamination that exceeds screening levels, additional COCs will be evaluated as part of the assessment (benzene, ethylbenzene, and vinyl chloride).
- Future new construction will be required to include a vapor barrier or other appropriate

[1] Figure 14 in Appendix I is a schematic drawing that presents the Selected Remedy for Soil Gas. The details will be refined during the remedial design.

means of sealing the ground surface underneath the new building slab or installation of a subsurface depressurization system (SSDS), as determined by EPA.

- In all existing buildings – currently occupied and occupied in the future – periodic indoor air monitoring will be required to verify previous assessment results and to confirm that engineering controls continue to protect indoor workers, due to the potential for unacceptable risk from the presence of indoor air contaminants above vapor intrusion screening levels (VISLs). Air monitoring may also be required in newly constructed buildings. If indoor air monitoring indicates exceedances of EPA VISLs, New Jersey VISLs, and/or New Jersey Indoor Air Remediation Standards (IARS) from Site COCs in existing or newly constructed buildings, further evaluation of the data would be needed to determine whether unacceptable risks/hazards exist in which case property owners or other parties would be required to implement further engineering controls to achieve New Jersey IARS as remediation goals.

Soil/Fill Alternative 4: Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal[2]

- ICs will be established in the form of deed notices site-wide to provide notice that future use of the Site must remain commercial or industrial and identify areas of the Site where contamination exceeds the State of New Jersey residential soil standards.[3] These requirements will be implemented in conjunction with the deed notice requirement for the soil gas remedy.
- Fencing will be required to be maintained and enhanced as appropriate to limit unauthorized access to the Site and use of the Site in a manner inconsistent with the remedy.
- NAPL-impacted soil/fill on Lot 63 will be excavated and disposed of off-site.
- Contaminated soil/fill material will be capped, with a cap that consists of the construction of a barrier over the contaminated areas, to prevent access to and contact with the contaminated media and/or to control its migration.
- A focused excavation and off-site disposal of lead-impacted soil/fill around Building #7 of the Site where high levels of lead were found will be performed.
- The bulkhead will be reinforced or reconstructed, as appropriate, in order to minimize the potential for interaction between the Site and surface water, minimize soil erosion, and prevent off-site transport of soil/fill containing COCs and Contaminants of Potential Ecological Concern (COPECs).

Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation[4]

- ICs will be established in the form of CEAs/WRAs site-wide to provide notice that the groundwater in the area does not meet designated use requirements and to prohibit the installation and use of wells for potable and other uses within the designated area.

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[2] Figure 15 in Appendix I is a schematic drawing that presents the Selected Remedy for Soil/Fill. The details will be refined during the remedial design

[3] The Proposed Plan incorrectly referenced the non-residential standards (NRDCSRS). This has been clarified to state that the deed notices will identify areas of the Site where contamination exceeds New Jersey residential soil standards (RDCSRS).

[4] Figure 16 in Appendix I is a schematic drawing that presents the Selected Remedy for Groundwater. The details will be refined during the remedial design.

- Targeted, periodic in-situ remediation of the groundwater will be conducted. The specific means will be determined during the remedial design with treatability studies to determine the most appropriate treatment approach and reagents. Possible treatments include chemical treatment, biosparging, and air sparging.
- A pump and treat system will be installed to provide hydraulic containment at the river's edge to minimize migration of contaminated groundwater to the river. Extracted groundwater will be collected, treated, and disposed. The number of extraction wells, pumping rate, and individual processes to be utilized for treatment will be determined during the remedial design.
- Groundwater monitoring will be performed to demonstrate that the selected remedy continues to be protective of human health and the environment.

The total estimated cost of the selected remedy is $38,923,100.

DECLARATION OF STATUTORY DETERMINATION

Part 1: Statutory Requirements

The Selected Remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

Part 2: Statutory Preference for Treatment

By utilizing targeted, periodic in-situ treatment to the extent practicable to treat the groundwater contamination in combination with pump and treat to provide hydraulic containment, the Selected Remedy meets the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element is satisfied. Furthermore, excavation of soil/fill material would reduce the mobility of the lead around Building #7 and NAPL on Lot 63 through removal and appropriate off-site disposal. As required by the disposal facility, the toxicity and volume may be reduced if material is treated to comply with disposal requirements.

Part 3: Five-Year Review Requirements

Because this remedy results in hazardous substances, pollutants, or contaminants remaining on the Site above levels that will allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years of the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment, unless determined otherwise at the completion of the remedial action.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the administrative record file for this action.

- A discussion of the current nature and extent of contamination is included in the "Summary of Site Characteristics" section.
- The Site COCs and their respective concentrations are presented in the “Summary of Site Characteristics” section.
- A discussion of the potential adverse effects associated with exposure to Site COCs and COPECs are included in the “Summary of Site Risks” section.
- The remediation goals for the Site COCs are presented in the “Remedial Action Objectives” section.
- A discussion of principal threat waste is included in the “Principal Threat Wastes” section.
- A discussion of the current and reasonably anticipated future land and groundwater use assumptions is included in the “Current and Potential Future Land and Resources Uses” section.
- The estimated capital, operation and maintenance, and total present-worth costs are presented in the “Description of Remedial Alternatives” section.
- A discussion of the key factors that led to the selection of the remedy is included in the “Comparative Analysis of Alternatives” and “Statutory Determinations” sections.

AUTHORIZING SIGNATURE

Evangelista, Pat

Digitally signed by Evangelista, Pat
Date: 2021.09.28 11:19:11 -04'00'

9/28/2021

Pat Evangelista, Director
Superfund and Emergency Management Division
EPA Region 2

Date

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DECISION SUMMARY

Riverside Industrial Park Superfund Site
Operable Unit One
EPA ID# NJSFN0204232
Newark, Essex County, New Jersey

SITE NAME, LOCATION, AND DESCRIPTION

The Site is currently a 7.6-acre partially active industrial park located in the North Ward community of Newark, Essex County, New Jersey (Figure 1 of Appendix I). PPG Industries, Inc. (PPG) and its predecessors occupied the Site and conducted paint and varnish manufacturing operations on the Site from approximately 1902 until 1971. After 1971, the Site was subdivided into 15 parcels/lots, and is now identified as the Riverside Industrial Park (Figure 2 of Appendix I).

Both Riverside Avenue and McCarter Highway border the Site to the west along with a segment of railroad track adjacent to McCarter Highway. Currently, the central and northern portions of the Site contain active industrial/commercial businesses, operating in buildings formerly operated by PPG for paint and varnish manufacturing, while the south side of the Site contains mostly vacant, former PPG buildings. The lots in the northern portion of the Site have Riverside Avenue addresses (Lots 1, 57, 58, 59, 60, 69, and 70), while the lots in the southern portion of the Site have McCarter Highway addresses (Lots 61, 62, 63, 64, 65, 66, 67, and 68). The main entryway is through a vehicle access point on Riverside Avenue; however, pedestrian trespassing occurs regularly through unsecured portions of the Riverside Industrial Park. The majority of the Site (70 percent) is covered with hardened surfaces, such as asphalt (approximately 19 percent), foundation and buildings (approximately 27 percent), and concrete (approximately 24 percent). The remaining portion of the Site is indicated to be pervious (approximately 30 percent). The Passaic River and its tidal mudflat border the Site on the east side. Sections of steel, concrete, and wooden bulkhead provide a retaining wall along most of the Site adjacent to the Passaic River; however, the bulkhead has fallen into disrepair in some locations and several sections of the wooden bulkhead have collapsed. Recent site observations indicate a combined sewer outfall pipe under the area of Lot 63 has collapsed, causing subsidence and a collapse of a section of the bulkhead.

There are 14 buildings at the Site with five of the buildings being vacant (Buildings #6, #7, #12, #15, and #17). At the time of the Remedial Investigation (RI), Buildings #1, #2, #3, #9, #10, #13, #14, and #16 had ongoing business operations along with a small garage building (Building #19) that was used for storage by the occupant of Building #13. The southern portion of the Site is primarily vacant with four of the five unoccupied buildings located there. Former Building #4 was damaged by fire and was demolished in 1982; a sub-grade concrete slab with concrete walls is currently present that was previously used by post-PPG occupants as secondary containment for multiple above-ground storage tanks (ASTs). Debris including several pieces of cars are located near the former Building #4. Former Building #5 was also damaged by fire and demolished in 1982, a vegetated soil/fill mound currently occupies much of the footprint of the building. At the time of the RI, debris/soil mounds were also present within a former AST dike on Lot 68 and on the south side of Building #15 on Lot 58. These soil/fill mounds are of unknown origin. The mound on Lot 68 was removed in 2019.

Smaller structures that are present on the Site include a vacant guard-shack at the entrance to the Site along Riverside Avenue and a small concrete structure of unknown use on the eastern side of Lot 67. Empty ASTs and/or process vessels are present on the exterior of Lots 58, 67, and 69. The empty AST on Lot 58 is a remnant feature from PPG manufacturing practices.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

An 1873 map from Atlas of the City of Newark, as compared to later maps, indicates that most of the Site was reclaimed from the Passaic River with imported fill material. An 1892 Certified Sanborn Map suggests that some filling occurred in the late 1800s; however, the major filling events at the Site occurred from 1892 to 1909 (Figure 3 of Appendix I). The origin of fill material at the Site is unknown. Boating docks shown on the north and central portions of the Site on the 1892 map suggest some placement of fill and reclamation of land from the Passaic River occurred. Most of Lots 57, 61, 62, 63, 64, 66, 67, 68, and 70 were within the footprint of the Passaic River with the Triton Boat Club operating a dock area on the north side of Lot 60. By 1909, most of the lots had been created via filling and land development and were developed with structures used by the Patton Paint Company, a hotel, and the Triton Boat Club. Portions of Lots 57 and 70 remained part of the Passaic River in 1909 but were created by placement of fill material prior to 1931. Lot 67 was completely filled by 1966.

From approximately 1902 to 1971, the Site was used for paint, vanish, linseed oil, and resin manufacturing by the Patton Paint Company and its corporate successors. Patton Paint Company merged into the Paint and Varnish Division of Pittsburgh Plate Glass Company in 1920, which changed its name to PPG Industries, Inc. (PPG) in April 1968. After discontinuing all manufacturing operations, PPG conveyed its interest in the Site in August 1971. Since then, the property has been subdivided into the 15 separate lots that exist today with multiple current and former owners and various industrial-related tenants. Detailed descriptions of the Site's ownership history, operational history, known historical activities, documented releases, and previous site investigations are provided in Sections 1.3 and 1.4 of the Remedial Investigation (RI) Report (2020). Highlights from those descriptions are provided below.

- PPG housed paint and varnish manufacturing operations from approximately 1902 to 1971. PPG's operations involved current Lot 1 and Lots 57 through 70. As stated in the Site Characterization Summary Report (SCSR) (Woodard & Curran, 2015), metal pigments were brought to the Site for the manufacturing of paints, including basic lead carbonate (also known as white lead) and copper oxide.

- Frey Industries, Inc. (Frey) occupied Lots 1, 61, 62, 63, and 64 from 1981 to 2007, when operations ceased. Frey warehoused, packaged, repackaged and distributed client-owned chemicals. As stated in the SCSR, products handled by Frey included polyester resins, flammable liquids, corrosives, and poisons. Jobar operated on a portion of Frey's leased property between 1979 and 1982 before its assets were acquired by Frey in 1983. Hazardous wastes generated during the Jobar and Frey operations were a result of cleaning transfer lines, floor sweepings, and absorbents used for cleanup of spills.

- Baron Blakeslee, Inc. (BBI) was a sub-tenant of Frey in the early 1980s. BBI occupied Lot 61 for product distribution, warehousing a variety of chemical products, and analysis of various chemical blends and waste samples. They also reportedly used Building #7 (Lot 63) as a laboratory, Lot 62 for drum storage, and Lot 68 as a common truck and tanker parking area where a 25-gallon tetrachloroethylene spill occurred in 1987. Purex (BBI's parent company) was acquired by Allied Signal. After a series of mergers and acquisitions,

BBI became part of Honeywell International, Inc. (Honeywell) in 1999. The City of Newark currently owns Lots 58, 61, 63, 64, and 68.

- Universal International Industries was identified as conducting various manufacturing operations on Lots 1, 63, and 64. No specific information was located regarding its manufacturing activities.

- Samax Enterprises (Samax) occupied Lot 1 from 1999 to 2011 when operations ceased. Samax stored various raw materials on-site and manufactured various chemicals under the brand name Rock Miracle. As stated in the SCSR, other products include deck strippers, deck wash, marine paint removers, restoration cleaners, lead paint removers, masonry cleaners, paint hardeners, and various solvents. An industrial company, 29 Riverside, LLC, currently occupies Lot 1. (The property is currently owned by Hatzlucha on Riverside, LLC.)

- HABA International, Inc. (HABA) occupied Lot 57 from at least 1982 until 1988. Davion Inc. (Davion), successor to HABA, currently operates on Lot 57. (The property is owned by Plagro Realty, Inc.) HABA and Davion manufactured nail polish remover and related products. As stated in the SCSR, products included acetone, ethyl acetate, dyes, fragrances, fatty acids, and lubricating oil. A material identified as HC Blue 2 was released in 1993 as a result of a fire involving nitrated aniline. Acupak, Inc. was a subtenant of HABA on Lot 57 from at least 1987 to 1988 and conducted packaging for HABA.

- Roloc Film Processing (Roloc) occupied Lot 60 from 1985 until 2008 when operations ceased, and manufactured foils utilized for holograms and decoration in plastic, graphic, automobile, and other related industries. As stated in the SCSR, the coatings on the foils were made from solvent-based material, such as butyl acetate, naphtha, ethyl alcohol, methyl isobutyl ketone, and cellosolve acetate.

- Gilbert Tire Corporation has occupied Lot 60 since at least 2015 (following Roloc's occupation) and is the current occupant. (The property is owned by Shefah in Newark, LLC.). There is no manufacturing equipment. Used tires and wheel rims are stored until transferred off property.

- Chemical Compounds, Inc. (CCI) is the listed owner of Celcor Associates, LLC and has occupied Lots 62, 66, and 67 from at least the early 1990s. These companies manufactured hair dyes and other personal hygiene products using the following raw materials: 8-hydroxyquinoline (technical, pure, sulfate, citrate, and benzoate), copper-8-quinolinolate, ammonium adipate/benzoate, diphenylacetonitrile, and 2-nitro-p-phenylene diamine (as stated in the SCSR). Beginning in 2015, Teluca began operating on Lot 62. Teluca packages and distributes hair dyes, hair color, and related ingredients to hair color marketers. The facility includes a laboratory for completing hair dye research, offices, and warehousing.

- Gloss Tex Industries, Inc. (Gloss Tex) occupied Lot 69 from 1979 to at least 1989 when operations ceased. Gloss Tex manufactured bulk nail enamel, lacquer, and related cosmetic

products. According to the SCSR, isopropyl alcohol and dibutyl phthalate are stored on-site. Gloss Tex leased the property from Industrial Development Associates/Corporation (IDA), which currently owns Lot 65.

- Ardmore, Inc. has occupied Lots 59 and 69 (following Gloss Tex's occupation) since 1982 and is the current occupant. (The properties are owned by Sharpmore Holdings, Inc. and Albert Sharphouse.) Ardmore, Inc. manufactures soaps and detergents on Lot 59 and stores empty drums on Lot 69. According to the SCSR, a 1-gallon allyl chloride spill occurred in 1987.

- Monaco RR Construction Company stored railroad rails, cross ties, and spikes on Lot 70. Following their operation, Federal Refining Company (Federal) occupied Lot 70 from 1985 to 2007 when operations ceased. Federal was a scrap metal recycler, specializing in recovery of precious metals for arsenic, barium, cadmium, lead, and zinc. According to the SCSR, an unknown quantity of nitrocellulose spilled in 1990. The current tenant is Midwest Construction Company. Material and equipment used by the company are stored and maintained at the property. (The property is owned by the Estate of Carole Graifman.)

Since 1971, at least 11 documented spills and releases have occurred at the Site, and at least seven lots at the Site are subject to New Jersey Industrial Site Recovery Act (ISRA) remediation cases under NJDEP environmental regulations. The ISRA investigations resulted in ICs on these properties with either modified deed notices for engineering controls (such as pavement surface cover) or groundwater CEAs/WRAs to restrict use of contaminated groundwater. RI sampling was conducted site-wide and was not limited by these state ICs. Refer to the RI Report for more details.

In 2009, EPA and NJDEP responded to an oil spill that was discharging from a pipe into the Passaic River called "The Passaic River Mystery Oil Spill" (NJDEP Case #09-10-29-1320-36). The source of the spill was identified at low tide when a pipe discharging the oil was observed. The pipe was sealed, stopping the release. The pipe that discharged into the Passaic River was traced to a catch basin. An oily substance similar to the material observed in the discharge to the river was observed in the catch basin, and a sewer pipe from Building #12 was observed to discharge into the basin. EPA traced the source to two basement tanks in Building #12, a vacant building located on Lot 64 that had recently been connected to the sewer pipe by a hose. Based on its investigation during removal activities, EPA concluded that contents of the two basement tanks had been intentionally discharged into the sewer line and catch basin and released to the river. The sewer line was plugged, and the tanks secured by EPA.

Further EPA investigations of Lots 63 and 64 led to the discovery of several 12,000-15,000 gallon USTs adjacent to Building #7, numerous 3,000-10,000 gallon ASTs, an underlain concrete basement/impoundment, a number of 55-gallon drums, and pigment hoppers and other smaller containers in Buildings #7 and #12. Between 2011 and 2014, EPA performed a removal action to address these conditions on Lots 63 and 64. EPA's removal action activities included: removal of the liquids from the basements of Buildings #7 and #12; investigation of the USTs with removal of two of them; investigation and disposal of the ASTs, drums, and smaller containers; and soil, groundwater, and waste sampling. The Site was added to the National Priorities list in May 2013.

In 2014, after the conclusion of the EPA's removal action, PPG signed an Administrative Settlement Agreement and Order on Consent (ASAOC) with EPA to complete the RI and the Feasibility Study (FS) for the Site. The RI was completed in April 2020 and the FS was completed in July 2020. The final RI and FS Reports and other related information in the administrative record file provide the basis for this ROD.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

Throughout the RI/FS process EPA provided progress updates and presented findings to the Passaic River Community Advisory Group (CAG). The CAG consists of stakeholders, who represent a broad range of interests and locales potentially affected by the contamination and cleanup of the Diamond Alkali Co. Superfund Site, including the Lower Passaic River Study Area. Since the Site is adjacent to the Passaic River, the investigation and cleanup of the Site were of interest to the CAG. Presentations given to the CAG were also posted to their website at www.ourpassaic.org.

EPA's preferred remedy and the basis for that preference were identified in a Proposed Plan. On July 22, 2020, EPA released the Proposed Plan for Riverside Industrial Park Superfund Site to the public for comment. Supporting documentation comprising the administrative record was made available to the public at the information repositories maintained at the EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York, and EPA's website for the Site at www.epa.gov/superfund/riverside-industrial.

EPA published notice of the start of the public comment period and the availability of the above-referenced documents in the Star Ledger on July 22, 2020. The notice was also translated into Spanish and was published in El Diario on July 22, 2020. A news release announcing the Proposed Plan, which included the public meeting date, time, and virtual meeting web link, was issued to various media outlets and posted on EPA's Region 2 website on July 22, 2020. The public comment period initially ran from July 22, 2020 to August 21, 2020 but several extensions were granted, and the public comment period ended on February 19, 2021. Notices of the comment period extensions were published in the Star Ledger and El Diario newspapers and on EPA's website.

A virtual public meeting was held on August 5, 2020, to inform local officials and interested citizens about the Superfund process, to review the preferred alternative as well as other alternatives evaluated in the Proposed Plan, and to respond to any questions from area residents and other attendees. Closed captioning and a Spanish translator were made available for this virtual meeting. During the meeting, public comments were related to details of the proposed remedy, the performance of the work at the Site, and local community health concerns.

Responses to the questions and comments received at the public meeting and in writing during the public comment period can be found in the attached Responsiveness Summary (See Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The NCP, at 40 CFR Section 300.5, defines an OU as a discrete action that comprises an incremental step toward comprehensively addressing site problems. A discrete portion of a remedial response eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into several OUs, depending on the complexity of the problems associated with the site.

For the Riverside Industrial Park Superfund Site, the entire Site is designated as OU1, which is expected to be the only OU for the Site. This ROD describes EPA's selected remedial action for OU1, which addresses contaminated soil, soil gas, sewer water, and groundwater present at the Site. This selected remedial action also addresses various wastes found across the Site. This remedy is expected to be the final action for the Site.

SUMMARY OF SITE CHARACTERISTICS

Hydrogeology

The majority of the Site was reclaimed from the Passaic River through placement of fill material into the river and along the adjacent shore to raise the surface elevation to today's approximate elevation, with most of this work being completed from 1892 to 1909. The fill material ranges in thickness from 6 to 15 feet. The fill material consists predominantly of sands, silts, and gravel, along with man-made materials such as brick, pieces of concrete block, wood, glass, and cinders. The fraction of each material in the fill varies across the Site, however, most of the historic fill material at the Site is characterized as a Loamy Sand or Sand Loam. Based upon historical maps, previous investigations, and data obtained during the RI, fill material is present in surface soil throughout the Site and in subsurface soil where historical filling was conducted to reclaim land from the Passaic River. This material meets the NJDEP definition of "historic fill" and, consistent with that definition, has been shown by RI data to be impacted by chemicals and metals. The sources of fill material are unknown. As fill placement occurred over a more than 30-year period, the sources, and thus the physical and chemical properties, of the fill could have differed over time. The historic fill material at the Site was also likely to have been impacted by historical and/or recent operations and recent and illegal disposal. Lower portions of the fill are saturated, as evidenced by groundwater depths that are typically less than 6 feet below grade. A silt loam underlies the fill unit over the majority of the Site except in areas to the northwest.

In order to understand the movement of groundwater at the Site, groundwater gauging was conducted at Site wells during three groundwater sampling events, slug testing was performed, and tidal influence studies were completed in a number of wells at the Site. The wells installed as part of the RI and existing wells on Site evaluated the shallow fill unit (wells named with the 100-series wells) and the alluvial deposits (wells names with the 200-series wells), which are referred to as the deep unit wells. Wells monitoring the shallow unit were generally screened from 2 to 12 feet below ground surface (bgs) with recharge attributed primarily to precipitation and higher surface elevation areas to the west as well as recharge from the Passaic River during high tide. The deeper groundwater unit is composed of quaternary alluvium (a geological unit known as Qal) and glacial lake deposits (a geological unit known as Qbn), which are hydraulically connected. Wells

monitoring the deep unit were screened from 20 to 26 feet bgs with recharge attributed primarily to higher surface elevation areas to the west as well as some leakage from the overlying shallow fill unit. Groundwater movement within the shallow fill unit would be expected to have a limited vertical component of flow due to the observed permeability/grain-size differences between the fill material and underlying fine-grained unit (silt loam), although the silt loam layer is thin and contains a sand fraction. Monitored groundwater elevations also suggest these deep wells are under tidal influence, which suggests some recharge from the Passaic River. The lacustrine lake bottom sediments (a geological unit known as Qbnl) underlying the deltaic deposits is believed to represent a semi-confining unit to vertical groundwater flow.

The primary groundwater flow direction in both the shallow and deep units is east toward the Passaic River, and both the shallow and deep groundwater units are considered to discharge to the Passaic River. Hydraulic conductivity in the wells tested at the Site varied between 4 and 264 feet per day (ft/day). While the data indicate a range of approximately two orders of magnitude for hydraulic conductivity, the fact that many of the wells are constructed in fill materials suggests this range is reasonable given the heterogeneity of fill. The fill material can reasonably be expected to vary between silty sand to low fines content sand and gravel mixes. Generally, the hydraulic conductivity appears to be higher in fill materials on the southern portion of the Site based on the slug-test results in MW-109 and MW-123 with a hydraulic conductivity in fill in the southern half of the Site ranging from approximately 30 to 260 ft/day (see Figure 5 for location of monitoring wells). In the fill in the northern half of the Site, the hydraulic conductivity ranges from 10 to 64 ft/day. In the deeper unit, the soil types vary between silty sands and sand and gravel both related to Qal and Qbn deposits. The wells in the deeper unit are screened in the Qal deposits, with the exception of MW-205 which is screened in the Qbn deposits. The hydraulic conductivity in the Qal appears to vary between approximately 4 and 264 ft/day. The lowest conductivities (4 – 12 ft/day) in the Qal were interpreted from MW-201. The conductivities for MW-202 through MW-204 range from 24 to 264 ft/day. This range likely reflects the heterogeneity expected in the alluvium left behind by the Passaic River. The interpreted conductivity from slug tests in MW-205 in the Qbn deposits varied between 181 and 230 ft/day and is generally reasonable given the description of this unit as deltaic sands and gravels.

Field-specific conductivity readings collected during groundwater sampling events indicate 25 of the 36 wells on the Site had conductivity readings above 1 millisiemens per centimeter (mS/cm), indicating brackish water. Groundwater samples from four of the five deep wells had conductivity readings that slightly exceeded 1 mS/cm. Higher specific conductivity readings in the range of possible brackish conditions were generally associated with wells in the northern portion of the Site closer to the river (MW-116, MW-118, MW-119, and MW-121).

The largest changes in groundwater elevations due to tidal changes are in the wells immediately adjacent to the shoreline. Tidal fluctuations in the deep unit indicate that deep wells on the north end of the Site also appear to exhibit more tidal influence suggesting that the materials on the more northern and inland portions (near MW-205) are more conductive or better connected to the river at depth or both.

Remedial Investigation

The RI was conducted in two phases of work from 2017 through 2019. Soil/fill material, shallow and deep groundwater, indoor air, water and deposited solids in sewer lines, water from sump pumps, discharge water from bulkhead pipes, and miscellaneous wastes were all sampled to define the nature and extent of contamination at the Site. Based on the results of the RI, EPA identified several concerns and organized them into the five categories of media below:

- Wastes. This medium includes LNAPL in the basement of Building #15A, USTs containing LNAPL and/or an aqueous solution on Lot 64, the NAPL-impacted soil/fill material surrounding the USTs, and several wastes in abandoned buildings.
- Sewer Water. This medium includes water and settled solids with elevated VOC concentrations in an inactive manhole.
- Soil Gas. The concentrations of VOCs in the soil/fill material and groundwater may impact the quality of indoor air due to vapor intrusion.
- Soil/Fill. This medium was found to be impacted by several contaminants, which generally included metals (lead, arsenic, and copper), PCBs, VOCs, and SVOCs.
- Groundwater. This medium was found to be impacted by several contaminants, which generally include metals (lead), VOCs, and SVOCs in the shallow groundwater unit and VOCs and SVOCs in the deep groundwater unit.

EPA is also working in conjunction with NJDEP to address unregulated discharges to the Passaic River from a pipe along the bulkhead on Lot 57. See discussion on Lot 57 below for more information.

Each of the media mentioned above are discussed in more detail in the following sections of this ROD. The following discussion focuses only on the media/contaminants for which EPA has determined that an action is needed. Additional information can be found in the RI Report.

<u>Waste</u>

This medium includes LNAPL in Building #15A, the USTs containing LNAPL and/or an aqueous solution on Lot 64, the NAPL-impacted soil/fill material surrounding the USTs, and several wastes in abandoned buildings. There are small volumes of contained waste found in Buildings #7, #12, and #17. These wastes are not associated with current operations, and the contents are not characterized as hazardous wastes for disposal purposes under the Resource Conservation and Recovery Act (RCRA). However, based on RI sampling, there are some constituents within the wastes that are hazardous, such as chromium or lead, and there is the potential for contaminants to be released into the environment.

Within Building #7, a white chalky talc-looking substance remains in an approximately 5-foot diameter hopper. The top of the hopper is accessible from the second floor, and the chalky contents are visible approximately 5 feet below the top. The estimated volume of solid waste in the hopper is approximately 11 cubic yards (CY). In Building #12, a plastic 55-gallon drum contains approximately 50 gallons of liquid waste. In Building #17, a five-gallon bucket labeled as a filler contains a solid waste.

Six USTs were identified in a tank field north of Building #12 on Lot 64. One UST was found to contain 1,600 gallons of LNAPL, which was characterized as diesel/heating oil approximately 0.9-foot thick. Approximately 3,500 CY of NAPL-impacted soil/fill material is surrounding the USTs. All six USTs contained liquid that was sampled, and the results found that none of the UST liquid was classified as a hazardous waste for disposal purposes under RCRA. Each tank measured approximately 30 feet (ft) long by 8 ft in diameter, and they contained a combined volume of approximately 32,600 gallons of liquid and 2,600 gallons of settled solids in the USTs (total amount). While the liquid is considered non-hazardous for waste disposal, the liquid contains primarily VOCs and chlorinated VOCs. The same VOCs found in the USTs were also reported in nearby groundwater wells. The tank contents are a potential source of soil/fill and groundwater contamination.

A portion of Building #15A also contains LNAPL in pooled water under a steel-grated floor. The LNAPL is approximately 0.5-foot to 0.65-foot thick and very viscous. Assuming that the grate and liquid underlies the entire floor area (approximately 650 square ft), and assuming an average thickness of 0.6-ft, the volume of LNAPL in Building #15A is estimated at 2,900 gallons. Based on RI laboratory results, the LNAPL is characterized as diesel fuel/heating oil.

Figure 4 in Appendix I identifies the areas of concern discussed above.

Sewer Water

The RI included an investigation of the sewer system at the Site. Sampling results for water collected from an inactive manhole on Lot 1 (identified in the RI as Manhole #8) found methylene chloride and trichloroethylene (TCE) at levels that exceeded the federal Maximum Contaminant Level (MCL). A solid sample collected from Manhole #8 also contained elevated levels of methylene chloride and toluene. The VOC concentrations in the water and solid samples in Manhole #8 were higher than nearby groundwater concentrations. Although there is currently no flow within this inactive sewer line on the Site, there is potential for contaminants within this line to be released into the environment. Other portions of the sewer system on the Site were not identified as potential sources of contamination to groundwater or soil/fill (see Figure 4 in Appendix I for location of the inactive sewer and manhole).

Soil Gas

Following the initial two rounds of groundwater sampling, the shallow groundwater results were screened against NJDEP VISLs (see Figure 5 in Appendix I for sampling locations). This comparison suggested that vapor intrusion may be a potential exposure risk/hazard.[5] Since a potential risk was found, indoor air sampling was conducted in 2019 within occupied buildings of the Site (Buildings #1, #2, #3, #9, #10, #14, and #16). Additionally, three exterior ambient air samples were collected to determine potential background concentrations near the occupied

[5] This comparison was conducted during the RI/FS for this Site. In May 2021, after the release of the Proposed Plan, NJDEP promulgated indoor air remediation standards for a number of VOCs, replacing the previous screening levels for those VOCs. NJDEP updated its Vapor Intrusion Technical (VIT) guidance shortly thereafter.

buildings. The samples were analyzed for benzene, ethylbenzene, xylenes, 1,1,2-trichloroethane (TCA), carbon tetrachloride, chloroform, isopropylbenzene, naphthalene, TCE, and vinyl chloride.

The Baseline Human Health Risk Assessment (BHHRA) vapor intrusion modeling indicated that there were no unacceptable health risks/hazards associated with exposure to indoor air from soil gas (modelled from shallow groundwater concentrations). A comparison of the shallow fill unit data to NJDEP's VISLs identified benzene, ethylbenzene, total xylenes, 1,3-dichloropropene (total), TCE, and vinyl chloride at concentrations above NJDEP VISLs (refer to Table 3-1 in FS Report). Under NJDEP's VIT guidance, these exceedances trigger the need to perform an investigation due to vapor intrusion concerns from groundwater contamination. The BHHRA also identified that soil/fill concentrations of naphthalene, TCE, and xylenes could present unacceptable risks/hazards to future indoor workers from potential soil gas intrusion (modelled from soil/fill concentrations) on three lots (Lots 58, 62, and 68), should these currently vacant areas be subject to improvement via construction of new buildings or occupation of existing vacant buildings (see Figures 6A, 6B, and 6C in Appendix I and Table 1 in Appendix II).

Soil/Fill

An extensive sampling regime was conducted to analyze the nature and extent of contamination in soil/fill material. Over 100 soil borings and a total of 210 soil samples were collected across the Site (see Figure 5 of Appendix I for sampling locations and Table 2 of Appendix II for a summary of soil/fill samples with detected contaminant concentrations that exceeded the RGs).

The majority of the Site (except the northwest section) was reclaimed from the Passaic River with imported fill. Fill material is documented at the surface throughout the Site with greater fill thicknesses associated with areas reclaimed from the Passaic River (up to 15 feet thick) and is generally described as a Loamy Sand or Sand Loam in most areas. Permeability testing conducted on two soil samples collected beneath the fill unit representative of the former riverbed indicated permeabilities of $1.1x10^{-5}$ to $3.3x10^{-7}$ centimeters per second (cm/s). EPA geotechnical data indicate that this former riverbed material beneath the fill is more appropriately described as a silt loam. The silt loam layer grades into a fine to coarse-grained sand and gravel with depth, which includes the following geological units known as Qal and Qbn followed by Qbnl, identified as glacial lake bottom deposits.

The RI identified a NAPL-impacted soil/fill material in several soil borings (Borings B-34, B-35, and B-90) east and south of the USTs on Lot 64. Isolated areas of NAPL-impacted soil/fill material were also observed in the soil/fill material during the drilling of a monitoring well (MW-201) on Lot 63. However, samples collected from monitoring wells in the vicinity of the USTs did not have a measurable thickness of LNAPL in the groundwater except for one temporary well-point installed at B-34. The sources of the NAPL-impacted soil/fill material on Lots 63 and 64 are likely releases from the USTs or illegal dumping. Samples collected from monitoring wells and temporary wells did have elevated benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations, which are potentially indicative of petroleum impacts to groundwater.

The RI identified lead as one of the primary contaminants of concern across the Site. A significant amount of lead contamination was found in soil/fill material on Lots 63 and 64 around Building

#7. Elevated lead (at concentrations that exceeded the NJDEP Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS) of 800 mg/kg) was also found on Lots 1, 57, 58, 61, 65, 67, 68, 69, and 70. Arsenic and copper were also metals identified as a concern in the RI, and they were found to be primarily co-located with lead in soil/fill material on Lot 63 (see Figures 7A, 7B, and 7C in Appendix I).

The VOCs identified at the Site include benzene, naphthalene, vinyl chloride, TCE and total xylenes. The highest chlorinated VOC soil sampling results were from Lot 68, where a chlorinated solvent release is known to have occurred, and on Lot 64, adjacent to the USTs. During the RI, benzene, naphthalene, and vinyl chloride concentrations exceeded NJDEP NRDCSRS on Lots 62, 64, and 68. Note that naphthalene may be reported as a VOC or SVOC (see Figures 8A, 8B, and 8C in Appendix I). In May 2021, after the release of the Proposed Plan in July 2020, NJDEP finalized amendments to its remediation standards and, as a result, naphthalene and vinyl chloride no longer exceed the NRDCSRS.

SVOCs of concern at the Site are a group of chemicals known as polycyclic aromatic hydrocarbons (PAHs). Benzo(a)pyrene was the most prevalent PAH across the Site, with concentrations exceeding the NJDEP NRDCSRS of 2 mg/kg on Lots 1, 57, 60, 61, 62, 63, 64, 66, 67, and 69. The other three PAH compounds of concern (benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene) had elevated concentrations that exceeded the NJDEP NRDCSRS on Lot 63 adjacent to known NAPL-impacted soil/fill material and on Lot 67. PCB concentrations exceeded the NJDEP NRDCSRS of 1 mg/kg on Lots 57, 64, 65, 67, and 70 (see Figures 9A through 9E in Appendix I).

Groundwater

The RI characterized the nature and extent of groundwater contamination beneath the Site. To conduct this characterization, 28 monitoring wells were installed (in addition to the 8 existing wells) to sample the shallow groundwater unit (also referred to as the shallow fill unit) and five monitoring wells were installed to sample the deep groundwater unit (see Figure 5 of Appendix I and Table 3 of Appendix II). Note that groundwater characterization was done site-wide and not by lot as was done with the soil/fill characterization, but lot numbers or building numbers were used to help identify the location of the contamination and the sources.

At the Site, groundwater is designated by NJDEP as a Class IIA aquifer, which means that this groundwater may be a source of potable water (e.g., drinking water). However, the groundwater is not currently used for potable water and is not reasonably expected to be used as a potable source in the future because the Site and surrounding area are served by the City of Newark's drinking water system, and the site-specific conductivity readings of the groundwater indicate possible brackish conditions.

Shallow Groundwater Unit

Several VOCs were detected throughout the shallow groundwater unit (also known as the shallow fill unit) at levels that exceeded the NJDEP Class IIA standards. Benzene, toluene, ethylbenzene, and total xylenes (also known as BTEX) were the most common VOCs detected in the shallow groundwater unit and are indicative of petroleum impacts. BTEX was primarily found in the UST area on Lot 64, extending east/southeast onto Lot 63 downgradient of the UST area. It was also found in a well adjacent to Building #15 on Lot 58. Chlorinated VOCs (including methylene chloride, tetrachloroethylene (PCE), TCE, and vinyl chloride) were primarily detected in monitoring wells on Lots 63 and 64 surrounding the USTs. The source of these chlorinated VOCs is likely the UST, which also contain elevated levels of chlorinated VOCs (see Figures 10A through 10I in Appendix I).[6]

SVOCs (including 1,4-dioxane and p-cresol) and PAH compounds (including 2-methylnaphthalene, benzo(a)anthracene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and bis(2-ethylhexyl)phthalate) were also present in the shallow groundwater unit at concentrations that exceed the NJDEP Class IIA standards. The PAH compounds were primarily detected in groundwater monitoring wells located within the vicinity of NAPL-impacted soils and where BTEX was also detected. 1,4-Dioxane exceedances were wide-spread across the Site, primarily focused on the eastern side of the Site (see Figures 11A through 11G in Appendix I).

Lead in groundwater was generally located in two areas: one area is on Lots 63 and 64, and the second area is north of Building #1 along the eastern and northern property boundaries. Lead concentrations in the shallow groundwater unit exceeded NJDEP Class IIA standards in wells located on Lots 57, 60, 61, 63, 64, 66, and 67 (see Figure 12 in Appendix I.).

As previously mentioned, while NAPL-impacted soil/fill material was observed in the UST area of Lot 64, measurable LNAPL was not observed in a nearby shallow monitoring well. No dense non-aqueous phase liquid (DNAPL) was observed in the RI monitoring wells.

Deep Groundwater Unit

Five monitoring wells were installed in the deep groundwater unit, with two wells in the northern portion of the Site and three in the southern portion.

Fewer VOCs were detected in the deep groundwater relative to the shallow groundwater unit. Benzene, PCE, 1,1,2,2-tetrachloroethane, and 1,1,2-TCA were the most common VOCs detected in the deep groundwater unit however, only Benzene and PCE exceeded NJDEP Class IIA standards in wells on Lot 63 and on Lot 58 near Building #15.

For SVOCs, benzo(a)anthracene and 1,4-dioxane concentrations in the deep groundwater exceeded NJDEP groundwater standards in wells on Lot 63 and Lot 64, and on Lot 57 near Building #10.

[6] Acetone was also identified as a concern on Lot 57. EPA is working in conjunction with NJDEP to address unregulated discharges to the Passaic River from a pipe along the bulkhead on Lot 57. See discussion on Lot 57 below for more information.

Lead was not detected above NJDEP groundwater standards in the deep unit. Metals exceeding NJDEP Class IIA standards in the deep groundwater monitoring wells included iron, arsenic, manganese, and sodium.

See Figures 13A through 13D in Appendix I for groundwater exceedances of the deep unit.

Lot 57: Discharge to the River

The RI identified two issues on Lot 57: 1) a river wall sewer pipe coming out of the bulkhead was found to be discharging elevated toluene and acetone concentrations to the river (the acetone concentration was 83,000 micrograms per liter (µg/L), which is above the NJDEP Class IIA standard of 6,000 µg/L); and 2) elevated concentrations of acetone were found in the groundwater adjacent to the building. The nearest shallow fill well (MW-118) to the wall sewer sample had acetone concentrations from 51,000 to 71,000 µg/L.

EPA determined that both issues are associated with ongoing operations at Lot 57 and is coordinating with NJDEP to resolve these issues. The Lot 57 sewer pipe, and the releases to the river from this waste line, are not being addressed as part of this remedy because there is no known impact on the Site from the sewer line. Further, it is EPA's current understanding that the cleanup of acetone in groundwater at Lot 57 was conducted under NJDEP cleanup authorities, with work overseen by a New Jersey Licensed Site Remediation Professional (LSRP). Groundwater sampling conducted during the pre-design investigation will confirm these conclusions. The NJDEP assigned case number for this remediation is 20-04-09-0923-04.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Land Use

The Site is zoned for industrial use[7] and is sub-divided into 15 lots, seven of which are occupied and the other eight of which are unoccupied. The occupied lots are currently used for industrial purposes. The five lots owned by the City of Newark, Lots 58, 61, 63, 64, and 68, as well as Lots 57 and 70, are expected to be used in the future for industrial purposes. The property owners of the remaining eight lots have indicated their intentions to continue current commercial/industrial uses. Portions of several lots within the Site are subject to NJDEP Deed Notice/Declarations of Environmental Restriction, which are ICs that provide notice of limitations on use of the properties to non-residential uses.

The Site is located in the North Ward in the City of Newark and a sub-district of the Passaic riverfront, which is located between Delavan Avenue and Fourth Avenue, and is a "dedicated industrial zone" for industrial and commercial uses. Surrounding properties include bulk storage tanks to the north, an auto body shop to the northwest across Riverside Avenue, and a construction contracting business to the south. There are medium density residential units west of McCarter

[7] City of Newark. 2013. Public Access & Redevelopment Plan. Newark's River. Final Plan Approved August 7, 2013 by the Newark Municipal Council. April.

Highway. New industrial development and increased future use of marine transportation is anticipated for the North Ward. The City of Newark's 2013 redevelopment plan states that:

> *The zoning of the area east of McCarter Highway will continue to support and attract manufacturing businesses that provide jobs and make use of constrained riverfront sites. Environmental contamination, like that recently identified by the Environmental Protection Agency at Riverside Industrial Park, will need to be addressed for this redevelopment strategy (or any other) to succeed.*

Considering the previously mentioned factors, EPA determined that the reasonably anticipated future land use at the Site is expected to remain industrial. EPA acknowledges that, in the State of New Jersey, especially in urban areas along waterways, former industrially zoned areas are being re-zoned and re-developed for future recreation and residential use. However, there is no information that suggests that this Site would be re-zoned for future recreation and residential use at this time.

Groundwater Use

Groundwater underlying the Site is considered by the State of New Jersey to be Class IIA aquifer, a source of potable water. However, residential and non-residential users in the area of the Site are currently using publicly supplied potable water, which is treated to assure all drinking water standards are met. Furthermore, specific conductivity readings of the shallow groundwater indicate possible brackish conditions due to tidal influence of the adjacent Passaic River. There are no current uses of groundwater resources at the Site and none are reasonably anticipated in the future based on the City of Newark's Master Plan for the North Ward.

SUMMARY OF SITE RISKS

Baseline human health and ecological risk assessments (BHHRA and SLERA) were conducted to evaluate the current and future impacts of site-related contaminants at the Site including receptors on the various lots under current and future exposure assumptions (e.g., indoor workers, outdoor workers, trespassers, and construction workers) and other receptors such as visitors to the lots. The final BHHRA Report, dated April 20, 2020, evaluated cancer risks and noncancer Hazard Quotients (HQs) for individual chemicals and Hazard Indices (HIs) for all chemicals with noncancer HQs that were summed based on the individual receptor exposures on the lots and exposures to site-wide groundwater under the assumption that shallow and deep groundwater would be used as a drinking water source in the future. The BHHRA also evaluated hypothetical future residential use of the Site to determine the need for ICs restricting future development on the Site.

A separate analysis was conducted to evaluate exposures to lead by receptors under current and future land use. The lead evaluation included comparing the Exposure Point Concentrations (EPCs) (i.e., for lead, the arithmetic mean concentrations) against the screening levels of 200 mg/kg (milligram/kilogram) for hypothetical future residents and 800 mg/kg for nonresidential receptors (e.g., industrial workers). In addition, EPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children and Adult Lead Methodology (ALM) are used to estimate

the concentration of lead in the blood of children and adults, respectively, who might be exposed to lead-contaminated soils. The estimated blood lead concentrations are used to evaluate the potential need for remedial action.

The SLERA, dated April 20, 2020, provides ecological risks for the individual lots and a side-wide assessment.

Baseline Human Health Risk Assessment

Summary of the Human Health Risk Assessment Process

A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure (RME) scenarios**,** and the results are summarized below.

- *Hazard Identification* – uses the analytical data collected to identify the contaminants of potential concern (COPCs) at the site for each medium, with consideration of a number of factors explained below.
- *Exposure Assessment* – estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (*e.g.*, ingesting contaminated soil) by which humans are potentially exposed.
- *Toxicity Assessment* – determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of effect (response).
- *Risk Characterization* – summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations that exceed acceptable levels, defined by the NCP as an excess lifetime cancer risk greater than 1×10^{-6} to 1×10^{-4} (risk of one in a million to one in ten thousand) or a HQ/HI for noncancer health effects greater than 1; contaminants at these concentrations are considered COCs and are typically those that will require remediation at the site. Also included in this section is a discussion of the uncertainties associated with these risks and HQ/HI.

The BHHRA evaluated both cancer risks and noncancer HQ/HIs from exposure to COPCs on each of the 15 individual properties (lots) that comprise the Site, as documented in the BHHRA (April 2020). Currently, seven properties are occupied and eight properties are vacant. The BHHRA evaluates exposure under current industrial land use, future industrial/commercial land use and future residential land use for the following receptors: young child (6 years and younger), adolescent (10 to 18 years), and adult (18 years and older) under these land uses assuming baseline conditions – *i.e.*, no remedial actions or ICs to prevent or control potential exposures. The BHHRA is based on current EPA risk assessment policy, guidance, and guidelines. The cancer risk and noncancer hazards on the individual lots are above EPA's levels of concern for various receptors who may be exposed to soils, groundwater and vapors in indoor air.

Cancer risks and noncancer hazards were calculated based on an estimate of the RME expected to occur under current and future conditions. The RME is defined as the highest exposure that is reasonably expected to occur at a site (EPA, 1989).

An assessment of lead exposure was also conducted. The assessment of lead is conducted based on blood lead concentrations (PbBs) that correlate exposure and adverse health effects. To predict blood lead concentration and the probability of a child's blood lead concentration exceeding 5 micrograms/deciliter (µg/dL) based on a given multimedia exposure scenario, a model which considers lead exposure and toxicokinetics in a receptor – i.e., a child (using the IEUBK model or fetus (using the ALM) to derive an exposure level that satisfies the risk reduction goal i.e., there should be no more than 5% of the exposed individuals with PbBs greater than 5 ug/dL.

The following sections summarize the basic steps of the Superfund BHHRA process.

Hazard Identification

In this step, COPCs in each medium are identified based on such factors as toxicity, frequency of detection, fate and transport of the contaminants in the environment, concentrations, and mobility. The BHHRA began with selecting COPCs in soil, groundwater, and vapors that could potentially cause adverse health effects in exposed populations. COPCs are selected by comparing the maximum sample detected concentrations of each chemical with appropriate risk-based screening levels. COPCs were further evaluated in the BHHRA for the individual receptors and exposure pathways.

With the exception of lead, a summary of the exposure point concentrations (EPCs) for the COPCs, or those chemicals requiring a response, can be found in Appendix II, Table 4a. For lead, the arithmetic mean concentration of all samples collected from the appropriate soil interval or the mean of maximum concentration from groundwater was used as the EPC for each chemical, and these values can be found in Tables 4b – 4d. A comprehensive list of EPCs for all COPCs can be found in Appendix C (Table 3 series) of the BHHRA.

Exposure Assessment

Exposure assessment estimates the type and magnitude, frequency, and duration of a human receptor's exposures to COPCs in the environment. The exposure assessment evaluates exposure pathways by which individuals are or can be exposed to the COPCs in different media (e.g., soil, groundwater, and indoor air from vapors). Consistent with Superfund policy and guidance, the BHHRA assumes no remediation or ICs to mitigate or remove hazardous substance releases. Cancer risks and noncancer HIs were calculated based on an estimate of the RME (defined above) expected to occur under current and future conditions at the Site.

The BHHRA evaluated potential cancer risks and noncancer hazards (HQ/HI) under current and potential future land uses. Factors relating to the exposure assessment include, but are not limited to, the concentrations that RME individuals are or can be exposed to and the potential frequency and duration of exposure. The three main elements of exposure assessment are the characterization of exposure setting, the identification of potential exposures (i.e., conceptual site model) and the quantification of exposure.

Land Use. Based on the current and future Site land use, the occupied lots are: Lots 1, 57, 59, 60, 62, 69, and 70; and the vacant lots are: Lots 58, 61, 63, 64, 65, 66, 67, and 68.

Conceptual Site Model. Table 5 summarizes current exposures at occupied lots, current exposures at unoccupied lots, and receptors for future exposures at all lots. The exposure pathways are discussed in the BHHRA Section 4.1 to Section 4.4.

Soil. The BHHRA evaluated samples collected from the surface soil (0 to 2 ft); subsurface soil (0 to 4 ft); and all soils (0 to 13 ft) that could potentially cause adverse health effects in exposed individuals. Under future conditions, the assessment considered subsurface soil being moved to the surface during future site redevelopment.

Groundwater. Site groundwater is classified as Class IIA by the State of New Jersey. The classification assumes all water may potentially be used as a drinking supply unless restrictions are enforced by the NJDEP. The assessment assumes consumption of groundwater based on sampling data collected from the shallow and deep aquifers.

Vapor Intrusion. Mathematical modeling was used to predict reasonable maximum indoor air concentrations due to vapor intrusion (from vapors in soil [all depths] and shallow and deep groundwater) in undeveloped portions of the properties. For the lots with currently occupied buildings, groundwater results from 2018 were used to inform indoor air sampling in these on-site buildings to assess the potential for vapor intrusion. Indoor air samples were collected from the seven occupied buildings (i.e., Buildings #1, 2, 3, 9, 10, 14, and 16) in January and February 2019. Three ambient air samples were also collected near these buildings to assess potential background sources of VOCs. These air samples were analyzed for select VOCs that were present in shallow groundwater above EPA vapor intrusion screening levels (benzene; 1,1,2-trichloroethane; carbon tetrachloride; TCE; chloroform; vinyl chloride; naphthalene; ethylbenzene; xylenes; and isopropyl benzene (cumene)).

The quantification of exposure includes three elements: the calculation of the EPCs (e.g., units of mg/kg in soil), the calculation of intakes represented in units of milligrams/kilogram-day (mg/kg-day), and measured or modeled air concentrations. The potential exposure pathways under current and anticipated future land use at and around the 15 lots that comprise the Site are summarized in the ROD Tables 1.1 to 1.3 for current, future and hypothetical future exposures, respectively.

The BHHRA evaluated potential risks to RME individuals associated with both current and potential future land uses. Below is a list of current and future receptors including areas where they may be exposed.

Potential Current and Future Exposures and Receptors.

- **Outdoor worker (adult)**: incidental ingestion, dermal contact, and inhalation of airborne soil particulates, and inhalation exposure of volatile COPCs released from surface (0 to 2 ft) and subsurface soils (0 to 4 ft) under current and future land use.
- **Indoor worker (adult)**: inhalation of volatile COPCs in subsurface soil (i.e., 0 ft. bgs to approximately 13 ft. bgs) and shallow groundwater due to vapor intrusion, and incidental

ingestion and dermal contact with outdoor surface soil that has been incorporated into indoor dust.

- **Utility worker (adult)**: incidental ingestion, dermal contact, and inhalation of soil or groundwater vapors and airborne soil particulates from depths of up to 0 to 13 ft bgs.
- **Construction worker (adult):** incidental ingestion, dermal contact, and inhalation of soil from depths of 0 to 2 ft. bgs or groundwater vapors from depths of 0 to 13 ft bgs) and airborne soil particulates from surface soils.
- **Trespasser (adolescent/adult)**: incidental ingestion, dermal contact, and inhalation of airborne soil particulates, and inhalation exposure to volatile COPCs from surface (0 to 2 ft bgs) and subsurface soils (0 to 4 ft bgs) is also possible.
- **Visitor (child/adult)**: incidental ingestion, dermal contact, and inhalation of airborne soil particulates (0 to 2 ft bgs), and inhalation exposure to volatile COPCs from surface and subsurface soil (0 to 4 ft. bgs) and shallow groundwater is also possible while outdoors.
- **Off-site worker (adult)**: off-site worker exposures were evaluated using outdoor worker exposures. No site-related contamination (soil or groundwater) is known to extend off-site.
- **Off-site resident (child/adult)**: off-site residential exposures were evaluated using on-site future residential exposures. No site-related contamination (soil or groundwater) is known to extend off-site.

Hypothetical Future.

- **Hypothetical future resident (child/adult)**: exposure assumes medium-density residential units and hypothetical future potable use scenarios for shallow and deep groundwater. Exposure to volatile COPCs in shallow groundwater via vapor intrusion was also assessed.

A summary of all the exposure pathways considered in the BHHRA, and the basis for inclusion in the BHHRA, can be found in Table 5. Typically, exposures are evaluated using a statistical estimate of the EPC, which is usually an upper bound estimate of the average concentration for each contaminant, but in some cases, where adequate data are not available to calculate an EPC, the maximum detected concentration is used. The EPCs for the various media are provided in Tables 4a – 41d.

Toxicity Assessment

In this step, the types of adverse health effects associated with contaminant exposures and the relationship between magnitude of exposure and severity of adverse health effects are determined.

Potential health effects are contaminant-specific and may include the risk of developing cancer over a lifetime or other noncancer health effects, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some contaminants are capable of causing both cancer and noncancer health effects.

Under current EPA guidelines, the likelihood of cancer risks and noncancer hazards due to exposure to site chemicals are considered separately. Consistent with current EPA policy, it is assumed that the toxic effects of the site-related chemicals would be additive. Thus, cancer risks and noncancer hazards associated with exposures to individual COPCs were summed to indicate

the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively. For those chemicals with total hazards greater than the goal of protection of an HI = 1, a further assessment of the Target Organ Specific Hazard Index (TOSHI) was developed and evaluated for exceedance of a HQ for the individual toxic endpoint equal or greater than 1.

Toxicity data for the human health risk assessment were selected consistent with EPA's Toxicity Hierarchy (EPA 2003). This information for the COCs is presented in Table 6 (noncancer toxicity data summary) and Table 7 (cancer toxicity data summary). Additional toxicity information for all COPCs is presented in Chapter 5 of the BHHRA.

Lead. Potential exposures to lead in soil are evaluated separately from the assessment for other COPCs because EPA evaluates the significance of lead exposures using the PbB level as an index of exposure, rather than in terms of cancer risk or noncancer hazards. Because there are no published quantitative toxicity values for lead it is not possible to evaluate risks and hazards from lead exposure using the same methodology as for the other COPCs. However, since the toxicokinetics (the absorption, distribution, metabolism, and excretion of toxins in the body) of lead are well understood, lead risks are regulated based on PbB. In lieu of evaluating risk using typical intake calculations and toxicity criteria, EPA developed models which are used to predict PbB and the probability of a child's PbB exceeding 5 micrograms per deciliter (µg/dL) based on a given multimedia exposure scenario. EPA's risk reduction goal for lead-contaminated sites is to limit the probability of a typical child's (or that of a group of similarly exposed individuals') PbB exceeding 5 µg/dL to 5% or less. In the BHHRA, lead risks for Site receptors were evaluated using EPA's IEUBK Model for Lead in Children and the ALM model all other adolescent and adult receptors.

The soil EPCs for lead are arithmetic mean concentrations rather than the Upper Confidence Limits on the Mean (UCLs) that are used for other COPCs, to be consistent with the principles of the PbB models and the risk-based screening levels derived from those models. Soil EPCs for lead are summarized in Tables 4b and 4c and groundwater EPCs for lead are presented in Table 4d.

Risk Characterization

This step summarizes the combined outputs of the exposure and toxicity assessments to provide a quantitative assessment of Site cancer risks, noncancer hazards, and PbBs. Exposures were evaluated based on the potential risk of developing cancer and the potential for noncancer hazards. Exposure from lead was evaluated using PbB modeling and is discussed in more detail later in this section.

Noncancer Hazards

Noncancer hazards were assessed using an HI approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels to chemicals for humans (including sensitive individuals) which are not anticipated to cause adverse health effects over a lifetime of exposure. The key concept for a

noncancer HQ/HI is that a "threshold level" (measured as an HQ/HI of less than or equal to 1) exists at which noncancer health effects are not expected to occur. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical ingested from contaminated soil) is compared to the RfD, or airborne vapors that are compared to the RfC, to derive the HQ for the contaminant in the particular medium. The HI is obtained by adding the HQs for all compounds within a particular medium that impacts a particular receptor.

The HQ for oral and dermal exposures is calculated as shown below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD

Where: HQ = Hazard Quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute). The appropriate toxicity value was applied based on the exposure duration for the receptor.

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific receptor. An HI greater than 1 indicates that the potential exists for noncancer health effects to occur as a result of Site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific receptor exceeds 1, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. Following is a summary of the noncancer hazards identified at the Site for current and hypothetical future exposures:

Under current exposure scenarios for many receptors (outdoor workers, indoor workers, utility workers, trespassers, off-site workers) all noncancer HI estimates are at or below the protection goal of 1. For the current construction worker, a noncancer HI value of 2 was estimated for exposure to soil at all depths at Lot 68 (See Table 6-11 in the BHHRA); it should be noted that no TOSHI values exceeded the protection goal of 1 for this population (See Table 6-12 in the BHHRA). For the current visitor, a noncancer HI value of 2 was estimated for exposure to soil at all depths at Lot 70 (See Table 6-18 of the BHHRA); it should be noted that no TOSHI values exceeded the protection goal of 1 for this population (Table 6-19 in the BHHRA). For off-site residents, a noncancer value of 2 was estimated for exposure to on-site soil that may migrate off-site via windblown soil vapor and particulates emanating from lots without groundcover (See Table 6-24 in the BHHRA); it should be noted that no TOSHI values exceeded the protection goal of 1 for this population (Table 6-25 in the BHHRA).

Noncancer hazards for future scenarios are:

- For all lots, the HI values were greater than the goal of protection of 1 for outdoor worker's

potential exposure to soil (0-2 feet) and exposure to shallow groundwater during hypothetical potable use, with the noncancer HIs ranging from 2 to 50. The target organ specific hazard indices (TOSHIs) are also above the goal of protection for Lots 57, 58, 63, 64, and 69. (See BHHRA Section 6.2.2.1, Table 6-32 and associated text.)

- For all lots, the HI values were greater than the goal of protection of 1 for indoor worker's potential exposure to soil (0-2 feet and all sample depths) and potential vapor intrusion exposure from shallow groundwater, with the noncancer HIs ranging from 2 to 50. The TOSHIs are also above the goal of protection for Lots 57, 58, 59, 61, 62, 63, 64, 65, 68 and 69. (See BHHRA Section 6.2.2.2, Table 6-41 and Table 6-42, and associated text.)
- For all lots, the HI values were greater than the goal of protection of 1 for outdoor/indoor/off-site workers' potential exposure to shallow and deep groundwater through ingestion, dermal contact, and inhalation of vapors during hypothetical potable use. Single-chemical hazard quotients (HQs) are above the goal of protection for several VOCs, SVOCs, and metals at each of the properties. (See BHHRA Section 6.2.2.1, Table 6-30; Section 6.2.2.2, Table 6-40; and Section 6.2.2.7, Table 6-74.)
- The indoor worker's HIs for potential soil vapor intrusion exposure (from all sampled depths) ranged from 0.0004 to 5, with Lots 58, 62, 64, and 68 showing HIs above the goal of protection of 1. The single-chemical HQs above the goal of protection are trichloroethene (Lots 58 and 68), xylenes (Lots 58 and 64), naphthalene (Lot 62), and benzene (Lot 64). (See BHHRA Section 6.2.2.2, Table 6-33 and associated text.) The TOSHIs are above the goal of protection for Lots 58, 62 and 68 and are at or below the goal of protection for Lot 64. (See BHHRA Section 6.2.2.2, Table 6-34 and text associated with Table 6-33).
- Lot 68 had HIs greater than the goal of protection of 1 for the construction worker's potential exposure to soil (all sampled depths) (see BHHRA Section 6.2.2.4, Table 6-50) and potential exposure to shallow groundwater through ingestion, dermal contact, and vapor intrusion during future development (see BHHRA Section 6.2.2.4, Table 6-54). No single-chemical HQ (for soil) and no TOSHIs (for shallow groundwater) are above the goal of protection. (See BHHRA Section 6.2.2.4, text associated with Table 6-50 and Table 6-54.)
- For potential soil exposure (0-2 ft) and potential soil vapor intrusion for a child visitor at all lots, the HIs ranged from 0.2 to 3, with Lots 63 and 70 having HI values above the goal of protection of 1 (see BHHRA Section 6.2.2.6, Table 6-59). The single-chemical HQs are at or below the goal of protection, except for copper at Lot 63 (see BHHRA Section 6.2.2.6, text associated with Table 6-59). The TOSHIs are above the goal of protection for Lot 63 and at or below the goal of protection for Lot 70. (See BHHRA Section 6.2.2.6, Table 6-60 and associated text.)
- For potential exposure of visitors to soil (all sampled depths) brought to the surface during future development at all lots, the HIs ranged from 0.2 to 2, with Lots 63 and 70 having HI values above the goal of protection of 1 for a child visitor. The single-chemical HQs are at or below the goal of protection (see BHHRA Section 6.2.2.6, Table 6-61). The TOSHIs are above the protection goal for Lot 70 and are at or below the goal of protection for Lot 63. (See BHHRA Section 6.2.2.6, Table 6-62 and associated text.)
- For all lots, potential exposure to shallow and deep groundwater from ingestion, dermal contact, and inhalation of vapors during hypothetical potable use showed HIs above the goal of protection of 1 for visitor/adult resident (range from 5 to 200) and for visitor/child

resident (range from 7 to 200). The single-chemical HQs are above the goal of protection for several VOCs, SVOCs, PCBs, and metals at each of the properties, with the highest HQs for trichloroethene, xylenes, 1,2,4-trichlorobenzene, 2-hexanone, cyanide, naphthalene, and iron. The most elevated HI in Lot 59 is primarily from exposure to total xylenes. (See BHHRA Section 6.2.2.6, Table 6-67 and Section 6.2.2.9, Table 6-87.)

- For all lots, the potential exposure to soil (0-2 ft) and shallow groundwater from vapor intrusion and hypothetical potable use showed HIs above the goal of protection of 1 for adult visitor (ranging from 5 to 200) and for child visitor (ranging from 8 to 200). (See BHHRA Section 6.2.2.6, Table 6-68.)
- For all lots, the potential exposure to soil brought to the surface during future development and shallow groundwater from vapor intrusion and hypothetical potable use showed HIs above the goal of protection of 1 for adult visitor (ranging from 5 to 200) and for child visitor (ranging from 8 to 200). Generally, at least one TOSHI is also above the goal of protection at each property. (See BHHRA Section 6.2.2.6, Table 6-69 and associated text.)
- For all lots, the potential for off-site workers' exposure to soil (0-2 feet and all sampled depths) and contact with shallow groundwater during excavation, vapor intrusion, and hypothetical potable use showed His above the goal of protection of 1 (ranging from 2 to 50). The TOSHIs are also above the goal of protection for Lots 57, 58, 59, 61, 63, 64, and 69. (See BHHRA Section 6.2.2.7, Table 6-75 and Table 6-76, and associated text.)
- For all lots, potential inhalation exposure to soil (0-2 feet and all sampled depths) for off-site child resident, the HIs ranged from 0.02 to 2, with Lots 62 and 68 having His above the goal of protection of 1. No single-chemical HQs are above the goal of protection (See BHHRA Section 6.2.2.8, Table 6-77 and Table 6-79). All TOSHIs are at or below the goal of protection. (See BHHRA Section 6.2.2.8, Table 6-78 and Table 6-80, and associated text.)
- For all lots, for potential exposure to soil from ingestion, dermal contact, inhalation of particulates (0-2 ft), and inhalation of vapors (all sampled depths) for child resident, the HIs ranged from 2 to 20, except for Lot 59 which was at the goal of protection of 1. Single-chemical HQs for metals (Lots 58, 61, 63, 65, 67, 68, and 69), benzo(a)pyrene (Lot 67), naphthalene (Lot 62), PCBs (Lots 57, 65, 67, and 70), and 2,3,7,8-TCDD (Lots 60 and 70) are above the goal of protection of 1. Also, at Lot 63, the HI for adult resident was 2, above the goal of protection of 1, with all single-chemical HQs at or below the goal of protection. (See BHHRA Section 6.2.2.9, Table 6-81.)
- For all lots, for potential exposure to child resident to soil (all sampled depths) brought to the surface during future development from ingestion, dermal contact, and inhalation of particulates and vapors, the HIs ranged from 2 to 20, except for Lots 1 and 59 which were at the goal of protection of 1. Single-chemical HQs for metals (Lots 58, 61, 63, 65, 67, 68, and 69), naphthalene (Lot 62), PCBs (Lots 57, 65, 67, and 70), and 2,3,7,8-TCDD (Lots 60 and 70) are above the goal of protection of 1. Also, at Lot 70, the HI for adult resident was 2, above the goal of protection of 1, with all single-chemical HQs at or below the goal of protection. (See BHHRA Section 6.2.2.9, Table 6-82.)
- For all lots, for potential inhalation exposure to soil vapors (all sampled depths) in indoor air, the HIs ranged from 0.03 to 300 (except for Lots 59 and 69) for adult resident and from 0.04 to 500 (except for Lots 59 and 69) for child resident. The single-chemical HQs above the goal of protection are benzene (Lots 1 and 64), tetrachloroethylene (Lot 68), trichloroethene (Lots 58, 60, 61, 63, and 68), xylenes (Lots 58, 64, and 68), naphthalene

(Lots 1, 57, 62, 63, 64, 65, 66, 67, 68, and 70), cyanide (Lots 63, 65, and 70), and mercury (Lots 1, 57, 58, 61, 62, 63, 64, 65, 66, 67, 68, and 70) for adult resident and/or child resident. (See BHHRA Section 6.2.2.9, Table 6-85.)

- For potential inhalation exposure to shallow groundwater vapors from vapor intrusion, the HIs for adult resident and child resident were 2, above the goal of protection of 1, at Lots 58 and 59. Single-chemical HQs for xylenes were above the goal of protection. (See BHHRA Section 6.2.2.9, Table 6-86.)
- For exposure from hypothetical potable use of shallow and deep groundwater, the HIs for the adult resident (HI values ranging from 5 to 200) and child resident (HI values ranging from 7 to 200) exceeded the goal of protection of 1. The single-chemical HQs are above the goal of protection for several VOCs, SVOCs, PCBs, and metals at each of the properties. The highest HQs are for trichloroethene, xylenes, 1,2,4-tricholobenzene, 2-hexanone, cyanide, naphthalene, and iron for adults and/or child. (See BHHRA Section 6.2.2.9, Table 6-87 and associated text; also see Table 6-88 for exposures to future residents from surface soil, inhalation of vapors released from soil (all sampled depths) and shallow groundwater from air vapor intrusion, and shallow groundwater from hypothetical potable use, and Table 6-89 for exposures to soil (all sampled depths), shallow groundwater from vapor intrusion, and shallow groundwater from hypothetical potable use.

A representative summary of the noncancer hazards discussed above is presented in Table 8; selected lots are shown as examples for specific receptor(s)/exposure scenarios. The complete presentation of all noncancer HI values can be found in the BHHRA Report, as identified parenthetically above.

Cancer Risks

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen under the conditions described in the *Exposure Assessment*, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the modeled IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (e.g., 1 x 10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These cancer risks are probabilities that are usually expressed in scientific notation (such as 1 x 10^{-4} of a cancer risk is one-in-ten thousand). An excess lifetime cancer risk of 1 x 10^{-4} indicates an estimate of one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the *Exposure Assessment*. Current NCP identifies the risk range for determining whether a remedial action is necessary as an individual lifetime excess cancer risk of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk), with 10^{-6} being the point of departure. Table 9 summarizes the estimated

cancer risks that exceed EPA's target risk range of 1 x 10^{-6} to 1 x $10^{-4.}$ Following is a summary of the carcinogenic risks identified at the Site for hypothetical future exposures that exceed the NCP risk range:

Under current exposure scenarios (outdoor workers, indoor workers, utility workers, construction workers, trespassers, visitors, off-site workers and residents), the cumulative cancer risk estimates are below or within NCP's risk range (10^{-4} to 10^{-6}).

Cancer risks for future scenarios are:

- For hypothetical potable use of shallow and deep groundwater by outdoor, indoor, and off-site workers, the cumulative cancer risks ranged from 1 x 10^{-4} to 7 x 10^{-4}, which is at or below the acceptable risk range. (See BHHRA Section 6.2.2.1, Table 6-30 for the outdoor worker, Section 6.2.2.2, Table 6-40 for the indoor worker, and Section 6.2.2.7, Table 6-74 for the off-site worker.)
- For all lots, the cumulative cancer risks were greater than the NCP's risk range for potential exposure of outdoor workers to surface soil (0-2 ft) and shallow groundwater during hypothetical potable use, ranging from 2 x 10^{-4} to 7 x 10^{-4}. (See BHHRA Section 6.2.2.1, Table 6-32,)
- For all lots, except Lot 70, the cumulative cancer risks were greater than the NCP's risk range for potential exposure of indoor workers to surface soil (0-2 ft) and shallow groundwater via vapor intrusion, ranging from 2 x 10^{-4} to 7 x 10^{-4}. The cumulative cancer risk for Lot 70 is at the higher end of the NCP's risk range (i.e., 10^{-4}). (See BHHRA Section 6.2.2.2, Table 6-41.)
- For all lots, tor potential exposure of indoor workers to soil (all sampled depths) and shallow groundwater via vapor intrusion, the cumulative cancer risks, ranging from 2 x 10^{-4} to 7 x 10^{-4}, were greater than NCP's risk range, except for Lot 67. (See BHHRA Section 6.2.2.2, Table 6-42.)
- For all lots, potential exposure of adult/child visitors to shallow and deep groundwater from ingestion, dermal contact, and inhalation of vapors during hypothetical potable use showed cumulative cancer risks above the NCP's risk range, ranging from 9 x 10^{-4} to 3 x 10^{-3}). (See BHHRA Section 6.2.2.6, Table 6-67.)
- For all lots, the potential exposure of adult/child visitors to soil (0-2 ft) and shallow groundwater from vapor intrusion and hypothetical potable use showed cumulative cancer risks above the NCP's risk range, ranging from 9 x 10^{-4} to 4 x 10^{-3}. (See BHHRA Section 6.2.2.6, Table 6-68.)
- For all lots, the potential exposure of adult/child visitors to soil brought to the surface during future development and shallow groundwater from vapor intrusion and hypothetical potable water use showed cumulative cancer risks above the NCP's risk range, ranging from 9 x 10^{-4} to 4 x 10^{-3}. (See BHHRA Section 6.2.2.6, Table 6-69.)
- For all lots, except Lots 62, 67, 68, and 70, cancer risks were greater than 1 x 10^{-4} for potential exposure of off-site workers to shallow groundwater through ingestion, dermal contact, and inhalation of vapors during hypothetical potable use, ranging from 2 x 10^{-4} to 7 x 10^{-4}.. The highest risks (i.e., above the upper end of the NCP's risk range [10^{-4}]) are for 1,2-dibromo-3-chloropropane, pentachlorophenol, dibenz(a,h)anthracene, and arsenic. (See BHHRA Section 6.2.2.7, Table 6-74.)

- For all lots, except Lots 67, 68, and 70, cancer risks were greater than 1 x 10^{-4} for potential exposure of off-site workers to soil (0-2 feet and all sampled depths) and shallow groundwater through contact during excavations, vapor intrusion, and hypothetical potable use (See BHHRA Section 6.2.2.7, Table 6-75 and Table 6-76.)
- For potential exposure of adult resident and resident child at all lots from ingestion, dermal contact, and inhalation of particulates (0-2 ft) and inhalation of vapors (all sampled depths), the cumulative cancer risks were at or within NCP's risk range, except for Lot 67 which was above the NCP's risk range at 2 x 10^{-4}. The single-chemical cancer risks are within the acceptable risk range for all contaminants. (See BHHRA Section 6.2.2.9, Table 6-81.)
- For potential exposure of adult resident and resident child to indoor air from soil vapors (all sampled depths) through vapor intrusion and inhalation of vapors released from soil at all lots, except Lots 58, 59, 60, 61, 63, 65, 66 and 69, the cumulative cancer risks were above the NCP's risk range, ranging from 4 x 10^{-4} to 1 x 10^{-2}. (See BHHRA Section 6.2.2.9, Table 6-85.)
- For all lots, the potential exposure of resident adults and resident child to shallow and deep groundwater during hypothetical potable use showed cancer risks above the NCP's risk range, ranging from 9 x 10^{-4} to 4 x 10^{-3}. The single-chemical cancer risks are above the lower end of the NCP's risk range (10-6) for several VOCs, SVOCs, PCBs, and metals at each of the properties. The highest cancer risks (i.e., above the upper end of the NCP's risk range [10^{-4}]) are for 1,3-dihloropropene (total), 1,2-dibromo-3-chloropropane, benzene, vinyl chloride, pentachlorophenol, benzo(a)pyrene, dibenz(a,h)anthracene, naphthalene, and arsenic. (See BHHRA Section 6.6.2.9, Table 6-87.)
- For all lots, the potential exposure of adult resident and resident child to soil (0-2 ft and all sampled depths), inhalation of vapors released from soil (all sampled depths) and shallow groundwater via vapor intrusion, and shallow groundwater from hypothetical potable use showed cancer risks above the NCP's risk range, ranging from 1 x 10^{-3} to 1 x 10^{-2}). (See BHHRA Section 6.6.2.9, Table 6-88 and Table 6-89.)

A representative summary of the cancer risks discussed above is presented in Table 9. selected lots are shown as examples for specific receptor(s)/exposure scenarios. The complete presentation of all cancer risks can be found in the BHHRA Report.

Estimated PbBs and Estimated Percentage of PbBs > 5 ug/dL

As summarized in the table below, the Region 2 goal for lead in non-residential soil (consistent with the reasonably anticipated future use of this Site is commercial/industrial) was exceeded for a number of receptors on individual lots. The following table summarizes lots with average soil Pb concentrations greater than 800 mg/kg and for which there is a greater than 5 percent probability that PbBs for current receptors would exceed 5 µg/dL. As discussed above, the IEUBK and ALM models were used to estimate the probabilities.

Lot #	Timeframe	Receptors	Soil Depth (ft.bgs)	Average Soil Lead Concentration (mg/kg)	Percentage PbBs Exceeding 5 µg/dL	BHHRA Table #
70	Current	Outdoor Workers	0 to 2	934	7.7	6-2
63	Current	Construction Workers	0 to 13	2,530	81	6-13
70	Current	Construction Workers	0 to 17	970	28	6-13
63	Current	Trespassers (Assuming adult outdoor worker exposure assumptions).	0 to 2	2,080	38	6-17
70	Current	Trespassers (Assuming adult outdoor worker exposure assumptions).	0 to 2	934	7.7	6-17
70	Current	Current Child Visitor	0 to 2	934	8.5	6-22

bgs = below ground surface
ft = feet

For future receptors, the following table summarizes lots with average soil Pb concentrations greater than 800 mg/kg and where there is a greater than 5 percent probability that PbB levels would exceed 5 µg/dL.

Lot #	Timeframe	Receptors	Soil Depth	Average Soil Lead Concentration (mg/kg)	Percentage PbB Levels Exceeding 5 µg/dL	BHHRA Table #
63	Future	Outdoor Workers	0 to 2	2,080	38	6-28
70	Future	Outdoor Workers	0 to 2	934	7.7	6-28
63	Future	Outdoor Workers	All Sampled Depths	2530	49	6-29

70	Future	Outdoor Workers	All Sampled Depths	970	8.4	6-29
63	Future	Indoor Worker	0 to 2	2080	23.0	6-38
63	Future	Indoor Worker	All Depths	2530	32.0	6-39
63	Future	Construction Worker	All Depths	2130	81.0	6-52
70	Future	Construction Worker	All Depths	970	28.0	6-52
63	Future	Trespasser	0 to 2	2080	38.0	6-57
70	Future	Trespasser	0 to 2	934	7.7	6-57
63	Future	Trespasser	All Depths	2530	49.0	6-58
70	Future	Trespasser	All Depths	970	8.4	6-58
63	Future	Child Visitor	0 to 2	2080	23.7	6-63
70	Future	Child Visitor	0 to 2	934	8.5	6-63
63	Future	Child Visitor	All Depths	2530	30.3	6-64
70	Future	Child Visitor	All Depths	970	8.9	6-64
63	Hypothetical Future	Child	0 to 2	2080	95.9	6-83
70	Hypothetical Future	Child	0 to 2	934	68.6	6-83

63	Hypothetical Future	Child	All Depths	2,530	97.9	6-84
70	Hypothetical Future	Child	All Depths	970	70.7	6-84

*Other properties with lead concentrations less than 800 mg/kg and the probability that PbB levels exceed 5 ug/dL are Lots 61, 64, and Lot 68. Only properties meeting the criteria of average soil Pb concentrations greater than 800 mg/kg and a greater than 5 percent probability that PbB levels exceed 5 ug/dL are included in these tables.

In addition to soil exposures, the Action Level for lead in drinking water of 15 ug/L (40 CFR Part 141 Subpart I) was exceeded in groundwater samples collected at Lots 57, 60, 63, 64, 67, and 69. Lead concentrations in the shallow groundwater unit exceeded NJDEP Class IIA standards (5 ug/L) in wells located on Lots 57, 60, 61, 63, 64, 66, and 67.

Uncertainties

Uncertainties are addressed by making health-protective assumptions concerning cancer risk, noncancer hazards, and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks and hazards to receptor populations and is unlikely to underestimate actual cancer risks and noncancer hazards.

The procedures and inputs used to assess cancer risks and noncancer hazards in this evaluation, as in all such assessments, are subject to uncertainties. In general, the main sources of uncertainty include:

- Environmental chemistry sampling and analysis;
- Environmental parameter measurement;
- Fate and transport modeling;
- Exposure parameter estimation; and,
- Toxicological data.

Environmental chemistry sampling and analysis. Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled. However, EPA follows Quality Assurance/Quality Control procedures in sampling and evaluation of data to reduce uncertainties.

Only detected chemicals were used to determine COPCs, which potentially underestimates cancer risks and noncancer hazards if chemicals are present at concentrations below the sample quantitation limits (SQLs). For chemicals that were not detected in a matrix (soil, groundwater, and indoor air), the SQLs were compared to the risk based screening levels to determine if additional COPCs would be identified assuming chemicals would be present at concentrations below the SQLs. While some SQLs for chemicals not detected in a matrix exceeded risk based screening levels (mostly semivolatile organic compounds (SVOCs) in groundwater), the expected magnitude of this uncertainty is anticipated to be low.

EPCs were calculated based on available data that resulted in the calculation of a 95% UCL on the arithmetic mean or the maximum concentration. Further analysis was conducted to evaluate if the dataset included a hot spot. If a hot spot (areas of very high contaminant concentrations relative to other areas of a site) is located near an area which, because of the site or population characteristics, is visited more frequently, exposure to the hot spot is assessed separately from the calculation of the EPCs consistent with EPA's ProUCL[8] guidance. For the BHHRA, the potential for hot spots at each of the 15 properties was evaluated. The results of the hot spot analysis did not affect the conclusions of the risk assessment, except for lead at Lot 64 (Sample B-75 from 1 to 3 ft. bgs, which is adjacent to Lot 63), which could affect the conclusions for future outdoor worker exposure to lead. This analysis for Lot 64 was based on the average Pb concentration consistent with the lead methodology outlined above. Non-detected and rejected results for COPCs were also reviewed and determined unlikely to impact the conclusions of the risk assessment. Conservative assumptions related to off-site air modeling likely overestimate exposure to the RME individual.

Exposure parameter estimation. Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the COCs, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the COCs at the point of exposure.

- *Exposure Factors.* Health protective assumptions related to utility worker and construction worker soil ingestion rates, trespassers' exposure frequency, the visitor receptor including a young child (younger than 6 years) and the child visitors' exposure frequency, may over or underestimate RME exposures. Cumulative cancer risk and noncancer HI estimates for soil and groundwater are summed to account for potential concurrent exposures to both media (e.g., utility or construction worker exposure to both soil and groundwater during excavations). The exposures to both soil and groundwater are calculated at the magnitudes, frequencies, and durations assumed for each medium and the cancer risks and HI are then summed to determine the combined cumulative cancer risk and combined noncancer HI. This summation may overestimate the RME (e.g., a utility worker's skin cannot be completely covered with soil and groundwater at the same time or future residents cannot be inside and outside at the same time). The evaluation of combined cumulative cancer risk and combined noncancer HI did not affect the conclusions of the BHHRA.

- *Lead.* Uncertainties related to lead screening levels for both the nonresidential screening level of 800 mg/kg and the residential screening level of 200 mg/kg may over- or underestimate lead hazards. Uncertainties in the application of the ALM model to worker exposure including a discussion of potential overestimates of the lead exposures are provided in the BHHRA Section 6.3.4). Uncertainties associated with the lead assessment for child visitors also may over- or underestimate lead exposures.

Toxicological data. Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. Another uncertainty is the lack of toxicity data for several of the chemicals that may underestimate the cancer risk and noncancer hazards.

[8] ProUCL is a comprehensive statistical software package initially developed by EPA for computing statistical intervals to respond to concerns at a specific Superfund site.

- *Toxicity Values.* Use of dermal toxicity values extrapolated from oral toxicity values may overestimate or underestimate cancer risk and noncancer HI estimates. Some COCs lack toxicity values, which may underestimate cancer risk and noncancer HI estimates. Uncertainties related to the ratio of hexavalent and trivalent chromium that chromate workers were exposed in the study used to derive the inhalation URF were evaluated and determined to only marginally change the conclusions of the risk assessment since inhalation exposure to hexavalent chromium only occurs from soil particulate inhalation (i.e., chromium is not volatile).

- Uncertainties related to using EPA's IRIS weight of evidence classification for ethylbenzene, which classifies ethylbenzene as a noncarcinogen, were evaluated using California EPA cancer toxicity values. Using CalEPA's cancer toxicity values for ethylbenzene was determined to only marginally change the conclusions of the risk assessment.

- The single-chemical residential soil vapor intrusion HQs for mercury and cyanide are above the noncancer protection goal of 1 for several properties. The use of an RfC for mercury and cyanide assumes that these metals are present in the volatile forms (i.e., elemental mercury and hydrogen cyanide). The types of mercury and cyanide present in the fill or used at the Site are unknown, and the analytical methods measure total concentrations which could consist of various forms of inorganic mercury and cyanide. The use of an RfC to assess total mercury and total cyanide is health protective and may overestimate noncancer hazards from vapor inhalation depending on the form of mercury and cyanide present at the Site.

Screening-level Ecological Risk Assessment

A SLERA was conducted and focused on the potential for terrestrial exposure from on-site surface soil/fill material. Approximately 70% of the Site is covered with impervious surfaces, such as asphalt. The remaining 30% of the Site contains pervious areas that may support potential ecological habitat. The habitat present on the Site is fragmented and of low value to wildlife with opportunistic, invasive, and transient species, such as the Japanese knotweed, being the dominant species observed or expected to be on the property. Although groundwater at the Site discharges to the Passaic River through the sediment, there are no groundwater discharges to the surface soil/fill material; therefore, the groundwater ecological exposure pathway was determined to be incomplete for the terrestrial portion of the Site.

Primary exposure pathways include direct contact (e.g., plant roots and soil invertebrates), soil ingestion (e.g., earthworms), incidental soil ingestion (e.g., preening by birds), and ingestion of soil invertebrates and small mammals. For wildlife, prey ingestion is assumed to dominate exposure. Due to the limited, fragmented, and low-quality ecological habitat available on-site and the proximity to active industrial and commercial operations, it is unlikely that federal-listed or state-listed sensitive species would be present on-site. The likely future use of this Site is to remain developed for commercial/industrial purposes and redevelopment of any portion of the Site will remove or alter the existing ecological resources in that area.

Potential river sediment impacts from site operations will be addressed through implementation of the Diamond Alkali Superfund Site, Lower 8.3 Miles ROD, which includes river-wide dredging of surface sediment to accommodate a bank to bank engineered sediment cap.

Based on the results of the SLERA, the primary terrestrial ecological pathway is contaminated surface soil/fill material. The SLERA identified this pathway as being related to unacceptable ecological risk. Chemicals of potential ecological concern (COPECs) identified in surface soil included several VOCs, PAHs and other SVOCs, one pesticide (heptachlor epoxide), PCBs, dioxin, and several metals. These compounds were identified using stringent comparison values and given the lack of quality habitat, the overall ecological risk is likely overestimated in the SLERA. In lieu of conducting an additional, more in-depth ecological evaluation for the Site, EPA has made a management decision that the remedial alternatives will address the potentially unacceptable ecological risks identified in the SLERA.

Basis for Taking Action

Based on the results of the RI/FS, including the risk assessments, EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), advisories, criteria and guidance to-be-considered (TBCs),[9] and Site-specific risk-based levels.

The following RAOs were established for the Site for contaminants of concern (COCs):

Waste

- Secure or remove wastes that act as a source of COCs to other media to the extent practicable.
- Prevent uncontrolled movement of COCs in wastes (i.e., spills and free-phase liquid) that may impact other media.
- Minimize or eliminate human and ecological exposure to NAPL.

Sewer Water

- Prevent exposure to COCs in sewer water and solids associated with a release from the inactive sewer system.
- Minimize concentrations of COCs in sewer water (inactive system).
- Prevent or minimize discharge of sewer water COCs to surface water to minimize the potential for interaction between the Site and the Passaic River.

[9] TBCs are advisories, criteria, or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies. TBCs are generally used to develop PRGs in the absence of ARARs.

Soil Gas

- Minimize contaminant levels in sources of COCs in soil gas that may migrate to indoor air.
- Prevent exposure to COCs in indoor air if unacceptable risk is found as a result of building assessments.

Soil/Fill

- Remove COCs or minimize COC concentrations and eliminate human exposure pathways to COCs in soil and fill material.
- Remove COCs or minimize COC concentrations and eliminate or minimize ecological exposure pathways to COCs in soil and fill material.
- Prevent or minimize off-site transport of soil containing COCs to minimize the potential for interaction between the Site and the Passaic River.
- Prevent or minimize potential for leaching of COCs to groundwater and surface water from soil and fill.

Groundwater

- Minimize COC concentrations and restore groundwater quality.
- Prevent exposure to COCs in groundwater.
- Prevent or minimize migration of groundwater containing COCs.
- Prevent or minimize discharge of groundwater containing COCs to surface water to minimize the potential for interaction between the Site and the Passaic River.

Remediation goals

Remediation goals (RGs) are chemical-specific, quantitative goals that are intended to be protective of human health and the environment and meet RAOs. RGs were developed for soil/fill material, soil gas, and groundwater based on ARARs, TBCs and risk-based concentrations (RBCs)[10] with consideration of current and reasonably anticipated future use, background concentrations, analytical detection limits, guidance values, and other available information. Furthermore, RGs were only established for site-related contaminants. The RGs selected and discussed below are protective of human health and ecological exposures[11] that are expected to be associated with the Site.

Waste and Sewer Water

No RGs have been developed for sewer water or waste. These media are discussed in more detail in the Description of Remedial Alternatives section. Soil/fill material surrounding the USTs that is impacted by LNAPL (diesel fuel/heating oil) will be evaluated and compared to NJDEP extractable petroleum hydrocarbon (EPH) promulgated requirements and delineated per NJDEP guidance.

[10] RBCs for human health and ecological receptors are derived for chemicals in each receptor scenario identified in the BHHRA and SLERA as posing risk/hazard in excess of EPA acceptable levels.

[11] Given the lack of ecological habitat and the anticipated future industrial use of the Site, the remediation goals selected were determined to be protective of ecological populations that may occasionally use the limited habitat on the Site as part of foraging or home ranges.

Soil Gas

For soil gas, EPA determined that the direct contact soil RGs mentioned below would not be protective of the vapor intrusion pathway for TCE, total xylenes and naphthalene. The BHHRA did not indicate unacceptable cancer risks/hazards for these COCs based on direct contact; however, there was a potential for an unacceptable risk or hazard for inhalation from the VOC concentrations in the soil, based on air concentrations that were modeled from soil concentrations, and estimating risk/hazard from exposure to the modeled air concentrations. Therefore, the RBCs for TCE, total xylenes, and naphthalene that take into account volatilization from soil into indoor air are selected as the RGs, as follows (see Table 10 in Appendix II):

- Xylenes – the RBC is based on a noncancer HI = 1 since no cancer toxicity value is available for this compound. The RBC RG for total xylenes is 6.5 mg/kg.
- TCE and Naphthalene – the RBCs based on a 1 x 10^{-6} cancer risk were compared to the noncancer hazard-based RBC, and the lower of the two values was selected. The RBC RG for TCE is 0.02 mg/kg and for naphthalene is 0.62 mg/kg.

The BHHRA vapor intrusion modeling indicated that there were no unacceptable health risks/hazards (modelled from shallow groundwater concentrations). However in the RI, a comparison of the shallow fill unit data to EPA and NJDEP VISLs identified benzene, ethylbenzene, total xylenes, 1,3-dichloropropene (total), TCE, and vinyl chloride at concentrations above either the EPA and/or NJDEP VISL. Under NJDEP's VIT guidance, an exceedance of a VISL triggers the need to perform an investigation for all buildings within 100 feet of groundwater contamination. To evaluate the vapor intrusion pathway in the future, VOC concentrations in shallow groundwater will be sampled and compared to VISLs per the guidance.[12,13]

No RG was developed for 1,3-dichloropropene (total) in groundwater because there was only one reported exceedance at the Site.

Soil/Fill

RGs for soil/fill material were developed by comparing RBCs to NJDEP NRDCSRS to determine the appropriate remediation goals for the Site. For this Site, NRDCSRS were identified based on the reasonably anticipated use of the Site as commercial/industrial. The more conservative of the RBCs and the NRDCSRSs were identified as the chemical-specific soil RGs (Table 10 in Appendix II).

For lead, RBCs range from 441 mg/kg to 3,292 mg/kg based on the ALM for adult receptors and the IEUBK Model for the child visitor receptor; the NRDCSRS for lead is 800 mg/kg, and the representative historic fill average value is 574 mg/kg. Of these values, a risk management decision was made to select the NRDCSRS of 800 mg/kg as the RG for lead. This concentration is similar to the RBC for the outdoor worker and adequately protective of both the indoor worker and utility

[12] The NJDEP Vapor Intrusion Technical Guidance (VIT) can be found at https://www.state.nj.us/dep/srp/guidance/vaporintrusion/

[13] EPA's guidance can be found at: https://19january2017snapshot.epa.gov/vaporintrusion/vapor-intrusion-screening-levels-visls.html

worker receptors. While lower RBCs were derived for the child visitor and construction worker scenarios, these values were not selected as RGs because: 1) the child visitor scenario, which assumed both indoor and outdoor routine exposures to a young child, is an unlikely scenario for an industrial property that is now and likely in the future to be largely paved/covered, and the higher intensity soil/fill exposures assumed for this young receptor are anticipated to be more limited if the child is accompanied by an adult; and 2) while a construction worker scenario is plausible considering the potential for redevelopment of the Site, EPA expects that exposures to lead during any future excavation work will be recognized and managed appropriately as part of the selected remedy.

For copper, the RBC of 526 mg/kg based on the child visitor scenario is substantially lower than the ARAR of 45,000 mg/kg, which is the NRDCSRS for copper. As discussed, the child visitor scenario is an unlikely, conservative scenario. High intensity outdoor soil/fill exposures are uncertain based on the industrial zoning of the Site. The BHHRA identified an HI greater than 1 for the child visitor scenario at only Lot 63; it is noted that the EPC for copper at this lot is driven primarily by one sample location (B-33), which is also co-located with an elevated lead concentration that exceeds the lead RG, and thus, will be addressed as part of the remedy. Use of the NRDCSRS as a cleanup objective may not be adequately protective of non-residential receptors if health risk is based on the oral RfD used in the BHHRA, given the 40-fold difference in toxicity values between those used to derive the NRDCSRS (0.04 mg/kg/day) and the RBC (0.001 mg/kg/day). Thus, the RBC of 526 mg/kg is conservatively selected as the RG for copper.

No RGs were developed for the iron and manganese NRDCSRS exceedances in soil/fill because these metals are naturally occurring in soil and there was only one reported exceedance of the RBC at the Site.

Groundwater

EPA and NJDEP have promulgated maximum contaminant levels (MCLs), and NJDEP has promulgated groundwater quality standards (GWQSs), which are enforceable, health-based, protective standards for various drinking water contaminants. For the Site, NJDEP GWQS are equal to, or more stringent than the MCLs and have been identified as ARARs and selected as the RGs for site-related COCs in groundwater because the groundwater is classified by the State of New Jersey as a Class IIA aquifer (Table 11 in Appendix II).

1,1,2-Trichloroethane concentrations exceed the NJDEP GWQS in multiple monitoring wells on Lot 63 and Lot 64. 1,1,2-Trichloroethane was detected in shallow groundwater monitoring wells surrounding the USTs, but not detected in the UST contents possibly due to elevated reporting limits. It should be noted that while the presence of 1,1,2-trichloroethane could not be confirmed in the USTs, the elevated reporting limits for 1,1,2-trichloroethane were above the GWQS of 3 ug/L in six of the seven tanks. The presence of 1,1,2-trichloroethane will be confirmed during the remedial design in the USTs and shallow groundwater.

No RGs were developed for the following groundwater constituents, even though they exceed NJDEP MCLs, or GWQS, because these constituents are naturally occurring in groundwater that is tidally impacted or do not appear to be associated with known on-site activities:

- Aluminum: Naturally occurring in groundwater
- Antimony: Mostly non-detected with four exceedances (MW-105, MW-101, MW-103, and MW-120) that are 1x to 3x NJDEP GWQS
- Arsenic: Mostly low-level detections; site-wide contaminant in shallow and deep groundwater
- Barium: Mostly low-level detections with one exceedance (MW-116) that is 2x the NJDEP GWQS
- Beryllium: Mostly non-detected with three low-level detections that exceed the NJDEP GWQS
- Cadmium: One exceedance at MW-110
- Iron: Naturally occurring in groundwater
- Manganese: Naturally occurring in groundwater
- Methyl ethyl ketone: One exceedance at MW-117
- Selenium: Mostly low-level detections with three exceedances (MW-116, MW-106, MW-101) that are 1x to 2x NJDEP GWQS
- Sodium: Naturally occurring in groundwater that is tidally influenced
- Dibromo-3-chloropropane, 1,2-: One exceedance at MW-121
- Dichloropropene, 1,3-: One exceedance at MW-122
- Hexanone, 2-: One exceedance at MW-122
- Tetrachloroethane, 1,1,2,2-: One exceedance at MW-203
- Trichlorobenzene, 1,2,4-: One exceedance at MW-122
- Pentachlorophenol: One exceedance in MW-107

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA Section 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives, to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the toxicity, mobility or volume of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4). Detailed descriptions of the remedial alternatives for addressing the contamination at the Site can be found in the FS Report, dated July 2020.

The remedial alternatives are summarized below. The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction. The "no-action" alternative was evaluated for all media because the NCP requires that the "no-action" alternative be considered as a baseline for comparison against other alternatives. Capital costs are based on 2020 dollars. The present worth calculation assumes that construction would begin in 2022 and assumes a 7 percent discount rate.

Waste Alternatives

Waste Alternative 1: No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 months

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, remaining source materials at the Site would be left in place, and no means of securing the materials to prevent future release to the environment would be implemented.

Waste Alternative 2: Removal and Off-Site Disposal

Capital Cost:	$1,798,211
Annual OM&M Cost:	$0
Present Worth Cost:	$1,580,700
Construction Time:	1-2 months

This alternative focuses on removal of principal threat waste along with removal of the various small volume wastes found across the Site to prevent an uncontrolled release to the environment. This alternative includes the removal of a chalky talc-looking substance in Building #7, a plastic 55-gallon drum in Building #12, a five-gallon bucket in Building #17, the USTs on Lot 64, the waste and/or LNAPL within the USTs, NAPL-impacted soil/fill material surrounding the USTs, and the LNAPL in the pooled water in Building #15A. These wastes will then be properly disposed at an off-site facility; if required by the facility, the waste may need to be treated. The LNAPL in the UST and Building #15A are considered principal threat wastes, and the removal and disposal of these wastes will address this concern. Upon removal of USTs and their contents, confirmation soil/fill (including underneath the tank) and groundwater sampling will occur consistent with substantive requirements of New Jersey tank closure regulations (N.J.A.C. 7:14B), NJDEP Technical Requirements for Site Remediation (N.J.A.C. 7:26E-5.1(e)), and in accordance with NJDEP's Evaluation of EPH in Soil Technical Guidance (2019).

It is assumed that approximately 3,500 CY of NAPL-impacted soil/fill adjacent to the USTs would require excavation and off-site disposal as part of this alternative. It is anticipated that excavation will extend 13 ft bgs. Note that removal of NAPL-impacted soil/fill on Lot 63, not directly associated with UST removal on Lot 64, is addressed in the soil/fill alternatives. During the remedial design, NJDEP guidance would be considered in determining the full extent of soil excavation for NAPL-impacted soil/fill.

The total volume of liquid waste estimated to be removed for off-site disposal is approximately 40,000 gallons consisting of: 55 gallons of waste from Buildings #12 and #17; 2,900 gallons of LNAPL in Building #15A; 1,600 gallons of LNAPL in the UST; and approximately 32,600 gallons

of liquid and 2,600 gallons of settled solids in the USTs (total amount). The total volume of solid waste estimated to be removed is approximately 3,511 CY, consisting of 11 CY in Building #7 and 3,500 CY of NAPL-impacted soil/fill associated with the UST removal and closure.

Any additional waste (such as LNAPL or EPH) found during remedial activities, would also be removed and disposed of off-site consistent with this alternative.

Sewer Water Alternatives

Sewer Water Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 months

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, the water and solids in the designated section of sewer and associated line would be left in place, and no means of securing the materials to prevent future release to the environment would be implemented.

Sewer Water Alternative 2 – Removal and Off-Site Disposal

Capital Cost:	$27,981
Annual OM&M Cost:	$0
Present Worth Cost:	$24,900
Construction Time:	1 month

This alternative consists of transferring the sewer water and solids (approximately 0.75 CY) from the inactive sewer line into appropriate containers or transport vehicles for off-site treatment and/or disposal along with proper closure of the line. Liquid materials would be pumped into drums and transferred to an appropriate facility for treatment and disposal. Remaining solids in the manhole would be placed into a drum and disposed in an appropriate solid waste landfill. The waste may need to be treated prior to disposal if required by the disposal facility.

Upon removal of the contents, the interior of the manhole and associated line would be cleaned and then closed in place by plugging/filling to prevent future buildup of water and solids in the manhole. Cleaning of the manhole and the one unplugged pipe (estimated to be 125 linear feet) would generate an estimated 2,500 gallons of additional liquid.

Soil Gas Alternatives

Soil Gas Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 month

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, no measures would be taken to protect future indoor workers from exposure to soil vapors.

Soil Gas Alternative 2 – Institutional Controls, Air Monitoring and, if needed, Engineering Controls (existing occupied buildings), and Site-Wide Engineering Controls (future buildings)

Capital Cost:	$123,525
Annual OM&M Cost:	$31,500
Present Worth Cost:	$449,800
Construction Time:	1-2 months

This alternative consists of establishing or enhancing deed notices and CEAs/WRAs to provide notice of certain restrictions upon the use of the property. Such restrictions would require that existing buildings have a building-specific assessment of sub-slab soil gas and/or indoor air quality performed and, if the assessment identified unacceptable risks/hazards, engineering controls approved by EPA, to protect occupants from unacceptable vapor intrusion risks/hazards associated with the COCs present in soil/fill material (TCE, total xylenes, and naphthalene). The assessments would be implemented for currently occupied buildings (Buildings #1, #2, #3, #9, #10, #14, and #16) and prior to future occupation of existing buildings.

During remedial design, in addition to TCE, total xylenes and naphthalene, the potential for vapor intrusion associated with benzene, ethylbenzene, and vinyl chloride would be investigated in all buildings that are within 100 feet of groundwater contamination where VOCs were detected at concentrations exceeding screening levels. The contaminant concentrations in shallow groundwater will be sampled and compared to VISL per NJDEP VIT guidance.[14]

For newly constructed buildings on the Site, requirements include construction of a vapor barrier or other appropriate means of sealing the ground surface underneath the new building slab, or installation of a subsurface depressurization system (SSDS), as approved by EPA.

In addition to the initial assessments, periodic indoor air monitoring would be required in existing, occupied buildings (this currently includes Buildings #1, #2, #3, #9, #10, #14, and #16) and any existing building occupied in the future. Air monitoring is necessary to confirm previous BHHRA results and/or to ensure the indoor workers are protected, due to the presence of VOCs in Site

[14] https://www.nj.gov/dep/srp/guidance/vaporintrusion/vit_main.pdf?version_5

media. Monitoring may also be required for newly constructed buildings with engineering controls, but less frequent monitoring is anticipated. Engineering controls (such as a SSDS) could also be implemented for existing buildings, though it should be noted that the use of SSDS would not eliminate the need for air monitoring but may reduce its frequency. If air monitoring indicates vapor intrusion is occurring at levels that exceed the EPA VISLs, New Jersey VISLs, and/or New Jersey IARS, an evaluation of the data would be necessary to determine whether unacceptable risk exists and, if so, the property owners or parties would be required to implement engineering controls to achieve New Jersey IARS as remediation goals.

Establishing or enhancing deed notices is an element of the Soil Remedial Alternatives; the requirements for soil gas could be captured in such deed notices, together with the requirements for soil/fill.

Soil Gas Alternative 3 – Institutional Controls, Air Monitoring and, if needed, Engineering Controls (future buildings), and In-Situ Remediation of Soil/fill (existing occupied buildings)

Capital Cost:	$4,591,968
Annual OM&M Cost:	$0
Present Worth Cost:	$4,050,800
Construction Time:	4-6 months (for initial round of injection)

This alternative includes the same institutional controls, periodic air monitoring, and/or engineering controls (such as SSDS), for both existing, currently occupied or to be occupied Site buildings, and for future construction, to protect building occupants from exposure to VOCs in soil gas as described for Soil Gas Alternative 2. During remedial design, potential vapor intrusion associated with the VOCs detected in groundwater would be investigated in buildings that are within 100 feet of groundwater contamination where the VOCs were detected at concentrations exceeding screening levels, consistent with NJDEP VIT guidance as described for Soil Gas Alternative 2.

This alternative also includes in-situ remediation of soil/fill containing TCE, and total xylenes above the RGs within 100 feet of existing occupied buildings. This alternative assumes a remedial footprint of 1.95 acres with an estimated depth to groundwater of 6 feet for a total of 18,900 CY. In-situ remediation of the designated soil/fill would be performed using chemical oxidation injection. Remaining soil/fill with VOCs above the associated RGs (but not within 100 feet of existing occupied buildings) would be addressed by the institutional controls requiring assessment and, if needed, mitigation prior to occupancy of existing buildings, and site-wide engineering controls for future construction.

Soil/Fill Alternatives

Soil/Fill Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 month

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, new deed restrictions and other institutional controls would not be implemented, and future use of the subject areas would be unrestricted, except that existing NJDEP-approved institutional and engineering controls would remain in place although they would not be enforced by EPA.

Soil/Fill Alternative 3 – Institutional Controls, Engineering Controls and NAPL Removal[15]

Capital Cost:	$11,140,405
Annual OM&M Cost:	$75,000
Present Worth Cost:	$10,450,900
Construction Time:	6-10 months

Soil/Fill Alternative 3 includes institutional controls (deed notices) and engineering controls (cover system) to contain and prevent direct contact with COCs, including lead. In addition, NAPL-impacted soil/fill would be removed from Lot 63 and the bulkhead would be reinforced or reconstructed, as appropriate, in order to minimize the potential for interaction between the Site and surface water, and to minimize soil erosion.

Deed notices would be recorded on all 15 lots or, for those lots on which deed notices have already been recorded, the existing deed notices would be revised to reflect RI results as well as the existing engineering controls. Use restrictions identified in the deed notices would ensure future use of the Site remains commercial or industrial and identify areas of the Site where contamination exceeds RDCSRS.[16] Fencing would be maintained and enhanced as appropriate to limit unauthorized access to the Site and use of the Site in a manner which may expose human receptors to unacceptable risk. Access restrictions could also include concrete barriers or guard rails. Other institutional controls include existing zoning and local ordinances that regulate use of the Site, which could be reviewed and modified as appropriate to ensure compliance with the objectives of this alternative. Institutional controls and access restrictions (to be determined during remedial design) would reflect the ongoing business operations at the Site.

[15] Soil/Fill Alternative 2 included institutional controls and NAPL removal but was screened out and not included in the Proposed Plan or this ROD because it did not meet ARARs and was not eligible for selection. The alternative numbering was maintained to be consistent with the FS.

[16] The Proposed Plan incorrectly referenced the non-residential standards (NRDCSRS). This has been clarified to state that the deed notices will identify areas of the Site where contamination exceeds New Jersey residential soil standards (RDCSRS).

NAPL-impacted soil/fill on Lot 63 would be excavated and disposed of off-site under this alternative. For cost estimating purposes, it is assumed that 311 CY would require disposal, based on the 1,200 square ft area and a depth of 7 ft bgs where NAPL-impacted soil/fill was observed during installation of a monitoring well. (NAPL in soil/fill adjacent to the USTs is addressed under the waste alternatives.) A pre-design investigation would be completed to further refine the extent of NAPL in soil/fill on the Lot 63 area. Any additional NAPL-impacted soil/fill found on-site during remedial activities, including but not limited to on Lot 63, would also be excavated and disposed of off-site. NJDEP guidance on NAPL-impacted soil/fill would be considered in determining the extent of soil excavation during the remedial design and in documenting attainment of RAOs.

A site-wide engineered cap would consist of the construction of a barrier to prevent direct exposure of human and ecological receptors. The engineered cap would also control migration of contaminated soil/fill material from erosion. Capping as an engineering control is a typical component of a NJDEP remedy for historic fill that has been further impacted from current or historic discharge. Impermeable caps, such as asphalt or concrete caps, also address the soil-to-groundwater pathway by reducing vertical infiltration. Existing building floor slabs in contact with soil/fill are incorporated into the cap. (If a building is demolished in the future and its floor slab removed, a new surface barrier could be warranted at that location.)

Existing pavement cover could be incorporated into the cap component of Alternative 3 if the existing pavement cover meets all cap design requirements. Current conditions at the Site are as follows: 1) an engineering control (concrete slab) has been established for portions of the building footprint on Lot 63, documented in a deed notice; and 2) asphalt pavement is the engineering control on Lots 68 and 70, documented in a deed notice. Other lots at the Site have concrete or asphalt surface pavement, although not documented as part of deed notices. During the remedial design, these surfaces would be inspected to determine whether they are suitable to be used as a cover. Some existing pavement may need to be repaired to function as an engineering control if the pavement otherwise meets the specifications of the cap design. The use of existing pavement as surface cap would reduce the amount of material resources, as encouraged under Region 2 Clean & Green Policy.

Where new cover material is required, the new pavement is assumed to be asphalt, but concrete would be acceptable as it provides the same protection of human health and environment as asphalt. Cracked and/or deteriorating asphalt, concrete, or building foundations would not meet minimum requirements for engineering controls EPA will determine if existing surfaces achieve the RAOs.

Accordingly, this alternative would include a site-wide six-inch asphalt cap along with a 6-inch gravel subsurface over exterior unpaved portions of the Site to prevent direct exposure to soil/fill. In areas to be capped that have existing surface pavement, the thickness of new asphalt pavement could be adjusted to include the existing pavement, as long as the combined system of the existing and new cap would be protective of human health and the environment. The estimated extent of the asphalt cap is approximately 5.62 acres, some of which is currently covered by concrete or asphalt. (Note that the total area of the Site is 7.6 acres, and the area of the existing building is assumed to cover 1.98 acres, so the area anticipated to be capped is 5.62 acres.) Surface water

management would also be evaluated during remedial design, to reduce potential off-site transport of soil/fill with COCs. Also, during remedial design, the use of different cover methods and material for different lots may be evaluated.

The existing bulkhead along the riverfront consists of various materials (steel, wood, concrete), and varies in condition from poor/failing to good, with the wood bulkhead sections generally in poor/failing condition and the steel and concrete sections generally in good condition. It is assumed that the wood sections would be replaced with new sheet piling tied into the adjacent steel and concrete sections of the wall. Additionally, steel sheeting would be installed along the river's edge on Lots 67 and 63 where a bulkhead is not currently present. Another option to address areas with poor/failing bulkhead or without a bulkhead that could be considered during the remedial design is shoreline revetment, which would require sloping the shoreline back (with possible building demolition) and placement of an impermeable liner and R-6 or larger riprap. A geotechnical investigation would be required for both bulkhead enhancement process options. Approximately 800 ft of new bulkhead walls would be constructed with an on-river operation (due to the limited space available on-site, assuming no building demolition). The deteriorating sections of bulkhead would be removed and properly disposed of.

Design and installation of bulkhead enhancement would incorporate active stormwater discharge pipes as appropriate, and existing inactive river wall pipes would be sealed. During the remedial design, the effective height of the bulkhead wall could be increased with soil/fill berms for surface water management; however, the cost estimate assumes that the bulkhead would be replaced/repaired to current site conditions. Bulkhead enhancement reduces the potential interaction between the Site and the Passaic River and minimizes soil erosion. This enhancement would also be compatible with the remedial action being designed in the lower 8.3 miles of the Lower Passaic River as part of the Diamond Alkali Superfund Site OU2 remedial design. Currently, the Diamond Alkali OU2 remedial design includes bank-to-bank sediment capping (with a chemical isolation layer) with dredging to accommodate the cap to prevent flooding. The installation of the shoreline revetment option would disturb less river sediment than the sheet pile wall. If the bulkhead repair, or shoreline revetment, occurs after the construction of the Diamond Alkali OU2 cap, and the OU2 cap is disturbed during construction by sheet pile placement or other shoreline revetments, the parties implementing the remedy at the Site would be responsible for working with EPA and/or the Diamond Alkali OU2 performing parties to address any impacts.

<u>Soil/Fill Alternative 4 – Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal</u>

Capital Cost:	$13,623,160
Annual OM&M Cost:	$75,000
Present Worth Cost:	$12,633,300
Construction Time:	8-12 months

Alternative 4 combines the institutional controls, engineering controls (capping with bulkhead replacement), and NAPL removal from Soil/Fill Alternative 3 with a focused excavation and off-site disposal of lead-impacted soil/fill in the vicinity of Building #7 (6,210 ppm in RI boring B-30, 8,690 ppm in RI boring B-75, and 10,800 ppm in historical boring HF-2). Alternative 4 focuses

on lead removal (in soils above the water table) at concentrations above the lead RG of 800 mg/kg around Building #7, which is predominantly located on Lot 63 and Lot 64. The footprint for this component of this remedial alternative (approximately 0.5 acres) is based on single-point compliance with the RG, delineated using soil borings collected in the vicinity of Building #7. Delineation of the area would be confirmed during the remedial design. The focused excavation would be based on assessment during remedial design to achieve the lead RGs. The assessment would include consideration of RI soil/fill samples along with remedial design samples and/or confirmation samples if necessary. The excavated areas would be backfilled with fill material selected considering the NJDEP "Fill Material Guidance for SRP Sites" dated April 2015. To prevent soil erosion, the excavated area would be covered with gravel.

Removal of soil/fill would reduce and/or eliminate potential impact-to-groundwater sources, primarily localized lead. Because of the extent of soil/fill across the Site that contains COCs exceeding NRDCSRS, excavation under this alternative would not reduce the extent of capping needed. The remaining affected soil/fill, including lead elsewhere on the Site, would be addressed with a site-wide cap to minimize potential unacceptable human health risks/hazards or ecological risks as described in Alternative 3 (minus the 0.5 acres excavated for the focused lead removal and backfilled).

Excavation adjacent to existing buildings raises building stability considerations. Additional measures would be undertaken to address building stability, including sequential smaller excavation areas around the perimeter of the building. The structural integrity of the building would be evaluated in the remedial design following an engineering assessment.

Soil/Fill Alternative 5 – Institutional Controls, In-Situ Remediation, Engineering Controls, and NAPL Removal

Capital Cost:	$15,222,505
Annual OM&M Cost:	$68,750
Present Worth Cost:	$13,971,400
Construction Time:	8-12 months

Alternative 5 combines the institutional controls, engineering controls (capping with bulkhead replacement), and NAPL removal from Soil/Fill Alternative 3 with in-situ treatment to address lead along with other COCs that exceed the NRDCSRS. The footprint of this alternative is estimated to be 3.62 acres; but would be delineated during the remedial design. Because of the mixture of inorganic and organic contaminants on Site, an in-situ stabilization/solidification technology was assumed for cost-estimating purposes (instead of an in-situ treatment technology).

Stabilization/solidification would be the most viable type of in-situ treatment for this Site. This process would involve the injection and mixing of an appropriate binding agent (such as cement, lime, or kiln dust) using a backhoe or large-diameter auger. Alternatively, an amendment could be used to immobilize the metals. After completion of stabilization activities, the treated areas would be capped as described under Soil/Fill Alternative 3. Note that due to the increase in soil/fill volume inherent with this approach, along with the need to cap treated soils, it may be necessary to remove and properly dispose of the top 12 to 18 inches of soil/fill prior to treatment, so that the

elevation of the final surface does not change. Treatability studies and/or pilot test(s) would be needed to determine the most effective binding agent and mixing ratio to treat Site soil/fill material.

Groundwater Alternatives

Groundwater Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 month

Under this alternative, no action would be taken to reduce the potential for unacceptable exposures of humans to impacted groundwater or minimize further aquifer degradation. Existing NJDEP-approved institutional controls would remain intact although they are not enforceable by EPA. This alternative is retained for comparison with the other alternatives as required by the NCP.

Groundwater Alternative 2 – Institutional Controls, Site Containment at River Edge, and Pump and Treat

Capital Cost:	$30,590,844
Annual OM&M Cost:	$1,125,000
Present Worth Cost:	$34,258,600
Construction Time:	12-18 months

Alternative 2 includes institutional controls on the entire Site, a physical barrier (wall) constructed at the river edge and an active groundwater remedy to achieve RGs. Interaction with the existing CEAs and WRAs would be coordinated with NJDEP along with the property owners or other parties for having recorded these controls. The CEAs provide notice that groundwater in the area does not meet designated use requirements, and the existing WRAs prohibit the installation and use of wells for potable and other uses within the designated area. During remedial design, groundwater samples would be collected, analyzed, and reported to update shallow and deep groundwater data. Updated results would be used for site-wide institutional controls and establishment of a site-wide CEA and WRA. Consistent with the requirements of New Jersey law, periodic monitoring and reporting to demonstrate compliance with the restrictions would be required as part of this alternative.

A vertical sheet pile barrier wall would be constructed along the river's edge as a means of reducing the potential for interaction between groundwater and the river. Sheet piling would be constructed to the top of an underlying confining layer, most likely the glacial lake bottom silt deposits, with a depth to be determined during remedial design. The barrier wall would have a total length of approximately 1,300 ft. The barrier wall is not intended to address geotechnical issues related to property redevelopment or to enhance the structural stability of the current bulkhead. A geotechnical investigation would occur during remedial design to determine wall alignment, depth and specifications.

Additionally, approximately 20 extraction wells would be installed throughout the Site to alleviate hydrostatic pressure behind the barrier wall and to extract both shallow and deep groundwater impacted by organics and shallow groundwater impacted by inorganics (such as lead). Extracted groundwater would be pumped to a new groundwater treatment facility, likely at least 5,000 to 7,500 square ft in floor area, to be constructed at an appropriate location on the Site.

The number of extraction wells, pumping rate, and individual processes to be utilized for treatment would be determined during the remedial design. For cost-estimating purposes, a 200-gallon per minute (GPM) system (i.e., 20 wells at 10 GPM per extraction well) including chemical oxidation, filtration, lead precipitation (chemical), and carbon polishing was assumed. Approval and/or necessary permits (if any) would be sought for discharge of treated water to the local Publicly Owned Treatment Works (POTW) or surface water.

This alternative's ability to achieve the RGs would be challenged by the on-going impacts of residual COCs in the soil/fill to the groundwater that would need to be treated; however, response actions undertaken for other media, including source control measures (i.e., UST removal and removal of elevated lead in the vicinity of Building #7), would remove potential groundwater sources, potentially allowing the pump and treat system to achieve RAOs faster.

The ability to achieve RGs would also be challenged by the presence of historic fill in some areas of the Site, albeit historic fill that was likely impacted by Site operations.

Groundwater Alternative 3 – Institutional Controls and In-Situ Remediation

Capital Cost:	$28,459,770
Annual OM&M Cost:	$131,250
Present Worth Cost:	$20,844,800
Construction Time:	9-12 months (for initial round of injection)

Alternative 3 includes the institutional controls described for Groundwater Alternative 2. Additionally, impacted groundwater would be subject to in-situ remediation. The objective of this alternative is to reduce COC concentrations (organic and inorganic) in groundwater, eventually restoring groundwater quality.

The potential in-situ treatment methods could include in-situ chemical treatment, biosparging, and air sparging. Pilot- and bench-scale testing would be required as part of the remedial design to determine the most appropriate treatment approach and reagents for Site groundwater. However, tidal influences and geochemical conditions on in-situ treatment may limit effectiveness and may need to be assessed during the remedial design.

Many of the COCs are co-located or are in close proximity, which could lead to complications in that different, potentially incompatible treatment approaches might be required. Additional groundwater sampling and performance of treatability studies would be required as part of the remedial design to evaluate and select the most cost-effective means for addressing both organic and inorganic constituents in groundwater. This alternative does not eliminate the need for institutional controls or reduce their expected duration.

This alternative's ability to achieve the RGs would be challenged by the on-going impacts of residual COCs in the soil/fill to the groundwater that would need to be treated; however, response actions undertaken for other media that include source control measures (i.e., UST removal and removal of elevated lead in the vicinity of Building #7), would remove potential groundwater sources, potentially allowing in-situ remediation to achieve RAOs faster.

As with Groundwater Alternative 2, the ability to achieve RGs would also be challenged by the presence of historic fill in some areas of the Site, albeit historic fill that was likely impacted by Site operations.

Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation

Capital Cost:	$12,831,750
Annual OM&M Cost:	$1,500,000
Present Worth Cost:	$24,234,400
Construction Time:	8-10 months (not including periodic injections)

This alternative combines the institutional controls and the site-wide pump and treat system of Groundwater Alternative 2 (with no barrier wall), and the targeted, periodic in-situ treatment approach described in Groundwater Alternative 3 for upgradient portions of the Site.

As with Groundwater Alternative 2, the pumping wells near the river would be located to provide hydraulic containment at the river's edge to capture groundwater COCs at concentrations exceeding RGs. The groundwater level would be monitored, and the extraction rates would be variable, to provide maximum containment/capture without causing excessive induced infiltration from the river. The number of extraction wells, pumping rate, and individual processes to be utilized for treatment would be determined during the remedial design. For cost-estimating purposes, a 200-GPM system (i.e., 20 wells at 10 GPM per extraction well), including chemical oxidation, filtration, lead precipitation (chemical), and carbon polishing was assumed. The flow rate through the treatment system would be appropriately adjusted during periods of in-situ treatment to promote remediation. Approval and/or necessary permits, if any, would be sought for discharge of treated water to the local POTW or surface water.

As with Groundwater Alternative 3, the extent of groundwater to be addressed by periodic in-situ applications and the specific means for addressing it would be determined during the remedial design, which would include additional groundwater sampling and the performance of treatability studies. For cost estimating purposes, this alternative assumes targeted, periodic in-situ applications would occur annually during the first five years of operation. The effectiveness of the treatment would be evaluated and modified, as needed, between each event. Under this hybrid approach, periodic in-situ remediation would be focused on the upgradient portion of the Site, targeting contaminated areas in both the shallow and deep groundwater. During the periodic injections, pumping at upgradient wells could be temporarily reduced or halted, as appropriate, to give the amendments adequate contact time with COCs in the groundwater. In any area where in-

situ treatment did not achieve RGs, regardless of the location on-site, pump and treat would be relied upon to achieve the RAOs.

As with Groundwater Alternatives 3 and 4, the ability to achieve RGs would be challenged by the presence of historic fill in some areas of the Site, albeit historic fill that was likely impacted by Site operations.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy for a site, EPA considers the factors set forth in Section 121 of CERCLA 42 U.S.C. § 9621, and conducts a detailed analysis of the viable remedial alternatives pursuant to Section 300.430(e)(9) of the NCP, 40 C.F.R § 300.430(e)(9), EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies (OSWER Directive 9355.3-01), and EPA's A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (OSWER 9200.1-23.P). The detailed analysis consists of an assessment of the individual alternatives against each of the nine evaluation criteria at 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis focusing upon the relative performance of each alternative against those criteria. The evaluation criteria are described below.

Threshold Criteria – The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet to be eligible for selection as a remedy.

- Overall protection of human health and the environment addresses whether a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- Compliance with ARARs addresses whether a remedy will meet all the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

Primary Balancing Criteria – The next five criteria are known as "primary balancing criteria." These criteria are factors by which tradeoffs between response measures are assessed so that the best options will be chosen, given site-specific data and conditions.

- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, which a remedy may employ.
- Short-term effectiveness addresses the period needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes estimated capital, O&M, and present-worth costs.

Modifying Criteria – The final two evaluation criteria are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.

- State acceptance indicates if, based on its review of the FS Report and Proposed Plan, the State concurs with the preferred remedy.
- Community acceptance refers to the public's general response to the alternatives described in the FS Report and Proposed Plan.

The following is a comparative analysis of the alternatives for each medium, based upon the evaluation criteria noted above.

Waste Alternatives

Overall Protection of Human Health and the Environment
Waste Alternative 1 (no action) is not protective of human health and the environment because it does not prevent exposure to or reduce contamination. Accordingly, it will not be carried through the remaining criteria analyses.

Waste Alternative 2 (removal and off-site disposal) would provide protection of human health and the environment, as the wastes (and principal threat waste) would be removed from the Site, thereby eliminating the potential for exposure of human and ecological receptors and release of the materials to environmental media.

Compliance with ARARs
Waste Alternative 2 would be implemented in compliance with action-specific ARARs, such as the substantive requirements of New Jersey UST closure regulations and NJDEP Technical Requirements (N.J.A.C. 7:26E-5.1(e)) that apply to treatment or removal of free product.

Long-Term Effectiveness and Permanence
Waste Alternative 2 would achieve long-term effectiveness and permanence through the removal and off-site disposal of waste, including principal threat waste identified on Lot 64.

Reduction of TMV through Treatment
Toxicity, mobility or volume may be reduced through treatment in Waste Alternative 2 if material must be treated on-site to comply with the disposal requirements of the disposal facility.

Short-Term Effectiveness
Waste Alternative 2 would be implemented within one month, so any short-term impacts to workers, the surrounding community and the environment would be minimal. Impacts may include

increased local traffic due to the commute of construction workers, transportation of construction equipment, shipment of waste containers, and importing of backfill materials.

Implementability
Removal of the wastes and USTs is readily implementable, as equipment and experienced vendors for this type of work are available along with backfill material and disposal facilities. However, work would be restricted to a certified contractor for the UST removal. All waste would need to be characterized and if required by the selected disposal facility, treated prior to disposal. The presence of subsurface utilities would need to be assessed prior to UST removal. Excavation to remove the USTs and NAPL-impacted soil/fill associated with the USTs on Lot 64 is anticipated to extend 13 feet bgs; groundwater in the excavation area will need to be managed during UST removal and saturated soil/fill would need to be dewatered prior to disposal.

Cost
The present worth cost for each of the Alternatives is:

Waste Alternative 1 - $0
Waste Alternative 2 - $1,580,700

Sewer Water Alternatives

Overall Protection of Human Health and the Environment
Sewer Alternative 1 (no action) is not protective of human health and the environment because it does not prevent exposure to or reduce contamination, nor does it meet chemical-specific ARARs. Accordingly, it will not be carried through the remaining criteria analyses.

Sewer Alternative 2 (removal and off-site disposal) would be protective because the sewer materials would be removed from the Site, thereby eliminating the potential exposure of humans and ecological receptors, release of contamination to the environment, or potential discharge of sewer water COCs to surface water.

Compliance with ARARs
Location- and action-specific ARARs would be met during implementation of Sewer Alternative 2.

Long-Term Effectiveness and Permanence
Sewer Alternative 2 would achieve long-term effectiveness and permanence through the removal and off-site disposal of the contents of the inactive sewer system. The magnitude of the residual risk/hazard would be minimal, and no material (aqueous or solid) requiring continuing controls would remain.

Reduction of TMV through Treatment
Toxicity, mobility or volume may be reduced in Sewer Alternative 2 if material is treated on-site to comply with the disposal requirements of the disposal facility.

Short-Term Effectiveness
Sewer Alternative 2 would be implemented in one and a half months, so any short-term impacts to workers, the surrounding community and environment will be minimal. Impacts may include increase local traffic due to the commute of construction workers, transportation of construction equipment, shipment of waste containers, and importing of backfill materials.

Implementability
Removal of the sewer materials and filling of the manhole and piping is readily implementable, as equipment and experienced vendors for this type of work are available. However, a specialized sewer contractor may be required. Solids removed from the sewer may need to be dewatered prior to disposal. Sewer water and solids would need to be characterized and if required by the selected disposal facility, treated prior to disposal.

Cost
The present worth cost for each of the Alternatives is:

Sewer Alternative 1 - $0
Sewer Alternative 2 - $24,900

Soil Gas Alternatives

Overall Protection of Human Health and the Environment
Soil Gas Alternative 1 (no action) is not protective of human health and the environment because it does not prevent exposure to or reduce contamination. Accordingly, it will not be carried through the remaining criteria analysis.

Soil Gas Alternatives 2 (institutional controls, air monitoring, and, if needed, engineering controls [existing buildings], and site-wide engineering controls [future buildings]) and 3 (in-situ treatment in lieu of air monitoring and engineering controls in existing buildings) would both be protective of human health, as potential risks/hazards associated with soil gas are directly addressed through air monitoring and engineering controls for both existing occupied buildings and future construction.

Compliance with ARARs
Soil Gas Alternatives 2 and 3 would comply with chemical-specific ARARs by requiring engineering controls (SSDS or vapor barrier) in new construction, and in existing buildings if assessments and monitoring identifies unacceptable risk, to achieve NJDEP's nonresidential Indoor Air Remediation Standards for the Vapor Intrusion Exposure Pathway for vapor intrusion concentrations. Soil Gas Alternatives 2 and 3 would both comply with location- and action-specific ARARs for addressing potential vapor intrusion.

Long-Term Effectiveness and Permanence
Soil Gas Alternative 3 would have greater long-term effectiveness than Soil Gas Alternative 2, as Alternative 3 includes in-situ remediation to permanently remove contaminants above RGs from soil/fill within 100 feet of existing occupied buildings, whereas Alternative 2 includes no active

remediation of contaminants and instead relies only on institutional and engineering controls (i.e., air monitoring and vapor barriers) to protect human health.

Reduction of TMV through Treatment
Soil Gas Alternative 3 would provide reduction of toxicity, mobility, or volume through in-situ treatment of TCE, total xylenes and naphthalene above RGs within 100 feet of existing occupied buildings.

Short-Term Effectiveness
Soil Gas Alternative 2 would have fewer short-term impacts to workers, the community and the environment than Soil Gas Alternative 3 because the activities are limited to the seven occupied on-site buildings where collection of vapor samples would take place, and, if needed, engineering controls would be implemented. These risks/hazards would be readily controlled by following appropriate health and safety practices. Alternative 3 would take 4 to 6 months to implement (including an initial round of injections).

Implementability
Soil Gas Alternatives 2 and 3 are implementable. Both would require the cooperation of the property owners and/or operators of the seven occupied buildings in order to conduct air monitoring and install and maintain compliance with engineering controls. As the implementation of institutional and engineering controls is the main component of Soil Gas Alternative 2, apart from potential challenges associated with imposing institutional and engineering controls, this alternative would be more easily implemented, with minimal disruption to ongoing activities, compared to Soil Gas Alternative 3, which also includes in-situ treatment. Alternative 3 would require treatability testing, and multiple applications may be necessary.

Cost
The present worth cost for each of the Alternatives is:

Soil Gas Alternative 1 - $0
Soil Gas Alternative 2 - $449,800
Soil Gas Alternative 3 - $4,050,800

Soil/Fill Alternatives

Overall Protection of Human Health and the Environment
Soil/Fill Alternative 1 (no action) is not protective of human health and the environment because it does not prevent exposure to or reduce contamination. Accordingly, it will not be carried through the remaining criteria analysis.

Soil/Fill Alternative 3 (cap and bulkhead enhancement), Soil/Fill Alternative 4 (focused excavation/disposal with capping and bulkhead enhancements) and Soil/Fill Alternative 5 (in-situ remediation with capping and bulkhead enhancement) would be protective of human health, as potential risks/hazards associated with direct contact of the soil/fill material would be addressed.

Compliance with ARARs

Soil/Fill Alternatives 3 through 5 would comply with chemical-specific ARARs by eliminating direct contact to concentrations exceeding NJ NRDCSRS with a site-wide cap and deed notices. Location- and action-specific ARARs would be met by Soil/Fill Alternatives 3 through 5. None of the alternatives eliminate the need for institutional controls.

Long-Term Effectiveness and Permanence

Soil/Fill Alternatives 3 through 5 would achieve long-term effectiveness and permanence by minimizing human and ecological exposure to soil/fill and preventing off-site transport of soil/fill containing COCs. Soil/Fill Alternative 4 would provide greater permanence than Alternative 3 because contaminated soil/fill would be excavated for off-site disposal in a licensed disposal facility. Similarly, under Alternative 5 in-situ treatment would permanently stabilize the contaminated soil/fill, making future exposure to the COCs less likely. Soil/Fill Alternatives 3 through 5 incorporate similar long-term O&M obligations through institutional controls, none anticipated to be less than the 30 years assumed for cost-estimating purposes.

Reduction of TMV through Treatment

Soil/Fill Alternative 5 would provide the greatest reduction of toxicity and mobility through treatment by stabilization/solidification of all COCs (organic and inorganic). However, the volume would not be reduced since contaminants are stabilized and solidified but remain on-site. Soil/Fill Alternative 4 would reduce mobility of COCs on-site, not through treatment but through removal and off-site disposal of elevated lead around Building #7, which also would remove co-located contaminants; however, toxicity and volume would only be reduced if material is treated prior to disposal. Soil/Fill Alternatives 3 through 5 include NAPL removal, which would reduce mobility of a principal threat waste, though not through treatment. The toxicity and volume may be reduced if material is treated to comply with disposal requirements at the off-site disposal facility.

Short-Term Effectiveness

Soil/Fill Alternatives 3 through 5 will all disrupt businesses to some extent, thus having a short-term impact on workers and potentially, the local community. The northern portion of the Site is extremely congested with ongoing business activities and also provides the only vehicle access point. The short-term impacts of Soil/Fill Alternatives 3 and 4 would be similar, as they are similar in scope. Soil/Fill Alternative 5 would cause the most short-term impacts because of the treatment areas in the northern portion of the Site which would cause significant disturbances to businesses as reagent delivery to the subsurface will require the use of large diameter augers and closely spaced injection points, due to the relatively shallow depth of impacts.

Implementability

Soil/Fill Alternatives 3 and 4 are both relatively implementable, though the excavation included in Soil/Fill Alternative 4 might be limited by proximity to buildings and underground utilities. Soil/Fill Alternative 5 would be the most technically challenging to implement because this alternative requires the use of specialized equipment and experienced vendors; pilot studies would be required to determine the appropriate reagent; and treatments may not be feasible due to underground utilities and closely spaced injection points due to the relatively shallow depth of impacts. Soil/Fill Alternatives 3 through 5 require engineering controls, including bulkhead enhancements. During construction of the bulkhead, if the engineered cap in the Lower Passaic River has been installed as part of the remedy of Diamond Alkali OU2, the parties implementing

the remedy at the Site would be responsible to work with EPA and/or the parties performing work in the river to address any such impacts. Soil/Fill Alternatives 3 through 5 would require long-term maintenance in the form of site inspections to ensure compliance with institutional controls, verify inspection of fencing, and maintain integrity of the cap and bulkhead.

Cost
The present worth cost for each of the Alternatives is:

Soil/Fill Alternative 1 – $0
Soil/Fill Alternative 3 – $10,450,900
Soil/Fill Alternative 4 – $12,633,300
Soil/Fill Alternative 5 – $13,971,400

Groundwater Alternatives

The performance of all the active groundwater alternatives will be influenced by the on-going impacts of residual COCs in the soil/fill to the groundwater that will need to be treated. Response actions undertaken for other media that include source control measures (i.e., UST removal and NAPL-impacted soil/fill removal) would remove potential groundwater sources and capping or excavation of contaminated soil/fill could also reduce residual COC infiltration into groundwater from unsaturated soil/fill.

Overall Protection of Human Health and the Environment
Groundwater Alternative 1 (no action) is not protective of human health and the environment because it does not prevent exposure to or reduce contamination. Accordingly, it will not be carried through the remaining criteria analysis.

Groundwater Alternative 2 (containment at river edge and pump and treat), Groundwater Alternative 3 (in-situ remediation), and Groundwater Alternative 4 (pump and treat with targeted periodic in-situ remediation) would be protective of human health because all of these alternatives would restore the groundwater quality to meet the standards applicable for a Class IIA aquifer.

Compliance with ARARs
Location- and action-specific ARARs would be met by Groundwater Alternatives 2, 3, and 4. In the short-term, Groundwater Alternatives 2, 3, and 4 would not comply with chemical-specific ARARs (NJ GWQS) associated with the restoration of groundwater; however, over time, the impacted groundwater are expected to eventually reduce COC concentrations to meet chemical-specific ARARs. The ability of all three alternatives to achieve ARARs would be challenged by the presence of residual COCs in the soil/fill, and by historic fill in some areas of the Site. Groundwater Alternative 4 will likely achieve chemical-specific ARAR before Groundwater Alternatives 2 and 3, because Alternative 4 includes both pump and treat technology and in-situ treatment, whereas Alternative 2 relies solely on pumping and treating, and Alternative 3, on in-situ treatment. Groundwater Alternative 3 may face challenges in meeting chemical specific ARARs because of the complex interaction between the in-situ treatments and the geochemistry of the aquifer. This would be true for Groundwater Alternative 4 as well; however, because the in-

situ component of Groundwater Alternative 4 would be more targeted, the challenge would be lesser.

Long-Term Effectiveness and Permanence

Groundwater Alternatives 2, 3, and 4 all require long-term O&M through institutional controls and long-term groundwater monitoring to remain effective, until the NJ GWQS are attained. The O&M period for all four groundwater alternatives is anticipated to be at least the 30 years assumed for cost-estimating purposes, although it is possible that the source removal activities implemented to address the waste and soil/fill contamination may reduce the duration of O&M that is required.

Reduction of TMV through Treatment

Groundwater Alternatives 2 and 4 would effectively reduce the toxicity, mobility and volume of all COCs in the groundwater through use of a pump and treat system. Groundwater Alternatives 3 and 4 could reduce toxicity, mobility and volume of organic COCs depending on success of the reagent used for in-situ treatment; however, inorganic metals (including lead) are only precipitated out of solution and cannot be destroyed, so for lead, only toxicity and mobility would be reduced through treatment.

Short-Term Effectiveness

Groundwater Alternatives 2 and 4 would be disruptive to business activities thus having a short-term impact on workers and potentially, the local community, as a result of the construction of a pump and treat system and associated well/piping network. The in-situ treatment activities associated with both Groundwater Alternatives 3 and 4 also lead to short-term impacts, but Alternative 3 would be more disruptive to business activities, workers and the local community than Groundwater Alternative 4 because multiple large-scale injections would be required. For Groundwater Alternative 4, in-situ treatments would be targeted periodic injections and generally at a smaller scale than Groundwater Alternative 3.

Implementability

Of the active groundwater alternatives, Groundwater Alternative 4 is the most implementable, while Groundwater Alternative 2 is the most challenging to implement because of the technical complexities of the construction of the barrier wall. The implementability challenges for Groundwater Alternative 3 are caused by the need to undertake multiple targeted rounds of in-situ injections. For Groundwater Alternatives 3 and 4, sampling and treatability studies would be required to evaluate how to address both organic and inorganic constituents in groundwater, taking into account tidal influences and geochemical conditions. The implementability of Groundwater Alternatives 2 and 4 is also affected by the need for access to a sufficiently sized portion of the Site property for construction of a groundwater treatment facility, which could lead to administrative challenges. Groundwater Alternatives 2 through 4 would each require site inspections to ensure compliance with institutional controls and operation and maintenance. Since Groundwater Alternative 4 is likely to achieve the RAO is the shortest time, there are fewer challenges associated with implementation.

Cost

The present worth cost for each of the Alternatives is:

Groundwater Alternative 1 – $0
Groundwater Alternative 2 – $34,258,600
Groundwater Alternative 3 – $20,844,800
Groundwater Alternative 4 – $24,234,400

State Acceptance

NJDEP concurs with EPA's selection of Waste Alternative 2, Sewer Water Alternative 2, Soil/Fill Alternative 4, and Groundwater Alternative 4. NJDEP does not concur with EPA's selection of Soil Gas Alternative 2. A letter of concurrence is attached in Appendix IV.

Community Acceptance

Comments received during the public comment period indicate that the public generally supports the selected remedy. These comments are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

PRINCIPAL THREAT WASTES

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, LNAPLs in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

For this Site, LNAPL in the UST on Lot 64, LNAPL in Building #15A, and the NAPL-impacted soil/fill on Lot 63 and Lot 64 are considered to constitute a principal threat waste due to their mobility and potential impact to groundwater.

SELECTED REMEDY

The selected remedy addresses five media which include: waste material, sewer water, soil gas, soil/fill material, and groundwater. Lead was found to be the primary COC in soils at the Site. In addition to lead, copper, arsenic, PCBs, VOCs, and SVOCs were found to be of concern in soils. Lead, VOCs, and SVOCs were found to be contaminants of concern for groundwater. VOCs were found to be COCs for soil gas. VOCs were also found to be a contaminant of concern in the settled solids in an inactive sewer manhole. Non-aqueous phase liquid (NAPL) and various other wastes containing hazardous constituents were found across the Site. The various other wastes are

currently contained; however, there is potential for contaminants to be released into the environment.

The major components of the selected remedy are:

Waste Alternative 2 - Removal and Off-Site Disposal

- Removal and off-site disposal of the USTs, the aqueous and solid waste and/or LNAPL within the USTs, NAPL-impacted soil/fill material surrounding the USTs, the LNAPL in the pooled water in Building #15A, the white chalky talc-looking substance in a hopper in Building #7, a plastic 55-gallon drum in Building #12 containing liquid waste, and a five-gallon bucket in Building #17 containing solid waste. The LNAPLs in the UST and in Building #15A are considered principal threat wastes, and the removal and disposal of these wastes will address this concern.
- Following removal of USTs and their contents, confirmation sampling of soil/fill (including underneath the tank) and groundwater will occur.

Sewer Water Alternative 2 – Removal and Off-Site Disposal

- Transfer of the sewer water and solids from the inactive sewer line into appropriate containers or transport vehicles for off-site treatment and/or disposal.
- The associated sewer line and manhole will be cleaned, and then closed in place by plugging/filling to prevent future buildup of water and solids in the manhole.

Soil Gas Alternative 2 - Institutional Controls, Air Monitoring and, if needed, Engineering Controls (existing occupied buildings), and Site-Wide Engineering Controls (future buildings)[17]

- ICs will be established in the form of deed notices and CEAs/WRAs site-wide to provide notice of certain restrictions upon the use of the property in relation to soil gas. This requirement will be implemented in conjunction with the deed notice requirement for the soil/fill remedy and the CEA/WRA requirement for the groundwater remedy.
- A building-specific assessment of sub-slab soil gas and/or indoor air quality will be required for any of the currently occupied existing buildings on the Site, and for existing buildings that will be occupied in the future, and, if the assessment identifies unacceptable risks/hazards, engineering controls will be implemented to protect the occupants of such existing buildings from unacceptable vapor intrusion risks/hazards. The assessment will evaluate vapor intrusion COCs in soil (TCE, total xylenes, and naphthalene), and, for buildings within 100 feet of groundwater contamination that exceeds screening levels, additional COCs will be evaluated as part of the assessment (benzene, ethylbenzene, and vinyl chloride).
- Future new construction will be required to include a vapor barrier or other appropriate means of sealing the ground surface underneath the new building slab or installation of a SSDS, as determined by EPA.
- In all existing buildings – currently occupied and occupied in the future – periodic indoor air monitoring will be required to verify previous assessment results and to confirm that engineering controls continue to protect indoor workers, due to the potential for

[17] Figure 14 in Appendix I is a schematic drawing that presents the Selected Remedy for Soil Gas. The details will be refined during the remedial design.

unacceptable risk from the presence of indoor air contaminants above VISLs. Air monitoring may also be required in newly constructed buildings. If indoor air monitoring indicates exceedances of EPA VISLs, New Jersey VISLs, and/or New Jersey IARS from Site COCs in existing or newly constructed buildings, further evaluation of the data would be needed to determine whether unacceptable risks/hazards exist in which case property owners or other parties would be required to implement further engineering controls to achieve New Jersey IARS as remediation goals.

Soil/Fill Alternative 4: Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal[18]

- ICs will be established in the form of deed notices site-wide to provide notice that future use of the Site must remain commercial or industrial and identify areas of the Site where contamination exceeds New Jersey residential soil standards.[19] These requirements will be implemented in conjunction with the deed notice requirement for the soil gas remedy.
- Fencing will be required to be maintained and enhanced as appropriate to limit unauthorized access to the Site and use of the Site in a manner inconsistent with the remedy.
- NAPL-impacted soil/fill on Lot 63 will be excavated and disposed of off-site.
- Contaminated soil/fill material will be capped, with a cap that consists of the construction of a barrier over the contaminated areas, to prevent access to and contact with the contaminated media and/or to control its migration.
- A focused excavation and off-site disposal of lead-impacted soil/fill around Building #7 of the Site where high levels of lead were found will be performed.
- The bulkhead will be reinforced or reconstructed, as appropriate, in order to minimize the potential for interaction between the Site and surface water, minimize soil erosion, and prevent off-site transport of soil/fill containing COCs and Contaminants of Potential Ecological Concern (COPECs).

Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation[20]

- ICs will be established in the form of CEAs/WRAs site-wide to provide notice that the groundwater in the area does not meet designated use requirements and to prohibit the installation and use of wells for potable and other uses within the designated area.
- Targeted, periodic in-situ remediation of the groundwater will be conducted. The specific means will be determined during the remedial design with treatability studies to determine the most appropriate treatment approach and reagents. Possible treatments include chemical treatment, biosparging, and air sparging.
- A pump and treat system will be installed to provide hydraulic containment at the river's edge to minimize migration of contaminated groundwater to the river. Extracted groundwater will be collected, treated, and disposed. The number of extraction wells,

[18] Figure 15 in Appendix I is a schematic drawing that presents the Selected Remedy for Soil/Fill. The details will be refined during the remedial design.

[19] The Proposed Plan incorrectly referenced the non-residential standards (NRDCSRS). This has been clarified to state that the deed notices will identify areas of the Site where contamination exceeds New Jersey residential soil standards (RDCSRS).

[20] Figure 16 in Appendix I is a schematic drawing that presents the Selected Remedy for Groundwater. The details will be refined during the remedial design.

pumping rate, and individual processes to be utilized for treatment will be determined during the remedial design.

- Groundwater monitoring will be performed to demonstrate that the selected remedy continues to be protective of human health and the environment.

Summary of the Estimated Selected Remedy Costs

Cost includes estimated capital and annual O&M costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value, assuming a seven percent discount rate. Cost estimates are expected to be accurate within a range of +50 to -30 percent. This is a standard assumption in accordance with EPA guidance.

The estimated capital costs, O&M costs and present worth costs for the alternatives are discussed in detail in the FS Report. The cost estimates are based on the best available information. The present-worth costs for the five components (waste, sewer water, soil gas, soil, and groundwater) of the selected remedy is $38,923,100.

Cost estimates for the soil, sediment and groundwater components of the selected remedy are presented in Tables 12 through 16 of Appendix II. Individual cost estimates for each remedial alternative evaluated are provided in the FS Report.

Expected Outcomes of the Selected Remedy

The components of the selected remedy will actively address various wastes found across the Site, as well as the Site contaminants found in sewer water, soil gas, soil, and groundwater. The results of the human health risk assessment indicate unacceptable noncancer health hazards were found for metals, VOCs, and SVOCs in soil/fill. TCE and total xylenes are soil/fill COCs with potential unacceptable risks/hazards associated with soil gas. In addition, several VOCs, SVOCs, and lead are groundwater COCs with unacceptable risks/hazards based on hypothetical potable use scenarios. Results of the ecological risk assessment found unacceptable risk to terrestrial or long-based species due to exposure to contaminated soil. The remedial action selected in this ROD will address the contaminated Site sewer water, soil gas, soils, and groundwater and, thereby, will mitigate the unacceptable risks associated with these exposure pathways, facilitate the commercial/industrial use of the Site property, and restore the groundwater to levels that meet state and federal standards.

Green Remediation

Consistent with EPA Region 2’s Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of the selected remedy components.

STATUTORY DETERMINATIONS

EPA has determined that the selected remedy complies with the CERCLA and NCP provisions for remedy selection, meets the threshold criteria, and provides the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. These provisions require the

selection of remedies that are protective of human health and the environment, comply with ARARs (or justify a waiver from such requirements), are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the toxicity, mobility and volume of hazardous substances as a principal element (or justifies not satisfying the preference). The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will protect human health and the environment because it will prevent human and ecological exposure to contaminated sewer water, soil gas, soil, and groundwater. The selected waste and sewer water remedies will remove these wastes, preventing an uncontrolled release. The selected soil gas remedy includes ICs and ECs to monitor or address potential vapor intrusion in buildings associated with soil gas contamination, which can be implemented in a short period and will be protective of human health. Any new construction would require ECs to prevent vapor intrusion. The selected soil/fill remedy will protect human health and the environment over the short and long term by removing the high-level lead contamination at the Site and capping the entire Site to prevent exposure to and migration of contaminated soils. Over the long term, the selected groundwater remedy will restore groundwater to levels that meet state and federal standards within a reasonable time frame. In addition, groundwater ICs will protect human health over both the short and long term by preventing groundwater use. This groundwater remedy would result in the reduction of exposure risk to levels within EPA's generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogens and below a HI of 1.0 for noncarcinogens. Implementation of the selected remedy will not pose unacceptable short-term risks that cannot be controlled with standard engineering and health and safety best practices.

Compliance with ARARs

The selected remedy is expected to achieve the remediation goals for soil/fill COCs based on NJDEP's NRDCSRSs (chemical-specific ARARs), for groundwater COCs based on NJDEP's GWQSs, and for soil gas COCs based on NJDEP's indoor air remediation standards when engineering controls are triggered by a finding of unacceptable risk (chemical-specific ARARs). The remedy will also comply with location- and action-specific ARARs.

A full list of the ARARs, TBCs, and other guidance related to implementation of the selected remedy is presented in Tables 17, 18 and 19 of Appendix II.

Cost Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (40 C.F.R. § 300.430(f)(1)(ii)(D)). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to cost to determine cost-effectiveness.

Each of the alternatives underwent a detailed cost analysis. In that analysis, capital and annual O&M costs were estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of each alternative. The total estimated present worth cost for implementing the selected remedy is $38,923,100.

Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost effective (40 C.F.R. § 300.430(f)(1)(ii)(D)) and the relationship of the overall effectiveness of the selected remedy was determined to be proportional to costs and hence, the selected remedy represents a reasonable value for the money to be spent. The selected remedy is cost-effective as it has been determined to provide the greatest overall protectiveness for its present worth costs. See Tables 12 through 16 of Appendix II.

Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to Maximum Extent Practicable

The selected remedy complies with the statutory mandate to utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable because it represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner to remediate the Site. The selected remedy satisfies the criteria for long-term effectiveness and permanence by permanently reducing the mass of contaminants in the Site wastes, sewer water, soils, and groundwater, thereby reducing the toxicity, mobility and volume of contamination.

Preference for Treatment as a Principal Element

By utilizing targeted, periodic in-situ treatment to the extent practicable to treat the groundwater contamination in combination with pump and treat to provide hydraulic containment, the Selected Remedy meets the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element is satisfied. Furthermore, excavation of soil/fill material would reduce the mobility of the lead around Building #7 and NAPL on Lot 63 through removal and appropriate off-site disposal. As required by the disposal facility, the toxicity and volume may be reduced if material is treated to comply with disposal requirements.

Five-Year Review Requirements

Because this remedy results in hazardous substances, pollutants, or contaminants remaining on the Site above levels that will allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years of the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment, unless determined otherwise at the completion of the remedial action.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for Riverside Industrial Park Superfund Site was released to the public on July 22, 2020. EPA received extension requests, and the comment period closed on February 19, 2021.The Proposed Plan identified the following as the preferred alternatives for remediating the

waste, sewer water, soil gas, soil, and groundwater, respectively, at the Site: Waste Alternative 2 – Removal and Off-Site Disposal; Sewer Water Alternative 2 – Removal and Off-Site Disposal; Soil Gas Alternative 2 – Institutional Controls, Air Monitoring and, if needed, Engineering Controls (existing occupied buildings), and Site-Wide Engineering Controls (future buildings); Soil/Fill Alternative 4 – Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal; and Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation.

The Proposed Plan stated in the description of the soil/fill alternatives that the institutional controls would include deed notices to provide notice that future use of the Site must remain commercial or industrial and identify areas of the Site where contamination exceeds New Jersey non-residential soil standards. This has been clarified to state that the deed notices will identify areas of the Site where contamination exceeds New Jersey residential soil standards.

In May 2021, after the release of the July 2020 Proposed Plan, NJDEP finalized amendments to its remediation standards, including promulgating indoor air remediation standards for a number of VOCs that replaced the previous screening levels for those VOCs, and revising a number of soil remediation standards. NJDEP updated its VIT guidance shortly thereafter. EPA updated Soil Gas Alternative 2, the selected soil gas remedy, to incorporate the promulgated indoor air remediation standards and the updated VIT guidance and added an RAO for soil gas to reflect these changes. EPA also incorporated the soil remediation standard changes into the remediation goals for soils and removed two contaminants (naphthalene and vinyl chloride) as COCs in soil/fill material, because concentrations of naphthalene and vinyl chloride detected at the Site no longer exceed NJDEP's NRDCSRS. These changes did not affect the selected remedy because the standard for lead, which is the driving contaminant for soil remediation at the Site, was not affected. EPA does not consider any of these to be significant changes.

NJDEP also promulgated soil and soil leachate remediation standards for the migration to ground water pathway; however, because the selected remedy includes a site-wide cap which will address the potential impact to groundwater, the new migration to groundwater standards were not considered. DEP guidance will be considered when implementing the cap.

Based upon review of the written and oral comments submitted during the public comment period, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

APPENDIX I

FIGURES

Figure 1 - Site Location

- Housing/Social Service near Riverside
- Church Near Riverside
- Fire Station
- Library
- Police Station
- Recreation Center
- School
- Riverside Industrial Park Superfund Site (or Riverside)
- City of Newark
- Neighborhood

0 500 1,000 Feet

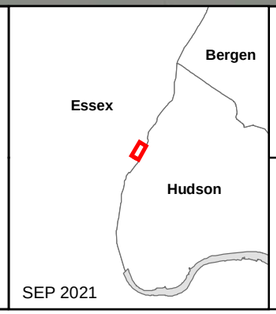
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 1 - Site Location.mxd

BLOCK 614 LOT #	BUILDING #	OWNER
1	2, 3	HATZLUCHA ON RIVERSIDE, LLC.
57	10	PLAGRO REALTY, INC.
58	15, 15A	CITY OF NEWARK
59	14	ALBERT SHARPHOUSE
60	1	SHEFAH IN NEWARK, LLC.
61	6	CITY OF NEWARK
62	9	CELCOR ASSOC., LLC.
63	7	CITY OF NEWARK
64	12	CITY OF NEWARK
65	NA	INDUSTRIAL DEV. CORP.
66	17	CHEMICAL COMPOUNDS, INC.
67	NA	CELCOR ASSOC., LLC.
68	NA	CITY OF NEWARK
69	13, 19	SHARPMORE HOLDINGS INC.
70	16	ESTATE OF CAROLE GRAIFMAN

Study Area
Parcel
UST

Structure
Occupied
Vacant
Demolished/Partially Demolished
12 Structure Number
63 Lot Number

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 2
Map of Site
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N

0 50 100 Feet

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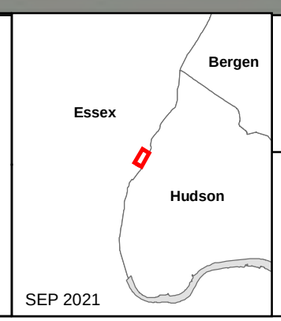
Shoreline (Year)
- 1873
- 1892
- 1901
- 1909
- 1931
- 1966

Study Area
Parcel (Newark, Oct 2017)
Existing/Former Structure

Sources:
"ArcGIS Map Service, Bing Aerial Photography", 2020
"City of Newark Parcel GIS", http://data.ci.newark.nj.us, 2017
"Certified Sanborn Map Report Riverside Industrial Park, Newark NJ" Inquiry Number: 3940448.3, Prepared by Environmental Data Resources, Inc., Dated May 12, 2014.
"Pittsburgh Plate Glass, Co., Chester Avenue Plant, Newark, NJ" Plate Tr. No I-492, dated June 1931
"1958 Pittsburgh Plate Glass, Co. Facility Drawing" Works No. 63. Last revised October 1958



SEP 2021

Figure 3
Map of Fill Events at Site
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N

0 50 100 Feet

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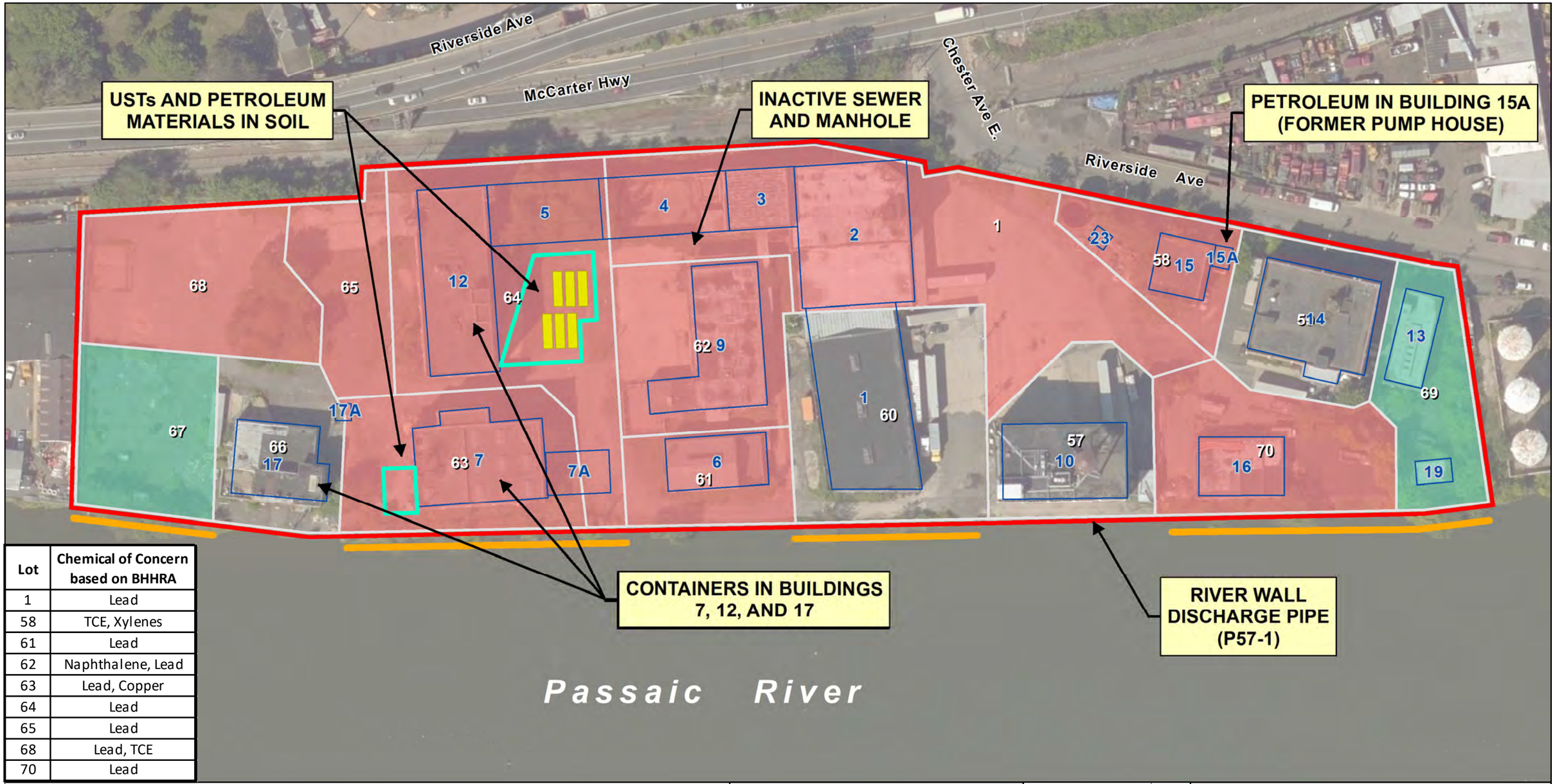


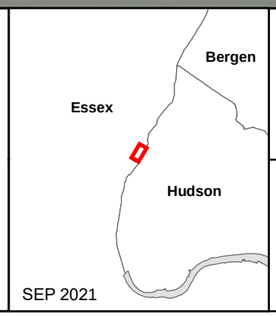
Lot	Chemical of Concern based on BHHRA
1	Lead
58	TCE, Xylenes
61	Lead
62	Naphthalene, Lead
63	Lead, Copper
64	Lead
65	Lead
68	Lead, TCE
70	Lead

Study Area
Parcel (Newark, Oct 2017)
Existing/Former Structure
UST
Footprint of UST and NAPL-Impacted Soil Excavation and Removal
Footprint of Bulkhead Repair and/or Replacement

Lots with unacceptable human health risk under current or future commercial/industrial use
Lots that do not have unacceptable human health risk but do have unacceptable ecological risk

CHEMICALS OF CONCERN
The chemicals listed are only COCs with unacceptable human health risks as indicated in the BHHRA. A full list of COCs, including those chemicals that exceed ARARs, can be found in Appendix II.

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us
"1958 Pittsburgh Plate Glass, Co. Facility Drawing" Works No. 63. Last revised October 1958



SEP 2021

Figure 4
Areas of Concern Identified in the RI
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

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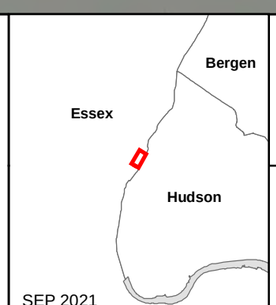
Sample Location
- RI Monitoring Well - Deep
- RI Monitoring Well - Shallow
- RI Temporary Well Point
- RI Phase1 Soil Boring
- RI Phase 2 Soil Boring
- RI Surface Sample

- Study Area
- Parcel (Newark, Oct 2017)
- Existing/Former Structure

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 5
Soil and Groundwater Sampling Locations
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

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Area	SqFt	Acres
NAPH-1	13671.79	0.31
NAPH-2	2527.79	0.06
NAPH-3	8077.46	0.19
NAPH-4	16078.80	0.37
NAPH-5	11021.63	0.25
NAPH-6	2077.04	0.05
NAPH-7	37278.79	0.86
NAPH-8	3687.50	0.08

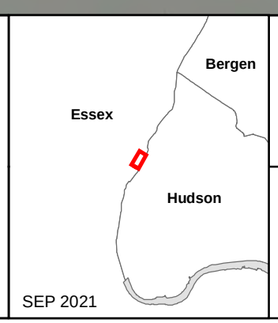
Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG
- RG Exceedance (non-detect reported at quantitation limit)

Remediation Goal (mg/kg)
Naphthalene (Vapor Intrusion): 0.62

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 6A
Site-Wide Soil Gas Remediation Goal Exceedances for Naphthalene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

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Area	SqFt	Acres
TCE-1	28907.11	0.66
TCE-2	4532.19	0.10
TCE-3	51815.44	1.19
TCE-4	5036.70	0.12
TCE-5	1742.84	0.04
TCE-6	23382.09	0.54

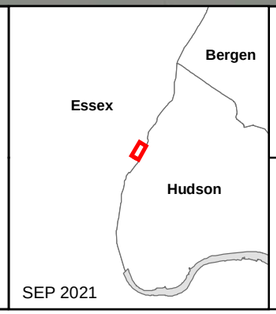
Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

Remediation Goal (mg/kg)
TCE: 0.02

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG
- RG Exceedance (non-detect reported at detection limit)

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 6B
Site-Wide Soil Gas Remediation Goal Exceedances for TCE
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

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Area	SqFt	Acres
Xy-1	6832.53	0.16
Xy-2	3749.60	0.09
Xy-3	6933.22	0.16
Xy-4	9386.19	0.22
Xy-5	1685.91	0.04
Xy-6	12740.48	0.29
Xy-7	3087.33	0.07

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
Xylenes (Total): 6.5

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

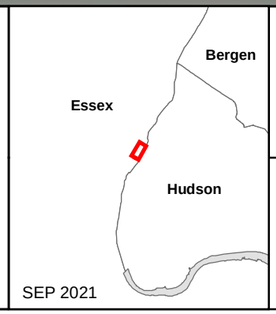

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Figure 6C
Site-Wide Soil Gas Remediation Goal Exceedances for Xylenes (Total)
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 6C_SG_Xylenes RemovalArea.mxd

Area	SqFt	Acres
As-1	9797.28	0.22
As-2	3557.01	0.08
As-3	29683.48	0.68
As-4	1495.11	0.03

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Delineated Area
- Parcel (Newark, Oct 2017)

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
Arsenic: 19

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

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Figure 7A
Site-Wide Soil/Fill Remediation Goal Exceedances for Arsenic
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 7A_SoilArsenic.mxd

Area	SqFt	Acres
Cu-1	5,743.13	0.13
Cu-2	4,433.10	0.10
Cu-3	2,438.08	0.06
Cu-4	2,091.23	0.05

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
Copper: 526

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

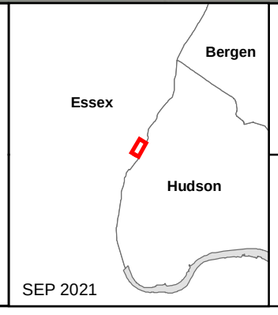

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Figure 7B
Site-Wide Soil/Fill Remediation Goal Exceedances for Copper
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 7B_SoilCopper.mxd

Area	SqFt	Acres
Pb-1	18,516.69	0.43
Pb-2	9,187.38	0.21
Pb-3	26,921.45	0.62
Pb-4	4,740.73	0.11
Pb-5	26,631.58	0.61
Pb-6	9,187.91	0.21

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

Remediation Goal (mg/kg)
Lead: 800

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Result Not Detected
- Detection Below RG
- Detection Exceeds RG

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

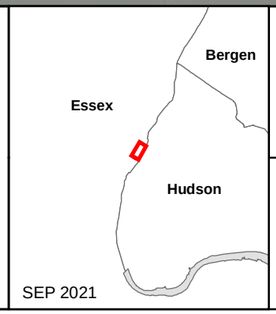

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Figure 7C
Site-Wide Soil/Fill Remediation Goal Exceedances for Lead
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 7C_SoilLead.mxd

Area	SqFt	Acres
Benzene-1	5,206.38	0.12
Benzene-2	5,205.43	0.12

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
Benzene: 5

The delineation was created for the RI/FS and Proposed Plan using the September 2017 N.J.A.C. 7:26D standards for non-residential direct contact soil remediation standard of 5 mg/kg. The remedial goal has been updated per the May 2021 promulgated standard of 16 mg/kg.

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

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Figure 8
Site-Wide Soil/Fill Remediation Goal Exceedances for Benzene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

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0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 8A_Soil_Benzene.mxd

Area	SqFt	Acres
B(a)A-1	3,275.03	0.08

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
Benzo(a)anthracene: 17

The delineation was created for the RI/FS and Proposed Plan using the September 2017 N.J.A.C. 7:26D standards for non-residential direct contact soil remediation standard of 17 mg/kg. The remedial goal has been updated per the May 2021 promulgated standard of 23 mg/kg.

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS",
http://data.ci.newark.nj.us

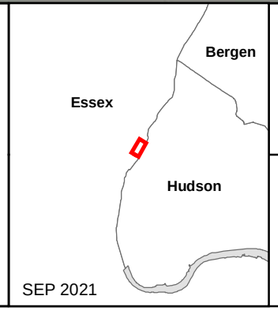

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Figure 9A
Site-Wide Soil/Fill Remediation Goal Exceedances for Benzo(a)anthracene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 9A_Soil_Benzo(a)anthracene.mxd

Parameter	SqFt	Acres
B(a)P-1	10,480.44	0.24
B(a)P-2	8,259.46	0.19
B(a)P-3	688.00	0.02
B(a)P-4	2,542.09	0.06
B(a)P-5	7,060.72	0.16
B(a)P-6	2,275.93	0.05
B(a)P-7	1,740.20	0.04
B(a)P-8	12,753.11	0.29
B(a)P-9	6,776.92	0.16
B(a)P-10	7,554.76	0.17
B(a)P-11	4,473.71	0.10
B(a)P-12	1,048.54	0.02
B(a)P-13	2,821.15	0.06
B(a)P-14	3,193.07	0.07

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
Benzo(a)pyrene: 2

The delineation was created for the RI/FS and Proposed Plan using the September 2017 N.J.A.C. 7:26D standards for non-residential direct contact soil remediation standard of 2 mg/kg. The remedial goal has been updated per the May 2021 promulgated standard of 2.3 mg/kg.

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

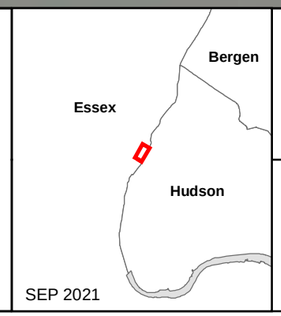

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Figure 9B
Site-Wide Soil/Fill Remediation Goal Exceedances for Benzo(a)pyrene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 9B_Soil_Benzo(a)pyrene.mxd

Area	SqFt	Acres
B(b)F-1	3,273.98	0.08

Structure
- Existing
- Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
Benzo(b)fluoranthene: 17

The delineation was created for the RI/FS and Proposed Plan using the September 2017 N.J.A.C. 7:26D standards for non-residential direct contact soil remediation standard of 17 mg/kg. The remedial goal has been updated per the May 2021 promulgated standard of 23 mg/kg.

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS",
http://data.ci.newark.nj.us

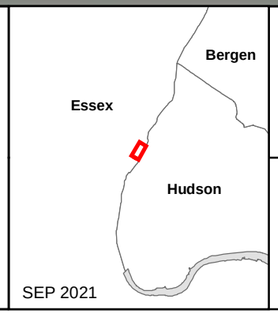

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Figure 9C
Site-Wide Soil/Fill Remediation Goal Exceedances for Benzo(b)fluoranthene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 9C_Soil__Benzo(b)fluoranthene.mxd

Area	SqFt	Acres
D(a,h)A-1	2,558.98	0.06
D(a,h)A-2	4,020.10	0.09

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Non-Detect
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
Dibenzo(a,h)anthracene: 2

The delineation was created for the RI/FS and Proposed Plan using the September 2017 N.J.A.C. 7:26D standards for non-residential direct contact soil remediation standard of 2 mg/kg. The remedial goal has been updated per the May 2021 promulgated standard of 2.3 mg/kg.

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS",
http://data.ci.newark.nj.us

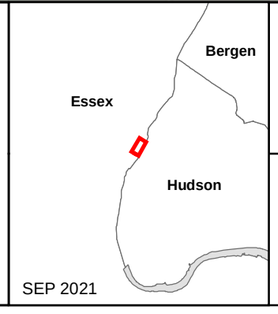

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Figure 9D
Soil/Fill Remediation Goal
Exceedances for Dibenzo(a,h)anthracene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 9D_Soil_Dibenzo(a,h)anthracene.mxd

Area	SqFt	Acres
PCB-1	3,661.67	0.08
PCB-2	3,311.66	0.08
PCB-3	7,001.54	0.16
PCB-4	10,318.49	0.24

Structure
- Existing
- Demolished/Partially Demolished
- UST
- Former Soil Mound

- Study Area
- Parcel (Newark, Oct 2017)
- Delineated Area

- RI Soil Boring
- Historical Sample
- Result Not Detected
- Detection Below RG
- Detection Exceeds RG

Remediation Goal (mg/kg)
PCBs (Total): 1

The delineation was created for the RI/FS and Proposed Plan using the September 2017 N.J.A.C. 7:26D standards for non-residential direct contact soil remediation standard of 1 mg/kg. The remedial goal has been updated per the May 2021 promulgated standard of 1.1 mg/kg.

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

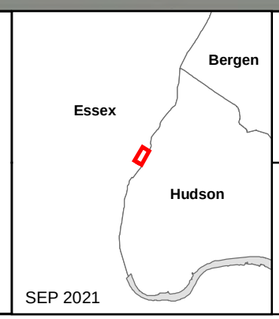

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Figure 9E
Site-Wide Soil/Fill Remediation Goal Exceedances for PCBs (Total)
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

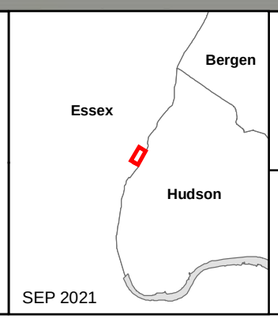
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 9E_Soil_PCB.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Acetone: 6,000

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 10A
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
Acetone
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10a_Shallow VOCs-Acetone.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Benzene: 1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

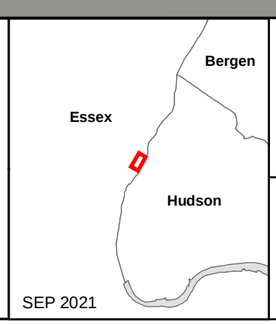


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Figure 10B
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
Benzene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

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N

0 50 100 Feet

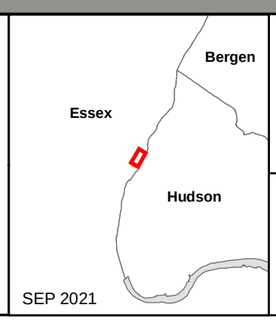
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10b_Shallow VOCs-Benzene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Ethylbenzene: 700

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 10C
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
Ethylbenzene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100
Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10c_Shallow VOCs-Ethylbenzene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Methylene chloride: 3

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

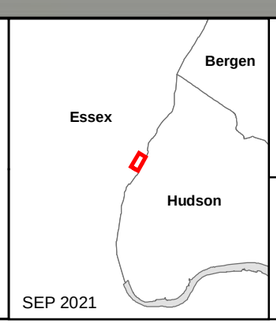


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Figure 10D
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
Methylene Chloride
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100
Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10d_Shallow VOCs-MethyleneChloride.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Tetrachloroethylene: 1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

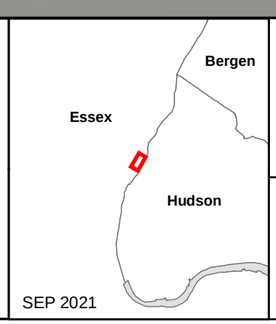

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Figure 10E
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
Tetrachloroethylene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100
Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10e_Shallow VOCs-Tetrachloroethylene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Toluene: 600

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

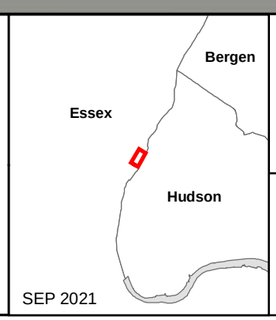

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Figure 10F
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
Toluene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10f_Shallow VOCs-Toulene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
TCE: 1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

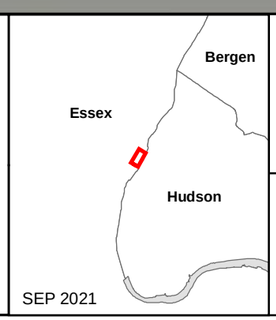

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Figure 10G
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
TCE
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100 Feet

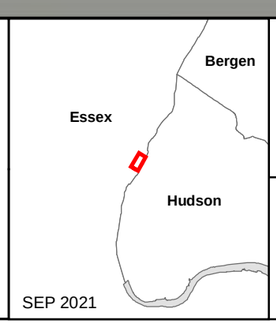
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10g_Shallow VOCs-Trichloroethylene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Vinyl chloride: 1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 10H
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
Vinyl Chloride
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100
Feet

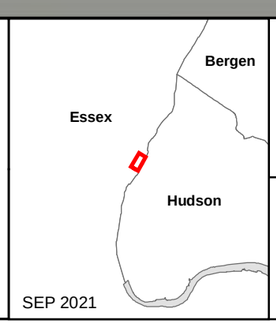
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10h_Shallow VOCs-Vinyl chloride.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Total Xylenes: 1,000

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 10 I
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for VOCs
Total Xylenes
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

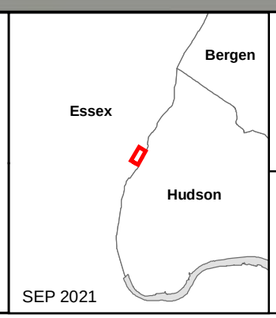
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 10i_Shallow VOCs-Total Xylene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Cresol, p-: 50

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 11A
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for SVOCs
Cresol, p-
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

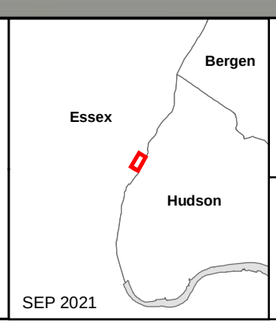
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 11a_Shallow SVOCs-Cresol, p-.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Benzo(a)anthracene: 0.1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 11B
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for SVOCs
Benzo(a)anthracene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100
Feet

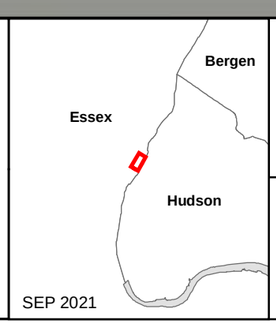
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 11b_Shallow SVOCs-Benz[a]anthracene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Benzo(a)pyrene: 0.1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 11C
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for SVOCs
Benzo(a)pyrene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

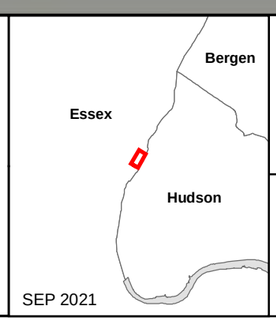
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 11c_Shallow SVOCs-Benzo[a]pyrene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Benzo(b)fluoranthene: 0.2

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 11D
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for SVOCs
Benzo(b)fluoranthene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100
Feet

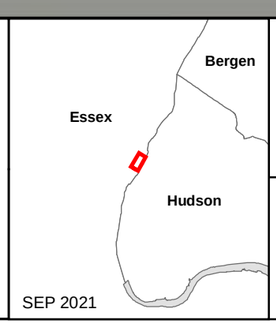
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 11d_Shallow SVOCs-Benzo[b]fluoranthene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Bis(2-ethylhexyl)phthalate: 3

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 11E
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for SVOCs
Bis(2-ethylhexyl)phthalate
Riverside Industrial Park Superfund Site
Essex County, New Jersey

N
0 50 100
Feet

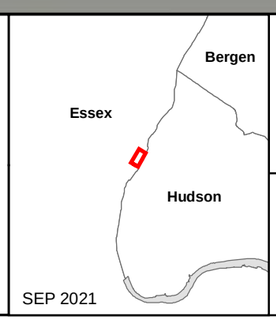
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 11e_Shallow SVOCs-Bis(2-ethylhexyl)phthalate.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Indeno(1,2,3-cd)pyrene: 0.2

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 11F
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for SVOCs
Indeno(1,2,3-cd)pyrene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

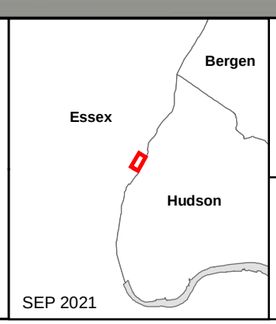
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 11F_Shallow SVOCs-Indeno[1,2,3-cd]pyrene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
2-Methylnaphthalene: 30

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 11G
Site-Wide Shallow Groundwater
Remediation Goal Exceedances for SVOCs
2-Methylnaphthalene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

N
0 50 100
Feet

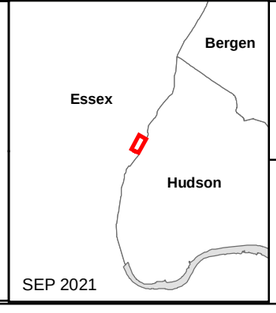
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 11G_Shallow SVOCs-Methylnaphthalene, 2-.mxd

Study Area
Parcel (Newark, Oct 2017)
Monitoring Well
Sump Pump

Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Lead: 5

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 12
Site-Wide Shallow Groundwater Remediation Goal Exceedances for Lead
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

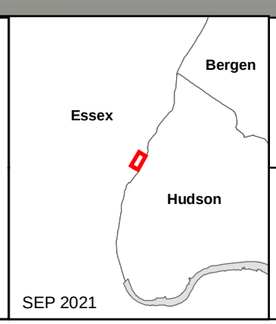
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 12a_GW_Lead.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Benzene: 1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 13A
Site-Wide Deep Groundwater
Remediation Goal Exceedances for Organics
Benzene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

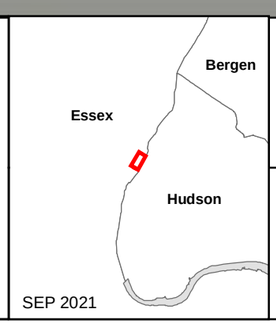
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 13A_Deep Organics-Benzene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Tetrachloroethylene: 1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 13B
Site-Wide Deep Groundwater
Remediation Goal Exceedances for Organics
Tetrachloroethylene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

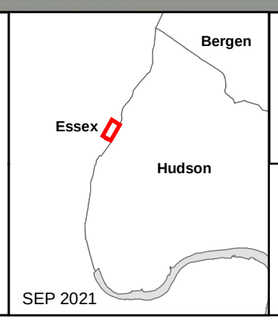
0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 13B_Deep Organics-Tetrachloroethylene.mxd

Study Area
Parcel (Newark, Oct 2017)
Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
Benzo(a)anthracene: 0.1

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 13C
Site-Wide Deep Groundwater
Remediation Goal Exceedances for Organics
Benzo(a)anthracene
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

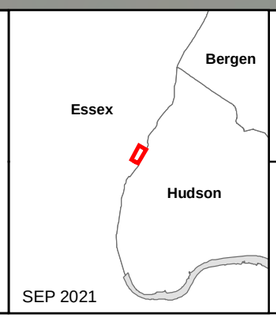
C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 13D_Deep Organics-Benz[a]anthracene.mxd

Study Area
Parcel (Newark, Oct 2017)

Monitoring Well
Non-Detect
Detection Below RG
Detection Exceeds RG
RG Exceedance (Non-detect reported at detection limit)

Remediation Goal (µg/L)
1,4-Dioxane: 0.4

2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us



SEP 2021

Figure 13D
Site-Wide Deep Groundwater
Remediation Goal Exceedances for Organics
1,4-Dioxane
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 13E_Deep Organics-Dioxane, 1,4-.mxd

Monitoring Well | Site Boundary | Vacant Building

RI Soil Boring | Site Lot | UST

Air Monitoring or Engineering Control (Existing Occupied Building)

Institutional Controls and Site-Wide Engineering Controls for Future Buildings

Shallow groundwater monitoring well with potential vapor intrusion. Existing or future buildings within 100-foot radius from monitoring well will warrant further investigation.

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS",
http://data.ci.newark.nj.us

SEP 2021

Figure 14
Soil Gas Remedy
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 14 - Soil Gas Remedy.mxd

RI Soil Boring | Site Boundary | Site Lot | UST

Institutional Controls

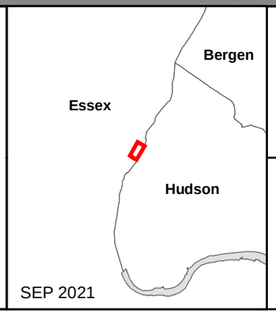
Footprint of Lead-Impacted Soil Excavation and Removal

Footprint of UST and NAPL-Impacted Soil Excavation and Removal

Footprint of the Engineering Control (Cap)

Footprint of Bulkhead Repair and/or Replacement

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

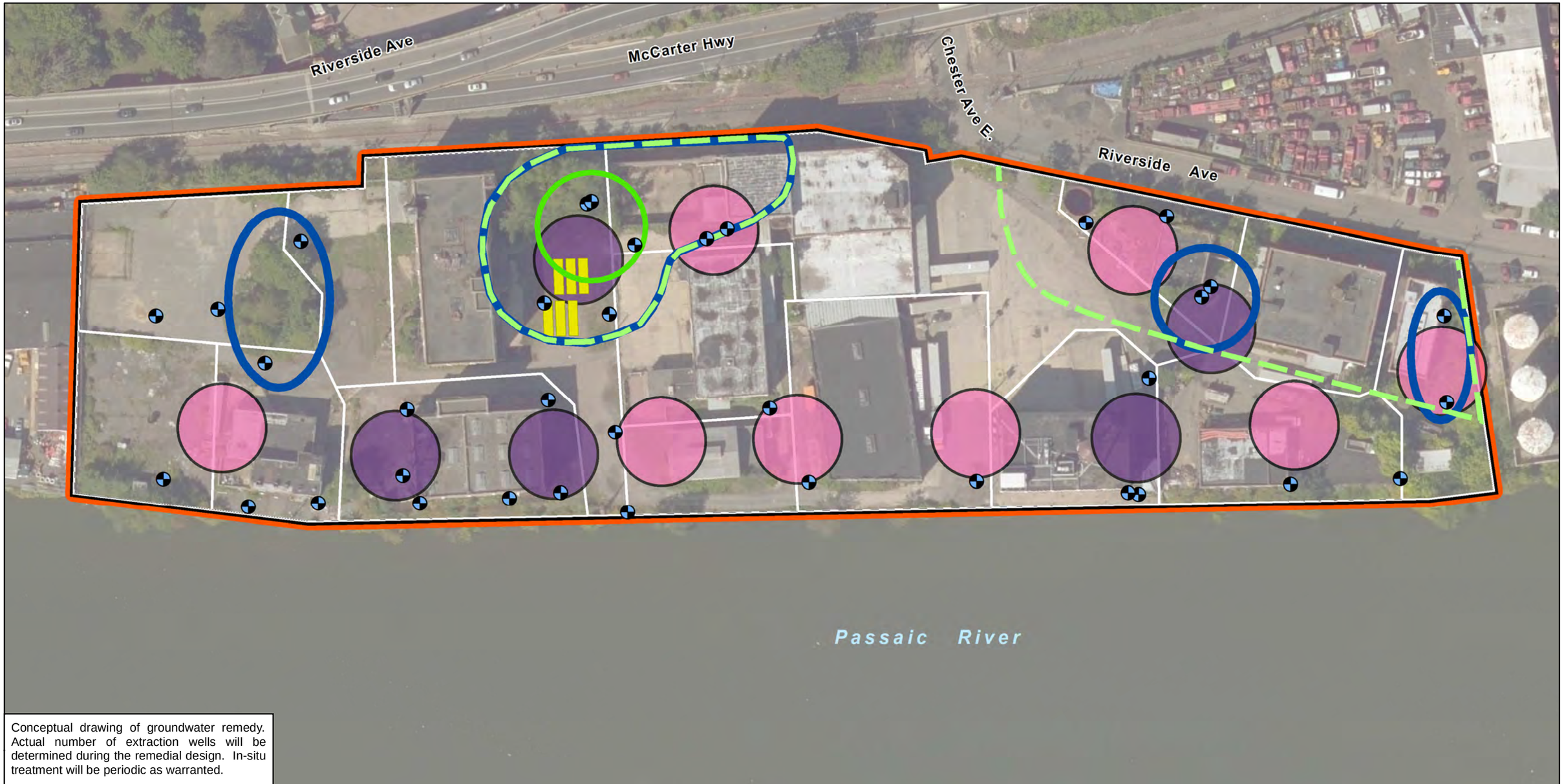


SEP 2021

Figure 15
Soil/Fill Remedy
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 15 - Soil Remedy.mxd



Conceptual drawing of groundwater remedy. Actual number of extraction wells will be determined during the remedial design. In-situ treatment will be periodic as warranted.

Monitoring Well | Site Boundary | Site Lot | UST

Extraction Well
- Shallow
- Deep

In-Situ Treatment
- Metals (Shallow)
- Organic (Shallow)
- Organic (Deep)

Institutional Controls

Sources:
2020 "ArcGIS Map Service, Bing Aerial Photography"
2020 "PPG/Woodard & Curran Riverside Industrial Park RI Report"
2017 "City of Newark Parcel GIS", http://data.ci.newark.nj.us

SEP 2021

Figure 16
Groundwater Remedy
Riverside Industrial Park Superfund Site
Essex County, New Jersey

0 50 100 Feet

C:\Work\Passaic\MapDocuments\0024_RiversideIndustrial\ROD\Figure 16 - Groundwater Remedy.mxd

APPENDIX II

TABLES

TABLE 1
SOIL SAMPLE RESULTS (WITH RESPECT TO SOIL GAS)

Sample Location	Naphthalene	Trichloroethylene	Xylene, m,p	Xylene, o-
Units	mg/kg	mg/kg	mg/kg	mg/kg
Remediation Goal	0.62	0.02	6.5	6.5
B-100(11-13)_121418	0.44	0	0	0
B-100(2.2-3.2)_121418	0.061	0	0.12	0.01
B-100(3.2-4.2)_121418	0.031	0	0.0024	0.0013
B-101(0-1)_121418	0.029	0	0.06	0.035
B-101(11-13)_121418	0	0	0	0
B-101(5-6)_121418	0.33	0	0	0
B-102(0-1)_121418	0	0	0.0021	0.00094
B-102(1-2.9)_121418	0	0	0	0
B-103(0-1)_121418	0.071	0	0	0
B-103(5-7)_121418	0	0	0	0
B-104(0-1)_121418	0.014	0	0.00092	0
B-104(7-8.7)_121418	0.0028	0	0	0
B-105(0.7-1.7)_121518	0.021	0.0093	0	0
B-105(1.7-3.2)_121518	0	0	0	0
B-12(0-1)_101317	0.15	0	23	2.1
B-12(1-3)_101317	0.097	0	23	1.8
B-13(0-1)_101117	0	0.04	0.12	0.054
B-13(1-3)_101117	0.33	0	95	29
B-14(0-1)_101717	0.051	0	0	0
B-14(7-7.5)_101717	0	0	0	0
B-15(0.25-1.25)_101717	0	0	0	0
B-15(5-6)_101717	0	0	0	0
B-16(0-1)_101217	0.29	2	10	1.1
B-16(7-7.75)_101217	2.1	0	1.5	0.72
B-17(0.25-1.25)_101717	0	0	0	0
B-17(5-6.5)_101717	0	0	0	0
B-18(0-1)_101217	0	0	0	0
B-18(5-6)_101217	0	0	0	0
B-19(0-1)_101117	0	0.035	0	0
B-19(2-4)_101117	0	0	0	0
B-20(3.5-4)_101817	0	0	0	0
B-20(5-6)_101817	0	0.012	0	0
B-22(0-1)_100617	0.088	0	0	0
B-22(1-3)_100617	0	0	0	0
B-23(0-1)_100517	0	0.0068	0	0
B-23(1-3)_100517	0	0.7	0	0
B-24(0.5-1.5)_100517	0.044	0	0	0
B-24(1.5-3.5)_100517	0.79	0	0.0078	0
B-25(0.5-1.5)_100517	0	0	0	0
B-25(5-5.5)_100517	0	0	0	0
B-26(0.5-1.5)_100517	0	0.21	0.0097	0
B-26(5-5.8)_100517	0.12	1.6	0.67	0
B-27(0.5-1.5)_100517	0.049	0	0.0076	0
B-27(5-5.5)_100517	0.091	0	0	0
B-28(0.5-1.5)_100917	0	0	0	0
B-28(1.5-2.75)_100917	0.11	0	0	0
B-29(0-1)_092917	0.058	0	0	0
B-29(1-3)_092917	0.059	0	0.0091	0
B-3(1-2)_102517	5.3	0	2.8	0.55
B-3(2-3)_102517	0.58	0	0.038	0.018
B-30(0-1)_100417	0.3	0	0	0
B-30(3-3.8)_100417	0.4	0	0.022	0
B-31(1-2)_101817	0.28	0	0	0
B-31(5-5.5)_101817	0.33	0	0.012	0
B-32(1-2)_100417	0.094	0	0	0
B-32(2-4)_100417	0.34	0	0	0
B-33(0.5-1.5)_100417	0.063	0.037	0.13	0
B-33(3.5-4.5)_100417	0.085	0	0.0064	0.0086
B-34(0-1)_100617	0.3	0	8	0.96
B-34(5-5.5)_100617	1.1	0	87	5.7
B-35(1-2)_100417	0.19	0.036	4.5	0.26
B-35(2-3.8)_100417	2.5	0	50	4.7
B-36(0-1)_100417	0.2	0	0	0
B-36(3-3.7)_100417	0.65	0	0	0
B-37(0-1)_100417	0	0	0.017	0.0073
B-37(1-3)_100417	0	0	0	0

TABLE 1
SOIL SAMPLE RESULTS (WITH RESPECT TO SOIL GAS)

Sample Location	Naphthalene	Trichloroethylene	Xylene, m,p	Xylene, o-
Units	mg/kg	mg/kg	mg/kg	mg/kg
Remediation Goal	0.62	0.02	6.5	6.5
B-38(0-1)_100917	0	0	1.1	0
B-38(1-3)_100917	0	0	0.01	0
B-38(FILL)_100917	0.22	0	0	0
B-39(0.5-1.5)_100317	0	0	0	0
B-39(5-7)_100317	0	0.0076	0	0
B-4(0-1)_100617	0	0	0	0
B-4(1-3)_100617	0.24	0	0.015	0
B-40(0-1)_092617	0	0	0	0
B-40(5-7)_092717	0	0	0	0
B-41(0-1)_092617	0	0	0	0
B-41(5-7)_092717	0	0	0	0
B-42(0.3-1.3)_100217	0	0	0	0
B-42(7-9)_100217	0.054	0	0	0
B-43(0-1)_092617	0.061	0	0	0
B-43(5-7)_092617	0.73	0	0.0042	0
B-44(0-1)_100217	0	0	0	0
B-44(5-5.5)_100217	1.5	0	1.1	0.53
B-5(0.5-1.5)_101317	0	0	0	0
B-5(5-6.5)_101317	0	0	0	0
B-51(1-2)_092817	0.26	0	0	0
B-51(5-7)_092817	0.24	0.028	0.015	0.007
B-52(0-1)_102317	0.53	0	9.2	1.3
B-52(1-3)_102317	0.13	0	0	0
B-53(0-1)_092817	0.049	0	0	0
B-53(1-3)_092817	3.9	0	0	0
B-54(1-2)_092817	3.3	0	0	0
B-54(7-8)_092817	0	0	0	0
B-55(0.5-1.5)_100317	0	0.012	0	0
B-55(3.5-5)_100317	0.12	0	0	0
B-56(1-2)_092717	0.16	0.038	0.0082	0
B-56(2-4)_092717	0	5.4	3.9	0.74
B-57(1-2)_100317	0	0	0	0
B-57(2-4)_100317	0	0	0	0
B-58(1-2)_092717	0.3	0	66	13
B-58(6-8)_092717	0	0	0	0
B-59(12-13.5)_100317	0	0	0	0
B-59(5-7)_100317	0	0	0	0
B-59(FILL)_100317	0	0	0	0
B-6(3.5-4.5)_101717	0	0	0	0
B-6(5-5.5)_101717	7.4	0	0	0
B-60(0-1)_092617	0.058	0	0	0
B-60(5-7)_092617	0.044	0	0	0
B-60(FILL)_092617	0.14	0	0	0
B-61(0-1)_101117	0.077	0	0	0
B-61(5-6)_101117	0	0	0	0
B-62(0-1)_101117	0	0	0	0
B-62(5-5.5)_101117	0.14	0	0	0
B-63(0-1)_101117	0	0	0.0074	0
B-63(1-3)_101117	0.64	0	0	0
B-64(1.5-2.5)_101117	0	0	0	0
B-64(2.5-4.5)_101117	0	0	0	0
B-65(0.5-1.5)_101317	0	0.02	0.43	0.14
B-65(1.5-2.7)_101317	0	0	0	0
B-66(1.5-2.5)_101017	0	0.037	0	0
B-66(2.5-4.5)_101017	0.048	0	0.025	0.0061
B-67(1.5-2.5)_101017	0	0.026	0	0
B-67(2.5-3.8)_101017	5.4	0	12	0.94
B-68(1-2)_102417	0	0.024	0	0
B-69(0-1)_092717	0	0	0	0
B-69(1-3)_092717	0.053	0	0.0025	0
B-7(0.5-1.5)_101017	0	0	2.9	0.56
B-7(5-6)_101017	0	0	0.0067	0
B-70(0-1)_092717	0	0	0	0
B-70(5-7)_092717	0	0	0.0068	0.0026
B-71(3-5)_101617	0	0	0	0
B-74(0-1)_100417	0	0	0.0099	0.0052
B-74(3-4)_100417	0	0	15	1.6

TABLE 1
SOIL SAMPLE RESULTS (WITH RESPECT TO SOIL GAS)

Sample Location	Naphthalene	Trichloroethylene	Xylene, m,p	Xylene, o-
Units	mg/kg	mg/kg	mg/kg	mg/kg
Remediation Goal	0.62	0.02	6.5	6.5
B-75(0-1)_092917	0	0	0	0
B-75(1-3)_092917	0	0	0	0
B-76(0-1)_102317	0.068	0	0	0
B-76(1-3)_102317	0	0	0	0
B-77(0-1)_092817	0	0	0	0
B-77(1-3)_092817	0	0	0	0
B-78(0.5-1.5)_102517	0	0	0	0
B-78(5-7)_102517	0.32	0	0	0
B-79(1-2)_102617	0.27	0	1.3	0.04
B-79(5-6)_102617	0	0	0.13	0
B-8(1.5-2.5)_101017	0	0	0	0
B-8(5-6.25)_101017	0	0	0	0
B-80(0.3-1.3)_121218	0.093	10	0.69	0
B-80(1.3-3.3)_121218	0.095	0.0028	0.00054	0
B-81(0.3-1.3)_121218	0.078	0	2	0.61
B-81(5-7)_121218	0.24	0	0	0
B-82(11-13)_121118	0.0013	0	0	0
B-82(1-2)_121118	0.039	0.88	0	0
B-82(5-7)_121118	0.0066	0	0	0
B-83(0.3-1.3)_121118	0.23	0.11	1.5	0.39
B-83(1.3-3.3)_121118	0.12	0	0.0093	0
B-84(11-13)_121218	0.04	0	0	0
B-84(1-2)_121218	0.011	0	0	0
B-84(2-4)_121218	0.22	0	0	0
B-85(0-0.5)_121218	0.0092	0	0	0
B-85(2.5-3.5)_121218	0.27	0	0	0
B-86(0.3-1.3)_121118	1.1	0	0	0
B-86(1.3-3.3)_121118	0.35	0	0	0
B-87(0-1)_121318	0.17	0.0018	0.005	0.0021
B-87(1-3)_121318	0.14	0.0063	0.0017	0.0011
B-88(0-1)_121318	0.19	0.0011	0.029	0.0092
B-88(11-13)_121318	0.064	0	0	0
B-88(1-3)_121318	0.11	0	0.18	0
B-89(0-1)_121318	0.011	0.00073	0.0014	0
B-89(1-3)_121318	0.41	0	0	0
B-9(0-1)_101617	0.49	0	0	0
B-9(5-6)_101617	0	0	0.017	0
B-90(0-1)_121218	0.017	0	0	0
B-90(11-13)_121218	0.069	0	0.48	0
B-90(1-2.2)_121218	0.039	0	0.0051	0
B-91(0-1)_121518	0.058	0	0.00066	0
B-91(11-13)_121518	0.019	0	0.0011	0
B-91(1-3)_121518	0.27	0.0012	0.0018	0.0011
B-92(0-1)_121218	0.019	0	0.0012	0
B-92(1-2.5)_121218	0.044	0.0023	0	0
B-93(1-2)_121518	68	NR	NR	NR
B-93(2-3)_121518	53	0	0	0
B-94(0-1)_121318	0	0	0	0
B-94(1-3)_121318	0.11	0	5.1	1.4
B-95(0-1)_121318	0.048	0	0.025	0.0096
B-95(11-13)_121318	0.0022	0	0	0
B-95(1-2.8)_121318	0.011	0	0.01	0.0018
B-96(1-2)_121518	0	0	0	0
B-96(2-3.5)_121518	0	0	0	0
B-97(11-13)_121518	0	0	0.0024	0
B-97(1-2)_121518	0.0093	0	0.0046	0.0014
B-97(2-3.8)_121518	0	0	0	0
B-98(0-1)_121418	0.14	0	0	0
B-98(1-2.9)_121418	0.17	0	0	0
B-99(0-1)_121518	0.031	0	0.01	0
B-99(11-13)_121518	0	0	0	0
B-99(1-2.9)_121518	0	0	0	0

Notes:
NR = Not reportable
Detected result exceeds RG

TABLE 2
SOIL SAMPLE RESULTS

Sample Location	Lead	Copper	Arsenic	Benzene	Trichloroethylene	Benzo(a)pyrene	Benzo(a)anthracene	Benzo(b)fluoranthene	Dibenzo(a,h)anthracene	Total PCBs
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Remediation Goal	800	526	19	16	0.02	2.3	23	23	2.3	1.1
B-100(11-13)_121418	189	72.8	7.1	0	0	3.5	6.8	6.2	1.3	0
B-100(2.2-3.2)_121418	598	107	4.3	0.027	0	0.059	0.093	0.13	0.032	2
B-100(3.2-4.2)_121418	486	166	4.8	0	0	0.16	0.19	0.21	0.047	0.65
B-101(0-1)_121418	849	363	4.9	0.0013	0	0.087	0.097	0.062	0.012	0.0077
B-101(11-13)_121418	6.4	15	0.62	0	0	0.0013	0.0012	0.001	0	0
B-101(5-6)_121418	52.7	26.8	2.3	0	0	0.036	0.027	0.027	0.0076	0.0053
B-102(0-1)_121418	264	69.9	5.6	0	0	0.23	0.26	0.31	0.061	0.29
B-102(1-2.9)_121418	174	120	4.2	0	0	0.29	0.33	0.4	0.065	0.0066
B-103(0-1)_121418	372	69.8	4	0	0	0.84	1.1	1.2	0.2	0.43
B-103(5-7)_121418	2.6	3	0.65	0	0	0	0	0	0	0
B-104(0-1)_121418	153	61.3	4.8	0	0	0.35	0.41	0.53	0.076	0.46
B-104(7-8.7)_121418	2.4	3.6	0.46	0	0	0	0	0.00039	0	0
B-105(0.7-1.7)_121518	97.9	18.8	10.7	0	0.0093	4	3.9	4.4	1	0
B-105(1.7-3.2)_121518	31.2	28.2	3	0	0	0.94	0.91	1.4	0.27	0.0037
B-12(0-1)_101317	2000	188	15.3	0	0	0.33	0.31	0.49	0.046	0.029
B-12(1-3)_101317	578	134	13.5	0	0	0.27	0.24	0.42	0.04	0.026
B-13(0-1)_101117	171	34.1	3.9	0	0.04	0.26	0.3	0.39	0.051	0
B-13(1-3)_101117	1390	127	10.1	0	0	0.28	0.41	0.62	0.092	0
B-14(0-1)_101717	33.9	78.8	2	0	0	0.65	0.72	0.88	0.094	0
B-14(7-7.5)_101717	1.9	8.1	0.74	0	0	0	0	0	0	0
B-15(0.25-1.25)_101717	545	47.3	10	0	0	0.028	0.028	0.1	0.021	0.21
B-15(5-6)_101717	310	35	6.3	0	0	0.0093	0.013	0.011	0	0
B-16(0-1)_101217	435	422	6.1	0	2	0.076	0.068	0.13	0.021	0
B-16(7-7.75)_101217	1.4	4.2	0	0	0	0.047	0.074	0.04	0.01	0
B-17(0.25-1.25)_101717	222	85.6	2.7	0	0	0	0.07	0.11	0	0.15
B-17(5-6.5)_101717	72.6	40.2	3.8	0	0	0.4	0.37	0.52	0.076	0
B-18(0-1)_101217	302	55.2	4	0	0	0.52	0.53	1.1	0.11	0
B-18(5-6)_101217	156	61.2	2.4	0	0	0.91	1	1.1	0.14	0
B-19(0-1)_101117	622	170	15.2	0	0.035	0.41	0.37	0.61	0.057	0
B-19(2-4)_101117	1190	58.7	6.9	0	0	0.084	0.094	0.13	0.017	0.19
B-20(3.5-4)_101817	294	71.5	6.8	0	0	0.052	0.075	0.065	0.0081	0
B-20(5-6)_101817	88.7	42.3	3.5	0	0.012	0.0079	0.012	0.0099	0	0
B-22(0-1)_100617	482	53	7.1	0	0	0.31	0.26	0.45	0.089	0.12
B-22(1-3)_100617	122	29.2	3.2	0	0	0.33	0.28	0.43	0.074	0
B-23(0-1)_100517	243	60.5	5.7	0	0.0068	0.36	0.34	0.54	0.085	0.075
B-23(1-3)_100517	350	63.3	7.7	0	0.7	0.21	0.18	0.27	0.041	0
B-24(0.5-1.5)_100517	205	68.8	10.8	0	0	0.82	0.79	1.2	0.18	0.1
B-24(1.5-3.5)_100517	420	32.5	56.8	0	0	3.8	4.6	5.1	0.77	0
B-25(0.5-1.5)_100517	32.4	40.4	2.8	0	0	3.8	3.6	4.8	0.71	0.1
B-25(5-5.5)_100517	427	89.2	4.4	0	0	0.089	0.094	0.13	0.018	0.099
B-26(0.5-1.5)_100517	1510	222	10.1	0	0.21	0.027	0.031	0.06	0.012	0.02
B-26(5-5.8)_100517	831	115	9.3	0.016	1.6	0.22	0.27	0.32	0.048	0.015
B-27(0.5-1.5)_100517	421	59.5	6	0.0081	0	0.16	0.17	0.23	0.03	0.021
B-27(5-5.5)_100517	213	130	5.5	0	0	0.14	0.16	0.19	0.025	0.015
B-28(0.5-1.5)_100917	375	101	3.5	0	0	4.1	4.3	5.9	0.91	0.059
B-28(1.5-2.75)_100917	643	137	10.5	0	0	2.3	3.2	3.2	0.51	0.164
B-29(0-1)_092917	802	137	4.5	0	0	4.6	5	6.3	0.81	0.189
B-29(1-3)_092917	851	150	5.2	0.005	0	2.4	2.7	3.6	0.39	0.157
B-3(1-2)_102517	620	60.5	5.3	2	0	0.53	1.1	1.8	0.2	0
B-3(2-3)_102517	9.9	23	2.5	0	0	0.0051	0.0087	0.0091	0	0
B-30(0-1)_100417	3700	316	19.9	0	0	3.5	3	4.8	0.82	0.19
B-30(3-3.8)_100417	6210	337	26.1	0	0	0.41	0.37	0.58	0.11	0.029
B-31(1-2)_101817	3880	151	35.6	0.024	0	0.45	0.51	0.64	0.058	0
B-31(5-5.5)_101817	3980	203	31.4	0.0066	0	4	5.5	5.8	0.67	0
B-32(1-2)_100417	1690	109	24.9	0	0	0.91	0.75	1.3	0.19	0.068
B-32(2-4)_100417	4540	132	36.5	0	0	2.2	1.4	2.6	0.4	0
B-33(0.5-1.5)_100417	911	1040	4.5	0	0.037	0.34	0.35	0.47	0.088	0.23
B-33(3.5-4.5)_100417	1210	117	11.7	0.006	0	0.42	0.41	0.58	0.094	0
B-34(0-1)_100617	287	63	4.7	0.17	0	0.32	0.29	0.42	0.068	0.045
B-34(5-5.5)_100617	311	54.1	4.8	0	0	0.24	0.24	0.28	0.048	0

TABLE 2
SOIL SAMPLE RESULTS

Sample Location	Lead	Copper	Arsenic	Benzene	Trichloroethylene	Benzo(a)pyrene	Benzo(a)anthracene	Benzo(b)fluoranthene	Dibenzo(a,h)anthracene	Total PCBs
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Remediation Goal	800	526	19	16	0.02	2.3	23	23	2.3	1.1
B-35(1-2)_100417	218	34.3	8.5	16	0.036	0.092	0.084	0.13	0.021	0.011
B-35(2-3.8)_100417	504	240	20.9	7.9	0	0.12	0.18	0.13	0.022	0.36
B-36(0-1)_100417	182	67.6	3	0	0	0.27	0.25	0.4	0.056	0.16
B-36(3-3.7)_100417	157	85.4	8	0	0	0.0029	0.0044	0.0054	0	0.018
B-37(0-1)_100417	92.5	42	1.8	0.0084	0	0.82	0.72	1.1	0.18	0.13
B-37(1-3)_100417	71.9	39.4	1.9	0	0	0.89	0.95	1.2	0.16	0.045
B-38(0-1)_100917	794	46.6	3.6	0	0	0.66	0.72	0.85	0.11	0.42
B-38(1-3)_100917	18.1	19.2	2.4	0	0	0.0038	0.008	0.0063	0	0
B-38(FILL)_100917	828	121	8.7	0	0	4.3	4.8	5.8	0.91	3.7
B-39(0.5-1.5)_100317	317	132	8.3	0	0	0.23	0.26	0.27	0.038	0.154
B-39(5-7)_100317	216	133	5.8	0	0.0076	0.026	0.023	0.031	0	0.037
B-4(0-1)_100617	650	238	7.3	0	0	2.1	2.3	2.8	0.44	0
B-4(1-3)_100617	1070	92.1	12.6	0.0048	0	3.1	3.2	4.2	0.72	0.051
B-40(0-1)_092617	295	104	3.1	0	0	0.33	0.57	0.93	0.14	3.1
B-40(5-7)_092717	270	68.6	7.5	0	0	0.055	0.06	0.089	0.011	0.036
B-41(0-1)_092617	829	134	7.2	0	0	2.4	2.6	3.3	0.5	1.4
B-41(5-7)_092717	240	19.8	2.2	0	0	0.059	0.07	0.083	0.0098	0
B-42(0.3-1.3)_100217	314	46.6	4.1	0	0	0.14	0.11	0.39	0.06	0.194
B-42(7-9)_100217	585	255	11.5	0	0	1.6	1.9	2	0.31	0
B-43(0-1)_092617	895	70.5	2.8	0	0	0.075	0.096	0.11	0.017	0.046
B-43(5-7)_092617	445	97.6	10	0	0	1.2	1.3	1.6	0.27	0.145
B-44(0-1)_100217	174	48.4	3.8	0	0	0.53	0.51	0.7	0.095	0
B-44(5-5.5)_100217	323	88.8	5.3	0.0079	0	2.2	2.6	2.8	0.42	0.21
B-5(0.5-1.5)_101317	254	55.6	4.8	0	0	0.062	0.076	0.089	0.0093	0
B-5(5-6.5)_101317	77.7	30.3	2.2	0	0	0.0088	0.012	0.012	0	0
B-51(1-2)_092817	159	61.3	4.5	0	0	0.21	0.27	0.31	0.079	0.153
B-51(5-7)_092817	215	28	2.8	0	0.028	0.37	0.46	0.47	0.086	0
B-52(0-1)_102317	528	174	5	0	0	0.54	0.58	0.77	0.069	5
B-52(1-3)_102317	813	201	15.1	0	0	0.68	0.74	0.9	0.078	0.44
B-53(0-1)_092817	297	426	7.3	0	0	2.6	2.8	3.6	0.53	0.193
B-53(1-3)_092817	803	118	16.5	0	0	13	16	17	2.2	0
B-54(1-2)_092817	484	112	10.2	0	0	13	16	16	2	0
B-54(7-8)_092817	471	215	19.8	0	0	0.66	0.86	0.87	0.13	0
B-55(0.5-1.5)_100317	241	132	10.9	0	0.012	2.1	2.3	2.5	0.42	0.024
B-55(3.5-5)_100317	450	111	10.8	0	0	0.75	0.78	1	0.14	0
B-56(1-2)_092717	384	116	6.8	0	0.038	0.37	0.36	0.52	0.1	0.183
B-56(2-4)_092717	838	254	13.4	0	5.4	0.054	0.067	0.077	0.0098	0.1
B-57(1-2)_100317	1060	168	15.9	0	0	1.2	1.2	1.5	0.24	0.01
B-57(2-4)_100317	798	590	17.2	0	0	0.035	0.03	0.053	0	0
B-58(1-2)_092717	753	543	26	0.18	0	0.17	0.19	0.29	0.037	0
B-58(6-8)_092717	50.7	469	3.9	0	0	0	0.0011	0	0	0
B-59(12-13.5)_100317	34.9	25.2	1.9	0	0	0.026	0.045	0.031	0	0
B-59(5-7)_100317	1770	152	12.5	0	0	0.47	0.44	0.6	0.13	0.027
B-59(FILL)_100317	288	74.4	6	0	0	0.11	0.12	0.17	0.026	0.13
B-6(3.5-4.5)_101717	298	72.2	2	0	0	0.0094	0.013	0.015	0	0
B-6(5-5.5)_101717	255	39.7	2.7	0	0	12	15	14	1.7	0
B-60(0-1)_092617	299	58.7	5.2	0	0	0.66	0.83	0.83	0.13	0
B-60(5-7)_092617	1180	278	7.5	0	0	0.3	0.33	0.42	0.074	0.024
B-60(FILL)_092617	2550	145	19.8	0	0	1.3	1.4	1.7	0.28	0
B-61(0-1)_101117	333	47.9	5.4	0	0	0.12	0.15	0.2	0.02	0.77
B-61(5-6)_101117	43.7	13.4	2.2	0	0	0.56	0.6	0.82	0.065	0
B-62(0-1)_101117	215	55.3	3.2	0	0	0.57	0.58	0.8	0.065	0.22
B-62(5-5.5)_101117	143	41.4	3.8	0	0	0.11	0.14	0.21	0.019	0
B-63(0-1)_101117	440	83.2	3.2	0	0	1.1	1	1.6	0.2	0.11
B-63(1-3)_101117	126	31.6	2.6	0	0	7.3	8.9	9.7	1.2	0.11
B-64(1.5-2.5)_101117	1080	84.5	8.2	0	0	0.54	0.56	0.74	0.08	0.3
B-64(2.5-4.5)_101117	823	88	5.7	0	0	0.2	0.13	0.31	0.036	0.19
B-65(0.5-1.5)_101317	141	76	4.4	0	0.02	0.077	0.071	0.14	0.017	0
B-65(1.5-2.7)_101317	3540	66.6	5.7	0	0	0.15	0.12	0.22	0.026	2.2
B-66(1.5-2.5)_101017	391	74.4	3.2	0	0.037	0.6	0.44	0.8	0.099	0.086
B-66(2.5-4.5)_101017	841	70	8.4	0.0096	0	0.56	0.5	0.76	0.1	0.059

TABLE 2
SOIL SAMPLE RESULTS

Sample Location	Lead	Copper	Arsenic	Benzene	Trichloroethylene	Benzo(a)pyrene	Benzo(a)anthracene	Benzo(b)fluoranthene	Dibenzo(a,h)anthracene	Total PCBs
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Remediation Goal	800	526	19	16	0.02	2.3	23	23	2.3	1.1
B-67(1.5-2.5)_101017	48.8	47.8	1.4	0	0.026	0.23	0.25	0.32	0.044	0.067
B-67(2.5-3.8)_101017	2880	101	5.3	0.13	0	0.32	0.46	0.55	0.048	10
B-68(1-2)_102417	422	60.5	4.3	0	0.024	0.034	0.045	0.045	0	0
B-69(0-1)_092717	153	56.3	2.7	0	0	0.2	0.21	0.28	0.04	0.04
B-69(1-3)_092717	167	58	3	0	0	0.23	0.25	0.35	0.056	0.56
B-7(0.5-1.5)_101017	273	34.1	3.7	0.36	0	0.084	0.084	0.12	0.019	0.088
B-7(5-6)_101017	24.1	30.7	4.6	0.01	0	0.022	0.022	0.022	0	0
B-70(0-1)_092717	210	80.4	2.4	0	0	0.1	0.12	0.16	0.025	0.157
B-70(5-7)_092717	3020	223	23	0.038	0	1.6	2	2.3	0.3	0
B-71(3-5)_101617	48.7	19.1	3.8	0	0	0.28	0.4	0.38	0.024	0
B-74(0-1)_100417	123	82.1	1.3	0	0	0.5	0.46	0.71	0.12	0.26
B-74(3-4)_100417	3080	102	10.2	68	0	0.035	0.025	0.05	0	0
B-75(0-1)_092917	76.3	70.1	1.1	0	0	0.12	0.12	0.18	0.03	0.093
B-75(1-3)_092917	8690	162	7.1	0	0	0	0	0	0	0.015
B-76(0-1)_102317	662	225	7.7	0	0	1.8	2.1	2.4	0.23	0
B-76(1-3)_102317	358	132	4.1	0	0	0.37	0.32	0.47	0.077	0
B-77(0-1)_092817	152	57.2	4.2	0	0	1.6	2	2	0.26	0.019
B-77(1-3)_092817	424	105	7.6	0	0	0.33	0.39	0.43	0.054	0
B-78(0.5-1.5)_102517	166	65.4	3.7	0	0	0.44	0.52	0.6	0.056	0
B-78(5-7)_102517	470	102	10.1	0	0	1.5	1.7	1.9	0.2	0
B-79(1-2)_102617	405	42	4.6	0	0	0	0.04	0.034	0	0
B-79(5-6)_102617	33.1	18.9	1.9	0	0	0	0.026	0.022	0	0.029
B-8(1.5-2.5)_101017	71.6	62.8	2.6	0	0	0.43	0.5	0.62	0.076	0.184
B-8(5-6.25)_101017	40.8	26.6	1.6	0	0	0.11	0.11	0.15	0.02	0.041
B-80(0.3-1.3)_121218	353	72.6	5.1	0.47	10	0.81	1	1.1	0.28	0.22
B-80(1.3-3.3)_121218	709	317	12.1	0	0.0028	0.65	0.46	0.85	0.17	0.011
B-81(0.3-1.3)_121218	103	37.2	1.5	0	0	0.36	0.39	0.36	0.094	0.81
B-81(5-7)_121218	180	60.4	3.2	0	0	1.5	2.3	2.4	0.63	0.091
B-82(11-13)_121118	17.5	13.8	3.8	0	0	0.0039	0	0	0.00055	0
B-82(1-2)_121118	137	27.3	16.1	0	0.88	0.92	1.2	1.1	0.22	0.15
B-82(5-7)_121118	450	259	9.7	0	0	0.061	0.063	0.086	0.023	0.013
B-83(0.3-1.3)_121118	798	70.3	5.6	0	0.11	1.1	1.4	1.2	0.28	0.17
B-83(1.3-3.3)_121118	414	85.4	9.3	0.092	0	1.1	0.71	1.3	0.28	0.21
B-84(11-13)_121218	236	190	10.5	0	0	0.75	0.83	0.6	0.13	0
B-84(1-2)_121218	46.2	29.8	1.7	0	0	0.22	0.24	0.24	0.058	0.0073
B-84(2-4)_121218	29.7	20.4	2	0	0	1.7	2.5	2.4	0.71	0
B-85(0-0.5)_121218	905	66.4	2.7	0	0	0.22	0.22	0.28	0.098	0.11
B-85(2.5-3.5)_121218	668	153	14.6	0	0	28	34	29	5	0
B-86(0.3-1.3)_121118	400	65.3	4.5	0	0	5.3	7.5	5.4	1.3	0.036
B-86(1.3-3.3)_121118	1190	158	8.3	0	0	6	7.9	7	1.6	0
B-87(0-1)_121318	2370	154	18.9	0.0036	0.0018	0.74	0.77	0.69	0.15	0.018
B-87(1-3)_121318	3910	245	34.8	0.0036	0.0063	0.35	0.44	0.38	0.095	0.082
B-88(0-1)_121318	472	127	5.2	0.0019	0.0011	0.78	0.7	1	0.22	0.28
B-88(11-13)_121318	122	80.7	8.7	0.0033	0	0.58	0.59	0.55	0.079	0
B-88(1-3)_121318	200	182	7.1	0.27	0	0.13	0.19	0.39	0.06	0.016
B-89(0-1)_121318	168	64.5	4.5	0.0018	0.00073	0.34	0.36	0.42	0.1	0.15
B-89(1-3)_121318	220	78.9	5.4	0.12	0	0.072	0.062	0.099	0.034	0.072
B-9(0-1)_101617	571	55.9	3.8	0	0	4.4	4.8	5.9	0.8	3.5
B-9(5-6)_101617	925	41.5	6.4	0	0	0.96	1	1.1	0.11	0.27
B-90(0-1)_121218	373	35.9	2.9	0	0	0.65	0.71	0.65	0.28	0.075
B-90(11-13)_121218	280	88.5	7.9	0	0	0.17	0.17	0.14	0.036	0
B-90(1-2.2)_121218	1170	41.2	4.5	0	0	0.32	0.4	0.37	0.17	0.071
B-91(0-1)_121518	439	62.8	4	0	0	1.4	1.4	1.3	0.33	1.4
B-91(11-13)_121518	18.6	18.5	2.1	0.0017	0	0.078	0.077	0.077	0.015	0
B-91(1-3)_121518	148	62.6	2.8	0.0006	0.0012	4.2	5.1	4.3	1.1	0.53
B-92(0-1)_121218	173	65	2.8	0.016	0	0.51	0.42	0.45	0.14	0.45
B-92(1-2.5)_121218	441	93.9	6.1	0	0.0023	0.88	1.2	1.2	0.31	0.47
B-93(1-2)_121518	683	111	7.1	NR	NR	0.49	0.55	0.58	0.29	0.074
B-93(2-3)_121518	272	109	9.3	0	0	0.5	0.64	0.65	0.24	0.089
B-94(0-1)_121318	97.1	55.7	2.2	0	0	0.84	0.84	1.2	0.2	0.11
B-94(1-3)_121318	850	215	10.8	0.41	0	0.27	0.26	0.32	0.075	0.22

TABLE 2
SOIL SAMPLE RESULTS

Sample Location	**Lead**	**Copper**	**Arsenic**	**Benzene**	**Trichloroethylene**	**Benzo(a)pyrene**	**Benzo(a)anthracene**	**Benzo(b)fluoranthene**	**Dibenzo(a,h)anthracene**	**Total PCBs**
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Remediation Goal	800	526	19	16	0.02	2.3	23	23	2.3	1.1
B-95(0-1)_121318	38.3	118	1.4	0.004	0	0.3	0.25	0.31	0.085	0.018
B-95(11-13)_121318	20.4	31	3.8	0	0	0.054	0.061	0.048	0.011	0
B-95(1-2.8)_121318	117	48.6	2.5	0.0036	0	0.44	0.55	0.57	0.11	0.014
B-96(1-2)_121518	197	38.2	4.5	0	0	0.16	0.2	0.2	0.037	0.0033
B-96(2-3.5)_121518	13.5	26.3	1.5	0	0	0.0088	0.0051	0.0048	0.00093	0
B-97(11-13)_121518	4.4	11	1.1	0	0	0	0	0	0	0
B-97(1-2)_121518	105	33	3.7	0	0	0.083	0.076	0.085	0.021	0.014
B-97(2-3.8)_121518	732	58.2	5.4	0	0	0.14	0.14	0.27	0.032	0
B-98(0-1)_121418	314	45.1	4.1	0.0036	0	2.9	4.2	3.1	0.55	0.049
B-98(1-2.9)_121418	182	33.4	5.3	0.0007	0	2.9	3.9	3.2	0.58	0.024
B-99(0-1)_121518	311	41.3	3.6	0.029	0	0.12	0.11	0.14	0.075	0.21
B-99(11-13)_121518	18.4	7	1.3	0	0	0	0	0	0	0
B-99(1-2.9)_121518	60.9	25.3	5.8	0	0	0.018	0.011	0.014	0.0034	0.0089

Detected result exceeds RG

Notes:
NR = Not reportable

TABLE 3
GROUNDWATER SAMPLING RESULTS

Sample Location	Benzene	Toluene	Ethylbenzene	Xylene, m,p	Xylene, o-	Methlyene Chloride	Tetrachloroethylene	Trichloroethylene	Vinyl Chloride	Acetone	Cresol, p-	1,4-Dioxane	2-Methylnaphthalene	Benzo(a)anthracene	Benzo(b)fluoranthene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene	Bis(2-ethylhexyl)phthalate	Lead
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Remediation Goal	1	600	700	1000	1000	3	1	1	1	6000	50	0.4	30	0.1	0.2	0.2	0.1	3	5
Basis	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS	NJGWQS
MW-101_021219	0.046	0	0	0	0	0	0	0	0.9	0	0	0.2	0	0	0	0	0	1.5	0
MW-101_031418	0	0	0	0	0	0	0	0	0	0	0	0.18	0	0	0	0	0	0	0
MW-101_060518	0	0	0	0	0	0	0	0	0.071	0	0	0.14	0	0	0	0	0	0	0
MW-102_021219	0	0	0	0	0	0	0	0	0	0	0	3.5	0	0.0045	0	0	0	0	1.1
MW-102_030618	0	0	0	0	0	0	0	0	0	36	0	2.3	0	0.049	0.049	0.039	0.064	0	12.8
MW-102_061218	0	0	0	0	0	0	0	0	0	63	0	5.9	0	0.012	0.01	0.0076	0.012	0	5.3
MW-103_021319	0	0	0	0	0	0	0.087	0.11	0	0	0	0.32	0	0	0	0	0	0	9.7
MW-103_030618	0	0	0	0	0	0	0	0	0	0	0	0.86	0	0.033	0.03	0.021	0.038	0	4.5
MW-103_061218	0.03	0	0	0	0	0	0.098	0.13	0	24	0	1.4	0	0	0	0	0	0	18.7
MW-104_021319	0.16	0	0.78	0	0	0	0	0	0.02	73	0	0.4	0.0096	0.024	0.018	0.01	0.021	0	7.2
MW-104_031418	0.2	0.053	1.5	0.46	0	0	0	0	0	14	0	0.48	0	0.052	0.034	0.022	0.044	0	7.8
MW-104_060718	0.21	0	2.2	0.38	0	0	0	0	0	220	0	0.38	0.047	0.11	0.076	0.054	0.12	0	10.4
MW-105_021319	0.33	0	0	0	0.2	0	0	0.098	0.021	17	1.6	0	0.052	0.067	0.071	0.046	0.075	2.8	42.8
MW-105_031318	0.54	0.054	0	0	0.21	0	0	0.079	0	29	0	0	0	0.0053	0	0	0	0	14.7
MW-105_060518	0.75	0.068	0.09	0.14	0.23	0	0	0.1	0	140	0	0	0	0	0	0	0	0	36.5
MW-106_021519	73	4.6	120	410	61	0	0	0	0	31	0	0.49	6.7	0	0	0	0	0	24.4
MW-106_031318	89	59	880	4000	140	9.2	3.5	35	0.92	140	14	16	24	0	0	0	0	0	12.8
MW-106_060418	82	12	500	1900	170	0	1.6	11	1.1	0	0	1.3	31	0	0	0	0	0	26.5
MW-107_021319	15	3	9.6	72	23	0	0.15	0.34	0.068	810	2.9	0.077	3	0.056	0.055	0.029	0.036	1.7	54.2
MW-107_030618	46	22	14	220	28	0	0.22	0.55	0.13	44	5.2	0.1	5.6	0.03	0.033	0	0	0	36.4
MW-107_060718	33	10	24	270	47	0	0.3	0.59	0	250	14	0	7.4	0	0	0	0	0	39.2
MW-108_021519	11	0.7	11	7.5	14	0	0	0	0.051	49	0	0.41	0.23	0.29	0.38	0.26	0.38	1.9	109
MW-108_030618	14	0.79	28	21	19	0	0.11	0	0.15	38	0	0.81	0	0.076	0	0	0.13	0	15.4
MW-108_060518	10	0.47	14	8.2	12	0	0.1	0	0.095	0	0	0.51	0	0	0	0	0	0	6.1
MW-109_021519	1.8	0.067	0	0.83	0.56	0	0	0	0	29	0	2.2	0.049	0.01	0.0065	0	0.0063	0	9.1
MW-109_030918	1.2	0.13	0	0.55	0.58	0	0.084	0	0	63	0	3.3	0.1	0.021	0.019	0.013	0.017	0	20.7
MW-109_060518	1.4	0.1	0.057	0.31	0	0	0	0	0	32	0	4.7	0	0.023	0	0	0	0	14.6
MW-110_021419	5.6	0.36	0	0	1	0	0	0	0	100	0	5.3	0.13	0.027	0	0	0	0	39.9
MW-110_031418	9.2	0.43	0.25	1	1.1	0	0	0	0.034	47	0	11	2.3	0	0	0	0	0	3.3
MW-110_060718	9.1	0.51	0.2	0.8	2	0	0	0	0.053	170	0	6.5	0.99	0	0	0	0	0	6.6
MW-111_021419	2.2	0.31	0	0	10	0	0	0.12	0.11	20	0	0.48	0.051	0.016	0.01	0.0087	0	0	14.6
MW-111_031418	2.4	1.1	0.28	1.3	8.9	0	0	0	0.066	0	0	0.14	0	0.011	0	0	0	0	4.9
MW-111_060718	1.5	0.47	0.72	2.6	8.9	0	0.18	0.17	0	20	0	0.11	0	0	0	0	0	0	10.7
MW-112_021419	0.083	0	0	0	0	0	0	0	0	42	0	1.1	0.042	0.0048	0	0	0	0	0.33
MW-112_030918	0.48	0.17	0.57	1.9	1.6	0	0	0	0	48	0	1.2	0	0	0.0085	0.0055	0.011	0	0.83
MW-112_060718	0.4	0.063	0.25	0.66	0.65	0	0	0	0	80	0	2.1	0	0	0	0	0	0	8.2
MW-114_021919	0	1	0.61	0.65	0.41	0	0	0	0	0	0	0	0.32	0	0	0	0	0	0
MW-114_030818	0.12	18	550	3000	360	0	0	0	0	0	0	0	5.9	0	0	0	0	0	0
MW-114_060618	0	4.8	8	0	0	0	0	0	0	61	0	0	0	0	0	0	0	0	0.28
MW-115_021919	2.1	43	200	260	210	0	0.24	0.89	0	0	0	0	2.4	0	0	0	0	0	0
MW-115_030918	2.6	210	480	1700	810	0	0.59	0.6	0.061	2400	0	0	7	0	0	0	0	3.1	0
MW-115_060618	0.55	60	270	710	340	0	0.36	0.39	0	0	0	0	0	0	0	0	0	0	0
MW-116_021919	0	0	0	0	0.18	0	0	0	0	0	0	2.4	0.017	0.028	0.0097	0.0044	0	0	1.2
MW-116_030818	0.064	0	0	3.2	0	0	0	0	0	280	2.3	4	0	0.033	0.012	0.005	0	1.2	1.6
MW-116_060618	0.049	0	0	0	0.23	0	0	0	0	0	0	2.8	0	0.041	0.013	0.0071	0	0	2
MW-117_021919	0	0	0	0	0	0	0.12	0.11	0	0	0	5.4	0.1	0.0029	0	0	0	0	17.7
MW-117_030818	0	0	0	4.4	0	0	0.17	0	0	280	0	7.4	0	0	0	0	0	1.2	8.9
MW-117_060618	0	0	0	0	0	0	0	0	0	0	0	20	0	0.0037	0	0	0	0	1.9
MW-118_021819	0	130	8.4	29	5.8	2.4	0.21	0	0	60000	120	0.94	0.33	0.1	0.058	0.04	0.065	12	13.8
MW-118_030818	3.3	230	0	61	0	0	0	0	0	71000	61	0	0	0	0	0	0	0	568
MW-118_061118	0	270	0	0	0	0	0	0	0	51000	56	0	0.22	0.3	0.27	0	0	0	26
MW-119_021419	0	0	1.6	0	0	0	0	0	0	37	0	0.69	0.0029	0	0	0	0	1.8	2
MW-119_030618	0	0	0	0	0	0	0	0	0	28	0	0	0	0.0065	0	0	0	0	6.5
MW-119_060618	0	0	0	0.19	0.16	0	0	0	0	0	0	0.98	0	0.039	0.032	0.02	0	0	7.9
MW-120_021919	0	0	0	0	0	0	0	0	0	0	0	0.19	0.0088	0.0094	0.0093	0.005	0	0	10.3
MW-120_030818	0.077	0	0.21	0.98	0	0	0	0	0	87	0	0.19	0	0.011	0.0066	0	0	0	25.3
MW-120_060618	0.035	0	0	0	0	0	0	0	0	21	0	0.18	0	0.015	0.011	0.008	0	0	12.6
MW-121_021919	0	0	0	0	0.16	0	0	0	0	0	0	1	0.011	0.012	0.0052	0	0	0	0.36
MW-121_030818	0	0	0	0.43	0	0	0	0	0	52	0	1.8	0	0.029	0.016	0.01	0	0	4.2
MW-121_060618	0	0.052	0	0.33	0.22	0	0	0	0	0	0	1.9	0	0.024	0.0071	0	0	0	2.6
MW-122_021919	0	0	0	0	0.22	0	0	0	0	0	0	0.35	0.019	0	0	0	0	0	0.71
MW-122_030818	0.044	0	0	0	0	0	0	0	0	34000	0	0.33	0	0	0	0	0	0	7
MW-122_060618	0.033	0	0	0.16	0.17	0	0	0	0	0	0	0.37	0	0	0	0	0	0	3.6
MW-123_021219	0	0	0	0	0	0	0	0	0.057	0	0	6.5	0.0041	0.0039	0	0	0	1.2	0
MW-123_031218	0	0	0	0	0	0	0	0	0.44	22	0	13	0	0.005	0	0	0	0	1.2
MW-123_060518	0	0	0	0	0	0	0	0	0.13	0	0	8.5	0	0.0035	0	0	0	0	0
MW-124_021419	0.11	2100	4900	24000	8700	0	0	0	0	240	0	0	3.4	0.17	0.24	0.29	0	0	0
MW-201_021319	1.3	1.3	1.1	6.6	2.2	0	0	0	0	15	0	5.5	0.17	0.0091	0.0052	0	0	1.9	1.5
MW-202_021419	23	0.52	7.3	26	33	0	0	0	0	160	4.2	1.4	0.74	0	0	0	0.089	0	0.63
MW-203_021319	0.037	0.092	0	0.52	0.48	0	0	0	0	36	0	0.069	0.014	0	0	0	0	0	0
MW-204_021819	0	0.064	0	0	0.15	0	0	0	0	0	0	0.64	0.83	0.12	0.02	0.0076	0.043	0	1.6
MW-205_021919	1.1	3.3	3.3	25	15	0	1.2	0.11	0	0	0	0.073	0.033	0	0	0	0	0	0

Notes:
NJGWQS = New Jersey Ground Water Quality Standard
Detected result exceeds RG

TABLE 4a
SUMMARY OF CHEMICALS OF CONCERN AND
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATIONS

Scenario Timeframe: Future Visitor
Medium: Soil (Lot 63)
Exposure Medium: Soil 0-2 ft

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)[1]	EPC Units	Statistical Measure
		Min	Max					
Soil	Trichloroethene	0.0018	7.32E-02	mg/kg	3 / 14	3.10E-02	mg/kg	95% KM (t)
Soil	Dibenzo(a,h)anthracene	0.058	8.20E-01	mg/kg	14 / 14	6.92E-01	mg/kg	95% Adjusted Gamma
Soil	Indeno(1,2,3-cd)pyrene	0.24	2.80E+00	mg/kg	14 / 14	2.38E+00	mg/kg	95% Adjusted Gamma
Soil	Arsenic	2.7 J+	3.56E+01	mg/kg	14 / 14	2.38E+01	mg/kg	95% Student's-t
Soil	Copper	66.4	1.04E+03	mg/kg	14 / 14	1.04E+03	mg/kg	Maximum
Soil	Benzo(a)anthracene	0.22	5.00E+00	mg/kg	14 / 14	3.77E+00	mg/kg	95% Adjusted Gamma
Soil	Benzo(a)pyrene	0.22	4.60E+00	mg/kg	14 / 14	3.74E+00	mg/kg	95% Adjusted Gamma
Soil	Benzo(b)fluoranthene	0.28	6.30E+00	mg/kg	14 / 14	5.34E+00	mg/kg	95% Adjusted Gamma

Scenario Timeframe: Future Resident
Medium: Soil (Lot 67)
Exposure Medium: Soil 0-2 ft

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)[1]	EPC Units	Statistical Measure
		Min	Max					
Soil	Trichloroethene	0.012	1.20E-02	mg/kg	2 / 12	1.20E-02	mg/kg	Maximum
Soil	Dibenzo(a,h)anthracene	0.041	2.20E+00	mg/kg	5 / 12	2.20E+00	mg/kg	Maximum
Soil	Indeno(1,2,3-cd)pyrene	0.21	7.30E+00	mg/kg	12 / 12	7.30E+00	mg/kg	Maximum
Soil	Naphthalene	0.049	3.90E+00	mg/kg	10 / 12	3.90E+00	mg/kg	Maximum
Soil	Arsenic	1.5	1.65E+01	mg/kg	12 / 12	1.24E+01	mg/kg	95% Student's-t
Soil	Copper	28	4.26E+02	mg/kg	12 / 12	2.39E+02	mg/kg	95% Student's-t
Soil	Benzo(a)anthracene	0.27	1.60E+01	mg/kg	12 / 12	1.60E+01	mg/kg	Maximum
Soil	Benzo(a)pyrene	0.21	1.30E+01	mg/kg	12 / 12	1.30E+01	mg/kg	Maximum
Soil	Benzo(b)fluoranthene	0.31	1.70E+01	mg/kg	12 / 12	1.70E+01	mg/kg	Maximum

Scenario Timeframe: Future Resident
Medium: Soil (Lot 62)
Exposure Medium: Indoor Air

Exposure Point	Chemical of Concern	Exposure Point Concentration (EPC)[1]	EPC Units	Statistical Measure
Vapors from soil	Dibenzo(a,h)anthracene	1.66E-11	mg/m3	Modeled
Vapors from soil	Indeno(1,2,3-cd)pyrene	1.93E-08	mg/m3	Modeled
Vapors from soil	Naphthalene	8.53E-01	mg/m3	Modeled
Vapors from soil	Benzo(a)anthracene	9.28E-07	mg/m3	Modeled
Vapors from soil	Benzo(a)pyrene	7.51E-08	mg/m3	Modeled
Vapors from soil	Benzo(b)fluoranthene	1.06E-05	mg/m3	Maximum

Scenario Timeframe: Future Indoor Worker
Medium: Soil (Lot 68)
Exposure Medium: Indoor Air

Exposure Point	Chemical of Concern	Exposure Point Concentration (EPC)[1]	EPC Units	Statistical Measure
Vapors from soil	Benzene	6.64E-04	mg/m3	Modeled
Vapors from soil	Ethylbenzene	1.89E-02	mg/m3	Modeled
Vapors from soil	Dibenzo(a,h)anthracene	1.62E-13	mg/m3	Modeled
Vapors from soil	Tetrachloroethene	8.99E-02	mg/m3	Modeled
Vapors from soil	Trichloroethene	3.16E-02	mg/m3	Modeled
Vapors from soil	Vinyl Chloride	3.44E-03	mg/m3	Modeled
Vapors from soil	Xylenes (total)	2.58E-01	mg/m3	Modeled
Vapors from soil	Benzo(a)anthracene	8.50E-09	mg/m3	Modeled
Vapors from soil	Benzo(a)pyrene	6.92E-10	mg/m3	Modeled
Vapors from soil	Benzo(b)fluoranthene	8.55E-08	mg/m3	Maximum

Scenario Timeframe: Future Outdoor Worker
Medium: Groundwater (Lot 59)
Exposure Medium: Indoor Air

Exposure Point	Chemical of Concern	Exposure Point Concentration (EPC)[1]	EPC Units	Statistical Measure
Vapors from shallow potable groundwater	Acetone	1.20E+00	mg/m3	Modeled
Vapors from shallow potable groundwater	Benzene	1.30E-03	mg/m3	Modeled
Vapors from shallow potable groundwater	1,4-Dioxane	1.85E-05	mg/m3	Modeled
Vapors from shallow potable groundwater	Ethylbenzene	2.45E+00	mg/m3	Modeled
Vapors from shallow potable groundwater	Toluene	1.05E+00	mg/m3	Modeled
Vapors from shallow potable groundwater	Trichloroethene	4.23E-04	mg/m3	Modeled
Vapors from shallow potable groundwater	Vinyl Chloride	3.05E-05	mg/m3	Modeled
Vapors from shallow potable groundwater	Xylenes (total)	1.64E+01	mg/m3	Modeled
Vapors from shallow potable groundwater	Naphthalene	4.45E-02	mg/m3	Modeled
Vapors from shallow potable groundwater	Benzo(b)fluoranthene	1.20E-04	mg/m3	Maximum

TABLE 4a
SUMMARY OF CHEMICALS OF CONCERN AND
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATIONS

Scenario Timeframe: Future Visitor
Medium: Groundwater (Lot 59)
Exposure Medium: Indoor Air

Exposure Point	Chemical of Concern	Exposure Point Concentration (EPC)[1]	EPC Units	Statistical Measure
Vapors from shallow potable groundwater	Acetone	1.20E+00	mg/m3	Modeled
Vapors from shallow potable groundwater	Benzene	1.30E-03	mg/m3	Modeled
Vapors from shallow potable groundwater	1,4-Dioxane	1.85E-05	mg/m3	Modeled
Vapors from shallow potable groundwater	Ethylbenzene	2.45E+00	mg/m3	Modeled
Vapors from shallow potable groundwater	Toluene	1.05E+00	mg/m3	Modeled
Vapors from shallow potable groundwater	Trichloroethene	4.23E-04	mg/m3	Modeled
Vapors from shallow potable groundwater	Vinyl Chloride	3.05E-05	mg/m3	Modeled
Vapors from shallow potable groundwater	Xylenes (total)	1.64E+01	mg/m3	Modeled
Vapors from shallow potable groundwater	Dibenzo(a,h)anthracene	1.79E-12	mg/m3	Modeled
Vapors from shallow potable groundwater	Indeno(1,2,3-cd)pyrene	2.55E-10	mg/m3	Modeled
Vapors from shallow potable groundwater	Naphthalene	2.50E-05	mg/m3	Modeled
Vapors from shallow potable groundwater	Benzo(a)anthracene	7.45E-10	mg/m3	Modeled
Vapors from shallow potable groundwater	Benzo(a)pyrene	5.14E-10	mg/m3	Modeled
Vapors from shallow potable groundwater	Benzo(b)fluoranthene	1.32E-08	mg/m3	Maximum

Scenario Timeframe: Future Outdoor Worker
Medium: Groundwater (Lot 57)
Exposure Medium: Shallow Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)[1]	EPC Units	Statistical Measure
		Min	Max					
Shallow potable groundwater	Acetone	0.0062	7.10E+01	mg/L	55 / 83	5.97E+01	mg/L	95% KM (t)
Shallow potable groundwater	Benzene	0.00003	3.30E-03	mg/L	53 / 92	2.22E-03	mg/L	95% KM (t)
Shallow potable groundwater	1,4-Dioxane	0.000074	4.00E-03	mg/L	74 / 91	4.00E-03	mg/L	Maximum
Shallow potable groundwater	Ethylbenzene	0.000057	8.40E-03	mg/L	35 / 92	8.40E-03	mg/L	Maximum
Shallow potable groundwater	Toluene	0.000052	2.70E-01	mg/L	39 / 92	2.19E-01	mg/L	95% KM (t)
Shallow potable groundwater	Trichloroethene	0.000068	NA	mg/L	19 / 92	3.30E-02	mg/L	1/2 SQL
Shallow potable groundwater	Vinyl Chloride	0.000068	NA	mg/L	22 / 92	6.50E-03	mg/L	1/2 SQL
Shallow potable groundwater	Xylenes (total)	0.00027	3.48E-02	mg/L	51 / 92	3.48E-02	mg/L	Maximum
Shallow potable groundwater	Dibenzo(a,h)anthracene	0.0000053	1.10E-05	mg/L	13 / 91	1.10E-05	mg/L	Maximum
Shallow potable groundwater	Indeno(1,2,3-cd)pyrene	0.0000042	4.00E-05	mg/L	25 / 91	4.00E-05	mg/L	Maximum
Shallow potable groundwater	Naphthalene	0.0000045	7.60E-04	mg/L	43 / 91	7.60E-04	mg/L	Maximum
Shallow potable groundwater	Arsenic	0.00087	1.20E-03	mg/L	90 / 91	8.36E-04	mg/L	95% KM (t)
Shallow potable groundwater	Benzo(a)anthracene	0.0000029	3.00E-04	mg/L	53 / 91	1.82E-04	mg/L	95% KM (t)
Shallow potable groundwater	Benzo(a)pyrene	0.0000063	6.50E-05	mg/L	16 / 91	6.50E-05	mg/L	Maximum
Shallow potable groundwater	Benzo(b)fluoranthene	0.0000052	2.70E-04	mg/L	32 / 91	2.70E-04	mg/L	Maximum

TABLE 4a
SUMMARY OF CHEMICALS OF CONCERN AND
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATIONS

Scenario Timeframe: Future (site-wide)
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)[1]	EPC Units	Statistical Measure
		Min	Max					
Tap Water	Benzene	0.000037	0.023	mg/L	4 / 5	0.023	mg/L	Maximum
Tap Water	Ethylbenzene	0.0011	0.0073	mg/L	3 / 5	0.0073	mg/L	Maximum
Tap Water	Trichloroethylene	0.00011	0.00011	mg/L	1 / 5	0.00011	mg/L	Maximum
Tap Water	Total Xylenes	0.00027	0.059	mg/L	5 / 5	0.059	mg/L	Maximum
Tap Water	Benzo(a)anthracene	0.0000091	0.00012	mg/L	2 / 5	0.00012	mg/L	Maximum
Tap Water	Benzo(a)pyrene	0.000043	0.000089	mg/L	2 / 5	0.000089	mg/L	Maximum
Tap Water	1,4-Dioxane	0.000069	0.0055	mg/L	5 / 5	0.0055	mg/L	Maximum

Footnotes:
(1) The exposure point concentration (EPC) is usually the 95% upper confidence limit (UCL) of the arithmetic mean. When the UCL is greater than the maximum detected concentration or ProUCL did not calculate an UCL, the maximum detected concentration is chosen.

Definitions:
UCL= upper confidence limit
Max = maximum detected concentration
KM = Kaplan-Meier
mg/kg = milligram per kilogram
mg/m3 = milligram per cubic meter
mg/L = milligram per liter
J = qualifier for estimated value
NJ = qualifier for tentatively identified and estimated value

TABLE 4b.
SUMMARY OF AVERAGE LEAD CONCENTRATIONS IN SOIL/FILL GREATER THAN USEPA REGION 2'S NON-RESIDENTIAL SCREENING LEVEL OF 800 MG/KG AND RESULTING IN MORE THAN 5% OF THE RECEPTOR POPULATION WITH BLOOD LEAD CONCENTRATIONS GREATER THAN 5 UG/DL: CURRENT EXPOSURES

Lot	Timeframe	Receptor Population [1]	Soil Depth	Lead Concentration (mg/kg)	P(PbBfetal > PbBt) [2, 3] (%)	BHHRA Table # [4]
70	Current	Outdoor Workers	0 to 2 ft. bgs	934	7.7	6-2
63	Current	Construction Workers	All sampled depths	2,530	81	6-13
70	Current	Construction Workers	All sampled depths	970	28	6-13
63	Current	Trespassers	0 to 2 ft. bgs	2,080	38	6-17
70	Current	Trespassers	0 to 2 ft. bgs	934	7.7	6-17
70	Current	Child Visitors	0 to 2 ft. bgs	934	8.5	6-22
	Current	Off-Site Workers	Not assessed			
	Current	Off-Site Residents	Not assessed			

Notes:
1 = Trespasser exposure was modeled assuming adult outdoor worker exposure assumptions
1 = P(PbBfetal > PbBt) is the probability (in %) that estimated fetal blood lead level exceeds the target blood lead level

2 = For the child visitor, a time-weighted average concentration was used to model exposure, representing time spent at and away from the Lot
3 = Table # in the BHHRA provided information on other Lots for current exposures
ft. bgs = feet below ground surface

TABLE 4c.
SSUMMARY OF AVERAGE LEAD CONCENTRATIONS IN SOIL/FILL GREATER THAN USEPA REGION 2'S NON-RESIDENTIAL SCREENING LEVEL OF 800 MG/KG AND RESULTING IN MORE THAN 5% OF THE RECEPTOR POPULATION WITH BLOOD LEAD CONCENTRATIONS GREATER THAN 5 UG/DL: FUTURE AND HYPOTHETICAL FUTURE EXPOSURES

Lot	Timeframe	Receptor Population [1]	Soil Depth	Lead Concentration (mg/kg)	P(PbBfetal > PbBt) [2, 3] (%)	BHHRA Table # [4]
63	Future	Outdoor Workers	0 to 2 ft. bgs	2,080	38	6-28
70	Future	Outdoor Workers	0 to 2 ft. bgs	934	7.7	6-28
63	Future	Outdoor Workers	All sampled depths	2,530	49	6-29
70	Future	Outdoor Workers	All sampled depths	970	8.4	6-29
63	Future	Indoor Workers	0 to 2 ft. bgs	2,080	23	6-38
63	Future	Indoor Workers	All sampled depths	2,530	32	6-39
63	Future	Construction Workers	All sampled depths	2,130	81	6-52
70	Future	Construction Workers	All sampled depths	970	28	6-52
63	Future	Trespassers	0 to 2 ft. bgs	2,080	38	6-57
70	Future	Trespassers	0 to 2 ft. bgs	934	7.7	6-57
63	Future	Trespassers	All sampled depths	2,530	49	6-58
70	Future	Trespassers	All sampled depths	970	8.4	6-58
63	Future	Child Visitor	0 to 2 ft. bgs	2,080	23.7	6-63
70	Future	Child Visitor	0 to 2 ft. bgs	934	8.5	6-63
63	Future	Child Visitors	All sampled depths	2,530	30.3	6-64
70	Future	Child Visitors	All sampled depths	970	8.9	6-64
	Future	Off-Site Workers	Not assessed			
	Future	Off-Site Residents	Not assessed			
63	Hypothetical Future	Child Residents	0 to 2 ft. bgs	2,080	95.9	6-83
70	Hypothetical Future	Child Residents	0 to 2 ft. bgs	934	68.6	6-83
63	Hypothetical Future	Child Residents	All sampled depths	2,530	97.9	6-84
70	Hypothetical Future	Child Residents	All sampled depths	970	70.7	6-84

Notes:

1 = Trespasser exposure was modeled assuming adult outdoor worker exposure assumptions

2 = P(PbBfetal > PbBt) is the probability (in %) that estimated fetal blood lead level exceeds the target blood lead level

3 = For the child visitor, a time-weighted average concentration was used to model exposure, representing time spent at and away from the Lot

4 = Table # in the BHHRA provided information on other Lots for current exposures

ft. bgs = feet below ground surface

TABLE 4d.
COMPARISON OF SHALLOW GROUNDWATER CONCENTRATIONS TO THE USEPA OFFICE OF WATER LEAD ACTION LEVEL OF 0.015 MG/L) BY LOT

Lot	Timeframe	Receptor Population	Groundwater Unit	Groundwater Concentration (mg/l)	Exceeds Lead Action Level (Yes/No)	BHHRA Table #
57	Future	Outdoor Workers	Shallow Groundwater	0.57	Yes	6-31
60	Future	Outdoor Workers	Shallow Groundwater	0.018	Yes	6-31
63	Future	Outdoor Workers	Shallow Groundwater	0.11	Yes	6-31
64	Future	Outdoor Workers	Shallow Groundwater	0.045	Yes	6-31
67	Future	Outdoor Workers	Shallow Groundwater	0.019	Yes	6-31
69	Future	Outdoor Workers	Shallow Groundwater	0.025	Yes	6-31

TABLE 5
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor (Age)	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Occupied Lots - 1, 57, 59, 60, 62, 69, and 70.								
Current	Groundwater	Shallow Groundwater	Shallow Groundwater	Indoor Workers	Adult	Ingestion	None	Groundwater is not currently used for potable or nonpotable purposes at the Site; water is supplied by the City of Newark.
						Dermal	None	
						Inhalation	None	
				Off-Site Workers	Adult	Ingestion	None	No site-related contamination is known to extend off-site. Groundwater is not currently used for potable or nonpotable purposes in and around the Site; water is supplied by the City of Newark.
						Dermal	None	
						Inhalation	None	
			Shallow Groundwater in evacuation pit	Utility Workers	Adult	Ingestion	Quantitative	During sub-surface excavations that extend into the water table, utility workers may contact contaminants in shallow groundwater via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Construction Workers		Ingestion	Quantitative	During sub-surface excavations that extend into the water table, construction workers may contact contaminants in shallow groundwater via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Off-site Workers		Ingestion	None	No site-related contamination in groundwater is known to extend off-site.
						Dermal	None	
		Outdoor Air	Vapors from shallow groundwater in excavation pit	Utility Workers	Adult	Inhalation	Quantitative	Potential inhalation exposure to vapors may occur during sub-surface excavations that extend into the water table.
				Construction Workers		Inhalation	Quantitative	Potential inhalation exposure to vapors may occur during short-term excavations that extend into the water table.
				Off-Site Workers		Inhalation	None	No site-related contamination in groundwater is known to extend off-site.
		Indoor Air	Vapors from the water table	Indoor Workers	Adult	Inhalation	Quantitative	Potential inhalation exposures to vapors from shallow groundwater may occur indoors if vapors migrate through building foundations.
				Visitors	Child and Adult	Inhalation	Quantitative	Potential inhalation exposures to vapors from shallow groundwater may occur indoors if vapors migrate through building foundations.
				Off-Site Workers	Adult	Inhalation	None	No site-related contamination in groundwater is known to extend off-site.
		Deep Groundwater	Deep Groundwater	Indoor Workers	Adult	Ingestion	None	Deep groundwater is not currently used for potable or nonpotable purposes in and around the Site; water is supplied by the City of Newark.
						Dermal	None	
						Inhalation	None	
				Off-Site Workers	Adult	Ingestion	None	No site-related contamination is known to extend off-site. Deep groundwater is not currently used for potable or nonpotable purposes in and around the Site; water is supplied by the City of Newark.
						Dermal	None	
						Inhalation	None	
				Off-Site Residents	Child and Adult	Ingestion	None	
						Dermal	None	
						Inhalation	None	

TABLE 5
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor (Age)	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Occupied Lots - 1, 57, 59, 60, 62, 69, and 70.								
Current	Soil	Soil	Soil	Outdoor Workers	Adult	Ingestion	Quantitative	Outdoor workers are employees at the Site who spend most of the work day conducting maintenance activities outdoors (e.g., moderate digging, landscaping) which may result in exposure to contaminants in surface soil via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Indoor Workers	Adult	Ingestion	Quantitative	Indoor workers are employees at the Site who spend most of the work day in indoor activities, and therefore have no direct contact with outdoor soils. They may, however, have exposures via incidental ingestion and dermal contact of indoor dust (i.e. surface soil that has been tracked indoors).
						Dermal	Quantitative	
				Utility Workers	Adult	Ingestion	Quantitative	Utility workers are not employees at the site. They may be present on-site occasionally to repair underground utilities, during which they may contact contaminants in surface and subsurface soil (0-4 feet bgs) via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Construction Workers	Adult	Ingestion	Quantitative	Construction workers may conduct site redevelopment or renovation and are at the Site for a short period (several months). They may contact contaminants in surface and subsurface soil (0-13 feet bgs) via incidental ingestion and dermal contact during construction activities (e.g., as part of site redevelopment).
						Dermal	Quantitative	
				Trespassers	Adolescent and Adult	Ingestion	Quantitative	Trespassers are assumed to be at the Site frequently based on graffiti on the walls and observations of young adults on the properties reported by contractors. Trespassers are adolescents age 10 to 18 and adults who may contact contaminants in surface soil in unpaved areas through incidental ingestion and dermal contact. Adult trespassers' exposures to outdoor soil are evaluated using outdoor workers' soil exposures.
						Dermal	Quantitative	
				Visitors	Child and Adult	Ingestion	Quantitative	Visitors are children and adults who are on-site occasionally and for short periods during which they may contact contaminants in surface soil in unpaved areas through incidental ingestion and dermal contact.
						Dermal	Quantitative	
		Outdoor Air	Vapors and particulates from soil	Outdoor Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposure to airborne soil particulates and vapors may occur while working outdoors.
						Inhalation of particulates	Quantitative	
				Utility Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposure to airborne soil particulates and vapors may occur during utility maintainance or repair activities at the Site.
						Inhalation of particulates	Quantitative	
				Construction Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposure to airborne soil particulates and vapors may occur during short-term construction activities at the Site that may include excavation, grading, or other types of surface/subsurface soil disturbance.
						Inhalation of particulates	Quantitative	
				Trespassers	Adolescent and Adult	Inhalation of vapors	Quantitative	Trespassers are adolescents age 10 to 18 and adults. Potential inhalation exposure to airborne particulates and vapors in unpaved areas may occur. Such adult trespasser exposures are evaluated using the outdoor workers' inhalation exposures.
						Inhalation of particulates	Quantitative	
				Visitors	Child and Adult	Inhalation of vapors	Quantitative	Visitors are children and adults who are on-site occasionally and for short periods. Potential inhalation exposure to airborne soil particulates and vapors in unpaved areas may occur.
						Inhalation of particulates	Quantitative	
				Off-Site Workers	Adult	Inhalation of vapors	Quantitative	Off-site workers are potentially exposed to airborne soil particulates and vapors blown off-site from on-site areas that are unpaved. Such exposures are evaluated using on-site outdoor workers' exposures.
						Inhalation of particulates	Quantitative	
				Off-Site Residents	Child and Adult	Inhalation of vapors	Quantitative	Off-site residents are potentially exposed to airborne soil particulates and vapors blown off-site from on-site areas that are unpaved, although such exposures are expected to be minimal since the residences nearest the Site are across McCarter Highway (which is elevated) and uphill from the Site.
						Inhalation of particulates	Quantitative	
		Indoor Air	Vapors from soil	Indoor Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposures to surface and subsurface soil vapors may occur indoors if vapors migrate through building foundations.
				Visitors	Child and Adult	Inhalation of vapors	Quantitative	Potential inhalation exposures to surface and subsurface soil vapors may occur indoors if vapors migrate through building foundations.

TABLE 5
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor (Age)	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Unoccupied Lots - 58, 61, 63, 64, 65, 66, 67 and 68								
Current	Groundwater	Shallow Groundwater	Shallow Groundwater	Off-Site Workers	Adult	Ingestion	None	No site-related contamination is known to extend off-site. Groundwater is not currently used for potable or nonpotable purposes in and around the Site; water is supplied by the City of Newark.
						Dermal	None	
						Inhalation	None	
			Shallow Groundwater in evacuation pit	Utility Workers	Adult	Ingestion	Quantitative	During sub-surface excavations that extend into the water table, utility workers may contact contaminants in shallow groundwater via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Construction Workers		Ingestion	Quantitative	During sub-surface excavations that extend into the water table, construction workers may contact contaminants in shallow groundwater via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Off-site Workers		Ingestion	None	No site-related contamination in groundwater is known to extend off-site.
						Dermal	None	
		Outdoor Air	Vapors from shallow groundwater in excavation pit	Utility Workers	Adult	Inhalation	Quantitative	Potential inhalation exposure to vapors may occur during sub-surface excavations that extend into the water table.
				Construction Workers		Inhalation	Quantitative	Potential inhalation exposure to vapors may occur during short-term excavations that extend into the water table.
				Off-Site Workers		Inhalation	None	No site-related contamination in groundwater is known to extend off-site.
		Indoor Air	Vapors from the water table	Off-Site Workers	Adult	Inhalation	None	No site-related contamination in groundwater is known to extend off-site.
		Deep Groundwater	Deep Groundwater	Off-Site Workers	Adult	Ingestion	None	No site-related contamination is known to extend off-site. Deep groundwater is not currently used for potable or nonpotable purposes in and around the Site; water is supplied by the City of Newark.
						Dermal	None	
						Inhalation	None	
				Off-Site Residents	Child and Adult	Ingestion	None	
						Dermal	None	
						Inhalation	None	
Current	Soil	Soil	Soil	Utility Workers	Adult	Ingestion	Quantitative	Utility workers are not employees at the site. They may be present on-site occasionally to repair underground utilities, during which they may contact contaminants in surface and subsurface soil (0-4 feet bgs) via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Construction Workers	Adult	Ingestion	Quantitative	Construction workers may conduct site redevelopment or renovation and are at the Site for a short period (several months). They may contact contaminants in surface and subsurface soil (0-13 feet bgs) via incidental ingestion and dermal contact during construction activities (e.g., as part of site redevelopment).
						Dermal	Quantitative	
				Trespassers	Adolescent and Adult	Ingestion	Quantitative	Trespassers are frequently at the Site based on graffiti on the walls and observations of young adults on the properties reported by contractors. Trespassers are adolescents age 10 to 18 and adults who may contact contaminants in surface soil in unpaved areas through incidental ingestion and dermal contact. Adult trespassers' exposures to outdoor soil are evaluated using outdoor workers' soil exposures.
						Dermal	Quantitative	
		Outdoor Air	Vapors and particulates from soil	Utility Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposure to airborne soil particulates and vapors may occur during utility maintainance or repair activities at the Site.
						Inhalation of particulates	Quantitative	
				Construction Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposure to airborne soil particulates and vapors may occur during short-term construction activities at the Site that may include excavation, grading, or other types of surface/subsurface soil disturbance.
						Inhalation of particulates	Quantitative	
				Trespassers	Adolescent and Adult	Inhalation of vapors	Quantitative	Trespassers are adolescents age 10 to 18 and adults. Potential inhalation exposure to airborne particulates and vapors in unpaved areas may occur. Such adult trespasser exposures are evaluated using the outdoor workers' inhalation exposures.
						Inhalation of particulates	Quantitative	
				Off-Site Workers	Adult	Inhalation of vapors	Quantitative	Off-site workers are potentially exposed to airborne soil particulates and vapors blown off-site from on-site areas that are unpaved.
						Inhalation of particulates	Quantitative	
				Off-Site Residents	Child and Adult	Inhalation of vapors	Quantitative	Off-site residents are potentially exposed to airborne soil particulates and vapors blown off-site from on-site areas that are unpaved, although such exposures are expected to be minimal since the residences nearest the Site are across McCarter Highway (which is elevated) and uphill from the Site.
						Inhalation of particulates	Quantitative	

TABLE 5
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor (Age)	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
All Lots - Future Exposures								
Future	Groundwater	Shallow Groundwater	Shallow Groundwater	Outdoor Workers	Adult	Ingestion	Quantitative	Potable use of shallow groundwater in the future is improbable since the Site and surrounding area use water supplied from the City and the shallow groundwater is brackish. However, if shallow groundwater is used in the future, outdoor workers could be exposed through ingestion, dermal contact and inhalation of vapors during potable uses. Such outdoor worker exposures are evaluated using indoor workers' potable groundwater exposures.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Indoor Workers	Adult	Ingestion	Quantitative	Potable use of shallow groundwater in the future is improbable since the Site and surrounding area use water supplied from the City and the shallow groundwater is brackish. However, if shallow groundwater is used in the future, indoor workers could be exposed through ingestion, dermal contact and inhalation of vapors during potable uses.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Visitors	Child and Adult	Ingestion	Quantitative	Potable use of shallow groundwater in the future is improbable since the Site and surrounding area use water supplied from the City and the shallow groundwater is brackish. However, if shallow groundwater is used in the future, visitors could be exposed through ingestion, dermal contact and inhalation of vapors during potable uses. Such visitor exposures are evaluated using residents' potable groundwater exposures.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Residents	Child and Adult	Ingestion	Quantitative	Potable use of shallow groundwater in the future is improbable since the Site and surrounding area use water supplied from the City and the shallow groundwater is brackish. However, if shallow groundwater is used in the future, residents could be exposed through ingestion, dermal contact and inhalation of vapors during potable uses.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Off-Site Workers	Adult	Ingestion	Quantitative	Potable use of shallow groundwater in the future is improbable since the Site and surrounding area use water supplied from the City and the shallow groundwater is brackish. However, if shallow groundwater is used in the future, off-site workers could be exposed through ingestion, dermal contact and inhalation of vapors during potable uses. Such exposures are evaluated using indoor workers' potable groundwater exposures.
						Dermal	Quantitative	
						Inhalation	Quantitative	
			Shallow Groundwater in evacuation pit	Utility Workers	Adult	Ingestion	Quantitative	During sub-surface excavations that extend into the water table, utility workers may contact contaminants in shallow groundwater via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Construction Workers		Ingestion	Quantitative	During sub-surface excavations that extend into the water table, construction workers may contact contaminants in shallow groundwater via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Off-site Workers		Ingestion	Quantitative	During sub-surface excavations that extend into the water table, off-site workers may contact contaminants in shallow groundwater via incidental ingestion and dermal contact. Such exposures are evaluated using utility workers' exposures.
						Dermal	Quantitative	
		Outdoor Air	Vapors from shallow groundwater in excavation pit	Utility Workers	Adult	Inhalation	Quantitative	Potential inhalation exposure to vapors may occur during sub-surface excavations that extend into the water table.
				Construction Workers		Inhalation	Quantitative	Potential inhalation exposure to vapors may occur during sub-surface excavations that extend into the water table.
				Off-Site Workers		Inhalation	Quantitative	Potential inhalation exposure to vapors may occur during short-term excavations that extend into the water table. Such exposures are evaluated using utility workers' exposures.
		Indoor Air	Vapors from the water table	Indoor Workers	Adult	Inhalation	Quantitative	Potential inhalation exposures to vapors from shallow groundwater may occur indoors if vapors migrate through building foundations.
				Visitors	Child and Adult	Inhalation	Quantitative	Potential inhalation exposures to vapors from shallow groundwater may occur indoors if vapors migrate through building foundations.
				Residents	Child and Adult	Inhalation	Quantitative	On-site residential land use is improbable. But if such use were to occur, potential inhalation exposures to vapors from shallow groundwater may occur indoors if vapors migrate through building foundations.
				Off-Site Workers	Adult	Inhalation	Quantitative	Potential inhalation exposures to vapors from shallow groundwater may occur indoors if vapors migrate through building foundations. Such exposures are evaluated using indoor workers' exposures.
		Deep Groundwater	Deep Groundwater	Outdoor Workers	Adult	Ingestion	Quantitative	Deep groundwater at the Site is not currently used for any purpose and future groundwater use is unlikely since the Site and surrounding area use water supplied from the City. However, if deep groundwater is used in the future, outdoor workers could be exposed through ingestion, dermal contact, and inhalation of vapors during potable uses. Such exposures are evaluated using indoor workers exposures.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Indoor Workers	Adult	Ingestion	Quantitative	Deep groundwater at the Site is not currently used for any purpose and future groundwater use is unlikely since the Site and surrounding area use water supplied from the City. However, if deep groundwater is used in the future, indoor workers could be exposed through ingestion, dermal contact, and inhalation of vapors during potable uses.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Visitors	Child and Adult	Ingestion	Quantitative	Deep groundwater at the Site is not currently used for any purpose and future groundwater use is unlikely since the Site and surrounding area use water supplied from the City. However, if deep groundwater is used in the future, visitors could be exposed through ingestion, dermal contact, and inhalation of vapors during potable uses. Such exposures are evaluated using residents' exposures.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Residents	Child and Adult	Ingestion	Quantitative	Deep groundwater at the Site is not currently used for any purpose and future groundwater use is unlikely since the Site and surrounding area use water supplied from the City. However, if deep groundwater is used in the future, residents could be exposed through ingestion, dermal contact, and inhalation of vapors during potable uses.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Off-Site Workers	Adult	Ingestion	Quantitative	Deep groundwater at the Site may migrate to off-site drinking water wells. If deep groundwater is used in the future, off-site residents could be exposed through ingestion, dermal contact, and inhalation of vapors during potable uses. Such exposures are evaluated using residents' exposures.
						Dermal	Quantitative	
						Inhalation	Quantitative	
				Off-Site Residents	Child and Adult	Ingestion	Quantitative	
						Dermal	Quantitative	
						Inhalation	Quantitative	

TABLE 5
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor (Age)	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
All Lots - Future Exposures								
Future	Soil	Soil	Soil	Outdoor Workers	Adult	Ingestion	Quantitative	Outdoor workers are employees at the Site who spend most of the work day conducting maintenance activities outdoors (e.g., moderate digging, landscaping) which may result in exposure to contaminants in surface soil via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Indoor Workers	Adult	Ingestion	Quantitative	Indoor workers are employees at the Site who spend most of the work day in indoor activities, and therefore have no direct contact with outdoor soils. They may, however, have exposures via incidental ingestion and dermal contact of indoor dust (i.e. surface soil that has been tracked indoors).
						Dermal	Quantitative	
				Utility Workers	Adult	Ingestion	Quantitative	Utility workers are not employees at the site. They may be present on-site occasionally to repair underground utilities, during which they may contact contaminants in surface and subsurface soil (0-4 feet bgs) via incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Construction Workers	Adult	Ingestion	Quantitative	Construction workers may conduct site redevelopment or renovation and are at the Site for a short period (several months). They may contact contaminants in surface and subsurface soil (0-13 feet bgs) via incidental ingestion and dermal contact during construction activities (e.g., as part of site redevelopment).
						Dermal	Quantitative	
				Trespassers	Adolescent and Adult	Ingestion	Quantitative	Trespassers are adolescents age 10 to 18 and adults who may contact contaminants in surface soil in unpaved areas through incidental ingestion and dermal contact. Adult trespassers' exposures to outdoor soil are evaluated using outdoor workers' soil exposures.
						Dermal	Quantitative	
				Visitors	Child and Adult	Ingestion	Quantitative	Visitors are children and adults who are on-site occasionally and for short periods during which they may contact contaminants in surface soil in unpaved areas through incidental ingestion and dermal contact.
						Dermal	Quantitative	
				Residents	Child and Adult	Ingestion	Quantitative	On-site residential land use is improbable, but if such use were to occur, then potential exposures may occur at unpaved areas (e.g., landscaped areas). Residents may contact contaminants in surface soil in unpaved areas through incidental ingestion and dermal contact.
						Dermal	Quantitative	
		Outdoor Air	Vapors and particulates from soil	Outdoor Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposure to airborne soil particulates and vapors may occur while working outdoors.
						Inhalation of particulates	Quantitative	
				Utility Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposure to airborne soil particulates and vapors may occur during utility maintainance or repair activities at the Site.
						Inhalation of particulates	Quantitative	
				Construction Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposure to airborne soil particulates and vapors may occur during short-term construction activities at the Site that may include excavation, grading, or other types of surface/subsurface soil disturbance.
						Inhalation of particulates	Quantitative	
				Trespassers	Adolescent and Adult	Inhalation of vapors	Quantitative	Trespassers are adolescents age 10 to 18 and adults. Potential inhalation exposure to airborne particulates and vapors in unpaved areas may occur. Such adult trespasser exposures are evaluated using the outdoor workers' inhalation exposures.
						Inhalation of particulates	Quantitative	
				Visitors	Child and Adult	Inhalation of vapors	Quantitative	Visitors are children and adults who are on-site occasionally and for short periods. Potential inhalation exposure to airborne soil particulates and vapors in unpaved areas may occur.
						Inhalation of particulates	Quantitative	
				Residents	Child and Adult	Inhalation of vapors	Quantitative	On-site residential land use is improbable, but if such use were to occur, then potential exposures may occur at unpaved areas (e.g., landscaped areas). Routes of exposure include inhalation of particulates and vapors.
						Inhalation of particulates	Quantitative	
				Off-Site Workers	Adult	Inhalation of vapors	Quantitative	Off-site workers are potentially exposed to airborne soil particulates and vapors blown off-site from on-site areas that are unpaved. Such exposures are evaluated using on-site outdoor workers' exposures.
						Inhalation of particulates	Quantitative	
				Off-Site Residents	Child and Adult	Inhalation of vapors	Quantitative	Off-site residents are potentially exposed to airborne soil particulates and vapors blown off-site from on-site areas that are unpaved, although such exposures are expected to be minimal since the residences nearest the Site are across McCarter Highway (which is elevated) and uphill from the Site.
						Inhalation of particulates	Quantitative	
		Indoor Air	Vapors from soil	Indoor Workers	Adult	Inhalation of vapors	Quantitative	Potential inhalation exposures to surface and subsurface soil vapors may occur indoors if vapors migrate through building foundations.
				Visitors	Child and Adult	Inhalation of vapors	Quantitative	Potential inhalation exposures to surface and subsurface soil vapors may occur indoors if vapors migrate through building foundations.
				Residents	Child and Adult	Inhalation of vapors	Quantitative	On-site residential land use is improbable, but if such use were to occur, then potential inhalation exposures to vapors from surface and subsurface soil may occur indoors if vapors migrate through building foundations.

Definitions:
- Surface soil is soil from 0 to 2 feet bgs and subsurface soil is soil from greater than 2 feet bgs.
- Shallow groundwater is groundwater in the fill above the silt loam layer.
- Deep groundwater is groundwater in the aquifer beneath the clayey silt layer (> 14 feet bgs).

TABLE 6
NON-CARCINOGENIC TOXICITY DATA SUMMARY

Pathway: Ingestion/Dermal

Chemicals of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD Target Organ	Dates of RfD
Acetone	Chronic	9.00E-01	mg/kg/d	1	9.00E-01	mg/kg/d	Urinary	1000	Integrated Risk Information System (IRIS)	7/31/2003
Arsenic	Chronic	3.00E-04	mg/kg/d	0.95	3.00E-04	mg/kg/d	Dermal; Cardiovascular	3	Integrated Risk Information System (IRIS)	6/1/1994
Benzene	Chronic	4.0E-03	mg/kg/d	1	4.0E-03	mg/kg/d	Immune	300	Integrated Risk Information System (IRIS)	4/17/2003
Copper	Chronic	1.0E-03	mg/kg/d	1	1.0E-03	mg/kg/d	Gastrointestinal	30	ATSDR. Minimal Risk Levels.	9/15/2004
Ethylbenzene	Chronic	1.0E-01	mg/kg/d	1	1.0E-01	mg/kg/d	Urinary; Hepatic	1000	Integrated Risk Information System (IRIS)	6/1/1994
Naphthalene	Chronic	2.0E-02	mg/kg/d	1	2.0E-02	mg/kg/d	Decreased body weight	3000	Integrated Risk Information System (IRIS)	9/17/1998
PCBs (total)	Chronic	2.0E-05 {72}	mg/kg/d	0.8	2.0E-05	mg/kg/d	Immune; Dermal; Ocular; Developmental/ Reproductive	300	Integrated Risk Information System (IRIS)	10/1/1994
Tetrachloroethylene	Chronic	6.0E-03	mg/kg/d	1	6.0E-03	mg/kg/d	Nervous; Ocular	NA	Integrated Risk Information System (IRIS)	2/10/2012
Toluene	Chronic	8.0E-02	mg/kg/d	1	8.0E-02	mg/kg/d	Urinary	3000	Integrated Risk Information System (IRIS)	9/23/2005
Trichloroethylene	Chronic	5.0E-04	mg/kg/d	1	5.0E-04	mg/kg/d	Immune; Developmental/ Reproductive; Cardiovascular	NA	Integrated Risk Information System (IRIS)	9/28/2011
Vinyl chloride	Chronic	3.0E-03	mg/kg/d	1	3.0E-03	mg/kg/d	Hepatic	30	Integrated Risk Information System (IRIS)	8/7/2000
Total Xylenes	Chronic	2.0E-01	mg/kg/d	1	2.0E-01	mg/kg/d	Decreased body weight; increased mortality	1000	Integrated Risk Information System (IRIS)	2/21/2003
Benzo(a)anthracene	Chronic	No oral RfD	mg/kg/d	No oral RfD	No oral RfD	mg/kg/d	No oral RfD	No oral RfD	Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) Database	6/19/2007
Benzo(a)pyrene	Chronic	3.0E-04	mg/kg/d	1	3.0E-04	mg/kg/d	Developmental/ Reproductive	300	Integrated Risk Information System (IRIS)	1/19/2017
Benzo(b)fluoranthene	Chronic	No oral RfD	mg/kg/d	No oral RfD	No oral RfD	mg/kg/d	No oral RfD	No oral RfD	Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) Database	4/30/2002
Dibenzo(a,h)anthracene	Chronic	No oral RfD	mg/kg/d	No oral RfD	No oral RfD	mg/kg/d	No oral RfD	No oral RfD	NA	NA
Bis(2-ethylhexyl)phthalate	Chronic	2.0E-02	mg/kg/d	1	2.0E-02	mg/kg/d	Hepatic	1000	Integrated Risk Information System (IRIS)	6/1/1994
1,4-Dioxane	Chronic	3.0E-02	mg/kg/d	1	3.0E-02	mg/kg/d	Hepatic; Urinary	300	Integrated Risk Information System (IRIS)	9/20/2013
Indeno(1,2,3-cd)pyrene	Chronic	No oral RfD	mg/kg/d	No oral RfD	No oral RfD	mg/kg/d	No oral RfD	No oral RfD	Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) Database	1/31/2002
2-Methylnaphthalene	Chronic	4.0E-03	mg/kg/d	1	4.0E-03	mg/kg/d	Respiratory	1000	Integrated Risk Information System (IRIS)	12/22/2003

TABLE 6
NON-CARCINOGENIC TOXICITY DATA SUMMARY

Pathway: Inhalation

Chemicals of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD Target Organ	Dates of RfC
Acetone	Chronic	3.09E+01	mg/m^3	Nervous	100	ATSDR. Minimal Risk Levels.	5/15/1994
Arsenic	Chronic	1.5E-05	mg/m^3	Cardiovascular; Dermal; Developmental/Reproductive; Nervous; Respiratory	NA	CalEPA. ARB. 2019. Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values.	12/15/2008
Benzene	Chronic	3.0E-02	mg/m^3	Immune	300	Integrated Risk Information System (IRIS)	4/17/2003
Copper	Chronic	No RfC	mg/m^3	NA	NA	NA	NA
Ethylbenzene	Chronic	1.0E+00	mg/m^3	Developmental/Reproductive	300	Integrated Risk Information System (IRIS)	6/1/1994
Naphthalene	Chronic	3.0E-03	mg/m^3	Respiratory; Nervous	3000	Integrated Risk Information System (IRIS)	9/17/1998
PCBs (total)	Chronic	No RfC	mg/m^3	NA	NA	NA	NA
Tetrachloroethylene	Chronic	4.0E-02	mg/m^3	Nervous; Ocular	1000	Integrated Risk Information System (IRIS)	2/10/2012
Toluene	Chronic	5.0E+00	mg/m^3	Nervous	10	Integrated Risk Information System (IRIS)	9/23/2005
Trichloroethylene	Chronic	2.0E-03	mg/m^3	Immune; Developmental/Reproductive; Cardiovascular	100	Integrated Risk Information System (IRIS)	9/28/2011
Vinyl chloride	Chronic	1.0E-01	mg/m^3	Hepatic	30	Integrated Risk Information System (IRIS)	8/7/2000
Total Xylenes	Chronic	1.0E-1	mg/m^3	Nervous	300	Integrated Risk Information System (IRIS)	2/21/2003
Benzo(a)anthracene	Chronic	No RfC	mg/m^3	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	2.0E-06	mg/m^3	Developmental/Reproductive	3000	Integrated Risk Information System (IRIS)	1/19/2017
Benzo(b)fluoranthene	Chronic	No RfC	mg/m^3	NA	NA	NA	NA
Dibenzo(a,h)anthracene	Chronic	No RfC	mg/m^3	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	Chronic	No RfC	mg/m^3	NA	NA	NA	NA
1,4-Dioxane	Chronic	3.0E-02	mg/m^3	Respiratory; Nervous	1000	Integrated Risk Information System (IRIS)	9/20/2013
Indeno(1,2,3-cd)pyrene	Chronic	No RfC	mg/m^3	NA	NA	NA	NA
2-Methylnaphthalene	Chronic	No RfC	mg/m^3	NA	NA	NA	NA

Footnotes:
The oral RfDs are taken from the USEPA Regional Screening Levels (RSLs) table, which gathers toxicity reference values from multiple sources using an established hierarchy.
The absorbed RfD for dermal is calculated by the following equation: RfD-oral x GIABS.
The inhalation RfCs are taken from the USEPA Regional Screening Levels (RSLs) table, which gathers toxicity reference values from multiple sources using an established hierarchy.

Definitions:
ATSDR = Agency for Toxic Substances and Disease Registry
GIABS = Gastrointestinal absorption factor
mg/kg-day = milligrams per kilogram per day
NA = not available
RfC = reference concentration
RfD = reference dose

TABLE 7
CANCER TOXICITY DATA SUMMARY

Pathway: Ingestion/ Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/Cancer Guideline[1]	Source	Date
Arsenic	1.5E+00	$(mg/kg\text{-}day)^{-1}$	0.95	$(mg/kg\text{-}day)^{-1}$	A	IRIS	7/3/1995
Benzene	5.5E-02	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	A	IRIS	1/19/2000
Naphthalene	1.2E-01	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	C	CalEPA. OEHHA. Toxicity Criteria Database.	6/1/2009
PCBs (total)	2.0E+00	$(mg/kg\text{-}day)^{-1}$	0.8	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	6/1/1997
Tetrachloroethylene	2.1E-03	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	LC	IRIS	2/10/2012
Trichloroethylene	4.6E-02	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	HC	IRIS	9/28/2011
Vinyl chloride	7.2E-01	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	A	IRIS	8/7/2000
Benzo(a)anthracene	1.0E-01	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	B2	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.	1/19/2017
Benzo(a)pyrene	1.0E+00	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	HC	IRIS	1/19/2017
Benzo(b)fluoranthene	1.0E-01	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	B2	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.	1/19/2017
Dibenzo(a,h)anthracene	1.0E+00	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	B2	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.	1/19/2017
Bis(2-ethylhexyl)phthalate	1.4E-02	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	6/1/1994
1,4-Dioxane	1.0E-01	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	LC	IRIS	9/20/2013
Indeno(1,2,3-cd)pyrene	1.0E-01	$(mg/kg\text{-}day)^{-1}$	1	$(mg/kg\text{-}day)^{-1}$	B2	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.	1/19/2017

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Slope Factor Units	Weight of Evidence/Cancer Guideline[1]	Source	Date
Arsenic	4.3E+00	$(\mu g/m^3)^{-1}$	NA	NA	A	IRIS	4/10/1998
Benzene	7.8E-03	$(\mu g/m^3)^{-1}$	NA	NA	A	IRIS	10/16/1998
Naphthalene	3.4E-02	$(\mu g/m^3)^{-1}$	NA	NA	C	CalEPA. OEHHA. Toxicity Criteria Database.	6/1/2009
PCBs (total)	5.71E-01	$(\mu g/m^3)^{-1}$	NA	NA	B2	IRIS	6/1/1997
Tetrachloroethylene	2.6E-04	$(\mu g/m^3)^{-1}$	NA	NA	LC	IRIS	2/10/2012
Trichloroethylene	4.1E-03	$(\mu g/m^3)^{-1}$	NA	NA	HC	IRIS	9/28/2011
Vinyl chloride	4.4E-03	$(\mu g/m^3)^{-1}$	NA	NA	A	IRIS	8/7/2000
Benzo(a)anthracene	6.0E-02	$(\mu g/m^3)^{-1}$	NA	NA	B2	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.	1/19/2017
Benzo(a)pyrene	6.0E-01	$(\mu g/m^3)^{-1}$	NA	NA	HC	IRIS	1/19/2017
Benzo(b)fluoranthene	6.0E-02	$(\mu g/m^3)^{-1}$	NA	NA	B2	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.	1/19/2017
Dibenzo(a,h)anthracene	6.0E-01	$(\mu g/m^3)^{-1}$	NA	NA	B2	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.	1/19/2017
1,4-Dioxane	5.0E-03	$(\mu g/m^3)^{-1}$	NA	NA	LC	IRIS	9/20/2013
Indeno(1,2,3-cd)pyrene	6.0E-02	$(\mu g/m^3)^{-1}$	NA	NA	B2	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.	1/19/2017

Footnotes:
(1) Weight of evidence information obtained from IRIS. Categories are as follows:
A = Known human carcinogen
B1 = Probable human carcinogen-indicates that limited human data are available
B2 = Probable human carcinogen based on sufficient evidence of carcinogenicity in animals
C = Possible human carcinogen
D = Not classifiable due to lack of animal bioassays and human studies
LC = Likely to be carcinogenic to humans
HC = Carcinogenic to humans

Definitions:
IRIS = Integrated Risk Information System
IUR = inhalation unit risk
NA = Not available
(mg/kg-day)-1 = per milligrams per kilogram per day
$(\mu g/m^3)^{-1}$ = per micrograms per cubic meter
SF = slope factor

TABLE 8*
RISK CHARACTERIZATION SUMMARY - NON-CARCINOGENS

Scenario Timeframe: Future (Lot 57)
Receptor Population: Outdoor/Indoor/Off-site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Groundwater	Shallow Groundwater	Potable Use	Trichloroethene	Immune; Developmental/Reproductive; Cardiovascular / Immune; Developmental/Reproductive; Cardiovascular	7.1E-01	3.5E-01	1.9E+00	**3.0E+00**
							Total Hazard Index (HI) Across Medium[1]=	**10.0**
							Cardiovascular HI Across All Media[1]=	**4.0**
							Developmental/Reproductive HI Across All Media[1]=	**4.0**
							Immune HI Across All Media[1]=	**3.0**

Scenario Timeframe: Future (Lot 59)
Receptor Population: Outdoor /Indoor/Off-site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Groundwater	Shallow Groundwater	Vapors from Shallow Potable Groundwater	Naphthalene	Decreased body weight / Respiratory; Nervous	NA	NA	3.40E+00	**3.00E+00**
			Xylenes (total)	Decreased body weight; increased mortality / Nervous	NA	NA	3.7E+01	**4.0E+01**
							Total Hazard Index (HI) Across Medium[1]=	**50.0**
							Nervous HI Across All Media[1]=	**37.0**
							Respiratory HI Across All Media[1]=	**3.0**
							Other HI Across All Media[1]=	**4.0**

Scenario Timeframe: Future (Lot 68)
Receptor Population: Indoor Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Soil-Vapor Intrusion	Indoor Air	All Depths- Vapors from Soil	Trichloroethene	Immune; Developmental/Reproductive; Cardiovascular / Immune; Developmental/Reproductive; Cardiovascular	NA	NA	3.6E+00	**4.0E+00**
							Total Hazard Index (HI) Across Medium[1]=	**5.0**
							Cardiovascular HI Across All Media[1]=	**4.0**
							Developmental/Reproductive HI Across All Media[1]=	**4.0**
							Immune HI Across All Media[1]=	**4.0**

Scenario Timeframe: Future (Lot 63)
Receptor Population: Visitor
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Soil	Soil	0 to 2 ft.	Copper	Gastrointestinal / No RfC	2.0E+00	NA	NA	**2E+00**
							Total Hazard Index (HI) Across Medium[1]=	**3E+00**
							Gastrointentinal HI Across All Media[1]=	**4.0**

Scenario Timeframe: Future (site-wide)
Receptor Population: Visitor/Off-site Resident/Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Groundwater	Deep Groundwater	Potable Use	Arsenic[2]	Dermal; Cardiovascular / Cardiovascular; Dermal; Developmental/Reproductive; Nervous; Respiratory	2.7E+00	1.5E-02	NA	**3.0E+00**
							Total Hazard Index (HI) Across Medium[1]=	**10.0**
							Cardiovascular HI Across All Media[1]=	**3.0**
							Dermal HI Across All Media[1]=	**3.0**
							Developmental/Reproductive HI Across All Media[1]=	0.4
							Nervous HI Across Medium[1]=	**3.0**
							Respiratory HI Across All Media[1]=	0.5

TABLE 8*
RISK CHARACTERIZATION SUMMARY - NON-CARCINOGENS

Scenario Timeframe: Future (site-wide)
Receptor Population: Visitor/Off-site Resident/Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Groundwater	Deep Groundwater	Potable Use	Arsenic[2]	Dermal; Cardiovascular / Cardiovascular; Dermal; Developmental/Reproductive; Nervous; Respiratory	4.4E+00	2.0E-02	NA	**4.0E+00**
							Total Hazard Index (HI) Across Medium1=	**20.0**
							Cardiovascular HI Across All Media[1]=	**4.0**
							Dermal HI Across All Media[1]=	**5.0**
							Developmental/Reproductive HI Across All Media[1]=	0.7
							Nervous HI Across All Media[1]=	**5.0**
							Respiratory HI Across All Media[1]=	0.5

Scenario Timeframe: Future (Lot 59)
Receptor Population: Visitor/Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Groundwater	Indoor Air	Vapors from Shallow Portable Groundwater	Ethyl Benzene	Urinary; Hepatic / Developmental/Reproductive	NA	NA	2.3E+00	**2.0E+00**
			Xylenes (total)	Decreased body weight; increased mortality / Nervous	NA	NA	1.6E+02	**2.0E+02**
			Naphthalene	Decreased body weight / Respiratory; Nervous	NA	NA	1.4E+01	**1.0E+01**
							Total Hazard Index (HI) Across Medium[1]=	**200.0**
							Developmental/Reproductive HI Across All Media[1]=	**4.0**
							Hepatic HI Across All Media[1]=	**3.0**
							Nervous HI Across All Media[1]=	**200.0**
							Respiratory HI Across All Media[1]=	**10.0**
							Urine HI Across All Media[1]=	**4.0**
							Other HI Across All Media[1]=	**8.0**

Scenario Timeframe: Future (Lot 59)
Receptor Population: Visitor/Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Groundwater	Indoor Air	Vapors from Shallow Portable Groundwater	Ethyl Benzene	Urinary; Hepatic / Developmental/Reproductive	NA	NA	2.3E+00	**2.0E+00**
			Xylenes (total)	Decreased body weight; increased mortality / Nervous	NA	NA	1.6E+02	**2.0E+02**
			Naphthalene	Decreased body weight / Respiratory; Nervous	NA	NA	1.4E+01	**1.0E+01**
							Total Hazard Index (HI) Across Medium[1]=	**200.0**
							Developmental/Reproductive HI Across All Media[1]=	**5.0**
							Hepatic HI Across All Media[1]=	**5.0**
							Other HI Across All Media[1]=	**10.0**
							Nervous HI Across All Media[1]=	**200.0**
							Respiratory HI Across All Media[1]=	**10.0**
							Urine HI Across All Media[1]=	**6.0**

Scenario Timeframe: Future (Lot 63)
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Soil	Soil	Soil - 0 to 2 ft.	Copper	Gastrointestinal / No RfC	1.3E+01	NA	NA	**1E+01**
							Total Hazard Index (HI) Across Medium[1]=	**2E+01**
							Gastrointestinal HI Across All Media[1]=	**20.0**

TABLE 8*
RISK CHARACTERIZATION SUMMARY - NON-CARCINOGENS

Scenario Timeframe: Future (Lot 62)
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Soil - Vapor Intrusion	Indoor Air	All Depths - Vapors from Soil	Naphthalene	Decreased body weight / Respiratory; Nervous	NA	NA	2.7E+02	**3E+02**
							Total Hazard Index (HI) Across Medium[1]=	**3E+02**
							Other HI Across All Media[1]=	0.3
							Nervous HI Across All Media[1]=	**300.0**
							Respiratory HI Across All Media[1]=	**300.0**

Scenario Timeframe: Future (Lot 62)
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary Target Organ(s) (Oral / Inhalation)	Non-Carcinogenic Hazard Quotient			
					Ingestion	Dermal Contact	Inhalation	Exposure Routes Total
Soil - Vapor Intrusion	Indoor Air	All Depths - Vapors from Soil	Naphthalene	Decreased body weight / Respiratory; Nervous	NA	NA	2.7E+02	**3E+02**
							Total Hazard Index (HI) Across Medium[1]=	**3E+02**
							Other HI Across All Media[1]=	0.1
							Nervous HI Across All Media[1]=	**300.0**
							Respiratory HI Across All Media[1]=	**300.0**

Footnotes:
* A summary of the non-carcinogenic hazards associated with future receptors and exposure scenarios are shown. Selected lots are shown as examples for specific receptor(s)/exposure, and more information regarding HI across the lots can be found in the summary of site risks section in the Record of Decision (ROD).
(1) The HI represents the summed HQs for all chemicals of potential concern at the site across all media, not just those requiring remedial action (i.e., the chemicals of concern [COCs]) which are shown in this table. For example, a non-cancer HI for 1,2,4-trichlorobenzene, iron, cyanide, iron and manganese were identified in the BHHRA. However, the Feasibility Study (FS) did not identify these chemicals as COCs. Further information regarding the designation of these chemicals is provided in the FS and ROD.
(2) Arsenic has not been identified as a potential COC in groundwater but is a potential COC in soil. More information regarding arsenic contamination on the site is provided in the FS and ROD.

Definitions:
NA = not available

TABLE 9*

RISK CHARACTERIZATION SUMMARY - CARCINOGENS

Scenario Timeframe: Future (Lot 67)
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Soil	0 to 2 ft - Soil	Benzo(a)pyrene	8.5E-05	2.8E-05	NA	1.0E-04
						Exposure Medium Total[1]=	**2.0E-04**
						Total Excess Cancer Risk Across All Media=	**2.0E-04**

Scenario Timeframe: Future (Lot 62)
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil - Vapor Intrusion	Indoor Air	All Depths - Vapors from Soil	Naphthalene	NA	NA	1.0E-02	**1.0E-02**
						Exposure Medium Total[1]=	**1.0E-02**
						Total Excess Cancer Risk Across All Media=	**1.0E-02**

Scenario Timeframe: Future (Lot 57)
Receptor Population: Outdoor/Indoor/Off-site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Shallow Groundwater	Potable Use	Arsenic[2]	1.2E-04	1.4E-06	NA	1.0E-04
						Exposure Medium Total[1]=	**6.0E-04**
						Total Excess Cancer Risk Across All Media=	**6.0E-04**

Scenario Timeframe: Future (Lot 59)
Receptor Population: Outdoor/Indoor/Off-site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Indoor Air	Vapors from Shallow Portable Groundwater	Naphthalene	NA	NA	1.2E-04	1.0E-04
						Exposure Medium Total[1]=	**2.0E-04**
						Total Excess Cancer Risk Across All Media=	**7.0E-04**

Scenario Timeframe: Future (Lot 59)
Receptor Population: Visitor/Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Indoor Air	Vapors from shallow portable groundwater	Naphthalene	NA	NA	5.4E-04	**5.0E-04**
						Exposure Medium Total[1]=	**1.0E-03**
						Total Excess Cancer Risk Across All Media=	**3.0E-03**

TABLE 9*
RISK CHARACTERIZATION SUMMARY - CARCINOGENS

Scenario Timeframe: Future (site-wide)
Receptor Population: Outdoor/Indoor/Off-site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Deep Groundwater	Potable Use	Arsenic[2]	1.5E-04	1.7E-06	NA	**2.0E-04**
						Exposure Medium Total[1]=	**2.0E-04**
						Total Excess Cancer Risk Across All Media=	**2.0E-04**

Scenario Timeframe: Future (site-wide)
Receptor Population: Visitor/Off-site Resident/Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Deep Groundwater	Potable Use	Arsenic[2]	5.1E-04	2.7E-06	NA	**5.0E-04**
						Exposure Medium Total[1]=	**6.0E-04**
						Total Excess Cancer Risk Across All Media=	**7.0E-04**

Footnotes:
* A summary of the carcinogenic risks associated with future receptors and exposure scenarios are shown. Selected lots are shown as examples for specific receptor(s)/exposure, and more information regarding risks across the lots can be found in the summary of site risks section in the Record of Decision (ROD).
(1) The carcinogenic risk represents the summed carcinogenic for all chemicals of potential concern at the site, not just those requiring remedial action (i.e., the chemicals of concern [COCs]) which are shown in this table.
(2) Arsenic has not been identified as a potential COC in groundwater but is a potential COC in soil. More information regarding arsenic contamination on the site is provided in the FS and ROD.

Definitions:
NA = not available

TABLE 10
SITE REMEDIAION GOALS FOR SOIL

Soil COC	RG (milligrams/kilogram, (mg/kg))	Basis for RG
Lead	800	NRDCSRS
Copper	526	RBC
Naphthalene *(see Note 1)*	0.62	RBC
Trichloroethylene *(see Note 1)*	0.02	RBC
Total Xylenes *(see Note 1)*	6.5	RBC
Arsenic	19	NRDCSRS
Total PCBs	1.1	NRDCSRS *(see Note 2)*
Benzene	16	NRDCSRS *(see Note 2)*
Benzo(a)anthracene	23	NRDCSRS *(see Note 2)*
Benzo(a)pyrene	2.3	NRDCSRS *(see Note 2)*
Benzo(b)fluoranthene	23	NRDCSRS *(see Note 2)*
Dibenzo(a,h)anthracene	2.3	NRDCSRS *(see Note 2)*

COC = Contaminant of Concern
NRDCSRS = NJDEP Non-Residential Direct Contact Soil Remediation Standard
RBC = Risk Based Concentration
RG = Remedial Goal
HQ = Hazard Quotient
ILCR = Incremental Lifetime Cancer Risk

Note 1: The soil/fill remedial goals (RGs) for Naphthalene, Trichloroethylene, and Total Xylene are for soil/fill material but are protective of vapor intrusion (as soil gas) for workers.

Note 2: For this COC, the non-residential direct contact soil remediation standard (NRDCSRS) has been updated per the May 2021 promulgated N.J.A.C 7:26D remediation standards. The RI/FS and Proposed Plan were develop using the September 2017 N.J.A.C 7:26D remediation standards.

TABLE 11
SITE REMEDIATION GOALS FOR GROUNDWATER

Groundwater COCs	RG (micrograms/liter, (ug/L))	Basis for RG
Lead	5	NJGWQS
Acetone	6,000	NJGWQS
Benzene	1	NJGWQS
Ethylbenzene	700	NJGWQS
Methylene chloride	3	NJGWQS
Tetrachloroethylene	1	NJGWQS
Toluene	600	NJGWQS
Trichloroethylene	1	NJGWQS
Vinyl chloride	1	NJGWQS
Total Xylene	1,000	NJGWQS
Cresol, p-	50	NJGWQS
Benzo(a)anthracene	0.1	NJGWQS
Benzo(a)pyrene	0.1	NJGWQS
Benzo(b)fluoranthene	0.2	NJGWQS
Bis(2-ethylhexyl)phthalate	3	NJGWQS
1,4-Dioxane	0.4	NJGWQS
Indeno(1,2,3-cd)pyrene	0.2	NJGWQS
2-Methylnaphthalene	30	NJGWQS

NJGWQS = New Jersey Ground Water Quality Standard
HQ = Hazard Quotient
ILCR = Incremental Lifetime Cancer Risk
PQL = Practical Quantitation Limit

TABLE 12
PRELIMINARY COST ESTIMATE
WASTE - ALTERNATIVE 2
REMOVAL AND OFF-SITE DISPOSAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
Direct Implementation Costs					
Consolidation/Containerization of Wastes	1	LS	$ 25,000	$ 25,000	
UST Removal/Disposal	6	Ea	$ 15,000	$ 90,000	
Impacted Soil Removal at USTs	3,500	CY	$ 22	$ 77,000	
Clean Backfill (provide/place/compact)	5,600	Ton	$ 60	$ 336,000	
6" Gravel Surface at NAPL Footprint	800	SY	$ 18	$ 14,400	
Waste Disposal, UST Soil (T&D)	5,800	Ton	$ 75	$ 435,000	
Waste Disposal, Non-haz liquids (T&D)	34,700	Gal	$ 0.25	$ 8,675	
Waste Disposal, LNAPLs (T&D)	4,500	Gal	$ 1	$ 4,500	
Waste Disposal, Non-haz solids/tanks (T&D)	30	Ton	$ 75	$ 2,250	
Soil Treatment for Disposal	880	Ton	$ 25	$ 22,000	
Water Management/Disposal	1	LS	$ 55,000	$ 55,000	
UST Closure Sampling/Reporting	1	LS	$ 20,000	$ 20,000	
			Subtotal - Direct Costs	$ 1,089,825	
Indirect Costs					
Remedial/Geotechnical Design	(10% of Direct Costs)			$ 108,983	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			$ 54,491	
Site Administration	(5% of Direct Costs)			$ 54,491	
Permitting/Legal Costs	(2% of Direct Costs)			$ 21,797	
Construction Management/Oversight	(10% of Direct Costs)			$ 108,983	
			Subtotal - Indirect Costs	$ 348,744	
			Contingency - 25% of Direct and Indirect Costs	$ 359,642	
			Total Capital Costs	**$ 1,798,211**	
Operation and Maintenance Costs					$ -
			Subtotal - O&M Costs		$ -
			Contingency Reserve - 25% of O&M Costs		$ -
			Total Annual O&M Costs		**$ -**
			Net Present Worth of Annual O&M Costs	**$ -**	
Total Net Present Worth of Alternative				**$ 1,580,700**	

Note: At time estimate was prepared, ENRCCI = 11392 (January 2020)

TABLE 13
PRELIMINARY COST ESTIMATE
SEWER WATER - ALTERNATIVE 2
REMOVAL AND OFF-SITE DISPOSAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
Direct Implementation Costs					
Removal of Liquids/Solids	1	LS	$ 5,000	$ 5,000	
Pressure Wash Manhole	1	LS	$ 3,000	$ 3,000	
Waste Disposal (liquids, non-haz, T&D)	2,500	Gallons	$ 0.30	$ 750	
Waste Disposal (solids, non-haz, T&D)	2	Drums	$ 250	$ 500	
Disconnect and Grout Pipe and Manhole	1	LS	$ 5,000	$ 5,000	
			Subtotal - Direct Costs	$ 14,250	
Indirect Costs					
Remedial Design		Lump Sum		$ 5,000	
Mobilization/Misc. Site Prep		(5% of Direct Costs)		$ 713	
Site Administration		(5% of Direct Costs)		$ 713	
Permitting/Legal Costs		(2% of Direct Costs)		$ 285	
Construction Management/Overisght		(10% of Direct Costs)		$ 1,425	
			Subtotal - Indirect Costs	$ 8,135	
			Contingency - 25% of Direct and Indirect Costs	$ 5,596	
			Total Capital Costs	**$ 27,981**	
Operation and Maintenance Costs					$ -
			Subtotal - O&M Costs		$ -
			Contingency Reserve - 25% of O&M Costs		$ -
			Total Annual O&M Costs		**$ -**
			Net Present Worth of Annual O&M Costs	**$ -**	
Total Net Present Worth of Alternative				**$ 24,900**	

Note: At time estimate was prepared, ENRCCI = 11392 (January 2020)

TABLE 14
PRELIMINARY COST ESTIMATE
SOIL GAS - ALTERNATIVE 2
INSTITUTIONAL CONTROLS, AIR MONITORING/ENGINEERING CONTROLS,
AND SITE-WIDE ENGINEERING CONTROLS

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
Direct Implementation Costs					
Deed Restrictions/CEAs	15	Lots	$ 4,000	$ 60,000	
Initial Round of Indoor Air Monitoring (3/bldg)	21	Sample	$ 1,500	$ 31,500	
			Subtotal - Direct Costs	$ 91,500	
Indirect Costs					
Remedial Design	(5% of Direct Costs)			$ 4,575	
Site Administration	(1% of Direct Costs)			$ 915	
Permitting/Legal Costs	(1% of Direct Costs)			$ 1,830	
			Subtotal - Indirect Costs	$ 7,320	
			Contingency - 25% of Direct and Indirect Costs	$ 24,705	
			Total Capital Costs	**$ 123,525**	
Operation and Maintenance Costs					
Indoor Air Monitoring	21	Sample	$ 1,500		$ 31,500
			Subtotal - O&M Costs		$ 31,500
			Contingency - 25% of O&M Costs		**$ 31,500**
			Net Present Worth of Annual O&M Costs	**$ 341,400**	
Total Net Present Worth of Alternative				**$ 449,800**	

Note: At time estimate was prepared, ENRCCI = 11392 (January 2020)

TABLE 15
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 4
INSTITUTIONAL CONTROLS, ENGINEERING CONTROLS, FOCUSED REMOVAL WITH OFF-SITE DISPOSAL OF LEAD, AND NAPL REMOVAL

	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
Direct Implementation Costs					
Deed Restrictions (legal/filing)	15	Lots	$ 4,000	$ 60,000	
Fencing Enhancements	1,000	LF	$ 20	$ 20,000	
Site Preparation					
Clear Vegetation	0.5	Ac	$ 1,500	$ 750	
Asphalt and Debris Removal	1	LS	$ 25,000	$ 25,000	
Asphalt and Debris Disposal (T&D)	7500	Ton	$ 75	$ 562,500	
Asphalt Cap					
Regrade as needed to level surface	2000	CY	$ 20	$ 40,000	
Base gravel - 6"	27,200	SY	$ 18	$ 489,600	
Bituminous concrete - 6"	24,800	SY	$ 48	$ 1,190,400	
Seal coating	24,800	SY	$ 1.25	$ 31,000	
NAPL Removal					
Excavate/Load Soil/Fill	310	CY	$ 15	$ 4,650	
Waste Disposal, Petroleum-impacted (T&D)	510	Ton	$ 75	$ 38,250	
Soil Treatment	510	Ton	$ 25	$ 12,750	
Clean Backfill (provide/place/compact)	510	Ton	$ 60	$ 30,600	
Vertical Barrier					
Temporary Silt Screens in river	1	LS	$ 25,000	$ 25,000	
Old Wall Excavation (non soil/fill debris)	240	CY	$ 50	$ 12,000	
Decontamination and Disposal of Old Wall (non-soil/fill debris, T&D)	400	Ton	$ 250	$ 100,000	
Sheet Pile Installation (800' x 30')	24,000	SF	$ 150	$ 3,600,000	
Seal inactive wall pipes		LS	$ 35,000	$ 35,000	
Limited Excavation/Disposal					
Foundation Protection During Excavation	1	LS	$ 200,000	$ 200,000	
Excavate/load soils	5,100	CY	$ 15	$ 76,500	
Disposal of soils (non-haz, T&D)	8,415	Ton	$ 75	$ 631,125	
Soil Treatment for Disposal	8,415	Ton	$ 25	$ 210,375	
Clean Backfill (provide/place/compact)	8,415	Ton		$ 504,900	
			Subtotal - Direct Costs	$ 7,900,400	
Indirect Costs					
Geotechnical Investigation		Lump Sum		$ 60,000	
Predesign Investigation/Soil Delineation		Lump Sum		$ 250,000	
Remedial Design		(10% of Direct Costs)		$ 790,040	
Mobilization/Misc. Site Prep		(5% of Direct Costs)		$ 395,020	
Site Administration		(5% of Direct Costs)		$ 395,020	
Permitting/Legal Costs		(2% of Direct Costs)		$ 158,008	
Oversight/Post-Ex Sampling		(10% of Direct Costs)		$ 790,040	
			Subtotal - Indirect Costs	$ 2,838,128	
			Diamond Alkali OU2 Contingency	$ 200,000	
			Contingency - 25% of Direct and Indirect Costs	$ 2,684,632	
			Total Capital Costs	**$ 13,623,160**	
Operation and Maintenance Costs					
Site Inspections/Maintenance	4	Qtr	$ 5,000		$ 20,000
Renew Top Coat every 10 yrs (annualized cost)	1	annualized	$ 35,000		$ 35,000
Five-Year Reviews	1	annualized	$ 5,000		$ 5,000
			Subtotal - O&M Costs		$ 60,000
			Contingency Reserve - 25% of O&M Costs		$ 15,000
			Total Annual O&M Costs		**$ 75,000**
			Net Present Worth of Annual O&M Costs	**$ 812,900**	
Total Net Present Worth of Alternative				**$ 12,633,300**	

Note: At time estimate was prepared, ENRCCI = 11392 (January 2020)

TABLE 16
PRELIMINARY COST ESTIMATE
GROUNDWATER - ALTERNATIVE 4
INSTITUTIONAL CONTROLS, PUMP AND TREAT, AND TARGETED PERIODIC IN-SITU REMEDIATION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
Direct Implementation Costs					
CEA/WRA Submissions	1	LS	$ 75,000	$ 75,000	
Year 1 Groundwater Monitoring	4	LS	$ 45,000	$ 180,000	
Extraction Well, pump, riser, well head, pump	20	EA	$ 1,500	$ 30,000	
Conveyance Trenching/Fill	2,500	CY	$ 40	$ 100,000	
Piping, conduit, wiring, instrumentation	30,000	LF	$ 37	$ 1,110,000	
Treatment Building, Pad, Utilities	7,500	SF	$ 250	$ 1,875,000	
Utilities (sewer, water, electrical)	1	LS	$ 100,000	$ 100,000	
Discharge line	500	LF	$ 150	$ 75,000	
200 gpm Treatment System, includes equipment, installation, labor					
Process Water Tanks	1	LS	$ 150,000	$ 150,000	
Oxidation System	1	LS	$ 500,000	$ 500,000	
Filtration Units	1	LS	$ 400,000	$ 400,000	
Metals Precipitaion System	1	LS	$ 275,000	$ 275,000	
Sludge Processing	1	LS	$ 150,000	$ 150,000	
Carbon Adsorption Units	1	LS	$ 250,000	$ 250,000	
Pumps and Piping	1	LS	$ 150,000	$ 150,000	
Electrical, Instrumentation, Controls	1	LS	$ 1,500,000	$ 1,500,000	
Chemical Feed System	1	LS	$ 175,000	$ 175,000	
			Subtotal - Direct Costs	$7,095,000	
Indirect Costs					
Predesign Investigation		Lump Sum		$ 750,000	
Geotechnical Investigation		Lump Sum		$ 150,000	
Remedial Design		(10% of Direct Costs)		$ 709,500	
Mobilization/Misc. Site Prep		(5% of Direct Costs)		$ 354,750	
Site Administration		(5% of Direct Costs)		$ 354,750	
Permitting/Legal Costs		(2% of Direct Costs)		$ 141,900	
Construction Management/Oversight		(10% of Direct Costs)		$ 709,500	
			Subtotal - Indirect Costs	$ 3,170,400	
			Contingency - 25% of Direct and Indirect Costs	$ 2,566,350	
			Total Capital Costs	**$ 12,831,750**	
Operation and Maintenance Costs					
Routine Groundwater Monitoring	2	event	$ 45,000		$ 90,000
Biennial Sampling Per CEA (annualized costs)	1	event	$ 10,000		$ 10,000
Treatment System					
Utilities	1	LS	$ 150,000		$ 150,000
Chemicals (oxidant, pH adjustment, etc.)	1	LS	$ 50,000		$ 50,000
Carbon Changeout	1	LS	$ 50,000		$ 50,000
Sludge/Waste Management	1	LS	$ 50,000		$ 50,000
Routine O&M (staffed 40 hrs per wk)	1	LS	$ 320,000		$ 320,000
Non Routine Maintenance	1	LS	$ 25,000		$ 25,000
Performance Sampling	1	LS	$ 150,000		$ 150,000
In-Situ Targetted Treatment for Selected Contaminants	1	LS	$ 300,000		$ 300,000
Five-year Reviews	1	annualized	$ 5,000		$ 5,000
			Subtotal - O&M Costs		$ 1,200,000
			Contingency Reserve - 25% of O&M Costs		$ 300,000
			Total Annual O&M Costs		**$ 1,500,000**
			Net Present Worth of Annual O&M Costs	**$ 14,200,200**	
Total Net Present Worth of Alternative				**$ 24,234,400**	

Note: At time estimate was prepared, ENRCCI = 11392 (January 2020)

TABLE 17
CHEMICAL-SPECIFIC ARARs AND TBCs

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
New Jersey Ground Water - Ground Water Quality Standards	State	N.J.A.C. 7:9C	Defines groundwater classifications and establishes groundwater quality standards for various compounds. The site groundwater is classified as Class IIA suitable for drinking water.	New Jersey classifies groundwater as Class IIA groundwater. Standards were used to develop the RGs.
New Jersey Water Statues and Rules - Primary Drinking Water Standards - Maximum Contaminant Level (MCLs)	State	N.J.A.C. 7:10	Establishes state discretionary MCLs that are generally equal to or more stringent than federal Safe Drinking Water Act MCLs.	Standards were used to develop the RGs.
EPA National Primary Drinking Water Regulations - Maximum Contaminant Level (MCL)	Federal	40 C.F.R. Part 141	Establishes legally enforceable primary standards and treatment techniques that apply to public water systems.	Standards were used to develop the RGs.
New Jersey Non-Residential Direct Contact Soil Remediation Standards	State	N.J.A.C. 7:26D-4	Establishes standards for soil cleanups.	Standards were used to develop the RGs.
New Jersey Non-Residential Indoor Air Remediation Standards for Vapor Intrusion	State	N.J.A.C. 7:26D-5	Establishes standards for indoor air cleanups.	Standards will be selected as RGs if active remediation for vapor intrusion is required.
NJDEP Vapor Intrusion Screening Levels (VISLs)	State	NJDEP Vapor Intrusion Technical (VIT) Guidance Version 5.0 (May 2021)	Identifies indoor air standards, soil gas VISLs, and groundwater VISLs for use in vapor intrusion investigations.	Screening levels are TBC and were used in the BHHRA to evaluate the vapor intrusion pathway. If future investigations indicate exceedances of NJDEP indoor air remediation standards, soil gas VISLs, or groundwater VISLs from site COCs, then further evaluation of the data would be performed to determine whether unacceptable risks/hazards exist.
EPA Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air	Federal	OSWER Publication 9200.2-154 (June 2015, errata January 29, 2018)	Presents current technical recommendations for assessing the vapor intrusion pathway, including calculation of vapor intrusion screening levels (VISLs)	Calculator and guidance were used in the BHHRA to evaluate the vapor intrusion pathway and develop the RGs. If indoor air monitoring indicates exceedances of EPA VISLs from site COCs, then further evaluation of the data would be performed to determine whether unacceptable risks/hazards exist.
EPA Vapor Intrusion Screening Levels (VISLs)	Federal	EPA Calculator (last accessed April 2020)	Provides screening level related to vapor intrusion investigation.	Calculator and guidance were used in the BHHRA to evaluate the vapor intrusion pathway and develop the RGs. If indoor air monitoring indicates exceedances of EPA VISLs from site COCs, then further evaluation of the data would be performed to determine whether unacceptable risks/hazards exist.

Legend
ARAR - Applicable, Relevant, or Appropriate Requirement
OSWER - Office of Solid Waste and Emergency Response
RG − Remediation Goal
TBC - Advisories, Criteria, and Guidance To Be Considered
RSL − Regional Screening Level
C.F.R. − Code of Federal Regulations
TSCA − Toxic Substances Control Act
EPA − United States Environmental Protection Agency
µg/dL − micrograms per deciliter
MCL − Maximum Contaminant Level
OLEM − Office of Land and Emergency Management
N.J.A.C. − New Jersey Administrative Code

TABLE 18
LOCATION-SPECIFIC ARARs AND TBCs

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
Clean Air Act, Standards of Performance for New Stationary Sources	Federal	40 C.F.R. Part 60	Air emissions standards apply to owners and operators of stationary sources.	During excavation, treatment, and/or stabilization, air emissions will be properly controlled and monitored to comply with these standards.
Clean Air Act, National Primary and Secondary Ambient Air Quality Standards (NAAOS)	Federal	40 C.F.R. Part 50	Establishes national ambient air quality standards with respect to health based criteria.	ARAR for remedial activities which emit contaminants into the atmosphere.
New Jersey Air Pollution Control Act	State	N.J.A.C. 7:27-22 N.J.S.A. 26:2C	Describes requirements and procedures for obtaining air permits and certificates; rules that govern the emission of contaminants into the ambient atmosphere.	This standard would apply to air emissions from remediation activities performed at the site. Under CERCLA Section 121(e)(1), no permits are required for response actions conducted entirely on-site. On-site work will comply with substantive requirements of otherwise required permits.
Subsurface and Percolating Waters Act and Well Construction, Maintenance, and Sealing Rules	State	NJSA 58:4A-5 et seq. and N.J.A.C. 7:9D	Requirements for drilling and installing wells, licensing of well driller and pump installer, constructions, and well casing specifications.	Applicable to installation of monitoring wells, extraction wells, or reinjection wells.
New Jersey Freshwater Wetland Protection Act	State	N.J.A.C. 7:7A	Establishes requirements for the protection of freshwater wetlands.	Potentially applicable for investigation and construction activities performed in the vicinity of a wetland or waterway.
Flood Hazard Area Control Act Rules	State	N.J.A.C. 7:13	Requirements for placement of fill, grading and other disturbances within floodplain.	Potential ARAR for remedial activities that are located in or near a 100-or 500-year floodplain.
Flood Hazard Area Control Act	State	N.J.A.C. 58: 16A-50	Delineates flood hazard areas and regulates use.	Potential ARAR for remedial activities are located in or near a 100- or 500-year floodplain.
Section 10 of the Rivers and Harbors Act of 1899	Federal	33 U.S.C. § 403, 33 C.F.R. Part 322	Governs coordination with the U.S. Army Corps of Engineers with regard to work at or below mean high water, including management of fill materials and vertical barriers. U.S. Army Corps of Engineers approval is generally required to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of any navigable water of the United States.	On-site activities will be properly conducted to minimize adverse effects and will be coordinated with the U.S. Army Corps of Engineers..
Coastal Zone Management Act (CZMA)	Federal	16 U.S.C.§ 1451, et seq. Federal Consistency Regulations, 15 C.F.R. Part 930	This act encourages states to develop coastal management plans to manage competing uses of and impacts to coastal resources, and to manage sources of nonpoint source pollution in coastal waters. The CZMA Federal Consistency Determination provisions require that any federal agency undertaking a project in the coastal zone of a state shall insure that the project is, to the maximum extent practicable, consistent with the enforceable policies of approved state management programs. Implemented through compliance with substantive requirements of New Jersey Waterfront Development Law and Coastal Zone Management Rules, N.J.A.C. 7:7.	Remedy will be consistent, to the extent practicable, with enforceable policies of approved state management programs.
Coastal Zone Management Rules	State	N.J.A.C. 7:7E	This program establishes standards for use and development of coastal resources.	Remedy will be consistent with substantive provisions of these regulations.
Statement of Procedures on Floodplain Management and Wetlands Protection	Federal	40 C.F.R. Part 6, Appendix A	This Statement of Procedures sets forth Agency policy and guidance for carrying out the provisions of Executive Order (EO) 11988 and EO 11990. with these regulations.	Remedy will be consistent, to the extent practicable.
Protection of Wetlands	Federal	Executive Order 11990	This Executive Order prohibits any federally-funded construction projects in wetlands unless there are no practicable alternatives to such construction, and the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.	Remedy will be consistent, to the extent practicable, with this policy.
Policy on Floodplains and Wetlands Assessments for CERCLA Actions	Federal	OSWER Directive 9280.0–02, 1985	Superfund actions must meet the substantive requirements of EO 11988, EO 11990, and 40 C.F.R. Part 6, Appendix A. This memorandum discusses situations that require preparation of a floodplains assessment, and the factors that should be considered in preparing an assessment, for response actions taken pursuant to Section 104 or 106 of CERCLA.	Remedy will be consistent, to the extent practicable, with this policy.

TABLE 18
LOCATION-SPECIFIC ARARs AND TBCs

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
Floodplain Management	Federal	Executive Order 11988, as amended by Executive Order 13690	Federal agencies are required to reduce the risk of flood loss, to minimize the impact of floods, and to restore and preserve the natural and beneficial values of floodplains.	The potential effects of any action will be evaluated to ensure that the planning and decision making reflect consideration of flood hazards and floodplains management, including restoration and preservation of natural undeveloped floodplains.
New Jersey Freshwater Wetlands Protection Act Rules	State	N.J.S.A.13:981, N.J.A.C. 7:7A	Regulates construction or other activities (including remedial action) that will have an impact on a river.	Best management practices will be used to avoid or minimize adverse impact to aquatic habitat, consistent with substantive requirements of N.J.A.C. 7:7A.
Fish and Wildlife Coordination Act	Federal	16 U.S.C. § 661–666c	Requires consideration of the effects of a proposed action on wetlands and areas affecting streams (including floodplains), as well as other protected habitats. Calls for federal agencies to consult with the United States Fish and Wildlife Service (USFWS) and the appropriate state agency with jurisdiction over wildlife resources prior to issuing permits or undertaking actions involving the modification of any body of water (including impoundment, diversion, deepening, or otherwise controlled or modified for any purpose).	Consultation with USFWS regarding potential impacts will occur during remedial design.
Migratory Bird Treaty Act	Federal	16 U.S.C. 703 et seq.	Requires that federal agencies consult with United States Fish and Wildlife Service (USFWS) during remedial design and remedial construction to ensure that the cleanup of the site does not unnecessarily impact migratory bird species.	Consultation with USFWS regarding potential impacts will occur during remedial design.

Legend
ARAR - Applicable, Relevant, or Appropriate Requirement
OSWER - Office of Solid Waste and Emergency Response
TBC - Advisories, Criteria, and Guidance To Be Considered
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R. − Code of Federal Regulations
EPA − United States Environmental Protection Agency
N.J.S.A - New Jersey Statutes Annotated
N.J.A.C. − New Jersey Administrative Code
U.S.C - United States Code

TABLE 19
ACTION-SPECIFIC ARARs AND TBCs

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
RCRA Identification and Listing of Hazardous Waste	Federal	40 C.F.R. Part 261.3 and 261.10	Describes methods for identifying hazardous wastes and lists known hazardous wastes.	Applicable to the identification of hazardous wastes that are generated, treated, stored, or disposed of during remedial activities.
RCRA Standards Applicable to Generators of Hazardous Waste	Federal	40 C.F.R. Part 262	Standards applicable to generators of hazardous wastes.	Potentially applicable. These standards will be followed if any hazardous wastes are generated on-site during the remedial action.
New Jersey Technical Requirements for Site Remediation	State	N.J.A.C. 7:26E	Establishes technical requirements for investigation and remediation processes under New Jersey cleanup programs.	Treatment or removal of free product from underground storage tanks will comply with substantive requirements of N.J.A. C. 7:26E-5.1(e).
New Jersey Hazardous Waste Regulations - Identification and Listing of Hazardous Waste	State	N.J.A.C. 7:26G-5	Methods for identifying hazardous wastes and lists known hazardous wastes.	This regulation will be applicable to the identification of hazardous wastes that are generated, treated, stored, or disposed of during remedial activities.
New Jersey Stormwater Management Rule	State	N.J.A.C. 7:8	This regulation sets the requirements for stormwater management during construction including nonstructural stormwater management strategies, erosion control, and stormwater runoff quality standards.	Applicable if remedial activities include total land disturbance exceeding regulatory threshold. If so, substantive requirements will be met during construction.
New Jersey Soil Erosion and Sediment Control Act	State	N.J.A.C. 2:90, N.J.S.A. 4:24-39, et seq.	Regulates construction that will potentially result in erosion of soil and sediment. Requirements include the submittal and approval of a plan for soil erosion and sediment control.	Applicable to remedial construction activities that result in total land disturbance greater than or equal to regulatory threshold.
New Jersey Noise Control	State	N.J.A.C. 7:29	Regulates noise levels for certain types of activities such as commercial, industrial, community service and public service facilities. Relevant and appropriate for establishing allowable noise levels.	This standard will be applied to remediation activities performed at the Site.
Hazardous Material Transportation Act, 49 U.S.C. § 1801-1819, Department of Transportation Rules for Transportation of Hazardous Materials	Federal	49 C.F.R. Part 107, 171, 172, 177-179	Applicable to the transportation of excavated material that is being managed as hazardous waste. Includes requirements for the packaging, labeling, manifesting, and transporting hazardous materials.	Any company contracted to transport hazardous material from the Site will be required to comply with this regulation.
RCRA Standards Applicable to Transporters of Hazardous Waste	Federal	40 C.F.R. Part 263	This regulation establishes standards for hazardous waste transporters.	Any company contracted to transport hazardous material from the Site will be required to comply with this regulation.
New Jersey Transportation of Hazardous Materials	State	N.J.A.C. 16:49	Regulates the shipping, packaging, marking, labeling, placarding, handling, and transportation of hazardous materials.	Applicable to the transport of hazardous material from the Site.
Clean Air Act - National Ambient Air Quality Standards	Federal	40 C.F.R. Part 50	This regulation specifies maximum primary and secondary 24-hour concentrations for particulate matter. Fugitive dust emissions from site excavation activities must be maintained below 260 µg/m3 (primary standard).	Proper dust suppression methods such as water spray would be specified when implementing excavation and/or solidification/stabilization actions.
Clean Water Act, Section 404, 33 U.S.C. § 1344, C.F.R. Part 230 (Guidelines for Specification of Disposal Sites for Dredged or Fill Material)	Federal	Section 404(b)(1)	Regulates the discharge of dredged and fill material into waters of the United States including wetlands.	On-site activities would be properly conducted to minimize adverse effects.

TABLE 19
ACTION-SPECIFIC ARARs AND TBCs

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
RCRA Land Disposal Restrictions (LDRs)	Federal	40 C.F.R. Part 268	Identifies hazardous wastes restricted for land disposal and provides treatment standards for land disposal.	Hazardous wastes will be treated to meet disposal requirements.
Effluent Guidelines and Standards for the Point Source Category	Federal	40 C.F.R. Part 414	These regulations establish effluent limitations organized by industry on any direct discharge and indirect discharge point sources.	Point source discharges will comply with substanive requirements.
The New Jersey Pollutant Discharge Elimination System (NJPDES)	State	N.J.A.C. 7:14A	Governs the discharge of any wastes into or adjacent to State waters that may alter the physical, chemical, or biological properties of State waters.	The remedial action will meet substantive NJPDES requirements for any surface water discharges or groundwater discharges, such as injection of reagent for in situ treatment.
Clean Air Act - National Ambient Air Quality Standards	Federal	40 C.F.R. Part 50	This regulation provides air quality standards for particulate matter, lead, NO2, SO2, CO, and volatile organic matter.	During excavation, treatment, and/or stabilization of waste, air emissions will be properly controlled and monitored to comply with these standards.
Standards of Performance for New Stationary Sources	Federal	40 C.F.R. Part 60	This regulation sets the general requirements for air quality for new stationary sources of air pollution.	During excavation, treatment, and/or stabilization of waste, air emissions will be properly controlled and monitored to comply with these standards.
National Emission Standards for Hazardous Air Pollutants	Federal	40 C.F.R. Part 61	This regulation provides air quality standards for hazardous air pollutants.	During excavation, treatment, and/or stabilization of waste, air emissions will be properly controlled and monitored to comply with these standards.
New Jersey Ambient Air Quality Standards	State	N.J.A.C. 7:27-13	This standard provides the requirements for ambient air quality control.	This standard would apply to air emissions from remediation activities performed at the Site.
Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria	State	NJDEP Technical Guidance (September 2012)	This guidance presents options for demonstrating compliance with New Jersey ARARs.	Guidance to be used in demonstrating whether soil remediation goals have been met.
Administrative Requirement for the Remediation of Contaminated Sites (ARRCS)	State	N.J.A.C. 7:26C	Establishes a paradigm for the remediation of contaminated sites in New Jersey, including the requirement that a person responsible for conducting the remediation employ a licensed site remediation professional (LSRP) to supervise the remediation.	Lot 57, while described in the ROD, is not being addressed as part of the CERCLA remedy but under NJ cleanup authorities.
Technical Guidance on the Capping of Sites Undergoing Remediation, Version 1.0	State	NJDEP Technical Guidance (July 2014)	This guidance provides options for implementing a capping remedy.	Guidance to be considered in implementing the site-wide cap.
Capping of Inorganic and Semivolatile Contaminants for the Impact to Ground Water Pathway, Version 1.0	State	NJDEP Technical Guidance (March 2014)	This guidance provides information the application of caps for addressing the impact to groundwater pathway	Guidance to be considered in implementing the site-wide cap.
Capping of Volatile Contaminants for the Impact to Ground Water Pathway, Version 1.1	State	NJDEP Technical Guidance (January 2019)	This guidance provides additional options for addressing the impact to groundwater pathway	Guidance to be considered in implementing the site-wide cap.

Legend
AOC - area of contamination
NO2 - Nitrogen dioxide
ARAR - Applicable or Relevant and Appropriate Requirement
NPDES - National Pollutant Discharge Elimination System
C.F.R. - Code of Federal Regulations
CO - Carbon monoxide
RCRA - Resource Conservation and Recovery Act
FR - Federal Register
SO2 – Sulfur dioxide
LDR - Land Disposal Restrictions
TBC - Advisories, Criteria, and Guidance To Be Considered
N.J.A.C. - New Jersey Administrative Code
TSCA - Toxic Substances Control Act
NJPDES - New Jersey Pollutant Discharge Elimination System µg/m3 - microgram per cubic meter

APPENDIX III

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

02/02/2021

REGION ID: 02

Site Name: RIVERSIDE INDUSTRIAL PARK
CERCLIS ID: NJSFN0204232
OUID: 01
SSID: 02PC
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
615362	02/02/2021	ADMINISTRATIVE RECORD INDEX FOR THE RIVERSIDE INDUSTRIAL PARK SITE	15	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
351663	04/15/2015	SITE CHARACTERIZATION SUMMARY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	767	Report		(WOODARD & CURRAN INCORPORATED)
518709	04/30/2015	US EPA CONCURS WITH THE FINAL SITE CHARACTERIZATION SUMMARY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	1	Letter	(PPG INDUSTRIES, INC)|EBBERT,THOMAS,J (PPG INDUSTRIES, INC)	(US ENVIRONMENTAL PROTECTION AGENCY)|BUTLER,ELIZABETH (US ENVIRONMENTAL PROTECTION AGENCY)
518712	08/01/2017	CORRESPONDENCE REGARDING US EPA CONDITIONALLY APPROVES THE REMEDIAL INVESTIGATION AND FEASIBILITY STUDY WORK PLAN FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(PPG INDUSTRIES, INC)|EBBERT,THOMAS,J (PPG INDUSTRIES, INC)	(US ENVIRONMENTAL PROTECTION AGENCY)|BUTLER,ELIZABETH (US ENVIRONMENTAL PROTECTION AGENCY)
528339	08/01/2017	REMEDIAL INVESTIGATION AND FEASIBILITY STUDY WORK PLAN FOR THE RIVERSIDE INDUSTRIAL PARK SITE	1780	Work Plan		(WOODARD & CURRAN INCORPORATED)
518715	09/20/2017	CORRESPONDENCE REGARDING FINALIZING THE AUGUST 2017 RI/FS QUALITY ASSURANCE PROJECT PLAN FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(PPG INDUSTRIES, INC)|EBBERT,THOMAS,J (PPG INDUSTRIES, INC)	(US ENVIRONMENTAL PROTECTION AGENCY)|BUTLER,ELIZABETH (US ENVIRONMENTAL PROTECTION AGENCY)
615452	01/15/2018	REMEDIAL INVESTIGATION QUALITY ASSURANCE PROJECT PLAN ADDENDUM NO. 1 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	95	Work Plan		(WOODARD & CURRAN INCORPORATED)

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615453	02/15/2018	REMEDIAL INVESTIGATION QUALITY ASSURANCE PROJECT PLAN ADDENDUM NO. 2 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	154	Work Plan		(WOODARD & CURRAN INCORPORATED)
615456	10/09/2018	TRANSMITTAL OF THE PHASE 1 INVESTIGATION DOCUMENTS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	1	Letter	(US ENVIRONMENTAL PROTECTION AGENCY)|BUTLER,ELIZABETH (US ENVIRONMENTAL PROTECTION AGENCY)	(WOODARD & CURRAN INCORPORATED)
615457	10/09/2018	PHASE 2 INVESTIGATION TECHNICAL MEMORANDUM FOR THE RIVERSIDE INDUSTRIAL PARK SITE	39	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WOODARD & CURRAN INCORPORATED)
594317	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	267	Letter		(PPG INDUSTRIES INCORPORATED)
594318	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 APPENDIX A FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2303	Letter		(PPG INDUSTRIES INCORPORATED)
594319	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 APPENDIX B - E FOR THE RIVERSIDE INDUSTRIAL PARK SITE	124	Letter		(PPG INDUSTRIES INCORPORATED)
615488	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 1 OF 15 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	12563	Report		(PPG INDUSTRIES INCORPORATED)
615489	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 2 OF 15 FOR THE RIVERSIDE INDUSTRIAL	5763	Report		(PPG INDUSTRIES INCORPORATED)

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615490	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 3 OF 15 FOR THE RIVERSIDE INDUSTRIAL	7744	Report		(PPG INDUSTRIES INCORPORATED)
615491	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 4 OF 15 FOR THE RIVERSIDE INDUSTRIAL	11886	Report		(PPG INDUSTRIES INCORPORATED)
615492	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 5 OF 15 FOR THE RIVERSIDE INDUSTRIAL	5382	Report		(PPG INDUSTRIES INCORPORATED)
615493	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 6 OF 15 FOR THE RIVERSIDE INDUSTRIAL	9536	Report		(PPG INDUSTRIES INCORPORATED)
615494	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 7 OF 15 FOR THE RIVERSIDE INDUSTRIAL	5134	Report		(PPG INDUSTRIES INCORPORATED)
615495	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 8 OF 15 FOR THE RIVERSIDE INDUSTRIAL	5542	Report		(PPG INDUSTRIES INCORPORATED)
615496	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 9 OF 15 FOR THE RIVERSIDE INDUSTRIAL	9227	Report		(PPG INDUSTRIES INCORPORATED)

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615497	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 10 OF 15 FOR THE RIVERSIDE INDUSTRIAL	9296	Report		(PPG INDUSTRIES INCORPORATED)
615498	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 11 OF 15 FOR THE RIVERSIDE INDUSTRIAL	6964	Report		(PPG INDUSTRIES INCORPORATED)
615499	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 12 OF 15 FOR THE RIVERSIDE INDUSTRIAL	7407	Report		(PPG INDUSTRIES INCORPORATED)
615500	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 13 OF 15 FOR THE RIVERSIDE INDUSTRIAL	11752	Report		(PPG INDUSTRIES INCORPORATED)
615501	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 14 OF 15 FOR THE RIVERSIDE INDUSTRIAL	15259	Report		(PPG INDUSTRIES INCORPORATED)
615502	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 - APPENDIX F PART 15 OF 15 FOR THE RIVERSIDE INDUSTRIAL	33757	Report		(PPG INDUSTRIES INCORPORATED)
594320	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 APPENDIX G FOR THE RIVERSIDE INDUSTRIAL PARK SITE	3564	Letter		(PPG INDUSTRIES INCORPORATED)

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594321	10/31/2018	SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 APPENDIX H - O FOR THE RIVERSIDE INDUSTRIAL PARK SITE	284	Letter		(PPG INDUSTRIES INCORPORATED)
615454	11/27/2018	REMEDIAL INVESTIGATION QUALITY ASSURANCE PROJECT PLAN ADDENDUM NO. 3 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2572	Work Plan		(WOODARD & CURRAN INCORPORATED)
615455	01/09/2019	REMEDIAL INVESTIGATION QUALITY ASSURANCE PROJECT PLAN ADDENDUM NO. 4 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	180	Work Plan		(WOODARD & CURRAN INCORPORATED)
615451	04/25/2019	PATHWAY ANALYSIS REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	180	Report		(RAMBOLL ENVIRON CORPORATION)
615486	05/01/2019	US EPA COMMENTS ON THE SITE CHARACTERIZATION SUMMARY REPORT - UPDATED CONCEPTUAL SITE MODEL FOR THE RIVERSIDE INDUSTRIAL PARK SITE	15	Memorandum		(US ENVIRONMENTAL PROTECTION AGENCY)
594316	05/16/2019	US EPA CONDITIONALLY APPROVES THE SITE CHARACTERIZATION SUMMARY REPORT ADDENDUM OCTOBER 2018 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	1	Letter	(PPG INDUSTRIES INCORPORATED)	BUTLER,ELIZABETH (US ENVIRONMENTAL PROTECTION AGENCY)
615449	06/12/2019	IDENTIFICATION OF TECHNOLOGIES MEMORANDUM FOR THE RIVERSIDE INDUSTRIAL PARK SITE	48	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WOODARD & CURRAN INCORPORATED)

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615450	07/17/2019	US EPA APPROVAL OF THE IDENTIFICATION OF TECHNOLOGIES MEMORANDUM FOR THE RIVERSIDE INDUSTRIAL PARK SITE	1	Letter	(PPG INDUSTRIES, INC)	(US ENVIRONMENTAL PROTECTION AGENCY)|BUTLER,ELIZABETH (US ENVIRONMENTAL PROTECTION AGENCY)
615447	08/28/2019	DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES TECHNICAL MEMORANDUM FOR THE RIVERSIDE INDUSTRIAL PARK SITE	71	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WOODARD & CURRAN INCORPORATED)
615471	01/17/2020	DRAFT SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT WITH COMMENTS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	47	Report		(RAMBOLL ENVIRON CORPORATION)
615474	01/17/2020	DRAFT REMEDIAL INVESTIGATION REPORT WITH COMMENTS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	227	Report		(RAMBOLL ENVIRON CORPORATION)
615475	01/17/2020	DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT VERSION 2 WITH COMMENTS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	309	Report		(RAMBOLL ENVIRON CORPORATION)
615477	01/17/2020	BASELINE HUMAN HEALTH RISK ASSESSMENT VERSION 2 - APPENDIX F UPDATES FOR THE RIVERSIDE INDUSTRIAL PARK SITE	68	Report		(RAMBOLL ENVIRON CORPORATION)
613935	02/20/2020	SAMPLING DATABASE FILES FOR THE RIVERSIDE INDUSTRIAL PARK SITE	1	Report		

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613933	02/27/2020	US EPA CONDITIONALLY APPROVES THE RIR, BHHRA, SLERA UPON US EPA COMMENTS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter		
615448	02/27/2020	US EPA CONDITIONAL APPROVAL OF THE DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES TECHNICAL MEMORANDUM FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(PPG INDUSTRIES, INC)	(US ENVIRONMENTAL PROTECTION AGENCY)|SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)
615470	02/27/2020	US EPA REVIEW OF RESPONSE TO COMMENTS ON THE SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	5	Chart/Table		(US ENVIRONMENTAL PROTECTION AGENCY)
615472	02/27/2020	US EPA REVIEW OF RESPONSE TO COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	31	Chart/Table		(US ENVIRONMENTAL PROTECTION AGENCY)
615473	02/27/2020	US EPA REVIEW OF RESPONSE TO COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	7	Chart/Table		(US ENVIRONMENTAL PROTECTION AGENCY)
615476	02/27/2020	US EPA REVIEW OF RESPONSE TO COMMENTS ON THE BASELINE HUMAN HEALTH RISK ASSESSMENT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	40	Chart/Table		(US ENVIRONMENTAL PROTECTION AGENCY)
615478	02/27/2020	US EPA REVIEW OF RESPONSE TO COMMENTS ON THE DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES TECHNICAL MEMORANDUM FOR THE RIVERSIDE INDUSTRIAL PARK SITE	18	Chart/Table		(US ENVIRONMENTAL PROTECTION AGENCY)

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615479	04/14/2020	LSRP FOLLOW UP ON THE WOODARD CURRAN INVESTIGATION AT THE RIVERSIDE INDUSTRIAL PARK SITE	3	Memorandum	(WOODARD & CURRAN INCORPORATED)	(ADVANCED GEOSERVICES)
613959	04/20/2020	FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	235	Report	(PPG INDUSTRIES, INC)	(RAMBOLL ENVIRON CORPORATION)
613960	04/20/2020	FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT - APPENDICES FOR THE RIVERSIDE INDUSTRIAL PARK SITE	16174	Report	(PPG INDUSTRIES, INC)	(RAMBOLL ENVIRON CORPORATION)
613961	04/20/2020	FINAL SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	83	Report	(PPG INDUSTRIES, INC)	(RAMBOLL ENVIRON CORPORATION)
613932	04/21/2020	CORRESPONDENCE REGARDING APPROVAL FOR THE REMEDIAL INVESTIGATION BASELINE HUMAN HEALTH RISK ASSESSMENT AND FINAL SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter		
615481	06/01/2020	US EPA COMMENTS ON SITE FIGURES FOR PPG TO ADDRESS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	28	Figure/Map/ Drawing		
615483	06/08/2020	DRAFT FEASIBILITY STUDY WITH COMMENTS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	154	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WOODARD & CURRAN INCORPORATED)

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613929	06/16/2020	FINAL REMEDIAL INVESTIGATION REPORT APPENDIX A FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2303	Report		(WOODARD & CURRAN INCORPORATED)
613930	06/16/2020	FINAL REMEDIAL INVESTIGATION REPORT APPENDICES B - E FOR THE RIVERSIDE INDUSTRIAL PARK SITE	645	Report		(WOODARD & CURRAN INCORPORATED)
613956	06/16/2020	FINAL REMEDIAL INVESTIGATION REPORT APPENDICES F - H FOR THE RIVERSIDE INDUSTRIAL PARK SITE	3980	Report		(WOODARD & CURRAN INCORPORATED)
613957	06/16/2020	FINAL REMEDIAL INVESTIGATION REPORT APPENDICES I - O FOR THE RIVERSIDE INDUSTRIAL PARK SITE	817	Report		(WOODARD & CURRAN INCORPORATED)
615458	06/16/2020	CORRECTED FINAL REMEDIAL INVESTIGATION REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	472	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WOODARD & CURRAN INCORPORATED)
615484	06/22/2020	US EPA REVIEW OF RESPONSE TO COMMENTS ON THE FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	29	Chart/Table		(US ENVIRONMENTAL PROTECTION AGENCY)
615482	06/23/2020	US EPA CONDITIONAL APPROVAL OF THE FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(PPG INDUSTRIES, INC)	(US ENVIRONMENTAL PROTECTION AGENCY)|SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)

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615459	06/30/2020	US EPA APPROVAL OF THE CORRECTED FINAL REMEDIAL INVESTIGATION REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(PPG INDUSTRIES, INC)	(US ENVIRONMENTAL PROTECTION AGENCY)|SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)
615480	07/14/2020	US EPA CORRESPONDENCE TO PPG REGARDING THE FEASIBILITY STUDY AND SITE RELATED LEAD IN GROUNDWATER FOR THE RIVERSIDE INDUSTRIAL PARK SITE	4	Letter	(PPG INDUSTRIES, INC)	(US ENVIRONMENTAL PROTECTION AGENCY)|SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)
615463	07/20/2020	COMMUNITY INVOLVEMENT PLAN FOR THE RIVERSIDE INDUSTRIAL PARK SITE	74	Work Plan		(US ENVIRONMENTAL PROTECTION AGENCY)
615464	07/20/2020	US EPA COMMUNITY UPDATE JULY 2020 - EPA ISSUES PROPOSED PLAN TO PROTECT HUMAN HEALTH AT THE RIVERSIDE INDUSTRIAL PARK SITE	3	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)
615465	07/20/2020	US EPA COMMUNITY UPDATE JULY 2020 - EPA ISSUES PROPOSED PLAN TO PROTECT HUMAN HEALTH (SPANISH VERSION - EN ESPANOL) AT THE RIVERSIDE INDUSTRIAL PARK SITE	3	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)
615466	07/20/2020	US EPA COMMUNITY UPDATE JULY 2020 - EPA ISSUES PROPOSED PLAN TO PROTECT HUMAN HEALTH (PORTUGUESE VERSION) AT THE RIVERSIDE INDUSTRIAL PARK SITE	3	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)
615467	07/20/2020	FINAL FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	311	Report	SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)	(US ENVIRONMENTAL PROTECTION AGENCY)

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615487	07/21/2020	US EPA CORRESPONDENCE TO PPG REGARDING THE FINAL FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(PPG INDUSTRIES INCORPORATED)	SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)
615509	07/21/2020	WOODARD & CURRAN RESPONSE TO COMMENTS ON THE FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	16	Letter	SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)	(WOODARD & CURRAN INCORPORATED)
615469	07/22/2020	PROPOSED PLAN FOR THE RIVERSIDE INDUSTRIAL PARK SITE	31	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)
THESE DOCUMENTS WERE PROVIDED AFTER THE START OF PUBLIC COMMENT PERIOD ON 07/27/2020						
591225	06/30/2020	FINAL FEASIBILITY STUDY REPORT WITH COMMENTS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	132	Report		(WOODARD & CURRAN INCORPORATED)
615529	06/30/2020	WOODARD & CURRAN'S RESPONSE TO US EPA COMMENTS TO THE FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	3	Letter	SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)	(WOODARD & CURRAN INCORPORATED)
615530	07/10/2020	US EPA REVIEW COMMENTS ON THE FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Email		SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)
THESE DOCUMENTS WERE PROVIDED AFTER THE START OF PUBLIC COMMENT PERIOD ON 08/05/2020						

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615544	07/30/2020	PPG INDUSTRIES INCORPORATED WRITTEN NOTIFICATION OF OBJECTIONS AND INVOCATION OF DISPUTE RESOLUTION IN THE FINALIZING OF THE FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	40	Letter	SMERALDI,JOSH (US ENVIRONMENTAL PROTECTION AGENCY)	(PPG INDUSTRIES INCORPORATED)|GENGEL,GARY,P (LATHAM & WATKINS)
615545	08/05/2020	US EPA ACCEPTANCE OF PPG INDUSTRIES INCORPORATED'S WRITTEN NOTIFICATION OF OBJECTIONS AND INVOCATION OF DISPUTE RESOLUTION IN THE FINALIZING OF THE FEASIBILITY STUDY REPORT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	GENGEL,GARY,P (LATHAM & WATKINS)	REILLY,WILLIAM,J (US ENVIRONMENTAL PROTECTION AGENCY)
THESE DOCUMENTS WERE PROVIDED AFTER THE START OF PUBLIC COMMENT PERIOD ON 09/18/2020						
615585	08/18/2020	US EPA FOLLOW UP LETTER REGARDING THE NOTICE OF DISPUTE PURSUANT TO DISPUTE RESOLUTIONS PROVISIONS OF ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	GENGEL,GARY,P (LATHAM & WATKINS)	REILLY,WILLIAM,J (US ENVIRONMENTAL PROTECTION AGENCY)
615295	09/04/2020	DISPUTE RESOLUTION PROCEEDING PURSUANT TO ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMEDIAL INVESTIGATION AND FEASIBILITY STUDY FOR CERCLA DOCKET NO. 02-2014-2011 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	35	Report		(US ENVIRONMENTAL PROTECTION AGENCY)

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615294	09/04/2020	DISPUTE EXHIBITS FOR THE NOTICE OF DISPUTE PURSUANT TO DISPUTE RESOLUTION PROVISIONS OF ADMINISTRATIVE SETTLEMENT FOR CERCLA DOCKET NO. 02-2014-2011 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2205	Document Packet		(US ENVIRONMENTAL PROTECTION AGENCY)
615292	09/10/2020	SETTLEMENT AGREEMENT FOR NOTICE OF DISPUTE TO THE RESOLUTION PROVISIONS OF ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR THE RI/FS FOR CERCLA DOCKET NO. 02-2014-2011 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Legal Instrument	GENGEL,GARY (LATHAM & WATKINS)	REILLY,WILLIAM,J (US ENVIRONMENTAL PROTECTION AGENCY)
THESE DOCUMENTS WERE PROVIDED AFTER THE START OF PUBLIC COMMENT PERIOD ON 11/05/2020						
615888	09/11/2020	PPG INDUSTRIES, INCORPORATED'S RESPONSE TO US EPA NOTICE OF DISPUTE RESOLUTION AND EXTENSION OF NEGOTIATION PERIOD FOR THE RIVERSIDE INDUSTRIAL PARK SITE	1	Letter	(US ENVIRONMENTAL PROTECTION AGENCY)|REILLY,WILLIAM,P. (US ENVIRONMENTAL PROTECTION AGENCY)	(LATHAM & WATKINS)|GENGEL,GARY,P (LATHAM & WATKINS)
615889	09/11/2020	US EPA'S OFFER TO EXTEND THE NEGOTIATION PERIOD TO PPG INDUSTRIES, INCORPORATED FOR THE RIVERSIDE INDUSTRIAL PARK SITE	1	Letter	(LATHAM & WATKINS)|GENGEL,GARY,P (LATHAM & WATKINS)	(US ENVIRONMENTAL PROTECTION AGENCY)|REILLY,WILLIAM,P. (US ENVIRONMENTAL PROTECTION AGENCY)
615890	09/14/2020	PPG INDUSTRIES, INCORPORATED'S RESPONSE TO US EPA'S OFFER TO EXTEND THE NEGOTIATION PERIOD FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(US ENVIRONMENTAL PROTECTION AGENCY)|REILLY,WILLIAM,P. (US ENVIRONMENTAL PROTECTION AGENCY)	(LATHAM & WATKINS)|GENGEL,GARY,P (LATHAM & WATKINS)
615894	09/17/2020	PPG INDUSTRIES, INCORPORATED'S RESPONSE TO US EPA STATEMENT OF POSITION FOR THE RIVERSIDE INDUSTRIAL PARK SITE	26	Letter	(US ENVIRONMENTAL PROTECTION AGENCY)|REILLY,WILLIAM,P. (US ENVIRONMENTAL PROTECTION AGENCY)	(LATHAM & WATKINS)|GENGEL,GARY,P (LATHAM & WATKINS)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

02/02/2021

REGION ID: 02

Site Name: RIVERSIDE INDUSTRIAL PARK
CERCLIS ID: NJSFN0204232
OUID: 01
SSID: 02PC
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
615891	10/20/2020	US EPA'S OFFER FOR A VIRTUAL MEETING REGARDING THE DISPUTE RESOLUTION SENT TO PPG INDUSTRIES, INCORPORATED FOR THE RIVERSIDE INDUSTRIAL PARK SITE	3	Letter	(LATHAM & WATKINS)|GENGEL,GARY,P (LATHAM & WATKINS)	(US ENVIRONMENTAL PROTECTION AGENCY)|REILLY,WILLIAM,P. (US ENVIRONMENTAL PROTECTION AGENCY)
615892	10/23/2020	PPG INDUSTRIES, INCORPORATED'S RESPONSE TO US EPA OFFER FOR A VIRTUAL MEETING REGARDING THE DISPUTE RESOLUTION FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(US ENVIRONMENTAL PROTECTION AGENCY)|REILLY,WILLIAM,P. (US ENVIRONMENTAL PROTECTION AGENCY)	(LATHAM & WATKINS)|GENGEL,GARY,P (LATHAM & WATKINS)
615893	10/29/2020	US EPA COMMENTS TO PPG INDUSTRIES, INCORPORATED'S RESPONSE TO US EPA OFFER FOR A VIRTUAL MEETING REGARDING THE DISPUTE RESOLUTION FOR THE RIVERSIDE INDUSTRIAL PARK SITE	2	Letter	(LATHAM & WATKINS)|GENGEL,GARY,P (LATHAM & WATKINS)	(US ENVIRONMENTAL PROTECTION AGENCY)|REILLY,WILLIAM,P. (US ENVIRONMENTAL PROTECTION AGENCY)
615895	11/03/2020	US EPA'S COMMENTS TO PPG INDUSTRIES, INCORPORATED'S RESPONSE TO US EPA STATEMENT OF POSITION FOR THE RIVERSIDE INDUSTRIAL PARK SITE	9	Letter	(LATHAM & WATKINS)|GENGEL,GARY,P (LATHAM & WATKINS)	(US ENVIRONMENTAL PROTECTION AGENCY)|REILLY,WILLIAM,P. (US ENVIRONMENTAL PROTECTION AGENCY)
THESE DOCUMENTS WERE PROVIDED AFTER THE START OF PUBLIC COMMENT PERIOD ON 01/13/2021						
616885	11/18/2020	DISPUTE RESOLUTION TECHNICAL MEETING TRANSCRIPT ON 11/18/2020 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	84	Meeting Document		

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

02/02/2021

REGION ID: 02

Site Name: RIVERSIDE INDUSTRIAL PARK
CERCLIS ID: NJSFN0204232
OUID: 01
SSID: 02PC
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
616886	11/18/2020	DISPUTE RESOLUTION TECHNICAL MEETING PRESENTATION ON 11/18/2020 FOR THE RIVERSIDE INDUSTRIAL PARK SITE	71	Meeting Document	(US ENVIRONMENTAL PROTECTION AGENCY)	(RAMBOLL ENVIRON CORPORATION)|(WOODARD & CURRAN INCORPORATED)
THESE DOCUMENTS WERE PROVIDED AFTER THE START OF PUBLIC COMMENT PERIOD ON 02/02/2021						
616849	02/02/2021	US EPA DECISION OF DISPUTE PURSUANT TO DISPUTE RESOLUTION PROVISIONS FOR THE RIVERSIDE INDUSTRIAL PARK SITE	6	Letter	GENGEL,GARY,P (LATHAM & WATKINS)	EVANGELISTA,PAT (US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX IV

STATE OF NEW JERSEY CONCURRENCE LETTER

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SITE REMEDIATION AND WASTE MANAGEMENT PROGRAM
401 East State Street
P.O. Box 420, Mail Code 401-06
Trenton, New Jersey 08625-0420
Tel. (609) 292-1250 • Fax (609) 777-1914
www.nj.gov/dep

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

SHAWN M. LATOURETTE
Commissioner

September 27, 2021

Pat Evangelista, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency Region II
290 Broadway
New York, NY 10007-1866

RE: Riverside Industrial Park Superfund Site
Newark, Essex County

Dear Mr. Evangelista:

The New Jersey Department of Environmental Protection (Department) has completed its review of the Record of Decision (ROD) dated September 2021 for the Riverside Industrial Park Superfund Site. The ROD addresses waste, sewer water, soil/fill, groundwater, and soil gas and was prepared by the U.S. Environmental Protection Agency (EPA) Region II. As noted below, the Department concurs with the selected remedies for waste, sewer water, soil/fill and groundwater; however, the Department does not concur with the selected remedy for soil gas.

A. The Department concurs with the following:

- Waste Alternative 2 – Removal and off-site disposal;
- Sewer Water Alternative 2 – Removal and off-site disposal;
- Soil/Fill Alternative 4 – Institutional Controls, engineering control, focused removal and offsite disposal of lead impacted soil and fill, and non-aqueous phase liquid removal; and
- Ground Water Alternative 4 – Institutional Controls, pump and treat, targeted periodic in-situ remediation and monitoring.

B. The Department does not concur with the following:

- Soil Gas Alternative 2 – Institutional Controls, air monitoring or engineering controls, and site-wide engineering controls.

The Department does not concur with the soil gas alternative because the alternative does not address indoor air with exceedances in currently occupied buildings in accordance with the Department's indoor air remediation standards, N.J.A.C. 7:26D-5.

It is the Department's understanding that PFAS will be investigated at a later date.

The Department appreciates the opportunity to participate in the decision-making process for this site. Should you wish to discuss this matter further please feel free to contact me at (609) 292-1250.

Sincerely,

Mark J. Pedersen
Assistant Commissioner

c: Brandon Holsten, BCM
Josh Smeraldi, USEPA

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
FOR THE
RECORD OF DECISION
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

INTRODUCTION

As required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at 40 C.F.R. 300.430(f)(3)(i)(F), this Responsiveness Summary provides a summary of the significant comments and concerns submitted by the public regarding the Proposed Plan for the Riverside Industrial Park Superfund Site (Site), and the U.S. Environmental Protection Agency's (EPA's) responses to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision for selection of the remedy for the Site.

This Responsiveness Summary is divided into the following sections:

I. SUMMARY OF COMMUNITY RELATION ACTIVITIES: This section provides the history of community involvement and concerns regarding the Site.

II. SUMMARY OF SIGNIFICANT COMMENTS, CRITICISMS, AND NEW RELEVANT INFORMATION, AND EPA's RESPONSES: This section includes summaries of oral comments received by EPA at the August 5, 2020 public meeting, EPA's responses to these comments, and responses to written comments received during the public comment period.

The Responsiveness Summary includes attachments which document public participation in the remedy selection process for the Site. The attachments are as follows:

- Attachment A – July 2020 Proposed Plan for the Riverside Industrial Park Superfund Site;
- Attachment B – Public Notice and comment period extension notices published in Newark Star Ledger and El Diario;
- Attachment C – Transcript of the August 5, 2020 Public Meeting;
- Attachment D – Written comments received by EPA during the comment period.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

On April 27, 2016, EPA held a public meeting under the Newark Superfund "Making a Visible Difference" initiative. This meeting provided information related to four federal Superfund sites located in the City of Newark (including the Site) and solicited feedback about the community's concerns, as well as suggestions for communication methods and community engagement. On July 6, 2017, EPA visited residences along Chester Avenue, between Riverside Avenue and Hinsdale Place, and distributed the Site fact sheet to the occupants prior to the start of field activities for the remedial investigation (RI). The fact sheet provided information on the Site background and an update on Site investigation activities. EPA subsequently held monthly telephone calls with the City of Newark to provide technical and legal updates during RI activities. Field investigations

were conducted at the Site from 2017 through 2019, which culminated in the completion of remedial investigation and feasibility study (RI/FS)[1] reports in April and July 2020, respectively. Throughout this period, EPA provided progress updates and presented findings to the Passaic River Community Advisory Group (CAG). The CAG consists of stakeholders who represent a broad range of interests and locales potentially affected by the contamination and cleanup of the Diamond Alkali Superfund Site, including the Lower Passaic River Study Area. Since the Site is adjacent to the Passaic River, the investigation and cleanup of the Site were of interest to the CAG. Presentations given to the CAG were also posted to its website at www.ourpassaic.org.

As part of EPA's public outreach efforts, a Community Involvement Plan (CIP) was developed and made available to the public in July 2020. The CIP was developed to facilitate communication between EPA and the communities affected by and interested in the Site, as well as to encourage community involvement. In May 2020, EPA and its consultant contacted approximately 20 stakeholders who may be affected, or perceive they are affected, by the Site. The interviewees represented a broad spectrum of the community from a diverse group of categories and included local residents, organizations, churches and clergy, activists, groups working with immigrants, elected officials, and cultural, historic, and civic associations. The process was considerably impacted by the coronavirus disease (COVID-19), and it was exceptionally difficult to find stakeholders who were able to participate in the interview process due to office closures and other significant issues. Nevertheless, ten individuals were interviewed, with interviews taking approximately 45 minutes to one hour, depending on the interests, concerns, activities, and level of input provided by the individual interviewees. Information from the interviews was analyzed and incorporated into the CIP which generally included the local community's environmental concerns, concerns related to the Site, and communication preferences.

EPA's preferred remedial alternative and the basis for that preference were identified in a Proposed Plan.[2] The Administrative Record that is the basis for EPA's identification of a preferred alternative, including the RI and FS reports, was available to the public on July 22, 2020, when the Proposed Plan was released to the public for comment. These documents were made available to the public at information repositories maintained at the EPA-Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York, 10007-1866 and on EPA's website for the Site at www.epa.gov/superfund/riverside-industrial. At the August 5, 2020 public meeting, EPA staff presented to the public EPA's preferred remedial action alternatives to address various wastes found across the Site, contaminated sewer water, soil gas, soil/fill, and groundwater.

A notice of availability for the above-referenced documents was published in the Star Ledger and in El Diario[3] on July 22, 2020. The public comment period initially ran from July 22, 2020 to August 21, 2020 but several extensions were granted, and the public comment period officially ended on February 19, 2021. Notice of the comment period extensions was published on August 17, 2020, September 21, 2020, October 19, 2020, November 17, 2020, December 18, 2020, and

[1] An RI determines the nature and extent of the contamination at a site and evaluates the associated human health and ecological risks. A FS identifies and evaluates remedial alternatives to address the contamination.
[2] A proposed plan describes the remedial alternatives considered for a site and identifies the preferred alternative and the rationale for this preference.
[3] El Diario is the largest Spanish-language daily in the United States. The notice was translated to Spanish for this publication.

January 18, 2021 in the Star Ledger and El Diario newspapers. Announcements of comment period extensions were also posted on EPA's website. On August 5, 2020, EPA held a virtual public meeting to inform local officials and members of the community about the Superfund process, present the Proposed Plan for the Site, including the preferred remedy, and respond to questions and comments from approximately 30 attendees (including residents, media, local business people and local government officials). Based upon the comments received during the public comment period, the public generally supports the preferred alternatives.

SUMMARY OF SIGNIFICANT COMMENTS, CRITICISMS, AND NEW RELEVANT INFORMATION, AND EPA's RESPONSES

Comments were received at the public meeting and in writing. The transcript from the public meeting can be found in Appendix V-C and written comments received can be found in Appendix V-D. A summary of the comments provided at the public meeting and in writing, as well as EPA's responses to those comments, are provided below.

A. Compliance with CERCLA and NCP, EPA Policies and Guidance

1. Comment: A commenter stated that the Proposed Remedial Action Plan (Proposed Plan) is inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) because the EPA did not adequately consider all relevant Site data. The commenter argued that, as a result, the Proposed Plan was arbitrary and capricious, and not in accordance with law.

   Response: EPA disagrees that the Proposed Plan did not adequately consider the relevant Site data or is inconsistent with the NCP.

   The Remedial Investigation (RI) Report (which was prepared by PPG Industries, Inc. (PPG) under the Administrative Settlement Agreement and Order on Consent (ASAOC) with EPA oversight) and the draft final FS Report were conducted in accordance with the NCP, which requires the collection of "data necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives." 40 C.F.R.§ 300.430(d)(1). *See also* the responses to comments in Section C (Conceptual Site Model [CSM]) that include additional discussions of data considered by EPA in developing the Proposed Plan.

   By letter dated July 30, 2020 from PPG Industries, Inc. (PPG) to EPA, PPG disputed EPA's decision to complete the FS, which is part of the administrative record that supports the Proposed Plan and Record of Decision. EPA's Statement of Position (dated September 4, 2020) countered that the completion of the FS Report (dated July 2020) was procedurally consistent with the ASAOC and was not arbitrary and capricious. The Director of EPA Region 2's Superfund and Emergency Management Division, who was designated by the ASAOC to issue a determination in the dispute, concluded in his February 2, 2021, decision that "…the record supports the modifications made by the Region to the FS Report and

that the Region's CSM is sufficiently supported by the data and technical findings of the record (p. 2)." The record of the dispute resolution proceeding invoked by PPG is included in the administrative record for the Site.

2. Comment: A commenter stated that EPA's retroactive extension of the public comment period on January 25, 2021, is inconsistent with the NCP, and claims that EPA intentionally manipulated the comment deadline to obtain the commenter's comments before the comment period expired on February 19, 2021.

   Response: The public comment period for the Proposed Plan was consistent with the NCP. The NCP, at 40 C.F.R. §300.430(f)(3)(i)(C), specifies that the Agency shall:

   > provide a reasonable opportunity, not less than 30 calendar days, for submission of written and oral comments on the proposed plan and the supporting analysis and information located in the information repository, including the RI/FS. Upon timely request, the lead agency will extend the public comment period by a minimum of 30 additional days.

   EPA provided an initial 30-day public comment period from July 22, 2020 to August 21, 2020, after which EPA granted several extensions, with the public comment ending on February 19, 2021. By the time EPA extended the comment period on January 25, 2021, EPA had already provided significantly longer than the 60 days required by the NCP. EPA did not, however, retroactively extend the comment period. EPA published notice of the extension on January 18, 2021, which was prior to the expiration of the comment period. EPA also notes that the NCP does not prohibit a retroactive extension of a comment period that was already extended well beyond the required time period. There is no basis for commenter's statement that EPA manipulated the extension of the comment period.

3. Comment: A commenter stated that the administrative record was not complete because, as of the closing date of the public comment period, EPA had not completed its response to a Freedom of Information Act (FOIA) for information that the commenter asserts was necessary to evaluate the Proposed Plan. The commenter accuses of EPA of intentionally not completing its response to the FOIA request to prevent the commenter from incorporating requested records into its Proposed Plan comments, and states that EPA's "lack of a timely substantive response to PPG's FOIA request" indicates that the agency "has been backfilling the administrative record" file to support a "pre-selected" remedy.

   Response: EPA established an administrative record file containing the documents and other information that formed the basis for the Proposed Plan. The administrative record was made available to the public when the Proposed Plan was released on July 22, 2020, with records from the dispute resolution proceeding added as they were issued during the public comment period, providing sufficient

time for the public to review the records in the administrative record file before the close of public comment period. The commenter erroneously states that it must receive and review EPA's response to its FOIA request (for records leading up to the completion of the draft final FS Report and the release of the Proposed Plan) to evaluate the Proposed Plan. EPA compiled the administrative record file in accordance with the NCP's requirements for the contents of administrative records at 40 C.F.R. § 300.810, and the administrative record file therefore contained the required information for the public to submit comments. EPA's response to the FOIA request is unrelated to the public comment period for the Proposed Plan. The commenter's unsubstantiated claims that EPA intentionally delayed completion of the FOIA response during the comment period and that EPA "has been backfilling" the administrative record file are without basis.

B. Remedy

1. Comment: Several commenters expressed support for EPA's preferred alternatives.

   Response: EPA acknowledges the comments in support of the preferred alternatives.

C. Conceptual Site Model

1. Comment: A commenter stated that EPA's CSM is flawed. The commenter indicated that the Proposed Plan is based on the assumption of a "top down" CSM, which ignores information presented in the RI. The commenter stated that EPA's CSM does not consider the historic fill as the primary, if not sole, source of lead in groundwater. The commenter stated that EPA's CSM is based on the assumption that historical releases from Site operations contaminated the soil, which in turn migrated to groundwater. The commenter indicated that the impervious surfaces of the Site would have prevented any spills or releases from Site activities from impacting the soil, and any lead that might have reached the soil is likely to be immobile. The commenter also argues that the 'hinged flappers' spaced along the base of the exterior walls in certain buildings were components of standard fire water management systems and were not for the discharge of waste. The commenter believes that historic fill is the source of lead in groundwater, and not the historical spills and/or releases of paint and other materials containing lead that are the basis of EPA's CSM.

   Response: EPA's CSM is consistent with the data presented in the RI Report (April 2020). Both the Site data and evidence about historical Site operations support the Region's determination that former lead paint manufacturing operations at the Site contributed the predominant source of lead contamination to the soil and groundwater. From approximately 1902 to 1971, the Site was used for paint, varnish, linseed oil, and resin manufacturing by Patton Paint Company ("Patton"), which merged into the Paint and Varnish Division of Pittsburgh Plate Glass

Company in 1920. Pittsburgh Plate Glass Company changed its name to PPG Industries, Inc. in 1968. PPG conveyed its interest in the Site in 1971. The RI Report (April 2020) states on page 1-3 that "Pigments would have been brought to the Site and used in the manufacture of paints. These were often metallic chemicals and would have included compounds of cadmium, chromium, lead, titanium, and zinc. Basic lead carbonate (white lead) would have been one of the pigments used as a raw material." This statement is consistent with the following two historical references to the use of basic lead carbonate on the Site, which are part of the record of the dispute resolution proceeding, included in the administrative record for the Site:

- A historical brochure for Patton, PPG's corporate predecessor, Sun-Proof Paints, printed circa 1897 states that "The composition of Patton's White is printed on every can, and is strictly pure white lead and zinc oxide, both doubly ground in strictly pure linseed oil to impalpable fineness, with the right amount of silica (Patton's secret)" (Exhibit 5 to EPA's September 4, 2020 Statement of Position).

- A Patton employee testified about Patton's use of lead carbonate and zinc oxide to the United States Supreme Court in *Heath & Milligan Mfg. Co. v. Worst*, 207 U.S. 338 (1907) on page 190 (Paragraph 323) of the Court's Transcript of Record (refer to Exhibit 6.A for the entire transcript, and Exhibit 6.B for a relevant excerpt of the transcript, EPA's September 4, 2020 Statement of Position).

Historical manufacture of white lead pigment was originally accomplished by corroding sheets or plates of lead (sometimes referred to as lead buckles) by applying heat and moisture, carbon dioxide, and acetic acid vapor. The corrosion product created from the lead sheets was the lead carbonate (or white lead) pigment, which was scraped off and finely ground into a powder. While it is not known if Patton, and later PPG, produced lead pigment at the Site from metallic lead or purchased and conveyed it to the Site as lead carbonate, the large amount of paint known to have been manufactured by Patton at the Site suggests that the company used a large quantity of white lead pigment at the Site in connection with those operations. The amount of white lead pigment that Patton used in the early 1900's can be conservatively estimated based on the volume of documented paint production at the Site. The document "Use of United States Government Specification Paint and Paint Materials" by P.H. Walker and E.F. Hickson (August 1924) contains minimum recommended quantities of components in certain paints (Exhibit 7.A to EPA's September 4, 2020 Statement of Position). Paint formulations based on a combination of white lead and zinc oxide pigments (as used by Patton) are addressed in rows 7-9 of Table 1 below, a 1924 federal government document which recommend 50 pounds (lbs) white lead and 50 lbs of zinc oxide to yield anywhere from 7 to 11 ¾ gallons of paint per batch.

Table 1: 1924 United States Government specifications for mixing components of paint (Exhibit 7.B to EPA's September 4, 2020 Statement of Position).

TABLE 1.—*Mixing formulas using Federal Specifications Board paste pigments, and dry red lead*

Formula number	Paste white lead, Federal Specifications Board Nos. 6 or 6	Paste zinc oxide, Federal Specifications Board Nos. 8 or 9	Dry red lead, Federal Specifications Board No. 11	Paste red lead, Federal Specifications Board No. 11	Paste titanium pigment, Federal Specifications Board No. 115	Raw linseed oil, Federal Specifications Board No. 4	Boiled linseed oil, Federal Specifications Board No. 4	Turpentine, Federal Specifications Board No. 7	Drier, Federal Specifications Board No. 29	Varnish, Federal Specifications Board Nos. 18 or 22	Approximate yield	Used for—
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Gals.*	*Gals.*	*Gals.*	*Pts.*	*Pts.*	*Gals.*	
1	100					3 to 4		2 to 4	1 to 2		7¾ to 11	(1)
2	100						7	1[2]			10⅝	(3)
3	100					7		1[2]	3		11	(3)
4	100					1 to 2		1½ to 2[2]	1		6 to 7	(4)
5	100					3 to 4½		¼ to ¾[2]	1		6½ to 7½	(5)
6	100							1½ to 3	¼ to ½	1 to 6	4¾ to 6½	(6)
7	50	50				3 to 4		2 to 4	3 to 4		8½ to 11¾	(3)
8	50	50				1½ to 2		2 to 3[2]	4		7¾ to 8¾	(4)
9	50	50				3 to 4		½ to ¾[2]	2 to 3		7 to 8½	(5)
10			100			3½		¼[2]	2¼		5¼	(3)
11				100		3		¼[2]	2½		5¾	(3)
12	60		40			2 to 4		1¾ to 2	1 to 2		6 to 8¼	(4)
13	60			40		1¾ to 4		1¾ to 2	1 to 2		6 to 7	(5)
14		40			60	4 to 4½		2 to 4	4 to 5		10¾ to 13½	(3)
14		40			60	2 to 2½		2 to 3[2]	4		8¾ to 10¼	(4)
16		40			60	4 to 4½		½ to ¾[2]	4 to 5		9¾ to 10	(5)

[1] For first (priming) coats, wood, new work.
[2] Volatile mineral spirits F. S. B. No. 16 can be used in place of turpentine in this formula.
[3] For first (priming) coats on plaster, concrete, cement, brick, and stone, new work.
[4] For body coats, wood, outside, new, and first coat repainting.
[5] For finish coats, outside.
[6] For finish coats, inside, flat to eggshell gloss.
[7] For first (priming) coats on metal.

NOTE 1.—In nearly all of the above formulas, except for priming coats on new wood, a mixture of one-third to one-half boiled linseed oil and the remainder raw linseed oil may be substituted for the raw oil, omitting the drier.

NOTE 2.—In using the mixing formulas read across the page on the horizontal line; for example, formula No. 9 reads thus:

50 pounds paste white lead,
50 pounds paste zinc oxide,
3 to 4 gallons raw linseed oil,
½ to ¾ gallons turpentine,
2 to 3 pints drier.

7 to 8½ gallons of paint, for finish coats, outside.

Patton's operation at the Site is estimated to have produced about 42,000 gallons[4] of paint per week in the early 1900's (Exhibit 8 to EPA's September 4, 2020 Statement of Position, Argus Ledger, Newark, NJ, December 31, 1902). For a white lead/zinc oxide mixture similar to that specified by the United States government in 1924, and assuming approximately 50 lbs of white lead for approximately every 10 gallons of paint manufactured, the plant would have required 210,000 lbs of white lead pigment per week as a feedstock.

In addition to its use in paint manufacturing, lead was historically added to varnishes as a drying agent. "The Influence of lead Ions on the Drying of Oils" by Charles Tumosa and Marion Mecklenburg (published by the Smithsonian Center for Materials Research and Education) addresses both lead pigments in paint and the use of "lead compounds or pigments [to] alter the drying behavior and physical properties of oil paints and varnishes." (Exhibit 9 to EPA's September 4, 2020

[4] 6,000 gallons per day was mentioned by the Argus Ledger article and 42,000 gallons per week was calculatedusing this reference.

Statement of Position.) The article indicates that by the late nineteenth to early twentieth century, manufacturers found that a combination of cobalt, manganese, and lead compounds was efficient to cause drying and polymerization in oils. The 1923 PPG publication "Glass, Paints, Varnishes and Brushes, Their History, Manufacture and Use (copyright 1923 Pittsburgh Plate Glass Company)" states that "An extensive variety of varnishes can be made by changing the operations, the gums, the oils, and the driers used … When the gums, oil, and metallic drying salts have been properly combined…" (Exhibit 10.A to EPA's September 4, 2020 Statement of Position, "Paint Section, The Manufacture of Varnish"). Based on this information, it is likely that PPG also added lead to varnishes as a drying agent, as it was common practice within the industry at the time.

During the manufacturing of the paints and varnishes at the Site, lead-containing material contaminated the surface and subsurface soils (including fill material) from accidental spills and discharges, as stated in the RI Report (page 7-1). An article titled "Power Plant in the Patton Paint Co., Newark, N.J." in the October 15, 1903 issue of *The Engineer* (Exhibit 11.A and Exhibit 11.B to EPA's September 4, 2020 Statement of Position) states that there were two motors used to drive lead chasers at the facility, "pieces of apparatus in which white lead, the foundation for all of a certain class of paints, is worked and freed of its contained moisture." Motors at the plant were "housed to protect them from the powdered white lead and dust which is very apt to be floating in the air … A 7-horsepower motor… drives a 7½ inch x 4 inch air compressor … used to blow dust out of motor armatures, etc…" Historical Patton/PPG plant housekeeping activities (such as floor cleaning and sweeping) likely released the powdered white lead pigment to surface soil/fill material, specifically since most buildings were constructed with drains and wall slots with hinged flappers at floor level to allow discharge of sweepings/floor washings to outside the building. The photo immediately below, Figure 1 (Exhibit 12 to EPA's September 4, 2020 Statement of Position) shows a floor flapper at Building #7 at the Site. Elevated concentrations of lead (greater than 800 mg/kg) have been detected in soil immediately outside Building #7. Given that the article in *The Engineer* describes the prevalence of white lead dust inside the Patton buildings, EPA reasonably developed a CSM that accounts for the release of lead contamination via disposal of floor sweeping/floor washing waste through the 'hinged flappers' spaced along the base of the exterior walls to the surface soils along the perimeter of the Patton buildings. The commenter argues that the flappers were components of standard fire water management systems and were not for the discharge of waste. The design of the flappers, however, would have permitted floor sweeping/floor washing waste to exit the buildings.

Figure 1: Photograph of floor flapper on Building #7 (Exhibit 12 to EPA's September 4, 2020 Statement of Position).

A photograph of the Patton facility from the book "Glass, Paints, Varnishes and Brushes, Their History, Manufacture and Use (copyright 1923 Pittsburgh Plate Glass Company)" (Figure 2) depicts Building #9 and Building #6 (looking northeast) on page 24 of its "Paint Section." Building #7A is also shown on the right side of the cited picture; Building #7A would eventually be replaced by the current Building #7. Note that barrels and various materials are stored on the ground in front of the buildings. These buildings border Lot 63/64, where the focused lead removal will occur, and Building #7 is on Lot 63. (Note that Lot 63 is one of 15 lots on the Site, and the RI Report includes information regarding Site operations for each lot [RI Report, pages 1-3 through 1-30]).

Figure 2: PPG paint manufacturing plant in City of Newark, New Jersey (Exhibit 10.B to EPA's September 4, 2020 Statement of Position).

The historic use of large quantities of lead in the production of paint at this Site and PPG's documented housekeeping practices support EPA's determination in the CSM that historical Site operations released lead into soil/fill at the Site.

EPA agrees that an impervious surface currently covers portions of the Site and may have existed in the past over some portions of the Site, but does not agree that there is enough evidence in the aerial imagery to conclude that the areas designated by the commenter as "impervious" were in fact impervious. Moreover, the first aerial image used in the commenter's evaluation is dated 1924, and there is no evidence that identifies the ground cover from the start of PPG's operations from 1902 to 1924. In addition, during PPG's operation, buildings were demolished, new buildings were erected, and underground utilities were installed. All of these activities would have resulted in disturbances to the ground cover. There was no engineering control designed to provide site-wide containment of lead or other hazardous substances released during the duration of operations from 1902 to 1971.

2. Comment: A commenter indicated that if EPA's CSM were accurate and the lead in soil and groundwater at the Site resulted from spills and/or releases from historical facility operations, including paint manufacturing, there would be a correlation between lead and other metals found in paint. The commenter argues that the correlation between lead and zinc does not support EPA's assertion that lead in soil/fill is from historical Site operations.

   Response: The historic facility operations support the conclusion that lead and zinc were released into the soil/fill material as a result of paint and varnish plant

housekeeping activities, along with incidental releases of white lead and zinc oxide pigments during material storage, handling, and transfer. The likelihood that PPG operations are a source of lead contamination in Site soil also is supported by a positive correlation between lead and zinc in the soil/fill material samples collected during the RI, with a linear regression coefficient of R^2 of 0.72. The highest levels of lead in the RI borings are reported on Lots 63 and 64 and are correlated with the highest levels of zinc (*see* the cluster of green and light brown points on the right side of Figure 3), strongly suggesting that historical facility operations are a primary source of lead and zinc at these locations.

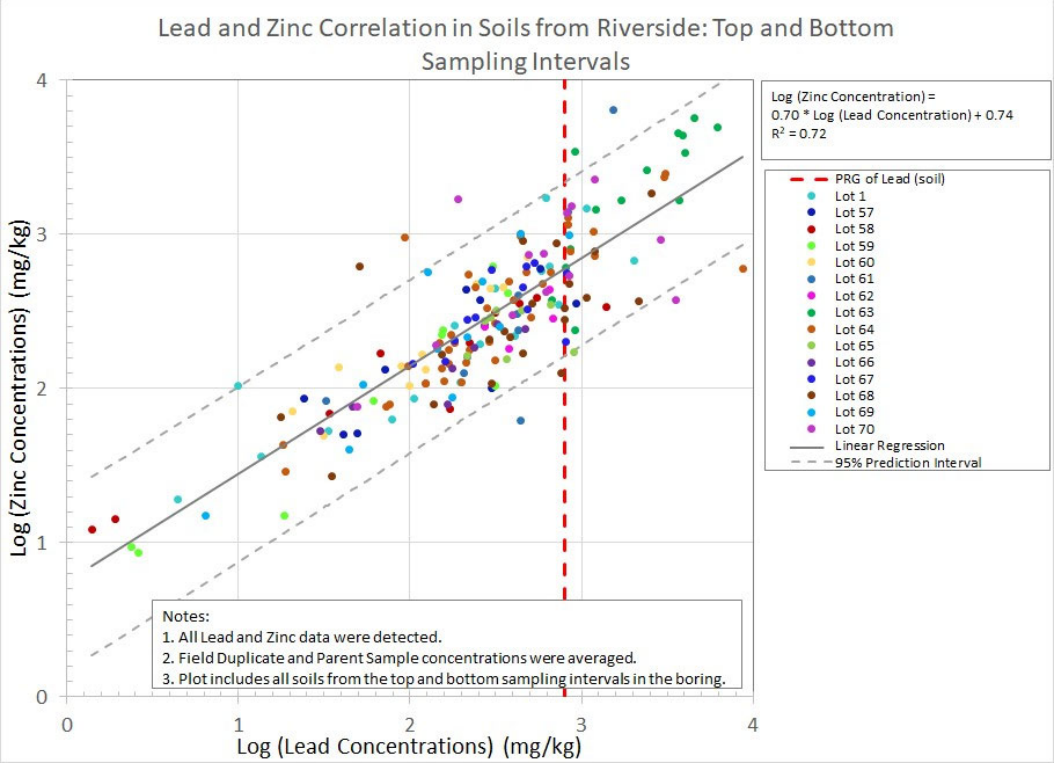

Figure 3: Lead and Zinc Correlation in Soil/Fill Material from Riverside (Exhibit 13 from EPA's September 4, 2020 Statement of Position)

3. Comment: A commenter stated that EPA's CSM is based on lead in soil being the source of lead in groundwater and that for this to be an accurate CSM, the lead in surface soil should correlate to lead in subsurface soil and to lead in groundwater, and the commenter suggests the data do not follow this pattern. The commenter states that the lack of a point-by-point correlation between lead in soil and lead in groundwater undermines EPA's CSM. The commenter also criticized EPA's CSM by presenting an analysis of groundwater data that included grouping the monitoring wells based on locations in the northern portion of the Site, the southern portion of the Site, and the monitoring wells on Lot 63. The commenter concluded from its analysis that the distribution of lead in groundwater is not consistent with EPA's CSM.

Response: The commenter incorrectly asserts that there is no spatial correlation

between lead levels in soil and elevated total lead levels in groundwater. A point-by-point spatial correlation between soil/fill material sample results and groundwater results cannot be undertaken at the Site because of the various groundwater gradients across the Site and lack of co-located samples. Co-located soil/fill material samples and shallow groundwater samples were mainly collected from the temporary well points; however, it was agreed between Region 2 and PPG during the scoping of the remedial investigation field work that these samples would be unvalidated screening samples that would be used only to design the monitoring well network. Consequently, no single soil sample can be used to evaluate the presence or absence of total lead exceedances in a co-located groundwater sample. Instead of using a point-by-point analysis, EPA determined that the cluster of soil/fill material exceedances around Building #7 represents the result of lead contamination related to historical PPG activities in that portion of the Site, and the consistent exceedances of total lead in groundwater samples collected from around Building #7 are consistent with the presence of a Site-related source of lead in soils (*see* Figure 4). Other clusters of soil exceedances are observed across the Site, particularly on Lot 70.

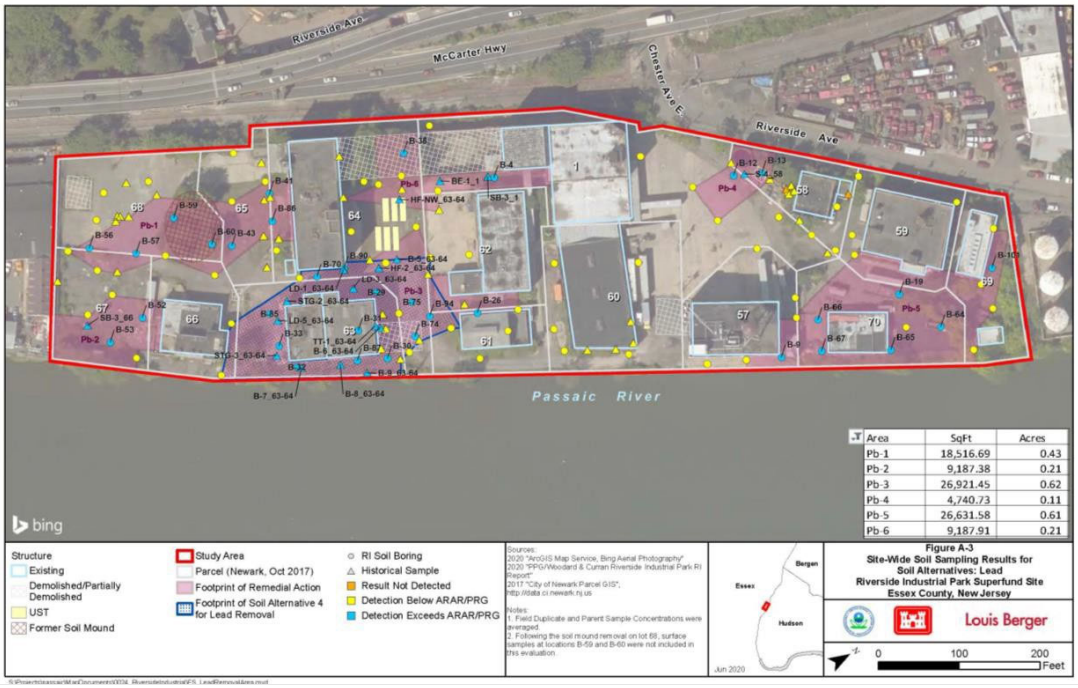

Figure 4: Figure A-3 from FS Report (July 2020) Appendix A showing delineated areas of lead in soil/fill material that exceed the remediation goal (RG) of 800 mg/kg and the footprint of lead removal around Building #7, which is part of EPA's Preferred Alternative for soil/fill material.

Two major technical errors in the commenter's argument are: (1) the commenter inaccurately infers a causal relationship between downgradient soil/fill material and upgradient groundwater samples, and (2) the commenter mischaracterizes the soil/fill material samples and groundwater sample depths. These errors confound any attempt to draw conclusions from the data presentation submitted by the

commenter.

The commenter attempted to compare soil/fill material and groundwater samples to demonstrate that elevated lead in soil/fill material could be found near relatively low-level concentrations of total lead in groundwater samples. The commenter assigned soil borings to monitoring wells based on geographical distance without considering the local hydrology. This point-by-point evaluation is flawed because it includes side-gradient and downgradient soil borings that would not impact lead concentrations detected in the nearby side-gradient and upgradient monitoring wells. As stated in the RI Report (April 2020, Section 3.4.1, pages 3-5), the groundwater movement is generally towards the east (towards the Passaic River) with "several local flow patterns that appear during both low and high tide including saddles, mounds, and a local flow direction to the northeast in the vicinity of Lot 58." Table 2 below lists the monitoring wells, the "nearest soil boring" assigned by the commenter, and EPA's comments. Note that soil borings positioned downgradient or side-gradient relative to a monitoring well would not have a significant effect on the groundwater contaminant concentrations. Shallow groundwater gradients are based on the piezometer surface maps presented in RI Figures 2-5 through 2-10.

Table 2: EPA Comments on Shallow Groundwater Gradients and Soil Boring Locations

Monitoring Well Identified by PPG	"Nearest Soil Locations" Selected by PPG	Comments on Shallow Groundwater Gradients and Soil Boring Locations
E1	B-59 and B- 77	Gradient is south-to-southeast depending on tides. B-77 is **side-gradient** to E-1 during high tide and low tide. B-59 is upgradient (as discussed in text below).
E-4	B-27	Gradient is northeast. B-27 is **side-gradient.**
E6 and E7	B-4	Gradient is north-to-east depending on tides. B-4 is **downgradient** from E-6 during high tide and low tide. B-4 is spatially co-located with E-7.
MW-103	B-53	Gradient is southeast. B-53 is **side-gradient** during high tide and low tide.
MW-105	B-38	Gradient is north. B-38 is spatially co-located with MW- 105; however, lead in the saturated zone is not characterized.
MW-106	B-35, B-36, B-37, and B- 91	MW-106 is located on a groundwater mound. Groundwater gradient is radial.

MW-114	B-12 and B- 13	Gradient is north-to-east depending on tides. B-13 is **downgradient** from MW-114 during high tide and low tide. B-12 is upgradient.
MW-117	B-10 and B-105	Gradient is either north, east, or west depending on tide. B-10 is **side-gradient** or **downgradient**; B-105 is upgradient only under certain tidal conditions.
MW-120	B-61 and B-62	Gradient is either north, east, or west depending on tide. B-61 and B-62 may be upgradient under certain tidal conditions.
MW-122	B-102	Gradient is either northwest, west, or southwest depending on tides. B-102 is **downgradient** during high tide and low tide.
MW-123	B-56 and B-82	Gradient is southeast-to-south depending on tides. B-82 is **side-gradient** and B-56 is **downgradient** during high tide and low tide.

As another example, the commenter attempted to draw a point-by-point comparison between the low-level total lead concentrations detected in well E-1 with two nearby soil borings (B-77 and B-59). In an attempt to disprove a relationship between lead contamination in soils and groundwater, the commenter argues that low-level total lead concentrations in well E-1 were not commensurate with the nearby elevated lead concentrations in the soil/fill material. Only boring B-59 is upgradient of well E-1; however, the commenter's data evaluation[5] comparing boring B-59 and well E-1 contains an error. The commenter plots the groundwater samples at a depth of approximately 6-7 feet below ground surface (bgs), which is actually the depth to water from the top of the well casing. Groundwater samples were collected at the pump intake, which was approximately 10 feet below top of casing (refer to RI Appendix G).

When the error is corrected, the detected total lead concentrations in E-1 groundwater samples collected at 10 feet below the top of the well casing (maximum total lead concentration of 1.3 ug/L) are commensurate with the one spatially comparable soil/fill material sample collected in the nearby boring B-59, at a depth of 9.0-10.5 feet bgs, with a relatively low-level detected lead concentration of 34.9 mg/kg. The data therefore do not support the commenter's position that low-level total lead concentrations in well E-1 were unrelated to the elevated lead concentrations in the nearby soil/fill material. Note that similar technical errors were found in the remaining figures generated by the commenter.

Further evaluation of the data refutes the commenter's claim that the distribution of lead in the northern portion of the Site, the southern portion of the Site, and the area

[5] *See* Figure 4A in PPG's comment submission dated January 20, 2021.

around Lot 63 do not follow the Region's CSM. Once released into the environment, lead-based compounds would be available to mix with the surface soil/fill material and infiltrate into the subsurface and shallow groundwater during precipitation events, potentially causing "top-down" contamination wherever these compounds were released or otherwise present in the environment. As discussed above, there is a substantial amount of lead contamination in the soil/fill around Building #7 on Lot 63 in the southern portion of the Site. While lead contamination in the northern portion of the Site is not as substantial in comparison to the southern portion, the soil/fill material on the northern portion of the Site nevertheless has been impacted from lead contamination, including by operations conducted on Lot 70. The commenter argues that "[The Region] has characterized the northern portion of the Site as an area that 'has not been substantially impacted by lead contamination'" and then draws conclusions about the presence of lead on the remainder of the Site based on conditions found on the northern portion. However, the data do not support the commenter's contention that, based on conditions in the northern portion of the Site, lead in shallow groundwater throughout the Site is attributable to fill material.

As noted in the RI Report, "Historic fill in some areas appears to have been impacted due to historical and/or current operations and chemical/waste handling at the Site. The source of soil contaminants depends on area and contaminants and are likely due to historic fill, past/current operations (spills/releases), and illegal disposal" (RI Report, page ES-2). Consistent with this statement, in the northern portion of the Site, there are some areas that have not been as significantly impacted by lead contamination, while other areas on the northern portion of the Site have been impacted by placement of historic fill material and by both past and current operations, including operations conducted on Lot 70. For example, one area in the northern portion of the Site that has not been as substantially impacted by placement of historic fill material containing lead is in the northwest corner. As stated in the RI Report:

> Fill material is documented at the surface throughout the Site with greater fill thicknesses associated with areas reclaimed from the Passaic River. The majority of the Site (except the northwest section) was reclaimed from the Passaic River with imported fill, which is described as a Loamy Sand or Sand Loam. Below the fill material, the next deeper layer that makes up the geology immediately under the Site is a silt loam, representing the former Passaic River sediment bed. Consistent with historical maps of shoreline development (Figure 1-3), this layer was not identified in borings on the northwest side of the Site, where less shoreline modifications occurred. (RI Report, p. 3-3)

Overall, with the exception of MW-118, which has been impacted by Building #10 operations (FS Report, Section 3.5.5), the shallow groundwater on the northern portion of the Site has not been as substantially impacted by lead contamination

when compared to the southern portion of the Site. Table 3 (Exhibit 22 in EPA's Statement of Position), below summarizes the maximum total lead concentration detected in each shallow monitoring well (with non-detected total lead concentrations presented at the laboratory reporting limit of 1 ug/L) on the northern portion of the Site, excluding MW-118. There are five wells on the northern portion of the Site with maximum total lead concentrations greater than the remediation goal (RG) of 5 ug/L. Monitoring wells MW-117 and MW-120 were found to contain elevated total lead concentrations over three times greater than the RG of 5 ug/L. Lead contamination in these two wells is discussed below:

- Groundwater movement near MW-120 is affected by the groundwater mound or ridge centered on Lot 70, causing gradients to shift at MW-120 from east to north to west. In either case, soil/fill material from Lot 70 is located upgradient of MW-120. (Shallow groundwater gradients are based on the piezometric surface maps presented in RI Report, Figures 2-5 through 2-10 [Exhibit 10.B to EPA's Statement of Position]). According to the RI Report, page 1-8, the Federal Refining Company operated on Lot 70 since 1985, recycling precious metals. "The metal recovery process involved meltdown of scrap metal and recovery of metal using various acidic and caustic liquids." As part of actions taken pursuant to the NJDEP Site Remediation Program, soil/fill materials were excavated in 2012 and an asphalt cap was placed over the property in 2014. Post-excavation samples indicated elevated lead levels over 800 mg/kg remain under the asphalt cap, which were verified during the RI, and may be acting as a source of lead contamination to MW-120.
- Groundwater movement near MW-117 is also affected by the groundwater mound or ridge centered on Lot 70, bifurcating groundwater movement between MW-117 and MW-114. MW-117 is downgradient of multiple potential soil/fill material sources. The tidal communication with MW-114 is noted in the RI Report in Section 3.4.3 under the tidal evaluation.

Table 3: Maximum Total Lead Concentration in Monitoring Wells on Northern Portion of Site

Monitoring Well Number on the Northern Portion of the Site	Maximum Total Lead Concentration (ug/L) Reported for Three Sampling Events over 11- month Period
E-4	7.4
E-5	1.4
E-6	3.3
E-7	2.0
E-8	1.0
MW-114	1.0
MW-115	1.0
MW-116	2.0
MW-117	17.7
MW-119	7.9

MW-120	25.3
MW-121	4.2
MW-122	7.0
MW-124	1.0

In contrast, on the southern portion of the Site, a cluster of elevated total lead concentrations (in particular at MW-107, MW-108, and MW-110) was detected in the vicinity of Building #7, where lead-contaminated soil/fill material acts as a source material to shallow groundwater (Table 4, which is Exhibit 23 in EPA's Statement of Position). Some areas of the southern portion of the Site have shallow groundwater concentrations similar to the northern section, which is to be expected since not all areas of the Site were impacted similarly by Site operations, and lead-contaminated soils at levels greater than 800 mg/kg were not reported across the Site. However, based on the available soil and groundwater data, the lead contamination in the shallow groundwater is associated with the lead-contaminated soils in areas where the evidence indicates that lead was released by Site-related operations.

Table 4: Maximum Total Lead Concentration in Monitoring Wells on Southern Portion of Site

Monitoring Well Number on the Southern Portion of the Site	Maximum Total Lead Concentration (ug/L) Reported for Three Sampling Events over 11- month Period
E-1	1.3
E-2	3.7
E-3	2.1
MW-101	1.0
MW-102	12.8
MW-103	18.7
MW-104	10.4
MW-105	45.2 *
MW-106	26.5 (near Building #7)
MW-107	54.2 (near Building #7)
MW-108	109 (near Building #7)
MW-109	20.85 * (near Building #7)
MW-110	39.9 (near Building #7)
MW-111	14.6 (near Building #7)
MW-112	8.2
MW-123	1.2
* Average of field sample and duplicate	

Site groundwater data (all events) are plotted in two Pareto Charts, below. Figures 5 and 6, below (Exhibits 24 and 25, respectively, to EPA's Statement of Position) show the frequency and magnitude of lead detections in groundwater in descending

magnitude (left to right), as well as their cumulative impact (orange line) plotted against the secondary (right) axis ranging from 0 percent when the first sample is examined and extending to 100 percent when the last sample is examined. For monitoring wells located on the northern portion of the Site, about half of the cumulative total lead detected in three rounds of sampling was in samples from MW-120 and MW-117, discussed above, with only 25 percent of all samples exceeding 5 ug/L of total lead, and the remaining 75 percent of samples below the total lead RG of 5 ug/L (*see also* Table 5). In contrast, in the southern portion of the Site, about half of the cumulative total lead detected in three rounds of sampling was in MW-105, MW-107, MW-108, and MW-110, with 56 percent of all samples exceeding the RG for total lead (*see also* Table 5; note that MW-107, MW-108, and MW-110 are located in the vicinity of Building #7). These charts demonstrate the significant differences between the northern and southern portions of the Site, such that developing broad site-wide conclusions using either the northern or southern portions is not appropriate. However, since groundwater total lead concentrations greater than the RG of 5 ug/L were reported on both the northern and southern portion of the Site, which are correlated to areas where lead was likely released as a result of Site operations, an active groundwater remedy is appropriate site-wide.

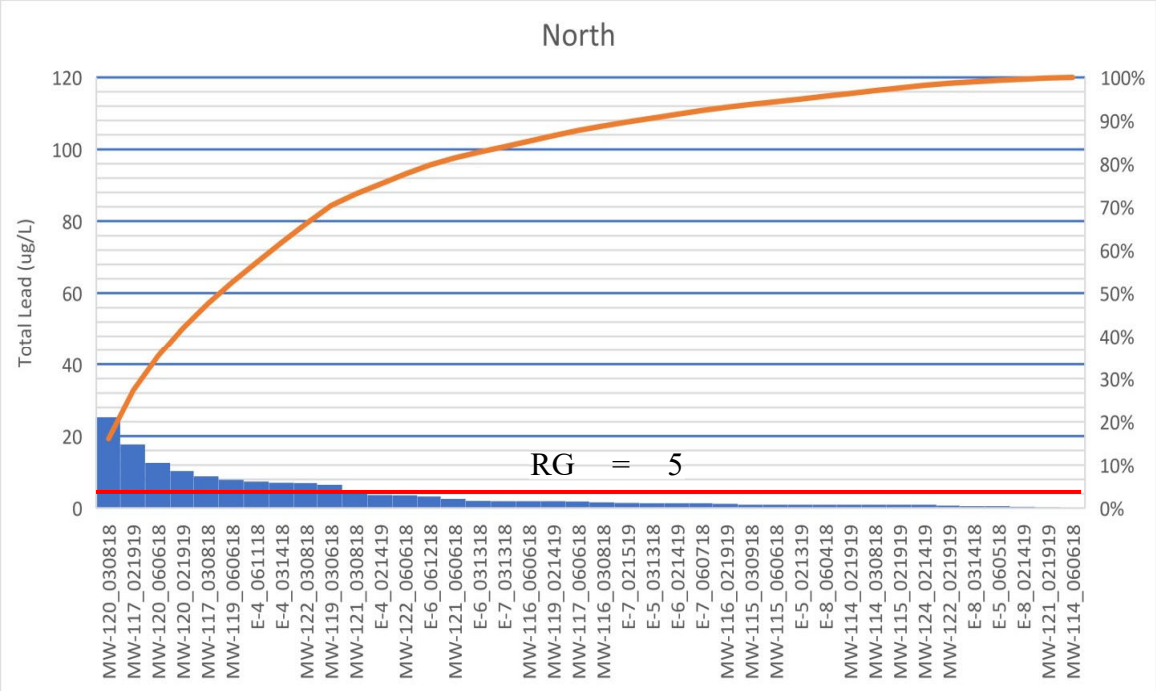

Figure 5: Pareto (frequency) Chart for Total Lead Concentrations in Monitoring Wells on the Northern Portion of Site

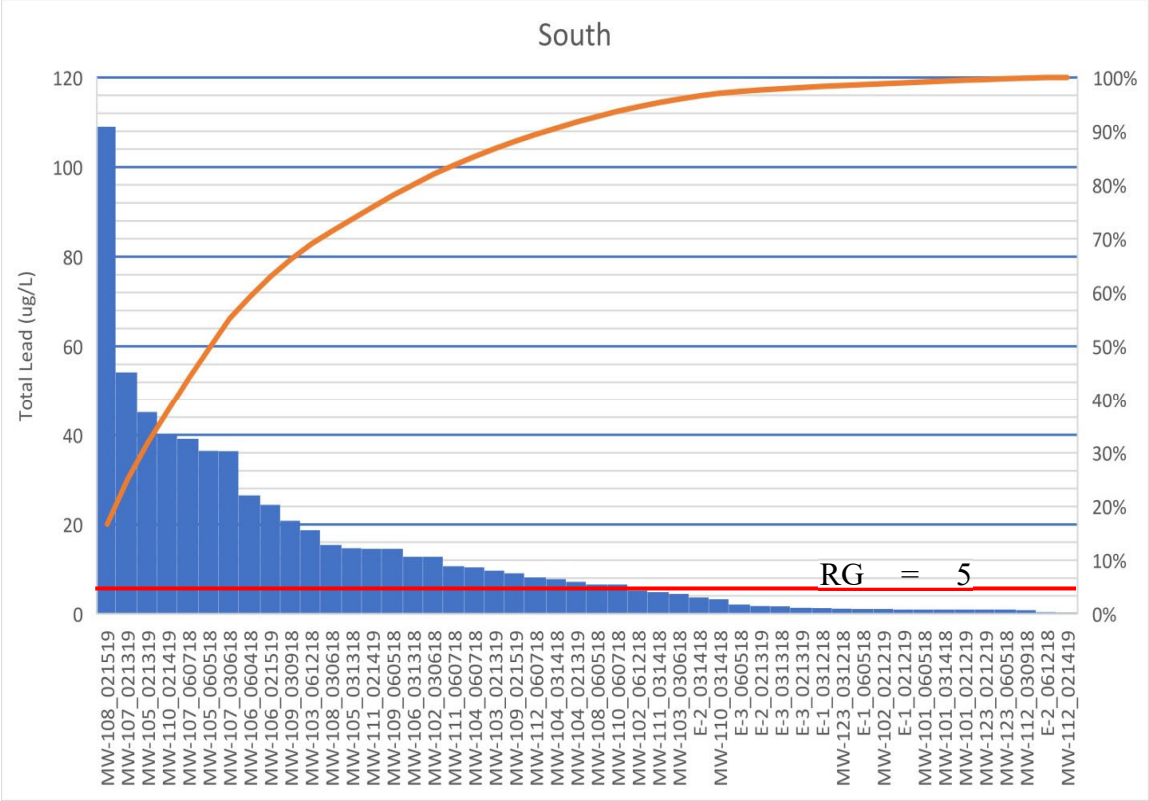

Figure 6: Pareto (frequency) Chart for Total Lead Concentrations in Monitoring Wells on the Southern Portion of Site

An alternate way of presenting the same data is to report the percentage of groundwater samples that exceed a specific concentration. As shown in the table below (Table 5, Exhibit 26 to EPA's Statement of Position), a groundwater sample on the southern portion of the Site was approximately two times more likely to exceed the RG (5 ug/L) for total lead than a groundwater sample from the northern portion, and a sample from the southern portion is eight times more likely to exceed 20 ug/L than a sample from the northern portion.

Table 5: Percent of Groundwater Samples Exceeding a Specific Concentration

Total Lead in Groundwater	Percent of Groundwater Samples Exceeding a Specific Concentration			
	>5 ug/L	>10 ug/L	>15 ug/L	>20 ug/L
Northern Portion of the Site	25%	10%	5%	2.5%
Southern Portion of the Site	56%	40%	25%	21%

In sum, based on the Region's analyses above, elevated groundwater lead concentrations are correlated to areas where lead was likely released as a result of Site operations. The data do not support the contention that, based on conditions in the northern portion of the Site, lead in shallow groundwater throughout the Site is attributable to historic fill material.

4. Comment: A commenter suggests that the movement of lead through the soil column is controlled by adsorption to soil, and the extent of adsorption is influenced by factors such as soil type, organic matter content and pH. The commenter believes Site conditions suggest lead would not migrate from soil to groundwater.

   Response: Once released into the environment, lead carbonate and other lead-based compounds documented as having been used at the Site would be available to mix with the surface soil/fill material and infiltrate into the subsurface and shallow groundwater during precipitation events, potentially causing "top-down" contamination wherever these compounds were released or otherwise present in the environment. This pathway is consistent with the soil-to-groundwater pathway in the RI Report's discussion of potential migration pathways (RI Report, page 5-2), which states that "Impacts from soils or potential site source areas would be expected to enter the unsaturated zone (shallow fill unit) and based on the nature of the release may reach groundwater which has an average depth of 5.1 feet bgs across the Site." The RI Report also states that "It should be noted that in complex mixtures such as groundwater, the effective solubility of individual compounds will differ significantly from the pure compound solubility." (RI Report, page 5-1). Depending on pH and ligand concentrations, lead-containing solids such as lead carbonate (cerussite, $PbCO_3$), hydrocerussite ($Pb_3(OH)_2(CO3)_2$), and anglesite ($PbSO_4$) may control the aqueous concentrations of lead in groundwater; the ultimate fate and transport of dissolved-phase lead will be dependent on the geochemistry of the aquifer over time. Dissolved lead could also adsorb to the surfaces of other solids in the soil/fill material and underlying aquifer, resulting in a source of lead from adsorption/desorption reactions. As presented in RI Report Figure 4-16, lead concentrations greater than 800 mg/kg are reported in surface and subsurface soil/fill material across the Site, with a cluster of comparatively elevated lead concentrations primarily detected in samples collected in the vicinity of Building #7. Elevated total lead concentrations in the shallow fill groundwater were also detected in samples from monitoring wells on Lots 63 and 64, and primarily within the vicinity of Building #7 (RI Report, April 2020, Figure 4-40). The soil/fill material with elevated lead concentrations (greater than 800 mg/kg) acts as a source material to the shallow groundwater in this area. Assuming 800 mg/kg for lead in the soils/fill, and a partitioning coefficient or log Kd values[6] ranging from 3.7 to 5, possible aqueous dissolved-phase lead concentrations are in the range from 8 to 150 ug/L. Total lead concentrations in groundwater were found to be greater than 5 ug/L across the Site and as high as 100 ug/L. This demonstrates that lead contamination in soil/fill, which was impacted by past operations, likely migrated to the shallow groundwater, recognizing that lead concentrations in the soil/fill were reported at levels much greater than 800 mg/kg.

[6] Kd value is a partitioning coefficient, which is the ratio of sorbed metal concentration (expressed in mg metal per kg sorbing material) to the dissolved metal concentration (expressed in mg metal per L of solution) at equilibrium.

5. Comment: A commenter criticized EPA's CSM by stating that the groundwater data do not follow the trend that would be expected if the source of lead in groundwater was actually historical spills and/or releases.

   Response: The RI field program for groundwater (excluding the temporary well point samples) consisted of three groundwater sampling events over an 11-month period. The data collected are insufficient to support trend analysis or to statistically evaluate groundwater variability over time. As stated in the RI Report (page 4-26) when discussing the shallow groundwater results: "The variations of results may be within reproducibly [sic] range of measurement or reflect Site conditions at time of sampling (seasonal variations, tides or recent precipitation events)." It would not be appropriate, in the CSM, to include conclusions from a trend analysis or a statistical evaluation of groundwater variability over time, based on the three groundwater sampling events due to the insufficient data.

6. Comment: A commenter questioned how EPA's CSM addressed a past release of lead-containing drinking water that was the result of a ruptured active water line which occurred during on-site work being conducted by EPA in 2012 that involved drilling test pits on Lot 64. The commenter reported that the City of Newark's 2012 Water Quality Report identified the 90th percentile concentrations of lead at 9 parts per billion (ppb) in the Pequannock System and 3.4 ppb in the North Jersey District Water Supply Commission (NJDWSC) system. The commenter concludes that this release is a source of lead to the groundwater and that EPA's CSM erroneously does not identify this source.

   Response: The data do not support the contention that the ruptured pipe was a significant source of lead at the Site. As the commenter indicates, in the City of Newark's 2012 Water Quality Report, the 90th percentile concentrations of lead are reported as 9.0 ppb in the Pequannock System and 3.4 ppb in the NJDWSC system. Using the Pequannock System's 90th percentile value reported in 2012 (9.0 ppb), it would have required a release of approximately 264,000 gallons of City of Newark drinking water to have contributed one gram of lead to the Site. The amount of water released was not documented, but this rupture was resolved in a few hours and sampling continued the next day. It is very unlikely that this single event made a significant contribution to lead contamination at the Site.

7. Comment: Commenters asked if CSMs had been developed for each of the impacted media presented in the Proposed Plan.

   Response: The CSM was developed for the Site and presents the potential sources of contamination, potentially affected media, potential transport mechanisms, and potential exposure pathways and receptors. The CSM is presented in Section 7.0 of the RI Report (April 2020). The selected remedy in the Record of Decision (ROD) addresses five media: waste material, sewer water, soil gas, soil/fill material, and groundwater.

D. Groundwater Remedy

1. Comment: A commenter believes that the groundwater remedy should not consider the aquifer as a drinking water aquifer. The commenter states that the presence of historic fill and the quality of the groundwater do not suggest that the aquifer would be used as a potable water supply. The commenter states that the presence of Classification Exception Areas (CEAs) at lots that have been remediated under the New Jersey Department of Environmental Protection's remediation programs suggests that the groundwater at the Site should not be considered as a potable water supply.

   Response: As stated in the RI Report (page 7-2), the groundwater at the Site is currently designated as a Class IIA aquifer by the State of New Jersey. N.J.A.C 7:9C has established groundwater quality standards for Class IIA aquifers, which EPA has identified as chemical-specific Applicable or Relevant and Appropriate Requirements (ARARs) for Site groundwater. EPA acknowledges the existing CEAs that have been established on the Site by the State of New Jersey along with the existing deed notices and engineering controls, which are documented in the RI Report (page 7-2).

   The NCP Preamble states, "Ground water that is not currently a drinking water source but is potentially a drinking water source in the future would be protected to levels appropriate to its use as a drinking water source" (55 Fed. Reg. 8666, 8717 [March 8, 1990]). Consistent with the NCP, the groundwater remedy in the ROD is expected to restore the groundwater quality for Site-related contaminants of concern (COCs) to meet the standards applicable for a Class IIA aquifer.

2. Comment: A commenter stated that the pumping and treating of groundwater to prevent its migration to the Passaic River is not necessary because the RI did not prove that groundwater is migrating to the river.

   Response: The remedial investigation established that Site groundwater is migrating east toward the river. As stated in RI Report (page 3-4), "The Passaic River acts as a regional discharge point for groundwater in the Newark, New Jersey area." The RI Report (Section 3.4.1) states that the general flow pattern for the shallow and deep groundwater units is east towards the river. "The six groundwater potentiometric maps developed for the shallow fill unit (Figures 2-5 to 2-10) identify similar flow patterns across the Site showing groundwater flow is primarily to the east during both high and low tide" (RI Report, page 3-5). "Two groundwater contour maps developed for the native deep [groundwater] unit beneath the fill material also indicate flow to the east (Figures 2-12 and 2-13)" (RI Report, page 3-6). The groundwater component of the remedy selected in the ROD therefore includes a pump and treat system to provide hydraulic containment at the river's edge to minimize migration of contaminated groundwater to the river.

3. Comment: A commenter stated that the pumping and treating of groundwater will be ineffective towards meeting the remedial goals of the Site since the placement of the wells will result in river water being pumped. Another commenter asked if a pilot study was conducted to confirm that a pump and treat system would contain impacted groundwater onsite. Another commenter asked whether the addition of a containment barrier such as a slurry wall or a reactive barrier wall would enhance the effectiveness of capturing groundwater to prevent any further impacts to the Passaic River.

   Response: EPA acknowledges in the ROD (*see* ROD section "Description of Remedial Alternatives") that the pumping rate of the pump and treat system will need to vary to minimize extraction of river water. EPA anticipates that the groundwater level will be monitored, and the extraction rates will be variable, to provide maximum containment/capture without causing excessive induced infiltration from the river. A pilot study has not been completed and the number of extraction wells, pumping rate, and individual processes to be utilized for treatment will be determined during the remedial design. At this time, EPA does not expect that the addition of a containment barrier such as a slurry wall or a reactive barrier wall is needed to achieve groundwater RAOs.

4. Comment: A commenter stated that EPA's preferred groundwater alternative, Groundwater Alternative 4, will not achieve the Remedial Goals (RGs) due to the presence of historic fill as an ongoing source of contamination to groundwater. The commenter provided a modeling analysis of the performance of a pump and treat system that concluded it would take an extremely long time to achieve the RGs due to the presence of the fill as an ongoing source of lead to groundwater.

   Response: Groundwater Alternative 4, the selected remedy for groundwater in the ROD, includes institutional controls, targeted, periodic in-situ remediation, a pump and treat system, and groundwater monitoring. The commenter's calculations showing a "One-Dimensional Modeling Parameters" and a "Pumping Rates Assessment" appear to assume that pump and treat is the sole component to address the groundwater contamination. EPA acknowledges that a pump and treat system by itself (as proposed in Groundwater Alternative 2) would take longer to meet RGs than an alternative that also includes remediation of source materials, and consequently Alternative 2 was not ranked as high as Alternative 4 (*see* the evaluation of Groundwater Alternative 2 in Section 6.2.3.2 in the FS Report).

   The pump and treat system in the selected groundwater remedy will provide hydraulic containment at the river's edge to satisfy the groundwater remedial action objective (RAO) to "[p]revent or minimize discharge of groundwater containing COCs to surface water to minimize the potential for interaction between the Site and the Passaic River" (*see* Proposed Plan pp. 12 and 19. *See also* ROD sections "Remedial Action Objectives" and "Description of Remedial Alternatives"). The selected groundwater remedy also calls for periodic in-situ remediation which would be focused on the upgradient portion of the Site, targeting contaminated

areas in both the shallow and deep groundwater. The commenter's analysis does not appear to consider the full breadth of the selected groundwater remedy. EPA acknowledges the ability to achieve RGs will also be challenged by the presence of COCs in the soil/fill, and by historic fill in some areas of the Site, albeit historic fill that was likely impacted by Site operations. Response actions undertaken for other media that include source control measures (i.e., UST removal and removal of elevated lead in the vicinity of Building #7) will remove potential groundwater sources, potentially allowing the selected remedy to achieve RAOs faster. Following source removal/control, groundwater data can be used to determine the effectiveness of the remedy and develop appropriate methods for monitoring impacts from historic fill, as distinguished from Site-related releases.

5. Comment: A commenter stated that EPA's preferred groundwater alternative is not the correct remediation alterative for this Site, and that the implementation of institutional controls, similar to those that have been selected at lots remediated under the NJDEP's Site Remediation Program, is the appropriate remedy.

   Response: A groundwater alternative with solely institutional controls (and no active remedial action) is not an appropriate alternative for the Site because it will not satisfy the threshold criteria of overall protection of human health and the environment and compliance with ARARs, and because active remedial measures are practicable. As provided in the NCP:

   > The use of institutional controls shall not substitute for active response measures (e.g., treatment and/or containment of source material, restoration of ground waters to their beneficial uses) as the sole remedy unless such active measures are determined not to be practicable, based on the balancing of trade-offs among alternatives that is conducted during the selection of remedy. 40 C.F.R. §300.430(a)(1)(iii)(D).

   See also "Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites" (EPA, December 2012).

6. Comment: A commenter noted that EPA's preferred groundwater alternative does not match groundwater areas with preliminary remediation goal (PRG) exceedance as shown in Figure 5 of the Proposed Plan.

   Response: EPA updated the corresponding groundwater figure in the ROD (Figure 16) but notes that the figures presented in the Proposed Plan and ROD are conceptual, schematic diagrams to provide an overview of the selected remedy; they do not represent remedial design drawings.

7. Comment: A commenter criticized EPA for selecting a preferred groundwater alternative, arguing that the groundwater remedy selection should be deferred to a later time after the sources of contamination to groundwater have been remediated.

   Response: EPA disagrees with the suggestion that EPA defer selection of a groundwater remedy. EPA has documented in the RI that the nature and extent of groundwater contamination and the fate and transport of contaminants associated with groundwater are understood. Exposure to the groundwater contamination poses an unacceptable risk to human health, and EPA therefore has selected a remedy for groundwater in this ROD. EPA acknowledges that the ability to achieve the groundwater RGs may be challenged by the migration of COCs in the soil/fill to the groundwater. The selected remedy for soil/fill therefore includes source control measures (i.e., UST removal and removal of elevated lead in the vicinity of Building #7) that would remove potential sources of groundwater contamination and are expected to allow the remedy to achieve RAOs faster.

8. Comment: A commenter stated that EPA disregarded Site conditions and Site data critical to properly conduct the comparative analysis of the groundwater alternatives, specifically that historic fill is the primary source for lead contamination, and concludes that selection of the groundwater remedy should be deferred.

   Response: As stated in response to the previous comment, EPA disagrees with the suggestion that EPA defer selection of a groundwater remedy. The commenter's assessment of the groundwater comparative analysis primarily hinges on its position that lead is not a Site-related contaminant and instead is primarily associated with historic fill. However, as discussed in the previous responses to comments (*see* Section C of this Responsiveness Summary), EPA's CSM, which takes into account historic information and Site data, supports EPA's conclusion that lead in groundwater is Site-related. The FS and Proposed Plan appropriately compared a set of groundwater alternatives that addressed Site-related contaminants, including lead from Site-related releases, and that would achieve the groundwater RAOs.

9. Comment: A commenter argues that the detections of certain contaminants at the Site do not justify their inclusion in the preferred groundwater alternative. The commenter noted for many of the contaminants that the concentrations varied during the remedial investigation and that some results for a particular contaminant were below the RG. The commenter also criticized EPA for not acknowledging the potential for off-site sources to impact on-site shallow and deep groundwater.

   Response: Unacceptable risk was identified based on exposure to groundwater, and therefore RAOs and remedial alternatives were developed to achieve RGs for Site-related COCs. The ROD includes RGs for all Site-related COCs that were identified during the RI. The remedial design will include a pre-design investigation to

characterize groundwater conditions at that time so that the design can be developed to focus on the relevant chemicals.

The RI acknowledges impacts of off-site sources on the Site. As stated in the RI Report (page 7-3) under identification of sources in the conceptual site model, "Off-site groundwater flow emanating from adjacent upgradient sites, or intrusion from the river to the Site due to tidal or high river levels, may also be a potential source of groundwater impacts. Additionally, minor releases may have collectively contributed to widespread low-level impacts across the Site." The RI Report (page 7-7) also states in the conceptual site model under potential Pathways from Off-Site Contaminant Sources that "There are numerous off-site facilities in the area that are reported contaminated sites. There is a groundwater CEA beneath the Site from an upgradient release(s) on the adjacent property. These off-site sources may impact on-site groundwater quality." EPA considered the off-site sources when it determined the RAOs for the Site, and developed the groundwater alternatives to address contaminants from on-site releases.

E. Soil/Fill Remedy

1. Comment: Commenters asked which buildings would be demolished and which would be preserved, as part of the remedy for the soil/fill. The derelict state of some of the buildings is a concern.

   Response: The ROD does not include demolition of existing buildings as they are not considered sources of contamination that could be released to the environment, nor is it necessary to remove existing buildings to implement the remedy. Existing building floor slabs in contact with soil/fill are incorporated into the site-wide cap. If a building is demolished in the future and its floor slab removed, additional cap construction would be warranted at that location.

2. Comment: Commenters asked for more information on the proposed cap thickness, and they stated that the preferred soil alternative would leave impacted soils in place, while future utility work would potentially result in dermal contact of these soils by the utility workers. The commenters also asked if EPA plans to utilize a demarcation barrier to mitigate these potential risks, which would require the removal and disposal of impacted soils in order to allow for the installation of a clean barrier/buffer layer to conform with the presumptive remedies in the NJDEP Technical Requirements for Site Remediation (N.J.A.C. 7:26E).

   Response: EPA's selected remedy for soil/fill material includes capping, which consists of the construction of a barrier over/around the contaminated areas. The site-wide cap is intended to prevent access to and contact with the contaminated media and/or to control its migration and will be consistent with the New Jersey Technical Requirements for Site Remediation. The cap would likely consist of a 6-inch asphalt cap (bituminous concrete) constructed over a 6-inch gravel subbase that would be placed on top of the existing surface. Where new cover material is

required, the new pavement is assumed to be asphalt, but concrete would be acceptable as it provides the same protection of human health and environment as asphalt. Some existing pavement may be incorporated into the cap, though it may need to be repaired to meet the criteria for an engineering control and the pavement would have to otherwise meet the specifications of the cap design. The use of existing pavement as a component of the cap would reduce the amount of material resources required, as encouraged under EPA Region 2 Clean & Green Policy. Using existing asphalt or concrete pavement reduces the environmental footprint of the remedial action. Deed notices will acknowledge the cap as an engineering control to prevent access to underlying contaminated soils. Any future disturbance to the cap would need to be coordinated with EPA. The remedial design for the Site will address these details.

3. Comment: A commenter asked for the volume of soil that would be excavated as part of the preferred soil alternative.

   Response: The preferred soil/fill alternative includes a focused excavation of lead-contaminated soil at concentrations greater than 800 mg/kg around Building #7 on Lots 63/64, above the water table. Based on available data, the footprint of this excavation assumed for cost estimating purposes is approximately 0.5 acre and approximately 5,000 cubic yards of soil (FS Report, Section 5.2.4, page 5-6 and Appendix B). These dimensions will be confirmed in the remedial design.

4. Comment: A commenter stated that the removal and off-site disposal and management of contaminated soils or source material is the most protective soil alternative, and that this should be to a location far enough away so that no one is affected by it.

   Response: As presented in the Proposed Plan, EPA evaluated removal and off-site disposal and management of waste and soil/fill material. The selected remedy for wastes identified at the Site, including free product [light non-aqueous phase liquid (LNAPL)] and water present in underground storage tanks and buildings, is removal and proper disposal at an off-site waste disposal facility. The remedy for soil/fill includes bulkhead replacement, capping of the entire Site, additional excavation and off-site disposal of NAPL-impacted soils on Lot 63, and a focused excavation and off-site disposal of lead-contaminated soil/fill above the RG in the vicinity of Building #7. The remedy will also reduce mobility of other contaminants of concern (COCs) in the soil/fill material that are co-located with lead in the vicinity of Building #7. Excavated soil/fill material will be tested, disposed, and managed at an appropriate off-site disposal facility (*see* ROD section "Description of Remedial Alternatives"). Excavated soil/fill material may contain elevated lead concentrations that may classify it as a Resource Conservation and Recovery Act (RCRA) characteristic waste (Waste Code D-008). Off-site disposal may therefore need to comply with RCRA land disposal restriction (LDR) requirements via treatment to eliminate the RCRA characteristic, or alternative LDR treatment standards under 40 C.F.R. §268.49 (Phase IV LDR). A detailed

comparison of the soil alternatives that considered excavation and off-site disposal can be found in Chapter 5 of the FS Report (July 2020).

5. Comment: A commenter criticized EPA for including bulkhead repair/replacement in the preferred soil/fill alternative, stating that the source of lead contamination in the soil is from the historic fill and not from a CERCLA release to the soil and that the bulkhead therefore does not address releases of Site-related contamination. The commenter also stated that the replacement of the bulkhead does not meet any ARARs for the Site.

   Response: One of the RAOs for soil/fill material is to "Prevent or minimize off-site transport of soil containing COCs to minimize the potential for interaction between the Site and the Passaic River" (*see* ROD section "Remedial Action Objectives"). As discussed in the response to comment C.1. (Conceptual Site Model), both the Site data and evidence about historical Site operations support EPA's determination that former lead paint manufacturing operations at the Site contributed the predominant source of lead contamination to the soil and groundwater. Furthermore, other COCs also are from sources other than historic fill, including but not limited to benzene, toluene, ethylbenzene, and xylenes that are likely the result of releases from USTs on Lots 63 and 64 or illegal dumping (*see* ROD section "Summary of Site Characteristics").

   The replacement and/or repair of the bulkhead in the soil/fill remedy satisfies the RAO by providing vertical containment of the impacted soils on-site for all COCs in the soil/fill material. As stated in the ROD, "The bulkhead will be reinforced or reconstructed, as appropriate, in order to minimize the potential for interaction between the Site and surface water, minimize soil erosion, and prevent off-site transport of soil/fill containing COCs and Contaminants of Potential Ecological Concern (COPECs)." The replacement and/or repair of the bulkhead will be implemented to comply with location-specific and action-specific ARARs , including those that apply to erosion and sedimentation control, and storm water management.

6. Comment: A commenter stated that EPA disregarded Site conditions and Site data that are critical to properly conducting the comparative analysis of the soil/fill alternatives, arguing that historic fill is the primary source for lead contamination and that the bulkhead enhancement in particular does not address contaminants attributable to releases or help achieve any of the NCP's balancing criteria. The commenter also stated that the bulkhead does not contribute to ARAR compliance or reduction of toxicity, mobility or volume ("TMV") through treatment.

   Response: The commenter's assessment of the soil/fill comparative analysis primarily hinges on its position that lead is not a Site-related contaminant and is primarily associated with historic fill. As discussed in previous responses to comments (*see* Section C of this Responsiveness Summary), EPA's CSM, which

takes into account historic information and Site data, supports EPA's conclusion that lead in soil/fill is Site-related.

The selected remedy for soil/fill (Alternative 4) includes institutional controls, engineering controls for containment (cap and bulkhead), and NAPL excavation and removal, and a focused excavation and off-site disposal for lead contaminated soil/fill above the RG in the vicinity of Building #7. The commenter's assessment of the comparative analysis focuses primarily on one element of the alternative, the bulkhead. As noted above, the replacement/repair of the bulkhead will be implemented so as to comply with location-specific and action-specific ARARs, including those that apply to erosion and sedimentation control, and storm water management. Further, while replacement/repair of the bulkhead will not reduce TMV through treatment, the repaired bulkhead (which provides vertical containment) in combination with the engineered cap (which provides horizontal containment) will limit mobility of soil/fill COCs and provide long-term effectiveness of the remedy to meet the soil/fill RAO to "[p]revent or minimize off-site transport of soil containing COCs to minimize the potential for interaction between the Site and the Passaic River."

Vertical containment of soil contaminated with COCs is necessary because the targeted excavation component of the soil/fill remedy is not intended to remove all COCs in soil at the Site that could potentially migrate to the river. The commenter therefore is incorrect that vertical containment provided by the bulkhead will not be necessary to protect human health or the environment, or contribute to the remedy's long-term effectiveness and permanence, after the excavation is completed.

When considering all elements of the selected soil/fill remedy, EPA concluded in the ROD that this component would reduce mobility of COCs, through excavation, removal and off-site disposal of elevated lead around Building #7. The toxicity and volume may be reduced if material is treated to comply with the requirements of the disposal facility.

7. Comment: A commenter stated, with regard to short-term effectiveness, that "it is unnecessary to incur the risks and disruptions associated with installation of the replacement bulkhead" and that "removal of soil/fill can occur more quickly than bulkhead enhancement." The commenter stated that the administrative and technical challenges with bulkhead enhancement raise questions as to whether it is implementable.

   Response: EPA assessed the short-term impacts of Alternative 4 for Soil/Fill in accordance with the NCP (40 C.F.R. 300.430(e)(9)(iii)(E)) and did not identify any short-term impacts from the bulkhead component that significantly weigh against its inclusion in the selected remedy. The speed at which soil/fill can be removed is not relevant to whether the bulkhead enhancement is effective in the short-term. EPA will continue to provide outreach to the community and local businesses on

the remedial action and construction schedule so that business activity can continue during construction.

EPA has not identified any insuperable administrative or technical challenges to implementing the bulkhead replacement/repair. Bulkhead work will be coordinated by EPA, the United States Army Corps of Engineers (USACE) and NJDEP.

8. Comment: A commenter stated that Soil/Fill Alternative 4 is not cost effective because "the bulkhead adds millions of dollars" the cost of that alternative "without remediating any contaminants actionable under CERCLA."

   Response: As discussed previously, EPA disagrees that the lead in soil at the Site is attributable only to historic fill. The bulkhead will provide vertical containment of lead and other COCs that resulted from Site-related releases that are property addressed by the CERCLA remedy for the Site. Further, the comment does not accurately characterize the cost criterion for remedy selection under the NCP's balancing criteria for evaluating remedial alternatives. The "cost" criterion evaluates and compares the cost of the respective alternatives, including capital costs, annual operation and maintenance costs, and the net present value of capital and O&M costs, but draws no conclusion as to the cost-effectiveness of the alternatives (*see* 40 C.F.R. § 300.430(e)(9)(iii)(G) and 55 F.R. 8666, 8722 [March 8, 1990]). Cost-effectiveness is a requirement for remedy selection under CERCLA Section 121(b) and considers whether the overall effectiveness of a remedy is proportional to its costs (40 C.F.R. § 300.430(f)(1)(ii)(D)). As set forth in the ROD, overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to cost to determine cost-effectiveness, and based on that comparison, the selected remedy meets the statutory requirement that Superfund remedies be cost effective (40 C.F.R. § 300.430(f)(1)(ii)(D)) and the relationship of the overall effectiveness of the selected remedy was determined to be proportional to costs and hence, the selected remedy represents a reasonable value for the money to be spent.

   EPA properly evaluated the soil/fill alternatives, as a whole, in the comparative analysis as required by the NCP.

9. Comment: A commenter questioned whether the repair/replacement of the bulkhead would interfere with the navigable portion of the river, as the river is currently used by rowers and other recreators.

   Response: Since replacement and repair of the bulkhead will likely involve in-river operations, temporary limitations or restrictions on the navigable portion of the waterway may occur, but no significant permanent impact to the navigable portion of the river is anticipated.

F. Waste Remedy

1. Comment: Commenters stated that in order for institutional and engineering controls to be effective for remediating the groundwater, any free or residual product, including the non-aqueous phase liquid (NAPL), would need to be identified and remediated, and any wastes that could pose a risk to further impacting on-site or off-site media would have to be removed for off-site disposal.

   Response: The selected remedy for wastes identified at the Site, including free product [light non-aqueous phase liquid (LNAPL)] and water present in underground storage tanks and buildings, is the removal and proper disposal at an off-site waste disposal facility. In addition, the selected soil/fill remedy will address NAPL impacted soils on Lot 63, which will be excavated and disposed of off-site. Disposal facility options, their disposal requirements, and locations will be evaluated as part of the remedial design. Removal and off-site disposal of the LNAPL and impacted soil will address a potential mobile source material to the groundwater. Underground tank removal would follow the substantive requirements of the New Jersey tank closure regulations and Technical Requirements for Site Remediation (N.J.A.C. 7:26E-5.1(e)).

2. Comment: A commenter stated that the Proposed Plan mischaracterized wastes. The commenter stated that the Proposed Plan references light non-aqueous phase liquid (LNAPL) in Lot 64 underground storage tanks (plural), but the RI and FS only identified LNAPL in one underground storage tank. The commenter also stated that the Proposed Plan includes a statement that the RI identified an aqueous solution on Lot 64 and that this aqueous solution on Lot 64 will be addressed by the remedy, while the RI did not identify an aqueous solution on Lot 64, and the FS does not discuss any aqueous waste on Lot 64 as part of any remedy.

   Response: EPA acknowledges the error identified by the commenter. EPA corrected the error and changed “tanks” to “tank” in the ROD.

   Regarding the issue of aqueous waste on Lot 64, EPA’s selected remedy for waste removal includes removal of six underground storage tanks on Lot 64 and the disposal of the tank contents, including aqueous and solid waste and/or LNAPL. On-site waste will be containerized and transported to an off-site facility for disposal. This aqueous solution in the tanks was sampled during the RI (page 4-2).

G. Sewer Remedy

1. Comment: A commenter indicated that the City of Newark is currently performing an assessment of its long-term control process and permitting with the State of New Jersey, and this effort, which is in the final stages, is expected to announce alternatives for improvements to the long-term control plan soon. The commenter identified the presence of the sewers located along Route 21 and asked if EPA is reviewing the long-term control plans with regard to these sewers and the preferred

alternative for the Site. The commenter asked if the remedial action for sewers would comply with the City of Newark's permits.

Response: The Proposed Plan for the Site identified an inactive sewer line on Lot 1 with a manhole that contained contaminated sewer water and associated solids. The sewer is inactive based on observations of no flow and because there was no current user upstream of the manhole. The selected remedy includes removal of the sewer water and associated solids, off-site treatment and disposal and proper closure of the line. Other portions of the sewer system on the Site were investigated and no other portions of the sewer system were identified as a potential source of contamination to the groundwater or soil/fill material (Proposed Plan, pages 5 and 14). Since this sewer line is inactive, remediation and closure of the line would not affect the City of Newark's long-term control plans with regard to its combined sewer system.

If, during the remedial design, it is determined that utility lines need to be added, moved, or augmented on-site, these designs would comply with substantive requirements of those laws and regulations identified as ARARs, but no permits would be obtained for on-site work, in accordance with the permit exemption at CERCLA Section 121(e)(1).

H. Risk Assessment

1. Comment: Commenters asked if there are impacts from the Site to environmentally sensitive natural resources, such as the Passaic River. The commenters added that EPA had previously indicated that any impacts to the Passaic River would be addressed by the remediation planned for that site and were curious if this was still correct. The commenters also asked what ecological studies had been performed for the Riverside Industrial Park Superfund site.

   Response: The Screening Level Ecological Risk Assessment (SLERA, dated April 2020) for the Site was focused on the potential for terrestrial wildlife exposure from on-site surface soil/fill material. The habitat present on the Site is fragmented and of low value to wildlife with opportunistic, invasive, and transient species being the dominant species observed or expected to be on the Site (*see* the Proposed Plan, pages 10-11). In a presentation to the Passaic River Community Advisory Group (CAG), EPA explained that sediments and surface water in the Lower Passaic River were evaluated as part of the remedial investigation for the lower 8.3 miles of the river, which is Operable Unit 2 (OU2) of the Diamond Alkali Superfund Site, and unacceptable ecological risk was identified for ecological receptors that are exposed to the sediment and surface water. The river adjacent to the Site is to be addressed through the EPA remedial action for the lower 8.3 miles (Diamond Alkali Superfund Site OU2) and was not included in the SLERA for this Site.

I. Air Emissions

1. Comment: Several commenters asked how air emissions will be controlled during remediation of the Site, particularly since this area has many environmental justice concerns associated with lower income communities and communities of color. The commenters requested that EPA provide the public with a written plan that details how the EPA will control air emissions during the remediation.

   Response: EPA is aware that air quality and environmental justice are community concerns. Both of these topics were discussed with the community during the 2020 community interviews (CIP, pp. 17 and 25). During the remedial design for the Site, construction activities will be reviewed and designed to mitigate air emissions, including dust and odor, and other impacts to air quality. The party performing the remedy will also develop a community impact mitigation plan, which EPA will review and approve. This plan will describe the air monitoring that will occur during construction and any corrective actions that would be undertaken if air quality standards are exceeded due to Site-related construction.

2. Comment: Several commenters expressed concern that air emissions from the nearby Diamond Alkali Superfund site may travel quite a distance to their homes.

   Response: EPA understands this to be a reference to the lower 8.3 miles of the Lower Passaic River, OU2 of the Diamond Alkali Superfund site, which is a different site from the subject of this Responsiveness Summary. EPA selected a remedy for the lower 8.3 miles in 2016. As part of implementing the remedy for the lower 8.3 miles, EPA anticipates that a community impact mitigation plan will be developed, which EPA will review and approve. Information about the Diamond Alkali site can be found in the site profile page: www.epa.gov/superfund/diamond-alkali.

J. Future Use

1. Comment: Commenters expressed their agreement with EPA's determination that the reasonably anticipated future land use would remain commercial/industrial, stating that it would be difficult and expensive to remediate the Site for residential use, and citing the potential exposure for residents.

   Response: EPA acknowledges comment on the reasonable anticipated future land use.

2. Comment: Commenters stated that the preferred remedial alternatives identified by EPA should be implemented in conjunction with a revitalization/redevelopment plan that focuses on many environmental justice concerns, including green infrastructure, spaces for agricultural production to support low-income families, education, administration, and housing.

   Response: Under Superfund law, EPA's goal is to reduce risks to human health and the environment from exposure to hazardous substances identified as COCs to

target ranges defined in the law and EPA guidance documents. While the remedy selection process does not give EPA the authority to develop revitalization/redevelopment plans, depending on site-specific circumstances, it is sometimes possible for aspects of development to be incorporated into a remedy. At present, however, EPA is not aware of any detailed plans for development. EPA considers the reasonably anticipated future land use when selecting remedies, based on factors including historical use, current use, surrounding land use, zoning, and town master plans. For the Site, a Reuse Assessment Plan (Appendix O of the RI Report) was developed to evaluate reasonable future land use at the Site. Currently, the Site is located within a "dedicated industrial" zone in the City of Newark. While the City of Newark may rezone the Site for redevelopment following EPA's remedial action, EPA concluded for purposes of remedy selection that the future use of the Site could reasonably be anticipated to remain commercial/industrial. This conclusion is supported by the City of Newark's 2013 Public Access and Redevelopment Plan for the North Ward. According to this plan, community gardens and community centers are not permitted in a "dedicated industrial" zone. (Data Source: City of Newark, 2013, "Newark's River: Public Access and Redevelopment Plan." Submitted to the Central Planning Board and Municipal Council by the Newark Planning Office, Department of Economic & Housing Development. April 2013).

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of the selected remedy components.

3. Comment: Several commenters identified the issue of homeless occupancy and security concerns at the Site, and asked about EPA's plan to address these issues, including cameras, security patrols or engineering controls, and/or provide social services for the homeless at the Site.

   Response: EPA acknowledged in the Proposed Plan that pedestrian trespassing occurs through unsecured portions of the Site, and potential risks to adolescent and adult trespassers were evaluated in the Baseline Human Health Risk Assessment (Proposed Plan, page 8). One of the RAOs for the Site is to "remove COCs or minimize COC concentrations and eliminate human exposure pathways to COCs in soil and fill material." Institutional controls in combination with other active remedial alternatives can achieve this RAO. All of the proposed soil/fill alternatives (except No Action) included institutional controls, including land use restrictions and barriers to restrict access. As stated in the ROD's description of the Selected Remedy for Soil/Fill, "Fencing will be required to be maintained and enhanced as appropriate to limit unauthorized access to the Site and use of the Site in a manner inconsistent with the remedy." The final combination of institutional controls and barriers to restrict access will be determined in the remedial design. EPA has also communicated with the City of Newark regarding patrolling vacant properties, installing fences, and securing abandoned buildings. The Superfund law does not provide EPA with the ability to provide social services.

4. Comment: Several commenters expressed their interest in river access from the Site, once the Site is remediated, suggesting options such as a riverwalk, boat ramp, and floating docks. Commenters stated that these types of developments would be beneficial to the community.

   Response: As noted above, under Superfund law, EPA's goal is to reduce risks to human health and the environment from exposure to hazardous substances identified as COCs to target ranges defined in the law and EPA guidance documents. EPA does not have the authority to require public walkways, boat ramps, or floating docks as part of the remedy. EPA's experience at other Superfund sites is that, after remediation, a cleaner site often encourages local municipalities and private entities to develop more public access to and from water bodies for recreational purposes.

5. Comment: A commenter asked about ways in which Newark residents can be trained to participate in some of these cleanup activities for job opportunities.

   Response: EPA is aware of job opportunities that have been created during construction and remediation at other Superfund sites (Hudson River PCBs site remedial action, Phase 1 of the 2008 removal action in the Lower Passaic River, at the Diamond Alkali site). EPA is committed to encouraging the use of a variety of programs that train local community members in skills that could be utilized during the construction and remedial action at the Site. One such program is the Superfund Job Training Initiative, which is discussed in the Site's Community Involvement Plan, and EPA will encourage the party or parties performing the remedial action to consider using it.

K. Implementation

1. Comment: A commenter asked who will be designing and implementing the remedy. Another commenter expressed concern that EPA may not be able to fund the remedy, thereby resulting in a dangerous condition at the Site where contaminated materials are exposed and the remediation cannot be completed.

   Response: It is EPA's policy to have Superfund cleanups performed by the parties legally responsible for the contamination, consistent with EPA's September 20, 2002 memorandum "Enforcement First for Remedial Action at Superfund Sites".[7] EPA will therefore seek to have the potentially responsible parties for the Site design and perform the cleanup, under EPA oversight.

2. Comment: A commenter asked for information about how remedial design and remedial action work will be bid and contracted for the cleanup.

[7] https://www.epa.gov/sites/default/files/documents/enffirst-mem.pdf

Response: As stated previously, EPA will look to the parties legally responsible for the contamination to fund the design and remedial work at the Site. If those parties perform the work, they would select contractors for the work.

L. Dispute

1. Comment: A commenter stated that EPA's Director of the Superfund and Emergency Management Division, who issued the dispute decision, failed to acknowledge the relevant Site data presented during dispute resolution.

   Response: This is not a comment on the Proposed Plan or its supporting information and is beyond the scope of the Responsiveness Summary.

M. Site History

1. Comment: A commenter submitted a thesis that contained detailed information on the Site history, including the period during which the facility operated as the home of several boat clubs.

   Response: EPA acknowledges the submission of information related to the history of the Site.

N. Public Comment Period

1. Comment: Several commenters requested that EPA extend the public comment period beyond the originally announced date of August 21, 2020 to allow for a thorough review of the Proposed Plan and EPA's preferred alternative.

   Response: EPA provided an initial 30-day public comment period from July 22, 2020 to August 21, 2020, after which EPA granted several extensions, and the public comment period ended on February 19, 2021.

APPENDIX V-A

PROPOSED PLAN

Riverside Industrial Park Superfund Site

Newark, New Jersey

Superfund Proposed Plan *July 2020*

PURPOSE OF THE PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the Riverside Industrial Park Superfund Site (Site or Riverside Industrial Park), identifies EPA's Preferred Alternative for this Site, and provides the basis for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New Jersey Department of Environmental Protection (NJDEP). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the Site and the remedial alternatives summarized in this Proposed Plan are described in the April 2020 Remedial Investigation (RI) report and July 2020 Feasibility Study (FS) report, respectively, both of which are available in the administrative record file. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

This Proposed Plan is being provided to inform the public of EPA's Preferred Alternative and to solicit public comments pertaining to all the remedial alternatives evaluated, including the Preferred Alternative. The Preferred Alternative consists of the following alternatives: Waste Alternative 2 – Removal and Off-Site Disposal; Sewer Water Alternative 2 – Removal and Off-Site Disposal; Soil Gas Alternative 2 – Institutional Controls,[1] Air Monitoring or Engineering Controls (in existing occupied buildings), and Site-Wide Engineering Controls (for future buildings); Soil/Fill Alternative 4 – Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and Non-Aqueous Phase Liquid (NAPL)[2] Removal; and Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation.

MARK YOUR CALENDAR

July 22, 2020 – August 21, 2020: Public comment period related to this Proposed Plan.

August 5, 2020 at 7:00 P.M.: Virtual Public meeting. One may find meeting-participation details using the following link: www.epa.gov/superfund/riverside-industrial

Alternately, one may participate by telephone using the following conference line number: (315) 565-0493, Code ID: 304001388#. Please register in advance of the virtual meeting by accessing: https://epa-riverside-proposed-plan.eventbrite.com or emailing Shereen Kandil, Community Involvement Coordinator, at: Kandil.Shereen@epa.gov or calling her at (212) 637-4333.

Anyone interested in receiving materials for the public meeting in hard copy should either email or call Shereen Kandil with such a request by Thursday, July 30.

The Administrative Record (supporting documentation) for the site is available at:
www.epa.gov/superfund/riverside-industrial

And at the following information repository:

USEPA-Region 2
Superfund Records Center
290 Broadway, 18th Floor
New York, NY 10007-1866
212-637-4308

EPA, in consultation with NJDEP, may modify the Preferred Alternative or select another alternative presented in this Proposed Plan based on new information, additional data, or public comments. Therefore, EPA is soliciting public comment on all the alternatives considered in the Proposed Plan and in the detailed analysis section of the FS report. The final decision regarding the selected remedy will be

[1] Institutional controls are non-engineered controls, such as property or groundwater use restrictions, placed on real property by recorded instrument (such as deed notices) or by a governmental body by law or regulatory activity for reducing or eliminating the potential for human exposure to contamination and/or protecting the integrity of a remedy.

[2] NAPLs are liquid contaminants that do not easily mix with water and remain in a separate phase in the subsurface. They can potentially migrate independently of groundwater and remain as a residual source of groundwater or soil contamination.

made after EPA has reviewed and considered all information submitted during the public comment period.

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NJDEP rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and other related information in the administrative record file, and this Proposed Plan, have been made available to the public for a public comment period that begins on **July 22, 2020** and concludes on **August 21, 2020**.

A virtual public meeting will be held during the public comment period at https://epa-riverside-proposed-plan.eventbrite.com on **August 5, 2020** at 7:00 p.m. to present the conclusions of the RI/FS, explain the Proposed Plan and the alternatives presented in the FS, and to receive public comments.

Oral and written comments received at the public meeting, as well as written comments received during the public comment period, will be summarized and responded to by EPA in the Responsiveness Summary section of the Record of Decision (ROD), the document that formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

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SITE BACKGROUND

Site Description

The Site is currently a 7.6-acre partially active industrial park known as the Riverside Industrial Park located in the North Ward community of the City of Newark, Essex County, New Jersey. PPG Industries, Inc. (PPG) and its predecessors occupied the Site and conducted paint and varnish manufacturing operations there from approximately 1902 until 1971. After 1971, the Site was subdivided into 15 parcels/lots, and is now identified as the Riverside Industrial Park.

Both Riverside Avenue and McCarter Highway border the Site to the west along with a segment of railroad track adjacent to McCarter Highway. Currently, the central and northern portions of the Site contain active industrial/commercial businesses, operating in buildings formerly operated by PPG for paint manufacturing, while the south side of the Site contains mostly vacant, former PPG buildings. The main entryway is through a vehicle access point on Riverside Avenue; however, pedestrian trespassing occurs regularly through unsecured portions of the Riverside Industrial Park. Much of the Riverside Industrial Park surface area is covered by buildings or pavement. The Passaic River and its tidal mudflat border the Site on the east side. Sections of steel, concrete, and wooden bulkhead provide a retaining wall along most of the Site adjacent to the Passaic River; however, the bulkhead has fallen into disrepair in some locations and several sections of the wooden bulkhead have collapsed.

There are 14 existing buildings at the Site with five of the buildings being vacant (Buildings #6, #7, #12, #15, and #17) (Figure 1). At the time of the remedial investigation, Buildings #1, #2, #3, #9, #10, #13, #14, and #16 had ongoing business operations, and a small garage building (Building #19) was used for storage by the occupant of Building #13. Remnants of Buildings #4 and #5 are present at the Site; a fire in 1982 caused significant damage and resulted in the buildings being partially demolished.

Site History

The majority of the Site was reclaimed from the Passaic River with imported fill between 1892 to 1909. The origin of the fill material is unknown, but it consists mainly of sands, silts, gravel, and man-made materials, such as brick, glass, concrete block, wood, and cinders. The fill material may have been contaminated prior to placement at the Site and was further impacted by accidental spills, illegal dumping, improper handling of raw materials, and improper waste handling/disposal from subsequent industrial and commercial activities conducted at the Site.

PPG manufactured paint, varnish, linseed oil, and resins at the Site from approximately 1902 until 1971. The original paint plant was constructed in the early 1900s by the Patton Paint Company, which merged into the Paint and Varnish Division of Pittsburgh Plate Glass Company in 1920, which has been known as PPG since 1968. PPG mixed resins, solvents, and metal pigments (including lead-based compounds) to produce paints. Varnishes were made from resins, oils, and solvents.

Following the closure of PPG's operations in 1971, the property was subdivided into 15 lots, and since that time a wide variety of industrial and manufacturing companies

have operated intermittently at the Site under various owners. Occupants and operations have included the following:

- Frey Industries, Inc./Jobar for warehousing, packaging, repackaging, and distribution of client-owned chemicals
- Baron Blakeslee, Inc. for product distribution, warehousing of a variety of chemical products, analysis of various chemical blends and waste samples, drum storage, and truck and tanker parking
- Universal International Industries for various manufacturing operations
- Samax Enterprises for chemical manufacturing
- HABA International, Inc./Davion Inc. for manufacturing nail polish remover and related products, and Acupak, Inc. for providing packaging services for HABA
- Roloc Film Processing for manufacturing foils utilized in various commercial products
- Gilbert Tire Corporation for storing used tires and wheel rims
- Chemical Compounds, Inc./Celcor Associates, LLC for manufacturing hair dyes and other personal hygiene products
- Teluca for packaging and distributing hair dyes, hair color, and related ingredients, hair dye research laboratory, offices, and warehousing
- Gloss Tex Industries, Inc. for manufacturing bulk nail enamel, lacquer, and related cosmetic products
- Ardmore, Inc. for manufacturing soaps and detergents, and storing their empty drums
- Monaco RR Construction Company for storing railroad rails, cross ties, and spikes
- Federal Refining Company for recycling metal
- Midwest Construction Company for storing and maintaining construction equipment and materials

Historic site operations, accidental spills, illegal dumping, improper handling of raw materials, and/or improper waste disposal are among the causes of the current soil and groundwater contamination at the Site.

In 2009, EPA and NJDEP responded to an oil spill that was discharging from a pipe into the Passaic River. The pipe was traced back to two basement tanks located in a vacant building on Lot 63 (Building # 7). Since the tanks contained several hazardous substances, EPA initiated an emergency removal action to stop the discharge and remove the source material. Further EPA investigations of Lots 63 and 64 led to the discovery of several 12,000-15,000 gallon underground storage tanks (USTs) adjacent to Building #7, numerous 3,000-10,000 gallon aboveground storage tanks (ASTs), an underlain concrete basement/impoundment, a number of 55-gallon drums, and pigment hoppers and other smaller containers in Buildings #7 and #12. Between 2011 and 2014, EPA performed a removal action to address these conditions on Lots 63 and 64. EPA's Removal Action activities included: removal of the liquids from the basements of Buildings #7 and #12; investigation of the USTs with removal of two of them; investigation and disposal of the ASTs, drums, and smaller containers; and soil, groundwater, and waste sampling.

In 2014, after the conclusion of the EPA's Removal Action, PPG signed an Administrative Settlement Agreement and Order on Consent (ASAOC) with EPA to complete the RI/FS for the Site. The RI was completed in April 2020 and the FS was completed in July 2020. The RI and FS and other related information in the administrative record file provide the basis for this Proposed Plan.

Prior to the start of the RI in 2017, at least seven lots at the Site were subject to Industrial Site Recovery Act (ISRA) remediation under New Jersey state law. The ISRA investigations resulted in institutional controls on these properties with either modified deed notices for engineering controls (such as pavement surface cover) or groundwater Classification Exception Areas (CEAs)/Well Restriction Areas (WRAs) to restrict use of contaminated groundwater. RI sampling was conducted site-wide and was not restricted by these State institutional controls.

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes segregated into different phases, or Operable Units (OUs), so that remediation of different aspects of a site can proceed separately. The entire Site is designated as OU1, and it is expected to be the only OU for the Site. This Proposed Plan describes EPA's preferred remedial action for OU1, which addresses contaminated soil, soil gas, sewer water, and groundwater present at the Site. This Preferred Alternative also addresses various wastes found across the Site. It is expected to be the final action for the Site.

SITE HYDROGEOLOGY

The majority of the Site was reclaimed from the Passaic River with imported fill. The fill is up to 15 feet (ft) thick and primarily consists of sands mixed with silts. Beneath the fill is the former riverbed, which is primarily silt.

Underlying deposits include glacial deposits of gravel and sand, followed by lake deposits consisting of silts, and ultimately bedrock.

Two groundwater units were investigated during the RI. The "shallow unit" represented groundwater at depths less than 12 ft below ground surface (bgs) in the fill material whereas the "deep unit" represented groundwater below the former riverbed at approximately 25 ft bgs.

The primary groundwater flow direction in both the shallow and deep units is east toward the Passaic River. Both the shallow and deep groundwater units at the Site are influenced by tidal changes, which are greatest in areas adjacent to the river. The tidal influence appears to be greater in the northern portion of the Site compared to the southern portion.

RESULTS OF THE REMEDIAL INVESTIGATION

The RI was conducted in two phases of work from 2017 through 2019. Soil, shallow and deep groundwater, indoor air, water and solids in sewer lines, sump pumps, bulkhead pipes, and miscellaneous abandoned containers were all sampled to define the nature and extent of contamination at the Site. Based on the results of the RI, EPA identified several concerns and organized them into the five categories of media below:

- Wastes. This medium includes light non-aqueous phase liquid (LNAPL)[3] in Building #15A, USTs containing LNAPL and an aqueous solution on Lot 64, the NAPL-impacted soil/fill material surrounding the USTs, and several containers of waste in abandoned buildings.
- Sewer Water. This medium includes water and solids with elevated concentrations of chlorinated organic chemicals in an inactive manhole.
- Soil Gas. The concentrations of volatile organic compounds (VOCs) in the soil/fill material may impact the quality of indoor air due to vapor intrusion.
- Soil/Fill. This medium was found to be impacted by several contaminants. These generally included metals, polychlorinated biphenyls (PCBs), VOCs, and semi-volatile organic compounds (SVOCs).
- Groundwater. This medium was also found to be impacted by several contaminants, which generally include metals, VOCs, and SVOCs.

EPA is also working in conjunction with NJDEP to address unregulated discharges to the Passaic River from a pipe along the bulkhead on Lot 57. See discussion on Lot 57 below for more information.

Each of the media mentioned above are discussed in more detail in the following sections of this Proposed Plan. Due to the extensive number of contaminants found at the Site, the following discussion focuses only on the most prominent contaminants in each medium. Furthermore, contaminants not discussed in this Proposed Plan are typically co-located with those that are discussed. Additional information can be found in the RI Report.

Waste

The primary focus of this medium is the LNAPL in Building #15A, the USTs containing LNAPL and an aqueous solution on Lot 64, the NAPL-impacted soil/fill material surrounding the USTs, and several wastes in abandoned buildings. There are a limited number and small volume of waste containers found in Buildings #7, #12, and #17. These containers were not associated with current operations, and the contents are not characterized as hazardous wastes for disposal purposes under the Resource Conservation and Recovery Act (RCRA). However, based on RI sampling, there are some constituents within the wastes that are hazardous, such as, chromium or lead and there is potential for contaminants to be released into the environment. Within Building #7, a white chalky talc-looking substance remains in an approximately 5-foot diameter hopper. The top of the hopper is accessible from the second floor, and the chalky contents are visible approximately 5 feet below the top. The estimated volume of solid waste in the hopper is approximately 11 cubic yards (CY). In Building #12, a plastic 55-gallon drum contains approximately 50 gallons of liquid waste. In Building #17, a five-gallon bucket labeled as a filler contains a solid waste.

Six USTs were identified in a tank field north of Building #12 on Lot 64. One UST was found to contain 1,600 gallons of LNAPL, which was characterized as diesel/heating oil. Approximately 3,500 CY of NAPL-impacted soil/fill material is surrounding the USTs. All six USTs contained liquid that was sampled, and the results found that none of the UST liquid was classified as a hazardous waste for disposal purposes under RCRA. Each tank measured approximately 30 ft long by 8 ft in diameter, and they contained a combined volume of 34,700 gallons of liquid. While the liquid is considered

[3] LNAPLs is a type of NAPL where liquid contaminants do not easily mix with water and they are less dense than water. This means that LNAPL is generally found at the top of the water table.

non-hazardous for waste disposal, the liquid contains primarily VOCs and chlorinated VOCs. The same VOCs found in the USTs were also reported in nearby groundwater wells. The tank contents are a potential source of soil and groundwater contamination.

A portion of Building #15A also contains LNAPL in pooled water under a steel grated floor. The LNAPL is approximately 0.5-foot to 0.65-foot thick and very viscous. Assuming that the grate and liquid underlies the entire floor area (approximately 650 square ft), and assuming an average thickness of 0.6-ft, the volume of LNAPL in Building #15A is estimated at 2,900 gallons. Based on RI laboratory results, the LNAPL is characterized as diesel fuel/heating oil.

Sewer Water

The RI included an investigation of the sewer system at the Site, which involved collecting samples from manholes across the Site. Sampling results for water and solids collected from an inactive manhole on Lot 1 (identified in the RI as Manhole #8) found methylene chloride and trichloroethylene (TCE). The sewer at this location was determined to be inactive based on observations of no flow and because there are no current users upstream of the location. Although there is currently no flow within the sewer lines on the Site, there is potential for contaminants to be released into the environment. Other portions of the sewer system on the Site were not identified as potential sources of contamination to groundwater or soil/fill.

Soil Gas

Following the initial two rounds of groundwater sampling, the shallow groundwater results were screened against NJDEP vapor intrusion screening levels (VISLs). This comparison suggested that vapor intrusion may be a potential exposure risk. Since a potential risk was found, indoor air sampling was conducted in 2019 within occupied buildings of the Site (Buildings #1, #2, #3, #9, #10, #14, and #16). Additionally, three exterior ambient air samples were collected to determine potential background concentrations near the occupied buildings. Some VOCs were found in indoor air samples, but it was determined that they did not pose unacceptable risk to occupants of the currently occupied buildings. However, based on modeling using soil and groundwater data, an unacceptable risk may be posed to occupants in future buildings. The risk drivers were naphthalene, TCE, and total xylenes in soil/fill material.

Soil/Fill

A significant sampling regime was conducted to analyze the nature and extent of contamination in soil/fill material. Over 100 soil borings and a total of 210 soil samples were collected across the Site.

The RI identified a NAPL-impacted soil/fill material in several soil borings east and south of the USTs on Lot 64. Isolated areas of NAPL-impacted soil/fill material were also observed in the soil/fill material during the drilling of a monitoring well on Lot 63. However, monitoring wells in this area of the Site did not have a measurable thickness of LNAPL in the groundwater. The sources of the NAPL-impacted soil/fill material on Lots 63 and 64 are likely releases from the USTs or illegal dumping.

Of all the contamination at this Site, lead is one of the primary contaminants of concern. A significant amount of lead contamination was found in soil/fill material on Lots 63 and 64 around Building #7. Elevated lead (at concentrations that exceeded the NJDEP Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS) of 800 mg/kg) was also found on Lots 1, 57, 58, 61, 65, 67, 68, 69, and 70. Copper and arsenic were also metals identified as a concern in the RI, and they were found to be primarily co-located with lead in soil on Lot 63.

The VOCs that were identified at the Site include benzene, naphthalene, vinyl chloride, TCE and total xylenes. The highest chlorinated VOC soil sampling results were from Lot 68, where a chlorinated solvent release is known to have occurred, and on Lot 64, adjacent to the USTs. Benzene, naphthalene, and vinyl chloride concentrations exceeded NJDEP NRDCSRS on Lots 62, 64, and 68. Note that naphthalene may be reported as a VOC or SVOC.

SVOCs of concern at the Site are a group of chemicals known as polycyclic aromatic hydrocarbons (PAHs). Benzo(a)pyrene was the most prevalent PAH across the Site, with concentrations exceeding the NJDEP NRDCSRS of 2 mg/kg on Lots 1, 57, 60, 61, 62, 63, 64, 66, 67, and 69. The other three PAH compounds of concern (including benzo[a]anthracene, benzo[b]fluoranthene, and dibenzo[a,h]anthracene) had elevated concentrations that exceeded the NJDEP NRDCSRS on Lot 63 adjacent to known NAPL-impacted soil and on Lot 67.

PCB concentrations exceeded the NJDEP NRDCSRS of 1 mg/kg on Lots 57, 64, 65, 67, and 70.

Groundwater

The RI characterized the nature and extent of groundwater contamination beneath the Site. To conduct this

characterization, 31 monitoring wells were installed to sample the shallow groundwater unit (also referred to as the shallow fill unit) and five monitoring wells were installed to sample the deep groundwater unit. Note that groundwater characterization was done site-wide and not by lot as was done with the soil characterization, but lot numbers or building numbers were used to help identify the location of the contamination and the sources.

At this Site, groundwater is designated by NJDEP as a Class IIA aquifer, which means that this groundwater may be a source of potable water (e.g., drinking water). However, the groundwater is not currently used for potable water and is not reasonably expected to be used as a potable source in the future because the Site and surrounding area are served by the City of Newark's potable water system, and the site-specific conductivity readings of the groundwater indicate possible brackish conditions.

Shallow Groundwater Unit

Several VOCs were detected throughout the shallow groundwater unit (also known as the shallow fill unit) at levels that exceeded the NJDEP Class IIA standards. Benzene, toluene, ethylbenzene, and total xylenes (also known as BTEX) were the most common VOCs detected in the shallow groundwater unit and are indicative of petroleum impacts to the groundwater. BTEX was primarily found in the UST area on Lot 64, extending east/southeast onto Lot 63 downgradient of the UST area. It was also found in a well adjacent to Building #15 on Lot 58. Chlorinated VOCs (including methylene chloride, tetrachloroethylene (PCE), TCE, and vinyl chloride) were primarily detected in monitoring wells on Lots 63 and 64 surrounding the USTs. The source of these chlorinated VOCs is likely the UST, which also contain elevated levels of chlorinated VOCs.

SVOC (including 1,4-dioxane) and PAH compounds (including 2-methylnaphthalene, benzo[a]anthracene, benzo[b]fluoranthene, and indeno(1,2,3-cd)pyrene) were also present in the shallow groundwater unit at concentrations that exceed the NJDEP Class IIA standards. The PAH compounds were primarily detected in groundwater monitoring wells located within the vicinity of NAPL-impacted soils and where BTEX was also detected. 1,4-Dioxane exceedances were wide-spread across the Site, primarily focused on the eastern side of the Site.

Lead in groundwater was generally located in two areas: one area is on Lots 63 and 64, and the second area is north of Building #1 along the eastern and northern property boundaries. Lead concentrations in the shallow groundwater unit exceeded NJDEP Class IIA standards in wells located on Lots 57, 60, 61, 63, 64, 66, and 67.

As previously mentioned, while NAPL-impacted soil/fill material was observed in the UST area of Lot 64, measurable LNAPL was not observed in a shallow monitoring well. Furthermore, no dense non-aqueous phase liquid (DNAPL) was observed in the RI monitoring wells.

Deep Groundwater Unit

The deep groundwater unit had five sampling wells, with two wells in the northern portion of the Site and three in the southern portion.

Fewer VOCs were detected in the deep groundwater relative to the shallow groundwater unit. Benzene, PCE, 1,1,2,2-tetrachloroethane, and 1,1,2-trichloroethane (TCA) were the most common VOCs detected in the deep groundwater. These VOCs exceeded NJDEP Class IIA standards on Lot 63 and Lot 64, and on Lot 58 near Building #15.

For SVOCs, benzo[a]anthracene and 1,4-dioxane concentrations in the deep groundwater exceeded NJDEP groundwater standards on Lot 63 and Lot 64, and on Lot 57 near Building #10.

Lead and PCBs were not identified as a concern in the deep groundwater in the RI. LNAPL was not observed in any deep monitoring wells.

Lot 57: Discharge to the River

The RI identified two issues on Lot 57: 1) a river wall sewer pipe coming out of the bulkhead was found to be discharging elevated toluene and acetone concentrations to the river; and 2) elevated concentrations of acetone were found in the groundwater adjacent to the building. EPA determined that both issues are associated with ongoing operations at Lot 57 and is coordinating with NJDEP to resolve these issues. The Lot 57 sewer pipe, and the releases to the river from this waste line, are not being addressed as part of this proposed remedy, because there is no known impact on the Site from the sewer line. Further, it is EPA's current understanding that the cleanup of acetone in groundwater at Lot 57 is being conducted under NJDEP cleanup authorities, with work being overseen by a New Jersey Licensed Site Remediation Professional (LSRP). The NJDEP assigned case number for this remediation is 20-04-09-0923-04.

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. The following four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals can cause both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a $1x10^{-4}$ cancer risk means a "one in ten thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of $1x10^{-4}$ to $1x10^{-6}$, corresponding to a one in ten thousand to a one in a million-excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a threshold (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as COCs in the ROD.

PRINCIPAL THREATS

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, LNAPLs in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element. For this Site, LNAPL in the UST on Lot 64, LNAPL in Building #15A, and the NAPL-impacted soil/fill on Lot 63 and Lot 64 are considered to constitute a principal threat waste due to their mobility and potential impact to groundwater.

SITE RISKS

A baseline human health risk assessment (BHHRA) was conducted to evaluate cancer risk and noncancer health hazards posed by exposure to Site-related contaminants. The BHHRA was conducted in the absence of remedial actions or controls (see the "What is Human Health Risk and How is it Calculated?" textbox).

A screening-level ecological risk assessment (SLERA) was also conducted to evaluate the potential for adverse ecological effects from exposure to Site-related contamination (see the "What is Ecological Risk and How is it Calculated?" textbox, below). The BHHRA and SLERA results are discussed below.

The waste material and sewer water material were not evaluated in the BHHRA or SLERA. However, a remedial action is being identified in this Proposed Plan to address these media to remove a principal threat waste and to prevent an unacceptable release of hazardous contaminants to the environment.

Baseline Human Health Risk Assessment

EPA follows a four-step human health risk assessment process for assessing site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (see adjoining box "What is Risk and How is it Calculated" for more details on the risk assessment process).

The BHHRA began with selecting COPCs in the various media that could potentially cause adverse effects from exposure. COPCs were selected by comparing the maximum detected concentration of each chemical with a risk-based screening level for the specific medium. COPCs were identified for each of the 15 Lots; seven occupied (Lots 1, 57, 59, 60, 62, 69, and 70) and eight vacant (Lots 58, 61, 63, 64, 65, 66, 67 and 68). Due to the variety of COPCs evaluated in the BHHRA the following discussion only focuses on the contaminants that resulted in unacceptable cancer risk or noncancer hazard. For additional information please see the BHHRA.

Based on current zoning and future land use assumptions, the following current and future receptor populations and routes of exposure were considered for the various lots:

Outdoor workers are present at occupied Lots 1, 57, 59, 60, 62, 69, and 70. These receptors have the highest potential outdoor exposures, assuming they spend most of the workday outdoors conducting maintenance activities where they may be exposed to COPCs in surface soil (0 to 2 ft. bgs). Potential routes of exposure to surface soil include incidental ingestion, dermal contact, and inhalation of airborne soil particulates. Inhalation exposure of volatile COPCs released from surface and subsurface soils is also possible.

Indoor workers at occupied Lots 1, 57, 59, 60, 62, 69, and 70 spend most of the work day indoors and may be exposed via inhalation of volatile COPCs in subsurface soil (i.e., 0 ft. bgs to approximately 13 ft. bgs) and shallow groundwater due to vapor intrusion. Indoor worker exposures also include incidental ingestion and dermal contact with outdoor surface soil that has been incorporated into indoor dust.

Utility workers occasionally perform repair of underground utilities at the Site and are potentially present at occupied or unoccupied lots. The depth of underground utilities (i.e., the surface of the frost line) is typically 4 ft. These receptors are not employees at the Site, and may be on-site occasionally to repair underground utilities resulting in exposures to surface and subsurface soil (0 to 4 ft. bgs) and shallow groundwater during subsurface excavation. Potential routes of exposure include incidental ingestion, dermal contact, and inhalation of soil or groundwater vapors and airborne soil particulates.

Construction workers may be exposed at Lots 57, 58, 61, 63, 64, 68, and 70 during future development. Construction workers may be on-site for relatively short periods (up to several months) to perform building construction. These receptors may contact surface and subsurface soil and shallow groundwater during subsurface excavation. Potential routes of exposure include incidental ingestion, dermal contact, and inhalation of soil or groundwater vapors and airborne soil particulates.

Trespassers are potentially present at occupied or unoccupied lots. Adolescents/teenagers (10 to 18 years) are the most likely age group to trespass on the Site. These receptors may contact COPCs in surface soil in unpaved areas. Potential routes of exposure to surface soil include incidental ingestion, dermal contact, and inhalation of airborne soil particulates. Inhalation exposure to volatile COPCs from surface and subsurface soils is also possible while trespassers are outdoors. Adult trespasser exposures to soil were evaluated using outdoor worker exposures.

Visitors may potentially be present at the occupied lots. Child and adult visitors are on-site for short time periods during which they may contact COPCs in surface soil in unpaved areas via incidental ingestion, dermal contact, and inhalation of airborne soil particulates. Inhalation exposure to volatile COPCs from surface and subsurface soil is also possible while outdoors. Visitors may also be exposed to volatile COPCs in subsurface soil and shallow groundwater due to vapor intrusion.

Off-site workers may potentially be exposed to COPCs in on-site surface soil that migrates off-site via windblown soil vapor and particulates or on-site groundwater that might migrate off-site in the future in the small area in the northwestern corner of the Site. Off-site worker exposures were evaluated using on-site worker exposures. No site-related contamination (soil or groundwater) is known to extend off-site.

Off-site residents may be exposed to COPCs in on-site surface soil that migrates off-site via windblown soil vapor and particulates emanating from on-site areas without groundcover. The potential for this exposure is expected to be minimal for off-site residents located across McCarter Highway, which is elevated and uphill from the Site. Off-site residential exposures were

evaluated using on-site future residential exposures. No site-related contamination (soil or groundwater) is known to extend off-site.

Hypothetical future resident exposure assumes medium-density residential units and hypothetical future potable use scenarios for shallow and deep groundwater. Exposure to volatile COPCs in shallow groundwater via vapor intrusion was also assessed.

For COPCs other than lead, exposure point concentrations (EPCs) were estimated using either the maximum detected concentration or the 95% upper-confidence limit (UCL) on the average concentration. Chronic daily intakes were calculated based on reasonable maximum exposure (RME), which is the highest exposure reasonably anticipated to occur at the Site. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures.

Lead Exposure Evaluation Process

It is not possible to evaluate health hazards from lead exposure using the same methodology as for the other COPCs because there are no published quantitative toxicity values for lead. However, since the toxicokinetics (i.e., the absorption, distribution, metabolism, and excretion of toxins in the body) of lead are well understood, lead risks are assessed based on blood lead (PbB) level, which can be correlated with both exposure and adverse health effects. Consequently, lead hazards were evaluated using blood lead models, which predict PbB levels based on the total lead intake from various environmental media. Lead hazards for non-resident adults (e.g., outdoors workers, construction workers) were assessed using the EPA Adult Lead Model (ALM). The target receptor for this model is an adult female of child-bearing age in order to protect a developing fetus. Lead hazards for children were evaluated using the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK model). Both models estimate a central tendency (geometric mean) PbB level on the basis of average or typical exposure parameter values. Therefore, the EPCs for lead were the arithmetic mean of all the samples within the exposure area from the appropriate depth interval.

The BHHRA included an evaluation of potential cancer risks and noncancer hazards based on the chemical-specific recommendations found in literature on the chemical toxicity (e.g., EPA's Integrated Risk Information System Chemical File). Section 6.2 of the BHHRA summarizes the results of the assessments for cancer risks, noncancer hazards, and exposure to lead.

Human Health Risk Assessment Findings by Exposure Route:

Current Land Use (Section 6.2.1 of the BHHRA). Average soil lead EPCs are greater than the EPA Region 2 nonresidential screening level of 800 mg/kg at currently occupied Lot 70 and unoccupied Lot 63. The estimated portion of the fetal PbB distribution exceeding the goal of protection of no more than 5% of the population with PbBs greater than 5 ug/dL (micrograms/deciliter) is identified for outdoor workers at Lot 70, construction workers at Lots 61, 63, 64, 68, and 70, and trespassers at Lots 63 and 70. For visitors, the estimated portion of the child PbB distribution exceeding the goal of protection of no more than 5% of the population with PbBs greater than 5 ug/dl is identified for child visitors at Lots 1, 62, and 70.

Cancer risks and noncancer hazards are within or less than the NCP risk range of 10^{-4} to 10^{-6} (cancer risk of one in ten thousand to one in a million) and below the goal of protection of a hazard index (HI) = 1, respectively.

Future Commercial/Industrial Land Use (Section 6.2.2 of the BHHRA). For exposures to COPCs in soil and groundwater, the cumulative cancer risk estimates are below or within NCP risk range.

The noncancer HIs above the goal of protection of a HI = 1 are:

- *Indoor worker* exposure to soil via vapor intrusion at Lot 58 (HI = 4 for TCE and xylenes), Lot 62 (HI = 3 for naphthalene), Lot 64 (HI = 2 for benzene and xylenes), and Lot 68 (HI = 5 for TCE)

- *Child visitor* outdoor exposure to soil at Lot 63 (HI = 3 for copper and single-chemical HI = 2 for copper)

Soil lead EPCs are greater than the EPA Region 2 nonresidential screening level of 800 mg/kg at Lots 63 and 70. The estimated portion of the fetal PbB exceeding 5 ug/dL is greater than 5% for future outdoor workers and trespassers at Lots 63 and 70, future indoor workers at Lot 63, and future construction workers at Lots 61, 62, 63, 64, 65, 68, and 70. For future visitors, the estimated portion of the child visitor's PbB exceeding the 5 ug/dL level is greater than 5% for child visitors at Lots 1, 62, 63, 64, 65, 68, and 70.

These results remain the same for the scenario in which soil below the 0 to 2 ft. depth interval (or 0 to 4 ft. depth interval for future utility worker) is brought to the surface in the future, except for the lead hot spot analysis. A hot spot analysis identified three locations on Lot 64 (8,690

mg/kg at 1 to 3 ft. bgs, 3,080 mg/kg at 3 to 4 ft bgs. and 3,020 mg/kg at 5 to 7 ft. bgs), which are adjacent to Lot 63) that could affect the conclusions of the risk assessment for future outdoor worker exposure to lead in soil if subsurface soil is brought to the surface.

Hypothetical Future Residential Land Use and Potable Groundwater Use (Section 6.2.2.9 of the BHHRA). A hypothetical future residential land use scenario assuming medium-density residential units was evaluated. Additionally, future hypothetical potable use of the shallow and deep groundwater was evaluated for on- and off-site workers, visitors and residents.

For outdoor exposures to surface soil, the cancer risks for the future resident exceed the NCP risk range for Lot 67 (2×10^{-4} for the future adult/child resident). For the future adult resident, the HI = 2 for Lot 63 and for the future child resident, HIs ranged from 2 to 20 for all lots except Lot 59 (HI = 1).

For soil below the 0 to 2 ft. depth interval brought to the surface, cancer risks are within or at the upper end of NCP risk range for the adult/child resident for all lots. For the adult resident, the HI = 2 for Lot 63. For the child resident, the HIs are above 1 for all properties except Lot 59, ranging from 2 to 20. COPCs with single-chemical cancer risks above the NCP risk range or HIs above the protection goal of HI = 1 are arsenic, benzene, TCE, PAHs, PCBs, and 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD).

For the 0 to 2 ft. interval, the soil lead EPCs are above the USEPA Region 2 residential screening level of 200 mg/kg at each property except Lots 60 and 66. For the scenario in which subsurface soil is moved to the surface during future site redevelopment, the soil lead EPCs exceed the USEPA Region 2 residential screening level of 200 mg/kg at each property except Lots 59 and 60. For the future child resident the estimated portion of the child's PbB exceeding the 5 ug/dL level is greater than 5% for soil from the 0 to 2 ft. interval at all properties except Lots 60 and 66 and for soil from all sampled depths at all properties except Lots 59 and 60.

For soil vapor intrusion exposures, cancer risks for future residents are above the NCP risk range for Lots 1, 57, 62, 64, 67, 68, and 70. HIs for both adult and child residents are above the protection goal of HI = 1 for every property except for Lots 59 and 69. For shallow groundwater vapor intrusion exposures, HIs above the goal of protection of HI = 1 were found at Lots 58 and 59 due to xylenes, using the maximum concentrations as the EPCs.

Cancer risks and HIs for future potable use of the shallow and deep groundwater are above NCP risk range and protection goal of HI = 1 for all lots. Section 6.2.2.9 of the BHHRA indicates that the COPCs with the highest single-chemical cancer risks above the NCP risk range are 1,3-dichloropropene (total), 1,2-dibromo-3-chloropropane, benzene, vinyl chloride, pentachlorophenol, benzo[a]pyrene, dibenz[a,h]anthracene, naphthalene, and arsenic. The COPCs with the highest single chemical HI values are TCE, 1,2,4-trichlorobenzene, 2-hexanone, xylenes, naphthalene, cyanide, and iron.

For shallow groundwater exposure to lead, the maximum lead concentration is below the federal action level of 0.015 mg/L at each property except Lots 57, 60, 63, 64, 67, and 69. As indicated above, the Site receives drinking water from the City of Newark's potable water system.

To summarize, unacceptable noncancer health hazards were found for copper and lead in soil/fill. Naphthalene, TCE, and total xylenes are soil/fill COPCs with unacceptable risks/hazards associated with soil gas. In addition, several VOCs, SVOCs, and metals are groundwater COPCs with unacceptable risks/hazards based on hypothetical potable use scenarios.

Screening Level Ecological Risk Assessment

A SLERA was conducted and focused on the potential for terrestrial exposure from on-site surface soil/fill material. Approximately 70% of the Site is covered with impervious surfaces, such as asphalt. The remaining 30% of the Site contains pervious areas that may support potential ecological habitat. The habitat present on the Site is fragmented and of low value to wildlife with opportunistic, invasive, and transient species, such as the Japanese knotweed, being the dominant species observed or expected to be on the property. Although groundwater under the Site discharges to the Passaic River through the sediment, there are no groundwater discharges to the surface soil/fill material; therefore, the groundwater ecological exposure pathway was determined to be incomplete for the terrestrial portion of the Site.

Primary exposure pathways include direct contact (e.g., plant roots and soil invertebrates), soil ingestion (e.g., earthworms), incidental soil ingestion (e.g., preening by birds), and ingestion of soil invertebrates and small mammals. For wildlife, prey ingestion is assumed to dominate exposure. Due to the limited, fragmented, and low-quality ecological habitat available on-site and the proximity to active industrial and commercial operations, it is unlikely that federal-listed or state-listed sensitive species would be present on-site. The likely future use of

WHAT IS ECOLOGICAL RISK AND HOW IS IT CALCULATED?

A Superfund baseline ecological risk assessment is an analysis of the potential adverse health effects to biota caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land and resource uses. The process used for assessing site-related ecological risks includes:

Problem Formulation: In this step, the contaminants of potential ecological concern (COPECs) at the site are identified. Assessment endpoints are defined to determine what ecological entities are important to protect. Then, the specific attributes of the entities that are potentially at risk and important to protect are determined. This provides a basis for measurement in the risk assessment. Once assessment endpoints are chosen, a conceptual model is developed to provide a visual representation of hypothesized relationships between ecological entities (receptors) and the stressors to which they may be exposed.

Exposure Assessment: In this step, a quantitative evaluation is made of what plants and animals are exposed to and to what degree they are exposed. This estimation of exposure point concentrations includes various parameters to determine the levels of exposure to a chemical contaminant by a selected plant or animal (receptor), such as area use (how much of the site an animal typically uses during normal activities); food ingestion rate (how much food is consumed by an animal over a period of time); bioaccumulation rates (the process by which chemicals are taken up by a plant or animal either directly from exposure to contaminated soil, sediment or water, or by eating contaminated food); bioavailability (how easily a plant or animal can take up a contaminant from the environment); and life stage (*e.g.*, juvenile, adult).

Ecological Effects Assessment: In this step, literature reviews, field studies or toxicity tests are conducted to describe the relationship between chemical contaminant concentrations and their effects on ecological receptors, on a media-, receptor- and chemical-specific basis. To provide upper and lower bound estimates of risk, toxicological benchmarks are identified to describe the level of contamination below which adverse effects are unlikely to occur and the level of contamination at which adverse effects are more likely to occur.

Risk Characterization: In this step, the results of the previous steps are used to estimate the risk posed to ecological receptors. Individual risk estimates for a given receptor for each chemical are calculated as a hazard quotient (HQ), which is the ratio of contaminant concentration to a given toxicological benchmark. In general, an HQ above 1 indicates the potential for unacceptable risk. The risk is described, including the overall degree of confidence in the risk estimates, summarizing uncertainties, citing evidence supporting the risk estimates and interpreting the adversity of ecological effects.

this Site is to remain developed for commercial/industrial purposes and redevelopment of any portion of the Site will remove or alter the existing ecological resources in that area.

Based on the results of the SLERA, the primary terrestrial ecological pathway is contaminated surface soil/fill material. The SLERA identified this pathway as being related to unacceptable ecological risk. Chemicals of potential ecological concern (COPECs) identified in surface soil included several VOCs, PAHs and other SVOCs, one pesticide (heptachlor epoxide), PCBs, dioxin, and several metals. These compounds were identified using stringent comparison values and given the lack of quality habitat the overall ecological risk is overestimated in the SLERA. In lieu of conducting an additional, more in-depth ecological evaluation for the Site, EPA has made a management decision to consider risk-based concentrations that are protective of ecological receptors in the selection of preliminary remediation goals to ensure that the remedial alternatives will address the potentially unacceptable ecological risks identified in the SLERA.

Based upon the results of the RI and risk assessments, EPA has determined that the Preferred Alternative or one of the other active measures considered in the Proposed Plan is necessary to protect public health, welfare, and the environment from actual or threatened releases of hazardous substances from the Site.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) advisories, criteria and guidance, and site-specific risk-based levels.

The following RAOs were established for the Site for contaminants of concern (COCs):

Waste

- Secure or remove wastes that act as a source of COCs to other media to the extent practicable.
- Prevent uncontrolled movement of COCs in wastes (i.e., spills and free-phase liquid) that may impact other media.
- Minimize or eliminate human and ecological exposure to NAPL.

Sewer Water

- Prevent exposure to COCs in sewer water and solids associated with a release from the inactive sewer system.
- Minimize concentrations of COCs in sewer water (inactive system).
- Prevent or minimize discharge of sewer water COCs to surface water to minimize the potential for interaction between the Site and the Passaic River.

Soil Gas

- Minimize contaminant levels in sources of COCs in soil gas that may migrate to indoor air.

Soil/Fill

- Remove COCs or minimize COC concentrations and eliminate human exposure pathways to COCs in soil and fill material.
- Remove COCs or minimize COC concentrations and eliminate or minimize ecological exposure pathways to COCs in soil and fill material.
- Prevent or minimize off-site transport of soil containing COCs to minimize the potential for interaction between the Site and the Passaic River.
- Prevent or minimize potential for leaching of COCs to groundwater and surface water from soil and fill.

Groundwater

- Minimize COC concentrations and restore groundwater quality.
- Prevent exposure to COCs in groundwater.
- Prevent or minimize migration of groundwater containing COCs.
- Prevent or minimize discharge of groundwater containing COCs to surface water to minimize the potential for interaction between the Site and the Passaic River.

PRELIMINARY REMEDIATION GOALS

Preliminary remediation goals (PRGs) are chemical-specific, quantitative goals that are intended to be protective of human health and the environment and meet RAOs. PRGs were developed for soil/fill material, soil gas, and groundwater based on ARARs and risk-based concentrations (RBCs)[4] (human health and ecological), with consideration of current and reasonably anticipated future use, background concentrations, analytical detection limits, guidance values, and other available information. Furthermore, PRGs were only established for site-related contaminants.

No PRGs have been developed for sewer water or waste. These are discussed in more detail in the Summary of Remedial Alternatives section. However, soil/fill material impacted by NAPL will be evaluated and compared to NJDEP extractable petroleum hydrocarbon (EPH) promulgated requirements and delineated per NJDEP guidance.

PRGs for soil/fill material were developed by comparing RBCs to NJDEP NRDCSRS to determine the appropriate remediation goals for the Site. For this Site, NRDCSRS were identified based on the reasonably anticipated use of the Site as commercial/industrial. The more conservative of the RBCs and the NRDCSRSs were identified as the chemical-specific soil PRGs. The PRGs for soil gas were based on RBCs for naphthalene, TCE, and total xylenes; the PRGs were developed for soil/fill but are protective of vapor intrusion (soil gas) for workers. The PRGs established for the site-related soil COCs, identified in Table 1, are protective of human health.

Table 1: Site PRGs for Soil

Soil COC	PRG (milligrams/kilogram, (mg/kg))
Lead	800
Copper	526
Naphthalene (Vapor Intrusion) *See Note 1*	0.62
Naphthalene (Soil) *See Note 1*	17
TCE *See Note 2*	0.02
Total Xylenes *See Note 2*	6.5
Arsenic	19
Total PCBs	1
Benzene	5
Benzo[a]anthracene	17
Benzo[a]pyrene	2
Benzo[b]fluoranthene	17

[4] RBCs for human health and ecological receptors are derived for each risk driver/receptor scenario identified in the BHHRA and SLERA as posing risk/hazard in excess of EPA acceptable levels.

Dibenz[a,h]anthracene	2
Vinyl chloride	2

Note 1: Naphthalene has two soil/fill PRGs, one to address vapor intrusion and another to address soil/fill. Where these two PRGs overlap in the remedial footprint the more conservative value will be used.

Note 2: The soil/fill PRGs for TCE and total xylene are for soil/fill, but are protective of vapor intrusion (soil gas) for workers.

EPA and NJDEP have promulgated maximum contaminant levels (MCLs), and NJDEP has promulgated groundwater quality standards (GWQSs), which are enforceable, health-based, protective standards for various drinking water contaminants. For the Site, NJDEP GWQS are equal to, or more stringent than the MCLs and have been selected as the PRGs for site-related COCs in groundwater (Table 2).

Table 2: Site PRGs for Groundwater

Groundwater COCs	PRG (micrograms/liter, (ug/L))
Lead	5
Acetone	6,000
Benzene	1
Ethylbenzene	700
Methylene chloride	3
Tetrachloroethylene	1
Toluene	600
Trichloroethylene	1
Vinyl chloride	1
Total Xylene	1,000
Cresol, p-	50
Benzo[a]anthracene	0.1
Benzo[a]pyrene	0.1
Benzo[b]fluoranthene	0.2
Bis(2-ethylhexyl)phthalate	3
Dioxane, 1,4-	0.4
Indeno[1,2,3-cd]pyrene	0.2
Methylnaphthalene, 2-	30

To evaluate the vapor intrusion pathway in the future, indoor air, sub-slab VOC and SVOC concentrations, and shallow groundwater will be compared to the chemical-specific EPA and NJDEP VISLs.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA Section 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives, to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a Site. CERCLA Section 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS Report. Since contamination would be left on the Site above levels that allow for unlimited use and unrestricted exposure for certain media, five-year reviews would be conducted to monitor the contaminants and evaluate the need for future actions. Capital costs are based on Year 2020 dollars. Present worth assumes that construction would begin in 2022 and assumes a 7 percent discount rate.

Waste Alternative 1: No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 months

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, remaining source materials at the Site would be left in place, and no means of securing the materials to prevent future release to the environment would be implemented.

Waste Alternative 2: Removal and Off-Site Disposal

Capital Cost:	$1,798,211
Annual OM&M Cost:	$0
Present Worth Cost:	$1,580,700
Construction Time:	1-2 months

This alternative focuses on removal of principal threat waste along with removal of the various small volume wastes found across the Site to prevent an uncontrolled release to the environment. This alternative includes the removal of a chalky talc-looking substance in Building #7, aplastic 55-gallon drum in Building #12, a five-gallon bucket in Building #17, the USTs on Lot 64, the waste and LNAPL within the USTs, NAPL-impacted soil/fill material surrounding the USTs, and the LNAPL in the pooled water in Building #15A, These wastes will then be properly disposed. The LNAPL in the USTs and Building #15A are considered principal threat wastes, and the removal and disposal of these wastes will address this concern.

Upon removal of USTs and their contents, confirmation soil/fill (including underneath the tank) and groundwater sampling will occur consistent with substantive requirements of New Jersey tank closure regulations and NJDEP Technical Requirements (N.J.A.C. 7:26E-5.1(e)).

Contaminated soil/fill and groundwater observed in the excavation after tank removal would be addressed in accordance with substantive requirements of New Jersey tank closure regulations and NJDEP Technical Requirements found at N.J.A.C. 7:26E-5.1(e). It is assumed that approximately 3,500 CY of NAPL-impacted soil/fill adjacent to the USTs would require excavation and off-site disposal as part of this alternative. It is anticipated that excavation will extend 13 ft bgs. Note that removal of NAPL-impacted soil/fill on Lot 63, not directly associated with UST removal on Lot 64, is addressed in the soil/fill alternatives.

The total volume of liquid waste estimated to be removed for off-site disposal is approximately 39,000 gallons: consisting of 55 gallons of waste from Buildings #12 and #17; 2,900 gallons of LNAPL in Building #15A; 1,600 gallons of LNAPL in the UST; and 34,700 gallons of water in the six USTs. The total volume of solid waste estimated to be removed is approximately 3,511 CY, consisting of 11 CY in Building #7 and 3,500 CY of NAPL-impacted soil/fill associated with the UST removal and closure.

Sewer Water Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 months

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, the water and solids in the designated section of sewer and associated line would be left in place, and no means of securing the materials to prevent future release to the environment would be implemented.

Sewer Water Alternative 2 – Removal and Off-Site Disposal

Capital Cost:	$27,981
Annual OM&M Cost:	$0
Present Worth Cost:	$24,900
Construction Time:	1 month

This alternative consists of transferring the sewer water and solids (approximately 0.75 CY) from the inactive sewer line into appropriate containers or transport vehicles for off-site treatment and/or disposal along with proper closure of the line. Liquid materials would be pumped into drums and transferred to an appropriate facility for treatment and disposal. Remaining solids in the manhole would be placed into a drum and disposed in an appropriate solid waste landfill.

Upon removal of the contents, the interior of the manhole and associated line would be water-jetted, and then closed in place by plugging/filling to prevent future buildup of water and solids in the manhole. Cleaning of the manhole and the one unplugged pipe (estimated to be 125 liner feet) would generate an estimated 3,000 gallons of additional liquid.

Soil Gas Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 month

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, no measures would be taken to protect future indoor workers from exposure to soil vapors.

Soil Gas Alternative 2 – Institutional Controls, Air Monitoring or Engineering Controls (existing

occupied buildings) and Site-Wide Engineering Controls (future buildings)

Capital Cost:	$123,525
Annual OM&M Cost:	$31,500
Present Worth Cost:	$449,800
Construction Time:	1-2 months

This alternative consists of establishing or enhancing deed notices and/or CEAs/WRAs site-wide to provide notice of certain restrictions upon the use of the property and groundwater. Such restrictions (institutional controls) would require that prior to existing buildings being occupied in the future, a building-specific assessment of sub-slab soil gas and/or indoor air quality would be performed and, if needed, some means of protecting the future occupants of such existing buildings from vapor intrusion risks/hazards would be implemented. Additional restrictions would require that future new construction include a vapor barrier or other appropriate means of sealing the ground surface underneath the new building slab or installation of a subsurface depressurization system (SSDS).

In addition, the NJDEP Vapor Intrusion Technical Guidance (VIT) is a TBC for soil gas. A comparison of the shallow groundwater concentration to NJDEP VISLs identified potential risks/hazards due to vapor intrusion for any building within 100 feet of the monitoring well where the exceedance was reported.

Ongoing indoor air monitoring or engineering controls (such as a SSDS) would be required in the seven existing occupied buildings (Buildings #1, #2, #3, #9, #10, #14, and #16). to confirm previous BHHRA results and/or to ensure the indoor workers are protected, due to the presence of soil gas or VOCs in groundwater above NJDEP VISLs in shallow monitoring wells within 100 feet of the building. If air monitoring indicates vapor intrusion, then property owners or other responsible parties would be required to implement engineering controls.

Soil Gas Alternative 3 – Institutional Controls, Air Monitoring or Engineering Controls (future buildings), and In-Situ Remediation of Soil/fill (existing occupied buildings)

Capital Cost:	$4,591,968
Annual OM&M Cost:	$0
Present Worth Cost:	$4,050,800
Construction Time:	4-6 months (for initial round of injection)

This alternative includes the same site-wide institutional controls and continued air monitoring or engineering controls (such as SSDS) for existing occupied and future buildings associated with soil gas and VOCs in groundwater above NJDEP VISLs, as described for Soil Gas Alternative 2.

This alternative also includes in-situ remediation of soil/fill containing TCE, total xylenes, and naphthalene above the PRGs within 100 feet of existing occupied buildings. Buildings inside the treatment area would not need air monitoring or engineering controls. This alternative assumes a remedial footprint of 1.95 acres with an estimated depth to groundwater of 6 ft for a total of 18,900 CY. In-situ remediation of the designated soil/fill would be performed using chemical oxidation injection. Remaining soil/fill with VOCs above the associated PRGs (i.e., not within 100 ft of existing occupied buildings) is addressed by the site-wide institutional controls requiring assessment and, if needed, mitigation prior to occupancy of existing buildings, and site-wide engineering controls for future construction.

Soil/Fill Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 month

Under this alternative, no action would be taken. This alternative is retained for comparison with the other alternatives as required by the NCP. Under no action, new deed restrictions and other institutional controls would not be implemented, and future use of the subject areas would be unrestricted, except that existing NJDEP-approved institutional and engineering controls would remain in place although they would not be enforced by EPA.

Soil/Fill Alternative 3 – Institutional Controls, Engineering Controls and NAPL Removal[5]

[5] Soil/Fill Alternative 2 includes institutional controls and NAPL removal but was screened out and not included in this Proposed Plan because it did not comply with ARARs and was therefore not eligible for selection.

Capital Cost:	$11,140,405
Annual OM&M Cost:	$75,000
Present Worth Cost:	$10,450,900
Construction Time:	6-10 months

Soil/Fill Alternative 3 includes institutional controls (deed notices) and engineering controls (cover system) to contain COCs, including lead which is a site-related contaminant. In addition, the bulkhead would be reinforced or reconstructed, as appropriate, in order to minimize the potential for interaction between the Site and surface water and minimize soil erosion.

Deed notices would be recorded on all 15 lots. Existing deed notices would be revised to reflect RI results and existing engineering controls for applicable lots. Use restrictions identified in the deed notices would ensure future use of the Site remains commercial or industrial, and identify areas of the Site where contamination exceeds NRDCSRS. Fencing would be maintained and enhanced as appropriate to limit unauthorized access to the Site and use of the Site in a manner which may expose human receptors to unacceptable risk. Access restrictions could also include concrete barriers or guard rails. Other institutional controls include existing zoning and local ordinances that regulate use of the Site, which could be reviewed and modified as appropriate to ensure compliance with the objectives of this alternative.

NAPL-impacted soil/fill on Lot 63 would be excavated and disposed off-site under this alternative (assume 311 CY based on 1,200 square ft area and a depth of 7 ft bgs where NAPL-impacted soil/fill was observed during installation of a monitoring well). (NAPL in soil/fill adjacent to the USTs is addressed under the waste alternatives.) A pre-design investigation would be completed to further refine the extent of NAPL in soil/fill on the Lot 63 area. NJDEP guidance on NAPL-impacted soil/fill would be considered in determining the extent of soil excavation during remedial design and in documenting attainment of RAOs.

Capping of contaminated areas consists of the construction of a barrier over/around the contaminated areas. The cap would be intended to prevent access to and contact with the contaminated media and/or to control its migration. Impermeable caps, like asphalt caps, also address the soil-to-groundwater pathway by reducing vertical infiltration. Existing building floor slabs in contact with soil/fill are incorporated into the cap. (If a building is demolished in the future and its floor slab removed, a new surface barrier could be warranted at that location.)

Existing pavement cover could be incorporated into the cap component of Alternative 3 if the existing pavement cover was constructed to meet all cap design requirements. Current conditions at the Site are as follows: 1) an engineering control (concrete slab) has been established for portions of the building footprint on Lot 63, documented in a deed notice; 2) asphalt pavement is the engineering control on Lots 68 and 70, documented in a deed notice. Other lots at the Site have concrete or asphalt surface pavement, although not documented as part of deed notices. During the remedial design, these surfaces would be inspected to determine whether they are suitable to be used as a cover. Some existing pavement may need to be repaired to be function as an engineering control if the pavement otherwise meets the specifications of the cap design.

Asphalt capping as an engineering control is a typical component of a NJDEP remedy for historic fill that has been further impacted from current or historic discharge. Accordingly, this alternative would include a site-wide six-inch asphalt cap along with a 6-inch gravel subsurface over exterior unpaved portions of the Site to prevent direct exposure to soil/fill. In areas to be capped that have existing surface pavement, the thickness of new asphalt pavement could be adjusted to include the existing pavement as long as the combined system of the existing and new cap would be protective of human health and the environment. The estimated extent of the asphalt cap, including Lots 67 and 69, is approximately 5.62 acres, some of which is currently covered by concrete or asphalt. Surface water management would also be evaluated during remedial design, to reduce potential off-site transport of soil/fill with COCs. Also during remedial design, the use of different cover methods and material for different lots could be evaluated.

The existing bulkhead along the riverfront consists of various materials (steel, wood, concrete), and varies in condition from poor/failing to good, with the wood bulkhead sections generally in poor/failing condition and the steel and concrete sections generally in good condition. A geotechnical investigation would be required for both bulkhead enhancement process options. Approximately 800 ft of new bulkhead walls would be constructed with an on-river operation (due to the limited space available on-site, assuming no building demolition). The deteriorating sections of bulkhead would be removed and properly disposed of.

Design and installation of the bulkhead enhancement would incorporate active stormwater discharge pipes as appropriate, and inactive outfalls would be sealed. During the remedial design, the effective height of the bulkhead

wall could be increased with soil/fill berms for surface water management; however, the cost estimate assumes replacement to current site conditions. The bulkhead enhancement will reduce the potential interaction between the Site and the Passaic River. This enhancement would also be compatible with, and will take into account as necessary, remedial action being designed in the Lower 8.3 miles of the Lower Passaic River as part of the Diamond Alkali Superfund Site OU2 remedial design. Currently, the OU2 remedial design incorporates bank-to-bank sediment capping with dredging to accommodate the cap without increasing flooding. During construction, any disturbance to the sediment cap would need to be repaired.

Soil/Fill Alternative 4 – Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal

Capital Cost:	$13,623,160
Annual OM&M Cost:	$75,000
Present Worth Cost:	$12,633,300
Construction Time:	8-12 months

Alternative 4 combines the institutional controls, engineering controls (capping with bulkhead replacement), and NAPL removal from Soil/Fill Alternative 3 with a focused excavation and off-site disposal of lead-impacted soil/fill in the vicinity of Building #7. Alternative 4 focuses on lead removal (in soils above the water table) at concentrations above the lead PRG of 800 mg/kg around Building #7, which is predominantly located on Lot 63 and Lot 64. The footprint for this remedial alternative (approximately 0.5 acres) is based on single-point compliance with the PRG, delineated using soil borings collected in the vicinity of Building #7. Delineation of the area would be confirmed during the remedial design. The focused excavation would be based on assessment during remedial design to achieve goal of protection for lead, cumulative cancer risk estimates below or within the NCP risk range (10^{-4} to 10^{-6}), the noncancer HI estimates are at or below the protection goal of 1, or to meet the PRGs to achieve ARAR compliance. The assessment would include consideration of RI soil/fill samples along with remedial design samples and/or confirmation samples if necessary. The excavated areas would be backfilled with fill material selected considering the NJDEP "Fill Material Guidance for SRP Sites" dated April 2015. To prevent soil erosion, the excavated area would be covered with gravel.

Removal of soil/fill reduces and/or would eliminate potential impact-to-groundwater sources, primarily localized lead. Because of the extent of soil/fill, some of which has been identified as historic fill, excavation under this alternative would not reduce the extent of capping needed. The remaining affected soil/fill site-wide would be capped to address the associated potential unacceptable risks as described in Soil/Fill Alternative 3.

Excavation adjacent to existing buildings raises building stability considerations. Additional measures would be undertaken to address building stability, including sequential smaller excavation areas around the perimeter of the building. The structural integrity of the building would be evaluated in the remedial design following an engineering assessment.

Soil/Fill Alternative 5 – Institutional Controls, In-Situ Remediation, Engineering Controls, and NAPL Removal

Capital Cost:	$15,222,505
Annual OM&M Cost:	$68,750
Present Worth Cost:	$13,971,400
Construction Time:	8-12 months

Alternative 5 combines the institutional controls, engineering controls (capping with bulkhead replacement), and NAPL removal from Soil Alternative 3 with in-situ treatment to address lead along with other contaminants. The footprint of this alternative is estimated to be 3.62 acres but would be delineated during the remedial design. Because of the mixture of inorganic and organic contaminants on Site, an in-situ stabilization/solidification technology was assumed for cost-estimating purposes (instead of an in-situ treatment technology).

Stabilization/solidification would be the most viable type of in-situ treatment for this Site. This process would involve the injection and mixing of an appropriate binding agent (such as cement, lime, or kiln dust) using a backhoe or large-diameter auger. Alternatively, an iron sulfide amendment could be used to immobilize the metals as insoluble metal sulfides incorporated into secondary metal precipitates. After completion of stabilization activities, the treated areas would be capped as described under Soil/Fill Alternative 3. Untreated areas of Lots 67 and 69 would be capped also. Note that due to the increase in soil/fill volume inherent with this approach, along with the need to cap treated soils, it may be necessary to remove and properly dispose of the top 12 to 18 inches of soil/fill prior to treatment, so that the elevation of the final surface does not change. Treatability studies and/or pilot test(s) would be needed to determine the most effective binding agent and mixing ratio to treat Site soil/fill.

Groundwater Alternative 1 – No Action

Capital Cost:	$0
Annual OM&M Cost:	$0
Present Worth Cost:	$0
Construction Time:	0 month

Under this alternative, no action would be taken to reduce the potential for unacceptable exposures of humans to impacted groundwater or minimize further aquifer degradation. Existing NJDEP-approved institutional controls would remain intact although they are not enforceable by EPA. This alternative is retained for comparison with the other alternatives as required by the NCP.

Groundwater Alternative 2 – Institutional Controls, Site Containment at River Edge, and Pump and Treat

Capital Cost:	$30,590,844
Annual OM&M Cost:	$1,125,000
Present Worth Cost:	$34,258,600
Construction Time:	12-18 months

Alternative 2 includes institutional controls on the entire Site, a physical barrier (wall) constructed at the river edge and an active groundwater remedy to achieve ARARs. Interaction with the existing CEAs and WRAs would be coordinated with NJDEP along with the property owners or other parties responsible for having recorded these controls. The CEAs provide notice that groundwater in the area does not meet designated use requirements, and the existing WRAs prohibit the installation and use of wells for potable and other uses within the designated area. During remedial design, groundwater samples will be collected, analyzed, and reported to update shallow and deep groundwater quality. Updated results will be used for site-wide institutional controls and establishment of a site-wide CEA and WRA. Consistent with the requirements of New Jersey law, periodic monitoring and reporting to demonstrate compliance with the restrictions would be required as part of this alternative.

A vertical sheet pile barrier wall would be constructed along the river's edge as a means of reducing the potential for interaction between groundwater and the river. Sheet piling would be constructed to the top of an underlying confining layer, most likely the glacial lake bottom silt deposits, with a depth to be determined during remedial design. The barrier wall would have a total length of approximately 1,300 ft. The barrier wall is not intended to address geotechnical issues related to property redevelopment or to enhance the structural stability of the current bulkhead. A geotechnical investigation will occur during remedial design to determine wall alignment, depth and specifications.

Additionally, approximately 20 extraction wells would be installed throughout the Site to alleviate hydrostatic pressure behind the barrier wall and to recover both shallow and deep groundwater impacted by organics and shallow groundwater impacted by inorganics (such as lead). Extracted groundwater would be pumped to a new groundwater treatment facility, likely at least 5,000 to 7,500 square ft in floor area, to be constructed at an appropriate location on the Site.

The number of extraction wells, pumping rate, and individual processes to be utilized for treatment would be determined during the remedial design. For cost-estimating purposes, a 200-gallon per minute (GPM) system (i.e., 20 wells at 10 GPM per extraction well) including chemical oxidation, filtration, metals precipitation (chemical), and carbon polishing was assumed. Approval and/or permit equivalency would be sought for discharge of treated water to the local Publicly Owned Treatment Works (POTW) or surface water.

This alternative's ability to achieve the PRGs would be challenged by the on-going impacts of residual COCs in the soil/fill to groundwater that would need to be treated; however, response actions undertaken for other media that include source control measures (i.e., UST removal and removal of elevated lead in the vicinity of Building #7), would remove potential groundwater sources, potentially allowing the pump and treat system to achieve RAOs faster.

Groundwater Alternative 3 – Institutional Controls and In-Situ Remediation

Capital Cost:	$28,459,770
Annual OM&M Cost:	$113,250
Present Worth Cost:	$20,844,800
Construction Time:	9-12 months (for initial round of injection)

Alternative 3 includes the institutional controls described for Groundwater Alternative 2. Additionally, impacted groundwater would be subject to in-situ remediation. The objective of this alternative is to reduce COC concentrations (organic and inorganic) in groundwater, eventually restoring groundwater quality.

The potential in-situ treatment methods would include in-situ chemical treatment, biosparging, and air sparging. Pilot- and bench-scale testing would be required as part of the remedial design to determine the most appropriate treatment approach and reagents for Site groundwater. However, tidal influences and geochemical conditions on

in-situ treatment may limit effectiveness and may need to be assessed during the remedial design.

It should be recognized that many of the COCs are co-located or are in close proximity, which could lead to complications in that different, potentially incompatible treatment approaches might be required. (Sequential treatment with different agents to address different classes of COCs was not assumed as part of this alternative.) Additional groundwater sampling and performance of treatability studies would be required as part of the remedial design to evaluate and select the most cost-effective means for addressing both organic and inorganic constituents in groundwater. This assessment may need to evaluate tidal influences and geochemical conditions. This alternative does not eliminate the need for institutional controls or reduce their expected duration.

This alternative's ability to achieve the PRGs would be challenged by the on-going impacts of residual COCs in the soil/fill to groundwater that would need to be treated; however, response actions undertaken for other media that include source control measures (i.e., UST removal and removal of elevated lead in the vicinity of Building #7), would remove potential groundwater sources, potentially allowing in-situ remediation to achieve RAOs faster.

Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation

Capital Cost:	$12,831,750
Annual OM&M Cost:	$1,500,000
Present Worth Cost:	$24,234,400
Construction Time:	8-10 months (not including periodic injections)

This alternative combines the institutional controls and the site-wide pump and treat system of Groundwater Alternative 2 (with no barrier wall), and a targeted, periodic in-situ treatment approach described in Groundwater Alternative 3 for upgradient portions of the Site.

As with Groundwater Alternative 2, the pumping wells near the river would be located to provide hydraulic containment at the river's edge to capture groundwater COCs at concentrations exceeding ARARs. The groundwater level would be monitored, and the extraction rates would be variable, to provide maximum containment/capture without causing excessive induced infiltration from the river. The number of extraction wells, pumping rate, and individual processes to be utilized for treatment would be determined during the remedial design. For cost-estimating purposes, a 200-gallon per minute (GPM) system (i.e., 20 wells at 10 GPM per extraction well), including chemical oxidation, filtration, metals precipitation (chemical), and carbon polishing, was assumed. The flow rate through the treatment system would be appropriately adjusted during periods of in-situ treatment to promote remediation. Approval would be sought for discharge of treated water to the local POTW or surface water.

As with Groundwater Alternative 3, the extent of groundwater to be addressed by periodic in-situ applications and the specific means for addressing it would be determined during the remedial design, including additional groundwater sampling and the performance of treatability studies. For costing purposes, this alternative assumes targeted, periodic in-situ applications would occur annually during the first five years of operation, and the effectiveness of the various approaches would be evaluated and modified, as needed, between each event. Under this hybrid approach, periodic in-situ remediation would be focused on the upgradient portion of the Site, targeting contaminated areas in both the shallow and deep groundwater. During the periodic injections, pumping at upgradient wells could be temporarily reduced or halted, as appropriate to give the amendments adequate contact time with COCs in the groundwater. In any area where in-situ treatment did not achieve PRGs, regardless of the location on-site, pump and treat would be relied upon to achieve the remedial objectives. To prevent uncontrolled release of injection fluids into the river, injection wells along the river may not be a viable option.

COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance. Seven of the nine evaluation criteria are discussed below. The final two criteria, "State Acceptance" and "Community Acceptance" are discussed at the end of the document.

Overall protection of human health and the environment addresses whether an alternative provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled

through treatment, engineering controls, or institutional controls.

Compliance with ARARs addresses whether an alternative would meet all the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

Long-term effectiveness and permanence refer to the ability of an alternative to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

Reduction in toxicity, mobility, or volume (TMV) through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

Short-term effectiveness addresses the time needed to achieve protection and any adverse impacts on the community and workers, and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability is the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement a particular option.

Cost includes estimated capital and OM&M costs, and net present worth costs, calculated using a 7% discount rate. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the state concurs with the preferred alternative at the present time.

Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

The following is a comparative analysis of the alternatives for each medium, based upon the evaluation criteria noted above.

Waste

Overall Protection of Human Health and the Environment

Waste Alternative 1 (no action) is not protective of human health and the environment because it does prevent exposure to or reduce contamination. No action-specific or location-specific ARARs would be triggered, because no action would be taken. Accordingly, it will not be carried through the remaining criteria analysis.

Waste Alternative 2 (removal and off-site disposal) would provide protection of human health and the environment, as the wastes (and principal threat waste) would be removed from the Site, thereby eliminating the potential for exposure of human and ecological receptors and release of the materials to environmental media.

Compliance with ARARs

Waste Alternative 2 would be implemented in compliance with location-specific ARARs, such as the substantive requirements of New Jersey UST closure regulations and NJDEP Technical Requirements (N.J.A.C. 7:26E-5.1(e)) that apply to treatment or removal of free product.

Long-term Effectiveness and Permanence

Waste Alternative 2 would achieve long-term effectiveness through the removal and off-site disposal of waste, including principle threat waste identified on Lot 64.

Reduction of TMV through Treatment

Toxicity, mobility or volume may be reduced in Waste Alternative 2 if material is treated on-site to comply with disposal requirements, as required by the disposal facility.

Short-Term Effectiveness

Waste Alternative 2 would be implemented within one month, so any short-term impacts to workers, the surrounding community and environment will be minimal.

Implementability

Removal of the wastes and USTs is readily implementable, as equipment and experienced vendors for this type of work are available along with backfill material and disposal facilities.

Cost

The present worth cost for each of the Alternatives is:

Waste Alternative 1 - $0
Waste Alternative 2 - $1,580,700

Sewer Water

Overall Protection of Human Health and the Environment

Sewer Alternative 1 (no action) is not protective of human health and the environment because it does not prevent

exposure to or reduce contamination, nor does it meet chemical-specific ARARs. No action-specific or location-specific ARARs would be triggered, because no action would be taken. Accordingly, it will not be carried through the remaining criteria analysis.

Sewer Alternative 2 (removal and off-site disposal) would be protective because the sewer materials would be removed from the Site, thereby eliminating the potential exposure of humans and ecological receptors, release of contamination to the environment, or potential discharge of sewer water COCs to surface water.

Compliance with ARARs
Location- and action-specific ARARs will be met during implementation by Sewer Alternative 2. This alternative would also meet chemical-specific ARARs for sewer water.

Long-term Effectiveness and Permanence
Sewer Alternative 2 would achieve long-term effectiveness through the removal and off-site disposal of the contents of the inactive sewer system.

Reduction of TMV through Treatment
Toxicity, mobility or volume may be reduced in Sewer Alternative 2 if material is treated on-site to comply with disposal requirements, as required by the disposal facility.

Short-Term Effectiveness
Sewer Alternative 2 would be implemented in one and a half months, so any short-term impacts to workers, the surrounding community and environment will be minimal.

Implementability
Removal of the sewer materials and filling of the manhole and piping is readily implementable, as equipment and experienced vendors for this type of work are available.

Cost
The present worth cost for each of the Alternatives is:

Sewer Alternative 1 - $0
Sewer Alternative 2 - $24,900

Soil Gas

Overall Protection of Human Health and the Environment
Soil Gas Alternative 1 (no action) is not protective of human health and the environment because it does not prevent exposure to or reduce contamination. No action-specific or location-specific ARARs would be triggered, because no action would be taken. Accordingly, it will not be carried through the remaining criteria analysis.

Soil Gas Alternatives 2 (institutional controls, air monitoring, and engineering controls) and Soil Gas 3 (in-situ treatment in lieu of air monitoring and engineering controls in existing buildings) would both be protective of human health, as potential risks/hazards associated with soil gas are directly addressed through air monitoring and engineering controls for both existing occupied buildings and future construction.

Compliance with ARARs
Soil Gas Alternatives 2 and 3 would both comply with location- and action-specific ARARs for addressing potential vapor intrusion, such as NJDEP VISLs. No chemical-specific ARARs were identified for soil gas.

Long-term Effectiveness and Permanence
Soil Gas Alternative 3 would have greater long-term effectiveness than Soil Gas Alternative 2, as this alternative includes actions to directly address soil/fill associated with potential vapor intrusion risks/hazards at occupied buildings.

Reduction of TMV through Treatment
Soil Gas Alternative 3 would provide reduction of toxicity, mobility, or volume through treatment, assuming that the selected in-situ technology destroys contaminant mass.

Short-Term Effectiveness
Soil Gas Alternative 2 would have fewer short-term impacts to workers, the community and the environment than Soil Gas Alternative 3 because the activities are limited to the seven occupied on-site buildings where collection of vapor samples would take place, and, if needed, installation of engineering controls. These risks/hazards would be readily controlled by following appropriate health and safety practices.

Implementability
Soil Gas Alternatives 2 and 3 are implementable. Both would require the cooperation of the property owners and/or operators of the seven occupied buildings, in order to conducting air monitoring and install and maintain compliance with engineering controls. As the implementation of institutional controls is the main component of Soil Gas Alternative 2, apart from potential challenges associated with imposing institutional and engineering controls, this alternative would be more easily implemented, with minimal disruption to ongoing activities, compared to Soil Gas Alternative 3, which also includes in-situ treatment.

Cost
The present worth cost for each of the Alternatives is:

Soil Gas Alternative 1 - $0
Soil Gas Alternative 2 - $449,800
Soil Gas Alternative 3 - $4,050,800

Soil/Fill

Overall Protection of Human Health and the Environment
Soil/Fill Alternative 1 (no action) is not protective of human health and the environment because it does not prevent exposure to or reduce contamination, nor does it meet chemical-specific ARARs. No action-specific or location-specific ARARs would be triggered, because no action would be taken. Accordingly, it will not be carried through the remaining criteria analysis.

Soil/Fill Alternative 3 (cap and bulkhead enhancement), Soil/Fill Alternative 4 (focused excavation/disposal with capping and bulkhead enhancements) and Soil/Fill Alternative 5 (in-situ remediation with capping and bulkhead enhancement) would be protective of human health, as potential risks/hazards associated with direct contact of the soil/fill material would be addressed with an engineered cap.

Compliance with ARARs
Soil/Fill Alternatives 3 through 5 would comply with chemical-specific ARARs by eliminating direct contact to concentrations exceeding NJ NRDCSRS with a site-wide cap and deed notices. Location- and action-specific ARARs would be met by Soil/Fill Alternatives 3 through 5. None of the alternatives eliminate the need for institutional controls.

Long-term Effectiveness and Permanence
Soil/Fill Alternatives 3 through 5 would achieve long-term effectiveness and permanence by minimizing human and ecological exposure to soil/fill and preventing off-site transport of soil/fill containing COCs. Soil/Fill Alternative 4 would provide greater permanence: under Alternative 4, contaminated soil/fill would be excavated for off-site disposal in a licensed disposal facility; under Alternative 5 in-situ treatment would permanently stabilize the contaminated soil/fill, making future exposure to the COCs less likely. Soil/Fill Alternatives 3 through 5 incorporate similar long-term O&M obligations through institutional controls, none anticipated to be less than the 30 years assumed for cost-estimating purposes.

Reduction of TMV through Treatment
Soil/Fill Alternative 5 would provide the greatest reduction of toxicity and mobility through treatment by stabilization/solidification of all COCs (organic and inorganic). However, the volume would not be reduced since contaminants are stabilized and solidified but remain on-site. Soil/Fill Alternative 4 would reduce mobility of COCs on-site, not through treatment but through removal and off-site disposal of elevated lead around Building #7, which also remove co-located contaminants; however, toxicity and volume would only be reduced if material is treated prior to disposal. Soil/Fill Alternatives 3 through 5 include NAPL removal, which would reduce mobility of a principal threat waste, though not through treatment. The toxicity and volume may be reduced if material is treated to comply with disposal requirements at the off-site disposal facility.

Short-Term Effectiveness
Soil/Fill Alternatives 3 through 5 will all disrupt businesses to some extent, thus having a short term impact on workers and potentially, the local community. The northern portion of the Site is extremely congested with ongoing business activities and also provides the only vehicle access point. The short-term impacts of Soil/Fill Alternatives 3 and 4 would be similar, as they are similar in scope. Soil/Fill Alternative 5 would cause the most short-term impacts because of the treatment areas in the northern portion of the Site which would cause significant disturbances to businesses as reagent delivery to the subsurface will require the use of either large diameter augers and closely spaced injection points, due to the relatively shallow depth of impacts.

Implementability
Soil/Fill Alternatives 3 and 4 are both relatively implementable, though the excavation included Soil/Fill Alternative 4 might be limited by proximity to buildings and underground utilities. Soil/Fill Alternative 5 would be the most technically challenging to implement because this alternative requires the use of specialized equipment and experienced vendors; pilot studies would be required to determine the appropriate reagent; and treatments may not be feasible due to underground utilities and closely spaced injection points due to the relatively shallow depth of impacts. Soil/Fill Alternatives 3 through 5 require engineering controls, including bulkhead enhancements. During construction of the bulkhead, if the engineered cap in the Lower Passaic River is disturbed, the parties implementing the remedy at the Site would be responsible to work with EPA and/or the parties performing work in the river to address any such impacts.. Soil/Fill Alternatives 3 through 5 would require long-term maintenance in the form of site inspections to ensure compliance with institutional controls, verify inspection of fencing, and maintain integrity of the cap and bulkhead.

Cost
The present worth cost for each of the Alternatives is:

Soil/Fill Alternative 1 – $0
Soil/Fill Alternative 3 – $10,450,900
Soil/Fill Alternative 4 – $12,633,300
Soil/Fill Alternative 5 – $13,971,400

Groundwater

The performance of all the active groundwater alternatives will be impacted by the on-going impacts of residual COCs in the soil/fill to the groundwater, which will need to be treated. Response actions undertaken for other media that include source control measures (i.e., UST removal and NAPL-impacted soil/fill removal) would remove potential groundwater sources and capping or excavation of contaminated soil/fill could also reduce residual COC infiltration into groundwater from unsaturated soil/fill.

Overall Protection of Human Health and the Environment
Groundwater Alternative 1 (no action) is not protective of human health and the environment because it does not prevent exposure to or reduce contamination, nor does it meet chemical-specific ARARs. No action-specific or location-specific ARARs would be triggered, because no action would be taken. Accordingly, it will not be carried through the remaining criteria analysis.

Groundwater Alternative 2 (containment at river edge and pump and treat), Groundwater Alternative 3 (in-situ remediation), and Groundwater Alternative 4 (pump and treat with targeted periodic in-situ remediation) would be protective of human health because all of these alternatives would restore the groundwater quality to meet the standards applicable for a Class IIA aquifer.

Compliance with ARARs
Location- and action-specific ARARs would be met by Groundwater Alternatives 2, 3, and 4. In the short-term, Groundwater Alternatives 2, 3, and 4 would not comply with chemical-specific ARARs (NJ GWQS) associated with the restoration of groundwater; however, over time, the impacted groundwater may eventually reduce COC concentrations to meet chemical-specific ARARs. Groundwater Alternative 4 will likely achieve chemical-specific ARAR before Groundwater Alternatives 2 and 3, because Alternative 4 includes both pump and treat technology and in-situ treatment, whereas Alternative 2 relies solely on pumping and treating, and Alternative 3, on in-situ treatment . Groundwater Alternatives 3 may face challenges in meeting chemical specific ARARs because of the complex interaction between the in-situ treatments and the geochemistry of the aquifer. This would be true for Groundwater Alternative 4 as well; however, because the in-situ component of Groundwater Alternative 4 would be more targeted, the challenge would be lesser.

Long-term Effectiveness and Permanence
Groundwater Alternatives 2, 3, and 4 all require long-term O&M through institutional controls and long-term groundwater monitoring to remain effective, until the NJ GWQS are attained. The O&M period for all four groundwater alternatives is anticipated to be at least the 30 years assumed for cost-estimating purposes, although it is possible that the source removal activities implemented to address the waste and soil/fill contamination may reduce the duration of O&M obligations, particularly for Groundwater Alternative 4, which includes both pump and treat and in-situ treatment technologies.

Reduction of TMV through Treatment
Groundwater Alternatives 2 and 4 would effectively reduce the toxicity, mobility and volume of all COCs in the groundwater through use of a pump and treat system. Groundwater Alternatives 3 and 4 could reduce toxicity, mobility and volume of organic COCs depending on success of the reagent used for in-situ treatment; however, inorganic metals (including lead) cannot be destroyed, only precipitated out of solution, so for metals, only toxicity and mobility would be reduced through treatment.

Short-Term Effectiveness
Groundwater Alternatives 2 and 4 would be disruptive to business activities thus having a short term impact on workers and potentially, the local community, as a result of the installation of monitoring wells (for all alternatives) and the construction of a pump and treat system. The in-situ treatment activities associated with both Groundwater Alternatives 3 and 4 also lead to short-term impacts, but Alternative 3 would be more disruptive to business activities, workers and the local community, than Groundwater Alternative 4 because multiple large-scale injections would be required. For Groundwater Alternative 4, in-situ treatments would be targeted periodic injections and generally at a smaller scale than Groundwater Alternative 3.

Implementability
Of the active groundwater alternatives, Groundwater Alternative 4 is the most implementable, while Groundwater Alternative 2 is the most challenging to implement because of the technical complexities of the construction of the barrier wall. The implementability challenges for Groundwater Alternative 3 are caused by the need to undertake multiple targeted rounds of in-situ injection. In addition, groundwater sampling and treatability studies would be required to evaluate how to address both organic and inorganic constituents in

groundwater, taking into account tidal influences and geochemical conditions. The implementability of Groundwater Alternatives 2 and 4 is also affected by the need for access to a sufficiently sized portion of the Site property for construction of a groundwater treatment facility, which could lead to administrative challenges. All three Groundwater Alternatives 2 through 4 would require long-term maintenance in the form of site inspections to ensure compliance with institutional controls and to perform operation and maintenance. Since Groundwater Alternative 4 is likely to achieve the RAO is the shortest time, the challenges associated with implementation over a long duration are less.

Cost
The present worth cost for each of the Alternatives is:

Groundwater Alternative 1 – $0
Groundwater Alternative 2 – $34,258,600
Groundwater Alternative 3 – $20,844,800
Groundwater Alternative 4 – $24,234,400

PREFERRED ALTERNATIVE

Based upon an evaluation of the various alternatives, the Preferred Alternative is comprised of the following:

- Waste Alternative 2 – Removal and Off-Site Disposal
- Sewer Water Alternative 2 – Removal and Off-Site Disposal
- Soil Gas Alternative 2 – Institutional Controls, Air Monitoring or Engineering Controls (existing occupied buildings), and Site-Wide Engineering Controls (future buildings)
- Soil/Fill Alternative 4 – Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal
- Groundwater Alternative 4 – Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation

Waste

The preferred waste alternative includes removal of various wastes found across the Site and disposing them off-site. The wastes identified in this preferred alternative include:

- Approximately 34,700 gallons of water and 1,600 gallons of LNAPL within the six USTs located north of Building #12 on Lot 64
- Excavated NAPL-impacted soil/fill material following UST removal (approximately 3,500 CY)
- The six tanks in the UST area
- Approximately, 2,900 gallons of LNAPL pooled under a steel grated floor in Building #15A
- 11 CYs of a white chalky talc-looking substance in a hopper in Building #7
- 50 gallons of liquid waste in a plastic drum in Building #12
- A five-gallon bucket of a waste labeled as a filler in Building #17

This preferred alternative would provide the greatest protection of human health and the environment and long-term effectiveness because removing the waste will prevent an uncontrolled release into the environment. In removing this waste, all ARARs will be complied with.

Furthermore, removing the USTs and addressing the LNAPL in the USTs and the NAPL-impacted soil/fill surrounding the USTs would eliminate the principal threat waste.

The preferred waste alternative should also improve the effectiveness of the groundwater alternatives with respect to organics. Removal of the USTs and their contents along with the LNAPL and NAPL-impacted soil/fill material will also remove a potential groundwater source. This action is expected to result in improved groundwater quality with respect to VOCs and may reduce the scope/footprint and time needed to achieve certain groundwater chemical-specific ARARs.

Sewer Water

The preferred sewer water alternative includes removal of sewer water and associated solids from an inactive portion of the northern sewer line (known as Manhole 8) on Lot 1. These wastes will then be properly disposed off-site.

This preferred alternative is expected to provide the greatest protection of human health and the environment and long-term effectiveness because removing the sewer water and solids will prevent an uncontrolled release into the environment. In removing this material, all ARARs will be complied with.

Soil Gas

The preferred soil gas alternative includes establishing deed notices and/or CEAs/WRAs site-wide, and/or updating existing deed notices and/or CEA/WRAs, to

provide notice of certain restrictions upon the use of the property and groundwater. In addition, ongoing indoor air monitoring or engineering controls (such as a SSDS) would be required.

While there are no unacceptable risks for indoor air in any currently occupied building on the Site, EPA has concluded that reoccurring air monitoring should be conducted in each occupied building to ensure there are no unacceptable levels of soil gas in the future. Furthermore, this alternative includes institutional controls to ensure that any new building has an engineering control to prevent potential vapor intrusion. Institutional controls and engineering controls will require consent of property owners for deed notices/restrictions. This preferred alternative can be implemented in a relatively short period, assuming the property owners at the Site provide their consent. The preferred alternative also is protective in the long-term, although it does not include in-situ treatment of COCs as does Soil Gas Alternative 3 (in-situ treatment). The present worth cost of this alternative is $449,800, as compared to the $4,050,800 cost of Soil Gas Alternative 3.

Soil/Fill

Soil/Fill Alternative 4, the preferred soil/fill alternative includes bulkhead replacement, capping of the entire the Site, NAPL removal on Lot 63, and a focused removal of lead around the perimeter of Building #7. This preferred alternative focuses on lead removal (in soil/fill material above the water table) at concentrations above the PRG of 800 mg/kg around Building #7, which is predominantly located geographically on Lot 63 and Lot 64. This alternative would reduce mobility of COCs on-site through removal and off-site disposal of not only lead but also co-located contaminants. The alternative also addresses the deteriorating portions of the bulkhead to minimize the potential for interaction between the Site and surface water and to minimize soil erosion. The site-wide cap would also prevent access and direct contact with the contaminated media and/or control contaminant migration. Impermeable caps, like asphalt caps, also address the soil-to-groundwater pathway by reducing vertical infiltration. Soil/fill with NAPL on Lot 63 will be excavated and disposed off-site.

The preferred soil alternative provides the best overall protection of human health/environment and compliance with ARARs while also being relatively easily to implement. Soil/Fill Alternative 5 (in-situ treatment) provides reduction of toxicity and mobility through treatment (which the preferred soil alternative does not) and is comparable to the preferred alternative for long-term effectiveness and permanence, but with respect to short-term effectiveness and implementability Soil/Fill Alternative 5 does not compare favorably. Soil/Fill Alternative 5 treatment areas in the northern portion would cause significant disturbances to businesses, as reagent delivery to the subsurface would require the use of either large diameter augers, which may not be feasible due to underground utilities, and closely spaced injection points, due to the relatively shallow depth of impacts. While Soil/Fill Alternative 3 would eliminate contact with soil/fill at concentrations exceeding PRGs through capping, the preferred soil alternative would offer better overall protection and compliance with the PRGs since, in addition to capping, lead contaminated soil/fill around Building #7 (along with co-located contamination) would be removed from the Site.

Furthermore, the preferred soil/fill alternative also improves the effectiveness of the groundwater alternatives with respect to organics and metals. First, removal of the NAPL-impacted soil/fill material on Lot 63 and the lead-impacted soil/fill material around Building #7 will also remove a potential groundwater source. This action is expected to result in improved groundwater quality with respect to VOCs and lead and may reduce the scope/footprint and time needed to achieve certain groundwater chemical-specific ARARs. In addition, the site-wide cap will limit the amount of surface water infiltrating through the soil/fill and impacting groundwater.

Groundwater

The preferred groundwater alternative, Groundwater Alternative 4, includes the installation of a site-wide pump and treat system, and a targeted, periodic in-situ treatment approach in upgradient portions of the Site. Ongoing groundwater monitoring would be performed to demonstrate that groundwater treatments continued to be protective of human health and the environment. The pumping wells near the river would be located to provide hydraulic containment at the river's edge to capture groundwater COCs at concentrations exceeding ARARs. The targeted, periodic in-situ applications would occur annually, and the effectiveness will be evaluated and modified, as needed, between each event.

The preferred groundwater alternative provides the best overall protectiveness, compliance with ARARs, long-term effectiveness, and reduction of toxicity, mobility and volume through treatment. Groundwater Alternatives 2 (river barrier and pump and treat only) and 3 (in-situ only) provide less long-term effectiveness and permanence, due to their sole reliance on pump and treat, and in-situ applications, respectively, which will likely extend the

timeframe to achieve the goal of groundwater restoration.

Basis for the Remedy Preference

The Preferred Alternative is believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time. EPA believes the Preferred Alternatives would be protective of human health and the environment, would comply with ARARs, would be cost-effective, and will utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. The Preferred Alternative may change in response to public comment or new information. The total present worth cost for all the Preferred Alternatives is $38,923,100.

Because the Preferred Alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA would require that the Site be reviewed at least once every five years.

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of a selected remedy.

State Acceptance

The Proposed Plan is currently under review by NJDEP.

Community Acceptance

Community acceptance of the Preferred Alternative will be addressed in the ROD following review of the public comments received on this Proposed Plan.

For further information on Riverside Industrial Park Superfund Site, please contact:
Josh Smeraldi
Remedial Project Manager
(212) 637-4302
Smeraldi.josh@epa.gov

Shereen Kandil
Community Involvement Coordinator
(212) 637-4333
Kandil.shereen@epa.gov

Information can also be found on the web:
www.epa.gov/superfund/riverside-industrial

The public liaison for EPA Region 2 is:
George H. Zachos
Regional Public Liaison
Toll-free (888) 283-7626, or (732) 321-6621
U.S. EPA Region 2
2890 Woodbridge Avenue, MS-211
Edison, New Jersey 08837-3679

BLOCK 614 LOT #	BUILDING #	OWNER
1	2, 3	HATZLUCHA ON RIVERSIDE, LLC.
57	10	PLAGRO REALTY, INC.
58	15, 15A	CITY OF NEWARK
59	14	ALBERT SHARPHOUSE
60	1	SHEFAH IN NEWARK, LLC.
61	6	CITY OF NEWARK
62	9	CELCOR ASSOC., LLC.
63	7	CITY OF NEWARK
64	12	CITY OF NEWARK
65	NA	INDUSTRIAL DEV. CORP.
66	17	CHEMICAL COMPOUNDS, INC.
67	NA	CELCOR ASSOC., LLC.
AR	NA	CITY OF NEWARK
69	13, 19	SHARPMORE HOLDING INC.
70	16	ESTATE OF CAROLE GRAIFMAN

Figure 1: Map of Riverside Industrial Park Superfund Site

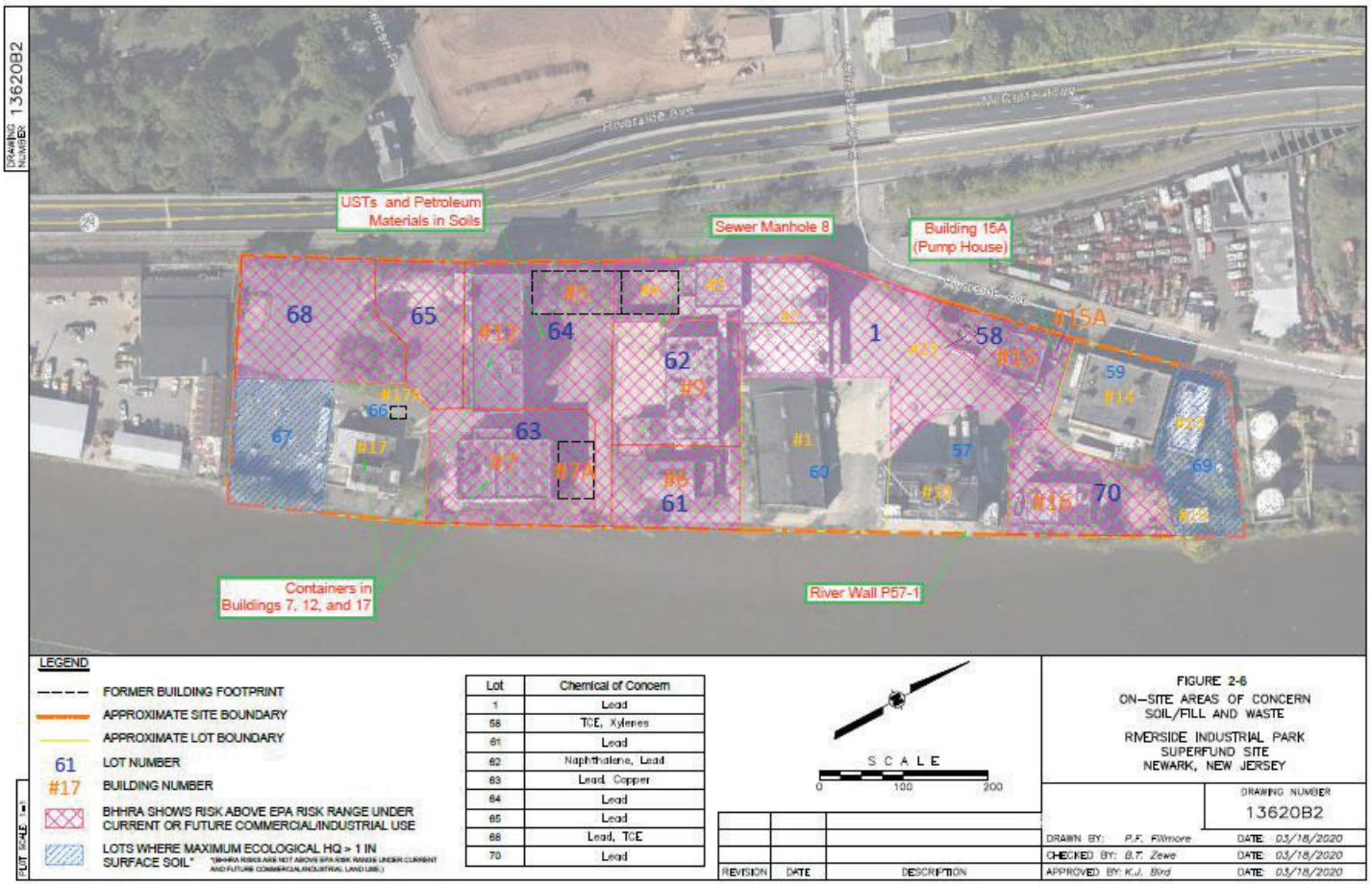


Figure 2: Map of Areas of Concerns for the Site

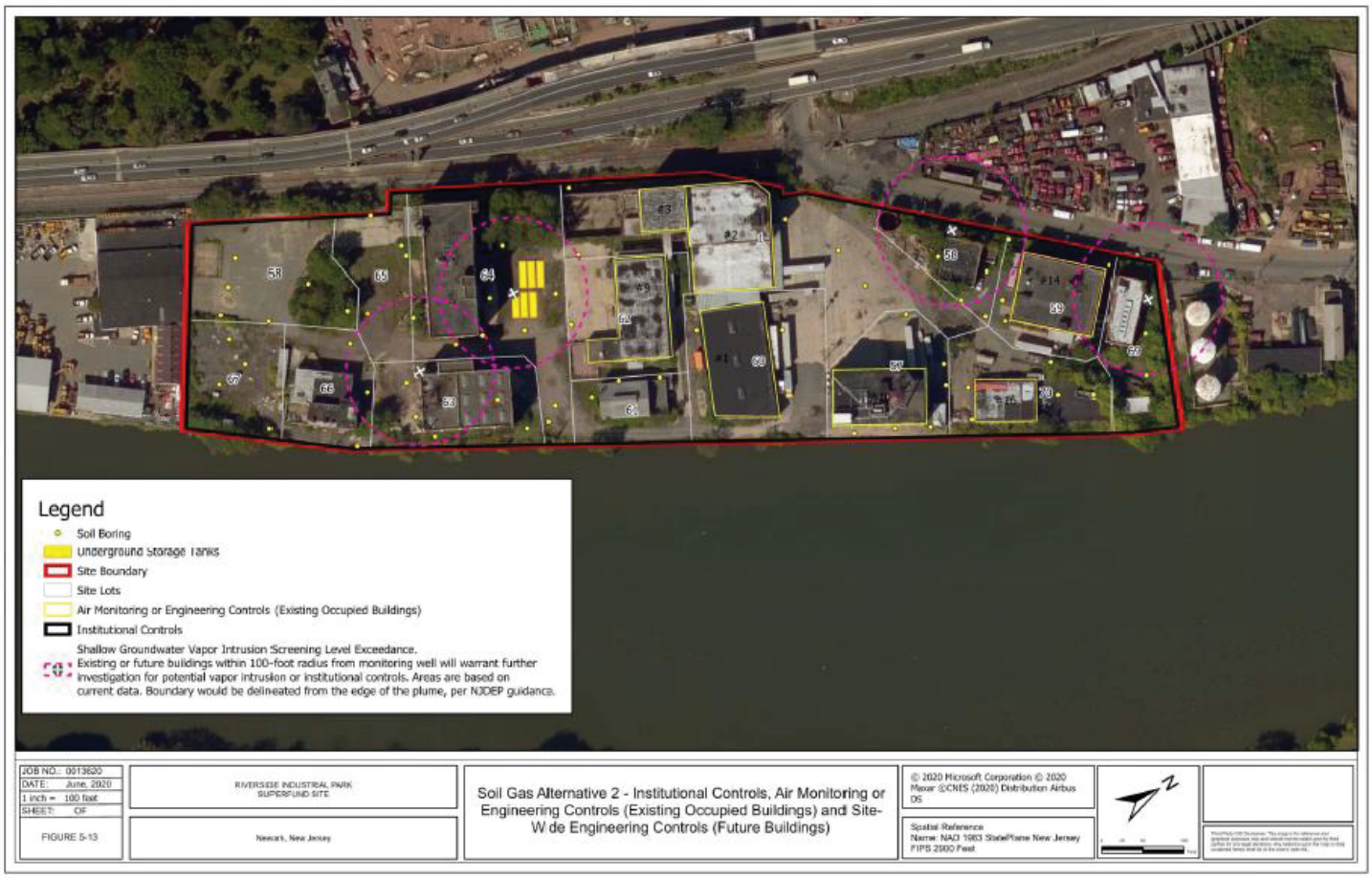


Figure 3: Map of Preferred Soil Gas Alternative

Figure 4: Map of Preferred Soil/Fill Alternative

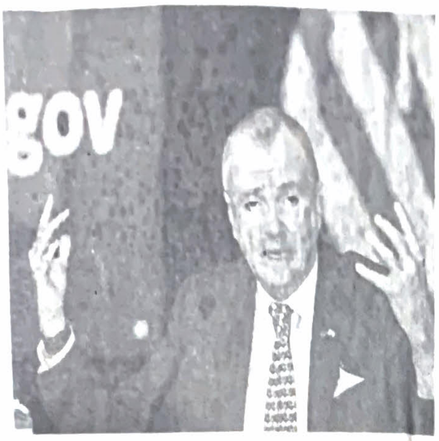
Figure 5: Map of Preferred Groundwater Alternative

APPENDIX V-B

PUBLIC NOTICE: COMENCEMENT OF PUBLIC COMMENT PERIOD

STATEHOUSE

Murphy pleads with GOP in Congress: More aid for states



Gov. Phil Murphy, seen in May, says states and local governments need more federal aid to keep fighting the coronavirus. *File photo*

Jonathan D. Salant and Brent Johnson *For The Star-Ledger*

Gov. Phil Murphy on Tuesday once again pleaded with Congress to provide more direct aid to states and local governments across the U.S. that otherwise may have to make deep spending cuts to education, health care programs, first responders, and more.

Murphy made his comments hours after Senate Majority Leader Mitch McConnell excluded state and local aid from the priorities he said he would include in his version of the next coronavirus stimulus legislation.

Murphy, acting in his role as chairman of the Democratic Governors Association, released a statement saying the proposal "leaves states and cities behind."

"If Congress does not give states the direct relief we need to shore up our budgets, it will do untold damage to our economies and undermine our response to COVID-19," Murphy said in a statement released by the DGA.

McConnell, R-Ky., listed what he planned to include in the Senate Republican bill in addition to insulating reopening businesses from coronavirus-related lawsuits. "I've said we will start with the facts and develop real, targeted solutions on the subjects that matter most to American families," he said Tuesday. "Well, it turns out that means three things: Kids. Jobs. And health care."

The statement came as numerous states across America faced upticks in new COVID-19 cases in recent weeks. New Jersey, once a hotspot, has seen its numbers drop dramatically and become relatively stable after months of lockdown orders.

New Jersey so far has received $2.4 billion in the $2 trillion stimulus law known as the CARES Act.

But Murphy has said more is needed. He has warned that the state faces a possible $20 million gap in the next state budget because of massive losses in tax revenue in the wake of business closings.

"Without funding from the federal government, states will be forced to make massive cuts and slash funding for education, health care programs, housing, first responders, and more. These cuts will deepen the recession and undermine the very programs that Americans will need to get back on their feet. States are leading in this crisis, but we need the federal government's help to make sure we can keep the fight up," he said Tuesday.

The House has passed a $3 trillion stimulus bill known as the HEROES Act that includes $875 billion for state and local governments. McConnell has refused to consider the legislation in the Senate.

NEW YORK

De Blasio: We'd take legal action if Trump sent officers

Associated Press

President Donald Trump's threat to send federal law enforcers to patrol the city is likely not serious but if he did follow through, New York City would take legal action, Mayor Bill de Blasio said Tuesday.

"I have to start by saying this president blusters and bluffs and says he's going to do things and they never materialize on a regular basis," de Blasio said.

State and local authorities in Oregon have charged in a lawsuit that masked federal officers have arrested people in Portland with no probable cause and whisked them away in unmarked cars. Trump defended the actions of the federal officers in Portland on Monday and said he would send officers to other cities including New York as well.

De Blasio said that if Trump did send federal officers to New York City, "it would only create more problems. It would backfire, it wouldn't make us safer, and we would immediately take action in court to stop it."

The Democratic mayor added, "From my point of view this would be yet another example of illegal and unconstitutional actions by the president. And we have often had to confront him in court and we usually win."

FORT STEWART, GA.

Soldier in West Point crash that killed cadet sentenced

Associated Press

An Army soldier found guilty of negligent homicide in a vehicle rollover that killed a West Point cadet from New Jersey last year was sentenced to three years' confinement and a discharge for bad conduct, military officials said Tuesday.

Staff Sgt. Ladonies Strong was found guilty of negligent homicide and prevention of authorized seizure of property on Saturday at Fort Stewart in Georgia, according to a spokesperson for the post.

She faced trial by court martial after a June 2019 training accident at the U.S. Military Academy killed 22-year-old Christopher J. Morgan and injured 19 of his fellow cadets.

Strong, 32, was acquitted of involuntary manslaughter, reckless operation of a vehicle, and two charges of dereliction of duty in the June 6, 2019 crash.

As part of the sentencing Monday, the eight-member military panel also reduced Strong's rank to private.

Morgan, of West Orange, died at the scene after the Army tactical vehicle — similar to a large, open-bed truck — overturned in wooded hills outside the main gates of the academy north of New York City.

He was a law and legal studies major in the Class of 2020 and had been a standout member of the Army wrestling team.

Two soldiers in the truck's cab were also injured.

Strong was being tried in Georgia because she's assigned to the Army's 3rd Infantry Division headquartered at Fort Stewart.

A call seeking comment was made to Strong's military defense attorney.

WASHINGTON

Lawmaker renews Lyme disease weapons query

Jonathan D. Salant *For The Star-Ledger*

Did the Pentagon look at using ticks with pathogens to infect America's enemies during the Cold War? And did some of those ticks escape into the U.S., bringing Lyme disease with them?

Those are the questions Rep. Chris Smith has been asking for years, and his House colleagues have once again agreed that they deserve answers.

The Democratic-controlled House voted to ask the Government Accountability Office, the investigative arm of Congress, to investigate whether the Pentagon did conduct research into using infected ticks as bioweapons.

The House last year voted to have the Defense Department inspector general investigate whether the ticks carrying Lyme Disease escaped a Pentagon lab, but the provision was left out of the final bill.

"For years, books and articles have been written credibly asserting that significant research at Ft. Detrick, Plum Island and elsewhere was conducted to turn ticks into bioweapons," said Smith, R-4th Dist.

"With Lyme disease and other tick-borne diseases exploding in the United States ... Americans have a right to know whether any of this true?"

The provision is part of the House version of the National Defense Authorization Act that sets defense policy for the 12 months beginning Oct. 1.

That's the same bill that includes funding for the Picatinny Arsenal and Joint Base McGuire-Dix-Lakehurst, including preventing the Air Force from retiring 16 KC-10 refueling tankers now stationed at the base, limiting it to taking only six as it prepares for the deployment of 24 new KC-46 aircraft.

México presentó un billete de la Lotería Nacional dedicado al chile, que otorgará un premio principal de 10 millones de pesos (unos 450.000 dólares) el miércoles.

Una cría de hipopótamo del Nilo nació el el pasado 13 de julio en el zoológico de Zacango, estado de México y expertos trabajan para aumentar sus expectativas de vida bajo cuidado humano.

Hacer parte de la escolta es un honor que muchos estudiantes atesoran. /CORTESÍA

estaba preñado.

"Una de las formas más complicadas de desigualdad son esos micromachismos tan sutiles que es difícil que se entiendan", advirtió Jazmín Márquez, activista de la Brigada Jurídica Feminista de la Universidad Nacional Autónoma de México. "¿Por qué sacar a una mujer de su mundo de su entorno sólo por estar embarazada y no al padre? Eso es absurdo, pero ocurre todos los días y en todos los ámbitos".

Organizaciones defensoras de los derechos de la mujer tienen una especial preocupación en tiempos de COVID-19. Según estimaciones del Observatorio de Mortalidad Materna desde que se decretaron las medidas extraordinarias para contenerlas, el embarazo adolescente se disparó hasta 35,000 casos.

Hilda Argüello, secretaria técnica de la organización detalla que en el día a día las mujeres de 15 a 19 años dejan de acudir a los servicios de salud sexual y reproductiva por el temor a contagiarse de COVID-19 o porque no las reciben por dar prioridad a los casos de coronavirus, en medio de una problemática que tiene años sin resolverse.

México ocupa el primer lugar de embarazos no planeados en América Latina y el segundo mundial sólo por detrás de Estados Unidos con alrededor de 400,000 casos anualesde entre 10 a 19 años.

"La salud sexual y maternal no debieron descuidarse en la pandemia", advirtió Arguello. "Menos aún cuando se sabe todas las complicaciones que tendrán las adolescentes.

A finales de junio, el presidente Andrés Manuel López Obrador propuso al Senado, a través de una iniciativa de reforma al Código Penal Federal, aumentar de tres a cuatro años y medio la pena de cárcel a quien cometa el delito de discriminación.

Actualmente, solo establece sanciones contra quien niegue a una persona un servicio o una prestación a la que tenga derecho; que niegue o restrinja derechos laborales, principalmente por razón de género o embarazo, limite un servicio de salud; o niegue o restrinja derechos educativos. Pero se quiere ir más allá.

"Aumentar hasta en un tercio el castigo a aquel que ejecute actos de violencia contra una persona y, en el caso de que el delito sea cometido por un servidor público, la pena aumentaría hasta en una mitad, al igual que si este se comete contra una mujer, y concurran razones de género", propone.

Por ahora Jatziry quiere dar a conocer su frustración de haber sido expulsada de la escolta como una de los mejores promedios de su generación "para que no vuelva a ocurrir a otra muchacha como a ella" porque golpeó su autoestima en un momento complicado.

Mientras se gestaba una vida dentro de ella, vio pasar a su suplente frente a ella en dos homenajes a la bandera en la escuela y en un desfile de la plaza pública y poco antes del parto se difundió un video sobre los jóvenes más destacados de su generación del que fue excluída, como si ella nunca hubiera sido parte de la escolta. Como si sus caminatas a la escuela hubieran sido en vano.

Hace una semana nació su hijo Kailál Gerardo Solís y le trajo muchas alegrías, como un nuevo estado de ánimo para seguir adelante con su pareja, también de 17 años. "Voy a cuidar a mi niño un año y luego voy a la licenciatura de administración de empresas porque sé que puedo hacerlo", promete mientras carga a su bebé en casa y mira de reojo sus fotos a lado de la bandera, cuando marchaba solemne por las calles del pueblo.•

Prioridades

La salud sexual y reproductiva (de los menores) no deberían haberse descuidado en la pandemia .

Extraen casi una treintena de cuerpos de fosa clandestina

EFE
Guadalajara

La Fiscalía del Estado de Jalisco informó que aumentó a 28 el número de cuerpos encontrados envueltos en bolsas en una fosa clandestina en una finca del municipio de El Salto.

"Hasta (el lunes) se habían logrado extraer 28 cuerpos, algunos de ellos ya identificados. Seguimos en las labores hasta terminar de procesarla", afirmó en conferencia de prensa el fiscal estatal Gerardo Octavio Solís.

Dijo que los peritos mantendrán la búsqueda de más cuerpos e indicios en el terreno que fue descubierto el lunes pasado tras una investigación de la Fiscalía Especializada en Personas Desaparecidas (FEPD).

El pasado lunes medios locales reportaron la presencia de la organización Familias Unidas por Nuestros Desaparecidos de Jalisco (FUNDEJ) en la fosa de El Salto, colectivo que señaló que "los cuerpos estaban completos", lo que facilita su identificación.

El fiscal dio a conocer que en los últimos meses han localizado 800 bolsas con indicios o segmentos en fosas en los municipios de Tlajomulco, Zapopan, Tlaquepaque y El Salto, de los cuales faltan por ser analizadas poco menos de un centenar de ellas.

La titular de la FEPD, Blanca Jaqueline Trujillo, detalló que los peritos mantienen los trabajos de excavación en tres fosas más, una de ellas está en la colonia el Mirador II, en el municipio de Tlajomulco en el que desde enero pasado han sido encontrados 104 víctimas y que está a punto de ser concluida.

Otra de ellas se ubica en la colonia La Higuera la cual fue descubierta el pasado 10 de junio y en donde han hallado 50 bolsas con restos humanos y restos óseos fuera del fosa.

Los bultos (bolsas) han sido procesados en un 95 % por personal del Instituto Jalisciense de Ciencias Forenses para determinar el número de víctimas.

De acuerdo con la información proporcionada por la fiscalía hasta el 20 de junio eran 39 personas las localizadas.

Jalisco es una las entidades con más personas desaparecidas, al tener a 9.413 personas pendientes de localizar, de acuerdo con el Sistema de Información Sobre Víctimas de Desaparición del Gobierno del estado.

A nivel nacional, México acumula un total de 73.201 personas desaparecidas y 3.978 fosas clandestinas.•

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEWS RELEASE
WWW.EPA.GOV/NEWSROOM

EPA Proposes Cleanup Plan to Address Soil and Groundwater Contamination at the Riverside Industrial Park Superfund Site in Newark, New Jersey

Contact: Sonia Mohabir, (212) 637-3241, mohabir.sonia@epa.gov

NEWARK, N.J. (July 22, 2020) – The U.S. Environmental Protection Agency (EPA) is proposing a cleanup plan for the Riverside Industrial Park Superfund site on the banks of the Passaic River in Newark. The proposed plan includes a combination of technologies and methods to address the cleanup of contaminated soil, sewer water, waste and groundwater at the site.

"EPA previously took action to prevent further release of hazardous chemicals into the river by plugging a discharge pipe and addressing the tanks that were the source of the release at the Riverside Industrial Park site," said **EPA Regional Administrator Pete Lopez.** "Today, after an extensive investigation of this industrial park with the New Jersey Department of Environmental Protection, we are proposing what we believe are the best methods to clean up the contamination and maintain the protection of public health over time."

The Riverside Industrial Park Superfund site is located on a 7.6-acre active industrial property. Beginning in 1903, industrial operations that included the manufacturing of paint, varnish, linseed oil and resins started. After 1971, the site was subdivided into 15 lots, some of which have ongoing business operations. The sources of soil and groundwater contamination include historic site operations, accidental spills, illegal dumping, improper handling of raw materials and/or improper waste disposal.

EPA's proposed cleanup plan addresses contaminated soil, soil gas (gas trapped in the soil), groundwater, sewer water and waste at the site. In consultation with NJDEP, EPA is proposing the following actions based on an evaluation of various alternatives:

- Off-site disposal, capping and taking other precautionary measures to protect people from soil contaminated with metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs). Lead-contaminated soil and fill in the vicinity of Building #7 would be excavated and disposed of off-site. The bulkhead would be reinforced or reconstructed and a cap would be placed over contaminated areas. In addition, deed notices will be recorded and fencing will be maintained and enhanced, as appropriate, across the site.

- Assessment of potential soil gas impacts on indoor air in buildings on the site and implementation of engineering and institutional controls. Sub-slab soil gas and/or indoor air quality will be assessed in existing buildings at the site and, if needed, vapor systems would be installed to protect future occupants from vapor intrusion. Buildings constructed in the future would include a vapor barrier or vapor intrusion mitigation system to protect occupants. EPA would ensure that site-wide deed notices and appropriate restrictions are established or amended to provide notice of certain property-use restrictions.

- Treatment of contaminated groundwater impacted by metals, VOCs, SVOCs and fuel-related constituents. In addition to targeted in-place treatment, installation of a pump and treat system would bring contaminated groundwater to the surface where it will be treated before it is discharged. Institutional controls would be used to prevent potable use of the contaminated groundwater.

- Removal and off-site disposal of sewer water. Sewer water contaminated by chlorinated organic chemicals and solids from a defunct sewer line would be transferred into appropriate containers or transport vehicles for off-site treatment and/or disposal along with proper closure of the sewer line.

- Removal and off-site disposal of waste**.** Waste from underground storage tanks (USTs), contaminated soil around the USTs and various non-hazardous wastes found across the site would be transferred into appropriate containers or transport vehicles for off-site treatment and/or disposal.

The Riverside Industrial Park site includes both current and former manufacturing and packaging facilities at 29 Riverside Avenue in Newark, New Jersey. The site covers approximately 7 acres and contains a variety of industrial buildings, some of which are vacant. In 2009, at the request of NJDEP, EPA responded to an oil spill into the Passaic River that was eventually traced to two basement storage tanks in a vacant building on the site. The state and the City of Newark requested EPA's help in assessing the contamination at the site and performing emergency actions to identify and stop the source of the spill. EPA investigated and discovered that chemicals including benzene, mercury, chromium and arsenic were improperly stored at the site. EPA took immediate actions to prevent further release of these chemicals into the river in the short-term. The site was added to the Superfund National Priorities List of the country's most hazardous waste sites in 2013, and in 2014 an agreement was signed with PPG Industries, Inc. to perform the study of the site.

As part of the public comment period, EPA will hold a virtual public meeting on the proposed plan on August 5, 2020 at 7:00pm. Please register in advance of the meeting by visiting https://epa-riverside-proposed-plan.eventbrite.com or by emailing Shereen Kandil, Community Involvement Coordinator, at kandil.shereen@epa.gov or calling her at (212) 637-4333. Anyone interested in receiving a hard copy of the proposed plan or the materials for the public meeting should contact Shereen Kandil with such a request by Thursday, July 30, 2020.

Written comments on EPA's proposed plan may be mailed or emailed to: Josh Smeraldi, Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 18th Floor, New York, New York 10007-1866 or smeraldi.josh@epa.gov. Comments postmarked up until **August 21, 2020**, will be accepted.

To view EPA's proposed plan for the site or for more information, please visit www.epa.gov/superfund/riverside-industrial

Follow EPA Region 2 on Twitter at http://twitter.com/eparegion2 and visit our Facebook page, http://facebook.com/eparegion2

20-048

Mail

FROM A1

Robert Duncan to testify.

Murphy announced last week that the state would send ballots to all 6.2 million registered voters due to the coronavirus pandemic, though there would still be opportunities to vote in person.

A $25 billion allocation for the Postal Service is part of the House-passed $3.4 trillion stimulus bill, which Senate Republicans have not taken up.

"The last thing we should be doing is politicizing the Postal Service," Democratic governor said on "Fox News Sunday. "Think about the seniors who rely on it for medicines, our veterans, our small businesses, the commerce associated with the backbone of this country.

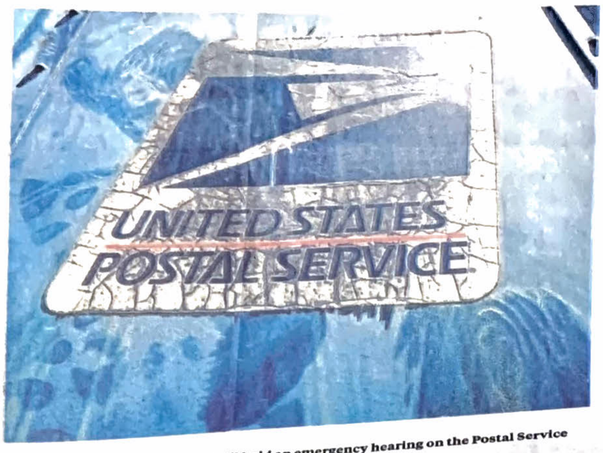
"We need to fund the Postal Service. We need to root for its success as opposed to the opposite."

Trump on Saturday said decisions like Murphy's to expand mail voting were contributing to the Postal Service's problems.

"They didn't know anything about this," Trump said at a press conference at his Bedminster golf club, where he spending the weekend. "How does a Postal Service that doesn't know about it, now all of a sudden, New Jersey is supposed to take out, and millions of ballots are going to be sent all over New Jersey?"

DeJoy has restructured the Postal Service, decommissioning machines, cutting overtime and changing work rules that postal workers say have had the effect of slowing down mail delivery.

The Postal Service also has apparently removed some mailboxes from streets, although it is not clear if they were already scheduled to be removed. In Morristown, a truck was seen carrying several mailboxes, and Mayor Timothy Dougherty's office said on the town's Facebook page that he was not told about any scheduled removals or replacements.



The House Oversight Committee will hold an emergency hearing on the Postal Service next Monday. *Bonnie Jo Mount, Associated Press*

Rep. Mikie Sherrill, D-11th Dist., said Dougherty later told her that one box had been replaced. She said she would look into the issue.

"I'd like to understand right now why we're seeing our mailboxes on the back of trucks being taken out of our city," Sherrill told NJ Advance Media.

Sen. Cory Booker also weighed in on the issue Sunday.

"What concerns me is an all-out attack — they're not even hiding it — by the president of the United States to undermine the United States Postal Service, to underfund it, to allow a mega-donor leading it to overtly do things to slow down the mail, put a chokehold on this institution and make it very difficult for states to do what they need to do to ensure that Americans will have the freedom to vote amidst the pandemic," U.S. Sen. Cory Booker, D-N.J., said on CNN's "State of the Union."

Rep. Bill Pascrell Jr., D-9th Dist., has asked state Attorney General Gurbir Grewal to convene a grand jury to begin an investigation of whether Trump and Postmaster General Louis DeJoy, a major donor to the president, are "participating in or have participated in the subversion of New Jersey state elections."

House Democrats also have a conference call scheduled for today to decide what they want to do next regarding the Postal Service.

"Congress has to get right back in session and investigate this," Sherrill said. "Everyone in elected office has a duty to ensure fair elections. We really need to stand up now and ensure we're supporting our Post Office system."

Murphy's predecessor as governor, Chris Christie, said New Jersey and other states don't have the equipment in place to count a deluge of mail-in ballots.

> **"I'd like to understand right now why we're seeing our mailboxes on the back of trucks being taken out of our city."**
>
> *Rep. Mikie Sherrill, D-11th Dist.*

"The county clerks aren't ready for this across this country to process all of these ballots in a timely fashion," Christie said on ABC's "This Week. "If we do this, we will be waiting weeks to find out who the president of the United States is."

He criticized Murphy for deciding to send out ballots to everyone.

"In our home, my home state of New Jersey, we still have people waiting in line six, seven, eight hours at motor vehicle to get licenses and registrations and license plates," Christie said. "Our governor is permitting that, but, somehow, to stand in line to vote is much too dangerous. But standing in line that the motor vehicle is OK?

"It seems to me we have our priorities backwards in that regard, at least here in New Jersey and in other states that are trying to do the same thing."

White House Chief of Staff Mark Meadows said on CNN he would "guarantee right now" that Trump was not going to stop Americans from voting by mail.

Meadows also told CNN that DeJoy said that postal employees would work overtime to make sure ballots are delivered on time.

Trump on Saturday praised DeJoy for his actions as postmaster general.

"The steps that he is taking are trying to stop the tremendous losses that have taken place for many, many years, Trump said. "He's trying to streamline the Post Office and make it great again. OK?"

Trump has opposed efforts like New Jersey's to automatically send ballots to every registered voter, expressing concerns over fraud.

A 2017 study by the Brennan Center for Justice at New York University found that the rate of voter fraud for mail-in ballots was 0.00004% to 0.0009%.

Jonathan D. Salant, NJ Advance Media jsalant@njadvancemedia.com

EPA
United States Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) is extending the public comment period for the Riverside Industrial Park Proposed Plan, which identifies EPA's preferred cleanup alternatives for addressing contamination at the site. EPA's proposal addresses contaminated soil, groundwater, and vapor intrusion as well as waste removal and cleaning out an inactive sewer to prevent an uncontrolled release of contaminants to the environment. A 30-day public comment period on the Proposed Plan began on Wednesday, July 22, 2020 and will now be extended to Monday, September 21, 2020. As part of the public comment period, EPA held a virtual public meeting on the Proposed Plan on August 5, 2020 at 7:00-9:00 p.m.

The Proposed Plan, public meeting materials, and other site documents are available on EPA's website: www.epa.gov/superfund/riverside-industrial. The public can also contact Shereen Kandil, EPA's Community Involvement Coordinator at 212-637-4333 or kandil.shereen@epa.gov, with any questions. Written comments on the Proposed Plan must be postmarked no later than **September 21, 2020** and may be mailed to Josh Smeraldi at EPA Region 2 Office, 290 Broadway, New York, New York 10007 or sent electronically to the following address: smeraldi.josh@epa.gov. The Administrative Record file containing the documents used or relied on in developing the alternatives and preferred cleanup plan is available for public review at the following information repository: USEPA Records Center, 290 Broadway, New York, New York 10007.

$109.48

8/17/2020

#NuestrosPaíses
#México

El fiscal general de El Salvador, Raúl Melara, dijo que está investigando las irregularidades en el manejo de fondos para atender la pandemia.

Sortear el coronavirus entre la basura

Seis organizaciones de 'pepenadores' se reparten las zonas del vertedero en busca de objetos para rescatar

El vertedero tiene cerca de 30 hectáreas y recoge los desechos de 1.2 millones de personas. /EFE

Eduard Ribas i Admetlla/EFE
NEZAHUALCÓYOTL

Amada lleva 35 años subsistiendo de recolectar y revender basura de un gigantesco vertedero de las afueras de la capital mexicana. Un arduo trabajo que ahora hace con guantes y cubrebocas, lo que ha evitado hasta el momento que haya contagios de COVID-19 entre sus compañeros.

Con cerca de 30 hectáreas y un millar de toneladas de basura al día, Neza III es la tercera prolongación del tiradero al aire libre de Nezahualcóyotl, municipio de los suburbios de Ciudad de México, que acoge los desechos de 1.2 millones de personas.

Entre las colinas de desperdicios no hay residuos hospitalarios, pero el nuevo coronavirus puede estar entre los restos de comida, plástico, ropa, muebles y objetos varios que los pepenadores (recolectores de basura) exploran sin descanso.

Rastrear pese a la pandemia

El coronavirus no ha roto la rutina de Amada Odilón, quien a sus 49 años acude a diario a este basurero a espaldas del aeropuerto capitalino para recoger plásticos y cartones que revende por 100 pesos (unos 4.5 dólares) o incluso 200 (9 dólares) en los días en que la suerte le sonríe.

Eso sí, a la gorra, capucha y sombrero de paja que siempre lleva para protegerse del sol, ahora le añade el obligado tapabocas para evitar que el virus le juegue una mala pasada, aunque el sofoco sea insoportable.

"Es demasiado cansado, es muy agotador. Ahorita con el cubrebocas uno suda y sube todo el vapor. Estamos como sardinas aquí sudando", cuenta con una risa de resignación.

Desde que llegó el virus al país, que roza los 500,000 contagios y los 55,000 muertos, se lava "constantemente" las manos y no teme infectarse, pues procura mantener la "sana distancia" con sus compañeros.

El sacrificio parece que ha dado resultado, puesto que según las autoridades no se han detectado contagios entre los 250 pepenadores que entran cada día al basurero para realizar un trabajo que la mayoría hace por herencia de sus familias.

Un trabajo familiar

Amada conoció el vertedero de pequeña, cuando acompañaba a su tía pepenadora para recoger juguetes. "Me gustó y ya no me fui de aquí", cuenta risueña esta mujer, cuyos dos hijos estudian y no les interesa el basurero.

"Es una herencia que ha existido desde hace muchos años. Aquí fueron sus abuelos o papás y son hijos o nietos de la gente que llegó, y no son parte de la administración", cuenta Jaime Ruiz, responsable de la recolección de desechos de Nezahualcóyotl.

Poco a poco van llegando los camiones del ayuntamiento que abocan las cosas que la sociedad no quiere y que ansían los pepenadores.

A raíz del cierre de las escuelas y de oficinas, los residuos que llegan a Neza III han bajado de 1,200 toneladas diarias a cerca de 800 toneladas. Es decir, menos ingresos para los recolectores.

Empujados por la necesidad, muchos se arremolinan alrededor de los camiones y no mantienen la distancia entre los demás, puesto que la regla no escrita es que el primero que toca algo se lo queda.

De todas formas, el uso de tapabocas y guantes es generalizado, puesto que así lo obliga el ayuntamiento, que también ha dividido los horarios de llegada de camiones y ha instalado surtidores con desinfectante en los vehículos.

"Tratamos de comentar con los compañeros que es importante que traten lo menos posible de andar en la calle o estar en reuniones con el menor grupo de gente", comenta Ruiz, quien sostiene que la "colaboración" de los recolectores ha sido vital.

Sin excusas

Desde una destartalada cabaña de madera y con la analítica mirada propia de sus 84 años de vida, Román Sierra observa minuciosamente el trabajo de sus compañeros.

Es el líder de una de las seis organizaciones de pepenadores que trabajan en el vertedero bajo una estricta lealtad y respeto hacia las zonas que corresponden a cada grupo.

Algunos rastrean las áreas más próximas a la puerta, mientras que otros se desplazan en moto a las zonas más alejadas del basurero, uno de los pocos de México que divide los residuos orgánicos de los inorgánicos.

"Aquí no hay discusiones ni pleitos, al pleito que veo los saco para afuera", comenta don Román, quien no permite a sus 40 pepenadores que beban ni fumen al lugar para prevenir incendios.

Sostenido gracias a un bastón, recuerda cuando con sus propias manos cargaba la basura en carretas, que luego fueron sustituidas por caballos y motocicletas.

Ahora con la pandemia, ha llegado un nuevo cambio pero mantiene la disciplina que le hizo crecer en el duro mundo de los pepenadores: "Todos aquí llevan tapabocas. Aquí no hay excusas de que 'no lo traje o se me olvidó'. Si no lo traes, no trabajas. Así es", sentencia.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEWS RELEASE
WWW.EPA.GOV/NEWSROOM

EPA Extends Public Comment Period on Proposed Cleanup Plan to Address Soil and Groundwater Contamination at the Riverside Industrial Park Superfund Site in Newark, New Jersey

Contact: Sonia Mohabir, (212) 637-3241, mohabir.sonia@epa.gov

NEWARK, N.J. (August 18, 2020) – The U.S. Environmental Protection Agency (EPA) has extended the public comment period to **September 21, 2020** on its proposed cleanup plan for the Riverside Industrial Park Superfund site on the bank of the Passaic River in Newark. The proposed plan includes a combination of technologies and methods to address the cleanup of contaminated soil, soil gas (gas trapped in the soil), groundwater, sewer water and waste at the site.

"EPA previously took action to prevent further release of hazardous chemicals into the river by plugging a discharge pipe and addressing the tanks that were the source of the release at the Riverside Industrial Park site," said **EPA Regional Administrator Pete Lopez.** "Today, after an extensive investigation of this industrial park with the New Jersey Department of Environmental Protection, we are proposing what we believe are the best methods to clean up the contamination and maintain the protection of public health over time."

The Riverside Industrial Park Superfund site is located on a 7.6-acre active industrial property that includes both current and former manufacturing and packaging facilities. Beginning in 1903, industrial operations started at the site that included the manufacturing of paint, varnish, linseed oil and resins. After 1971, the site was subdivided into 15 lots, some of which have ongoing business operations. The sources of soil and groundwater contamination include historic site operations, accidental spills, illegal dumping, improper handling of raw materials and/or improper waste disposal.

In 2009, at the request of NJDEP, EPA responded to an oil spill into the Passaic River that was eventually traced to two basement storage tanks in a vacant building on the site. The state and the City of Newark requested EPA's help in assessing the contamination at the site and performing emergency actions to identify and stop the source of the spill. EPA investigated and discovered that chemicals including benzene, mercury, chromium and arsenic were improperly stored at the site. EPA took immediate actions to prevent further release of these chemicals into the river in the short-term. The site was added to the Superfund National Priorities List of the country's most hazardous waste sites in 2013, and in 2014 an agreement was signed with PPG Industries, Inc. to perform the study of the site.

EPA held a virtual public meeting to explain and receive comments on the proposed plan on August 5, 2020 at 7:00 pm.

Written comments on EPA's proposed plan may be mailed or emailed until **September 21, 2020** to: Josh Smeraldi, Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 18th Floor, New York, New York 10007-1866 or smeraldi.josh@epa.gov.

To view EPA's proposed plan for the site or for more information, please visit www.epa.gov/superfund/riverside-industrial

Follow EPA Region 2 on Twitter at http://twitter.com/eparegion2 and visit our Facebook page, http://facebook.com/eparegion2

20-054

Water

FROM A8

water handouts.

Shortly after the results of the filter study were made public, Baraka gave a fiery, defiant speech defending the city's handling of the lead crisis at a town hall in the New Jersey Performing Arts Center.

"We will never concede that we allowed people to drink the water without telling them," Baraka said at the time, as press releases and the mayor did indeed, while brandishing a stack of mailers and being cheered on by supporters. The confused." by the pledge that "some people may have gotten city's earlier messaging about the issue.

PROGRESS MADE

The breakthrough That's when what happened this July.

eral standards for became official that Newark met fed- lead in the first half of 2020. After three years — six consecutive six-month monitoring periods — of high lead levels, the Brick City had tangible results to celebrate.

"This is not an opportunity for us to say the lead issue in Newark is finished," Baraka said at a July 2 press conference. "However, it's our opportunity to share good news in the spirit of all of the craziness that has been going on for a long time."

The city has replaced more than 14,800 lead service lines as of Friday, according to the city's website. Baraka planned a press conference today to announce the city was entering its final phase of the lead line replacement program.

Adeem said that at the peak of work, city contractors were replacing up to 125 of the lines daily. That rate slowed to about 60 lines per day in the spring, when safety concerns related to COVID-19 slowed the crews, he added.

McCabe applauded Newark's lowered lead levels, and the rapid replacement of the lead service lines.

"I think it was the best outcome that we could've predicted within this timeframe, and I think that all goes to the good here," McCabe said.

There is still more testing to be done.

Newark has set up a system to test the water of every home that gets a lead service line replacement six months after that work is done, Adeem said. Those follow-up tests are automatically mailed to the homeowner at the six-month mark. It is up to the homeowner to collect the water sample and mail it back to the city for testing.

Adeem estimates that more than 4,000 of these follow-up tests have been mailed by the city so far. Of those, he said about 2,000 have been returned, and only a handful have shown houses that still have high lead levels. In those cases, he added, it is possible that there is still lead in the home's plumbing.

"Part of our follow-up is making sure they're following the procedures we laid out when we replaced their lead service line," Adeem said. "Did you change the aerator? Are you still using the filter? Are you still flushing the water in the morning? Things like that."

As part of ongoing community outreach, Adeem said the city would begin posting messages at bus stops and on billboards urging residents to test their water.

Not everyone is happy with the work done so far. Diaz said he believes many community members have had their trust in city water fundamentally shaken, and he doubts that can be restored.

He added that the Newark Water Coalition wants to see lead levels go lower, and investment in special education and mental health programs in Newark to handle what he describes as the fallout of the water crisis.

"I think that Newark has made a lot of progress, but obviously, social justice warrior here, they haven't gone far enough for me," Diaz said. "And one of the things that I talk about all the time is how this issue, it's been going on since 2016 so you're talking about four years of trauma, of poisoning, of health issues that people now have to live with for the rest of their lives on."

But the progress made so far in Newark's water infrastructure is widely seen as a win for the city, and one that might be able to be replicated elsewhere. It even drew praise from the NRDC and the NEW Caucus, even as the organizations remain engaged in their court battle with the city.

"Newark is definitely making progress in fixing its water system," said Erik Olson, senior strategic director for health at NRDC. "By completing the work — replacing all lead service lines, optimizing the water treatment, and ensuring filters are being used properly — Newark may emerge as a role model for other communities struggling with lead in drinking water. We are also hopeful that this effort could help pave the way for a statewide plan to help communities across New Jersey to replace their lead service lines."

Michael Sol Warren, NJ Advance Media, mwarren@njadvancemedia.com

CITY OF HACKENSACK, COUNTY OF BERGEN

NOTICE OF MOUNT LAUREL FAIRNESS HEARING

PLEASE TAKE NOTICE that on October 22, 2020, beginning at 10:00 a.m., the Honorable Gregg A. Padovano, J.S.C. will conduct a "Fairness Hearing" in in the Matter of the Application of the City of Hackensack, in the County of Bergen bearing Docket No: BER-L-5731-15 ("the Action") at the Bergen County Courthouse located at the Bergen County Justice Center, Courtroom 331, 10 Main Street, Hackensack, NJ 07601. Please note that if the courthouse is still closed to the public at that time due to COVID-19, the hearing may take place via video conference. Information about courtroom closings are available at njcourts.gov, and if the court is still closed at that point, any interested party should contact the office of Nancy L. Holm, Esq., Surenian, Edwards & Nolan, LLC, at 732-612-3100 at least 48 hours in advance of the hearing to obtain instructions on how they can participate.

Fair Share Housing Center ("FSHC"), a public interest organization representing the housing rights of New Jersey's low and moderate-income households and interested party in connection with the above-referenced lawsuit, has sought to enhance opportunities for low & moderate income housing in the City of Hackensack. The City of Hackensack and FSHC have resolved various substantive issues concerning Hackensack's affordable housing "fair share" and the means by which the City intends to satisfy those obligations, subject to all required public hearings. The terms of the settlement have been memorialized in the formal Settlement Agreement referenced above.

The terms of the settlement include, but are not limited to, the following:

1. Hackensack's "Rehabilitation" obligation is 582.
2. Hackensack's "Prior Round" obligation is 201.
3. Hackensack's allocation of the "Round 3" (1999-2025) regional need is 0.

Satisfaction of the Rehabilitation Obligation: The City has a 582-unit Rehabilitation obligation, and has/shall satisfy that obligation as follows:

a) The Housing Authority of City of Hackensack has rehabilitated the following units.

Project	Total Units	COAH Eligible Units*
Barsalona Court	50	48
Harry Berkie Gardens	100	98
Oratam Court	144	133
Ostrowski Court	50	46
Windhall Towers	100	100
79 Campbell Ave	1	1
70 Cedar Ave	2	2
83 Linden Street	1	1
135 Ricardo Pl	1	1
73 Vanderbeek	1	1
Total Units Rehabilitated Since 2010	450	431
Balance of Rehabilitation Obligation		151

*due to HUD income standards v. Region 1 income standards

b) The remainder of the rehabilitation obligation shall be satisfied by participating in the Bergen County Home Improvement Program.

Satisfaction of the Prior Round and Round 3 Obligation: Hackensack has a 201-unit Prior Round Obligation, and will satisfy that obligation as follows:

Housing Type	Project/Address	Year Built	Units	Rental Bonus	Total Credits
Family For-Sale	Clinton Terrace Condos	1994	22	0	22
Family For-Sale	Pulaski Place Condos	1982	4	0	4
Family For-Sale	Franklin Garden Condos	1984	2	0	2
Senior Rental	Patrick DiZenzo Court	1982	50*	0	50
Supportive/Special Needs	AAH Bergen County 266 Spring Valley Ave (Group Home)	1995	3		3
Supportive/Special Needs	Advance Housing 279 Clark Street (Group Home)	1999	2		2
Supportive/Special Needs	Advance Housing 10 Orchid Street (Group Home)	1999	2		2
Supportive/Special Needs	Advance Housing 451 Heath Place (Group Home)	1999	2		2
Supportive/Special Needs	Bergen & Passaic ARC (Group Home)	1980	4	0	4
Supportive/Special Needs	Comprehensive Behavioral Healthcare 298 Jackson St	1988	7		7
Supportive/Special Needs	Community Action for Independent Living	1996	5		5
Supportive/Special Needs	NJ ARC Bergen-Passaic Unit 279 Lookout Avenue	1980	6	0	6
Family Rental (Proposed)	100% Affordable Project	Proposed	60	51**	111
TOTAL			163	51**	214

*Maximum 25% cap on age-restricted units
** 25% Rental bonus cap

Municipally-Sponsored Project: 60-unit family rental project

a) The City of Hackensack is currently considering the following 60-unit, 100% affordable, family rental projects to satisfy its prior round obligation.

i. **251 West Railroad Avenue Family Apartments:** Greater Bergen Community Action, Inc. has partnered with Pennrose to build a 42-unit family rental project on this City-owned parcel. Greater Bergen/Pennrose is looking to increase the project to 60 units to satisfy the City's prior round obligation.

ii. **Hackensack Housing Authority (HHA):** Prior to the Compliance Hearing in this matter, the City will enter into a Memorandum of Understanding with the HHA supporting the HHA's efforts in building a 60-unit, 100% affordable project within the City.

iii. **Housing Authority of Bergen County (HABC):** HABC is proposing a mixed-use, 100% affordable project along Hudson Street.

iv. **"Arena Diner" Project by Hampshire Properties (250 Essex Street, Block 232, Lot 1.01):** Hampshire Properties is a current redeveloper of a project in the Main Street Rehabilitation Area, and has expressed interest in providing a 100% affordable project on what is known as the "Arena Diner" site, located at 250 Essex Street (Block 232, Lot 1.01).

The Settlement Agreement shall be placed on file for public inspection and copying during regular business hours at the Office of the City Clerk, City of Hackensack, 65 Central Avenue, Hackensack, NJ 07601. Due to the current COVID-19 pandemic, copies of the Settlement Agreement and all relevant documents can be requested via email from the City Clerk, listed below.

Any interested party, including any low- or moderate-income person residing in the housing region, any organization representing the interests of low- and moderate-income persons, any owner of property in the City of Hackensack, or any organization representing the interests of owners of property in the City of Hackensack may file comments on, or objections to, the proposed Settlement Agreement. The City requests that all objections provide: 1) A clear and complete statement as to each aspect of the municipality's Settlement Agreement contested by the objector; 2) An explanation of the basis for each objection; 3) Copies of all such expert reports, studies, or other data relied upon by the objector. Such comments or objections, together with copies of any supporting affidavits or other documents, **must be filed in writing,** on or before October 11, 2020 at 4:00 p.m. with the Honorable Gregg A. Padovano, J.S.C. at Bergen County Courthouse located at the Bergen County Justice Center, Courtroom 331, 10 Main Street, Hackensack, NJ 07601, with copies of all papers being forwarded by mail or e-mail to:

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Surenian, Edwards & Nolan, LLC
707 Union Avenue, Suite 301
Brielle, NJ 08730
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Deborah Karlsson, City Clerk
City of Hackensack
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Oakland, NJ 07436
skleinman@cgajlaw.com

This Notice is intended to inform all interested parties of the existence of the proposed Settlement Agreement and the possible consequences of Court approval of the Settlement Agreement, which may ultimately lead to a Judgment of Compliance and Repose or the judicial equivalent of a grant of Substantive Certification pursuant to the New Jersey Fair Housing Act, N.J.S.A. 52:27D-301 to -329. It does not indicate any view by the Court as to the merits of the City's Mount Laurel Declaratory Action, the fairness, reasonableness, or adequacy of the proposed settlement, or whether the Court will approve the Settlement Agreement.

9/21/2020 $813.44

Rebate

FROM A1

coronavirus.

Nearly 1.6 million New Jersey workers have filed unemployment claims since the start of the pandemic in mid-March.

State Sen. Steven Oroho, R-Sussex, said if what the state's Democratic leaders are looking for is an economic recovery, cutting out seniors is a mistake.

"They like to have disposable income and spend it. They like to go out and frequent our small business, Main Street shops. That's blood running through the veins," said Oroho, who pushed in 2016 to quadruple the gross income tax exclusion for pension and retirement income. "That's where you get the multiplier effect of things."

Asked why childless families were excluded from the tax break, a spokesman for state Assembly Speaker Craig Coughlin, who forged the deal, said: "We believe two-parent families and especially single-parent families are most in need of assistance as they provide food, clothing and shelter for their children."

There's plenty of help for all demographics in the governor's proposed budget, spokesman Kevin McArdle said, mentioning the Earned Income Tax Credit, the Child and Dependent Care Tax Credit.

There's also nearly $500 million for the Homestead and Senior Freeze property tax credits, he noted.

Murphy similarly called the tax rebate "one piece" of his "stronger and fairer" agenda.

"We have an enormous amount of investments into the folks who are living below the poverty line, who are up against it, whether it's the environmental justice bill today, whether it's the notion of baby bonds, whether it's that health care premium that we have now taken the disproportionate amount to direct to folks who could not prior to this afford or access health care," Murphy said Friday during his latest coronavirus briefing in Trenton.

Samantha Marcus, NJ Advance Media, smarcus@njadvancemedia.com

Brent Johnson, NJ Advance Media, bjohnson@njadvancemedia.com

The City of Linden announces the sale of 2019 and prior year delinquent taxes and other municipal charges through an on-line auction on October 23, 2020. For a listing of all parcels, delinquencies and costs, please visit:

https://linden.newjerseytaxsale.com/
****information can be viewed free of charge****

9/21, 9/28, 10/5, 10/13/2020 $154.56

EPA
United States Environmental Protection Agency

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9/21/2020 $109.48

#Nacional
#Supremo

El candidato demócrata Joe Biden vinculó la pandemia de COVID-19 con la posible confirmación del candidato que Trump designe para cubrir una vacante en el Tribunal Supremo, en un intento de volver a poner el foco del debate electoral en la gestión del mandatario de la crisis sanitaria.

Aumentan voces que rechazan nombrar nueva jueza antes de las elecciones

Jesús García

Las senadoras republicanas Susan Collins y Lisa Murkowski. /ARCHIVO.

Dos republicanas rechazan votar por reemplazo de Trump para el Supremo

La anticipada batalla política para definir al reemplazo de la jueza Ruth Bader Ginsburg, quien murió el viernes víctima del cáncer, está escalando rápidamente y los pasos decisivos fueron dados por dos republicanas de alto rango en el Senado: Susan Collins (Maine) y Lisa Murkowski (Alaska).

El presidente Donald Trump afirma que los republicanos tienen la obligación constitucional de nombrar a un reemplazo de la jueza Bader Ginsburg –quien se ha vuelto un icono de los derechos civiles y la igualdad en EEUU–, pero Collins y Murkowski afirmaron que no participarán en cualquier votación sobre el tema antes de las elecciones.

"Durante semanas dije que no apoyaría llenar una vacante potencial en la Corte Suprema cerca de las elecciones. Lamentablemente, lo que entonces era hipotético es ahora nuestra realidad, pero mi posición no ha cambiado", dijo Murkowski.

Recordó que en 2016 rechazó aprobar la nominación del juez que reemplazara al magistrado Antonin Scalia cuando había un mayor periodo para tomar esa decisión, por lo que ahora incluso resulta más justificable su postura.

"Ahora estamos aún más cerca de las elecciones de 2020, menos de dos meses antes, y creo que se debe aplicar el mismo estándar", expresó.

El sábado, la senadora Collins consideró necesario que los electores tuvieran fe en sus representantes, sin importar el partido político, y aunque el presidente Trump tenga el derecho de nominar a una nueva jueza –como lo adelantó el mandatario– y el Comité Judicial también pueda avanzar en la revisión de las credenciales de dicha propuesta, ella considera que no debe tomarse una decisión antes del 3 de noviembre.

"Dada la proximidad de la elección presidencia, como sea, no creo que el Senado deba votar una nominación antes de la elección. Para ser justos con los estadounidenses, quienes reelegirán al Presidente o elegirán a uno nuevo, la decisión de una posición de por vida en la Corte Suprema deberá ser hecha por el Presidente que gane la elección del 3 de noviembre", expresó.

En su mitin del sábado en Carolina del Norte, el presidente Trump dijo que la próxima semana tomará una decisión y será por una mujer.

"Presentaré una nominada la semana que viene. Será una mujer", dijo escuetamente.

Aunque es menos mediática que varios de sus compañeros, la senadora Murkowski tiene un alto rango en la bancada republicana del Senado, donde preside el Comité de Energía y Recursos Naturales, además de tener injerencia en los comités de Asignaciones; de Salud, Educación, Trabajo y Pensiones, además de ser miembro de alto rango del Comité de Asuntos Indígenas.

En tanto, Collins es parte del Comité Selecto de Inteligencia y del Comité de Apropiaciones.

El líder del Senado, Mitch McConnell afirmó que se asegurará de que haya una votación para nombrar a quien supla la posición dejada por Bader Ginsburg.

El proceso puede avanzar sin problema, ya que no hay impedimento legal para ello, aunado a que los republicanos tienen control del Comité Judicial, presidido por Lindsey Graham (Carolina del Sur).

El sábado y ayer, decenas de manifestantes acudieron a la vivienda de McConnell, para exigirle que detenga cualquier esfuerzo para nombrar a una nueva jueza.

Los demócratas rechazan el nombramiento en el Supremo, pero enfrentan críticas debido a sus intenciones en 2016 de que el presidente Barack Obama nombrara al sustituto de Scalia y ahora defiendan retrasar la elección.

Cabe recordar que al final, el presidente Obama no nombró al sustituto del juez que murió aquel año y había sido nombrado por Reagan.

Quién es la jueza favorita de Trump para la Corte Suprema

Su nombre es Amy Coney Barrett. En 2017 fue confirmada como jueza del Séptimo Circuito de Apelaciones. Es de convicciones conservadoras en contra del aborto.

Es una de las mujeres que lidera la lista de posibles nominadas por el presidente para ocupar la posición que dejó la jueza Ruth Bader Ginsburg. Además de Barrett, el presidente Trump considera a la jueza hispana Bárbara Lagoa, pero ésta tiene menos posibilidades.

Los republicanos califican a Barrett como una "conservadora confiable", ya que es una católica devota y considera que "la vida comienza en la concepción".

A los 48 años, Barrett sería el juez más joven en la Corte Suprema, donde no sería ninguna novata, ya que trabajó para el difunto juez Antonin Scalia después de graduarse de la Facultad de Derecho de la Universidad de Notre Dame.

Barrett nació y creció en Nueva Orleans, está casada con Jesse Barrett, un ex fiscal federal adjunto con quien tiene siete hijos. **J.G.**

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEWS RELEASE
WWW.EPA.GOV/NEWSROOM

EPA Again Extends Public Comment Period on Proposed Cleanup Plan to Address Soil and Groundwater Contamination at the Riverside Industrial Park Superfund Site in Newark, New Jersey

Contact: Sonia Mohabir, (212) 637-3241, mohabir.sonia@epa.gov

NEWARK, N.J. (September 21, 2020) – The U.S. Environmental Protection Agency (EPA) has extended the public comment period a second time to **October 21, 2020** on its proposed cleanup plan for the Riverside Industrial Park Superfund site on the bank of the Passaic River in Newark. The proposed plan includes a combination of technologies and methods to address the cleanup of contaminated soil, soil gas (gas trapped in the soil), groundwater, sewer water and waste at the site.

The Riverside Industrial Park Superfund site is located on a 7.6-acre active industrial property that includes both current and former manufacturing and packaging facilities. Beginning in 1903, industrial operations started at the site that included the manufacturing of paint, varnish, linseed oil and resins. After 1971, the site was subdivided into 15 lots, some of which have ongoing business operations. The sources of soil and groundwater contamination include historic site operations, accidental spills, illegal dumping, improper handling of raw materials and/or improper waste disposal.

In 2009, at the request of NJDEP, EPA responded to an oil spill into the Passaic River that was eventually traced to two basement storage tanks in a vacant building on the site. The state and the City of Newark requested EPA's help in assessing the contamination at the site and performing emergency actions to identify and stop the source of the spill. EPA investigated and discovered that chemicals including benzene, mercury, chromium and arsenic were improperly stored at the site. EPA took immediate actions to prevent further release of these chemicals into the river in the short-term. The site was added to the Superfund National Priorities List of the country's most hazardous waste sites in 2013, and in 2014 an agreement was signed with PPG Industries, Inc. to perform the study of the site.

EPA held a virtual public meeting to explain and receive comments on the proposed plan on August 5, 2020 at 7:00 pm.

Written comments on EPA's proposed plan may be mailed or emailed until **October 21, 2020** to: Josh Smeraldi, Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 18th Floor, New York, New York 10007-1866 or smeraldi.josh@epa.gov.

To view EPA's proposed plan for the site or for more information, please visit www.epa.gov/superfund/riverside-industrial

Follow EPA Region 2 on Twitter at http://twitter.com/eparegion2 and visit our Facebook page, http://facebook.com/eparegion2

20-064

Weed

FROM A1

A recent poll found 75% of potential voters had not seen any ads for the question, and that some 30% of voters did not know the question was on the ballot.

Brindle also initially predicted more funding would go toward digital advertising, where the main campaign coalition in favor of legalizing has put their efforts.

Even with less funding than expected, the legal marijuana question has already pushed its way into the top 10 costliest in state history. Nearly all of the money has gone to the pro-legal marijuana effort. One group that opposes legal weed, Don't Let NJ Go to Pot, has raised just under $10,000, according to the latest filings.

For the past three years New Jersey lawmakers, activists and lobbyists, along with Gov. Phil Murphy, have put marijuana front and center in political conversations. They have highlighted how police continue to arrest 100 people a day for marijuana possession, a disproportionate number of whom are Black. And they've touted the job creation and new tax revenue the industry could bring, particularly if New Jersey beats its neighbors in Pennsylvania and New York to the punch.

"I think there's more general social acceptability in New Jersey with respect to marijuana," said Ariel Alvarez, an associate professor of political science and law at Montclair State University. "It's been at the forefront of New Jersey politics. The people who would otherwise throw money at this, the dispensary people, the people from California and these folks that are in the throes of getting financial benefits, they know they're ahead."

That funding so far comes largely from two marijuana industry leaders and the ACLU-NJ. So far, "big weed" companies, including several that operate medical marijuana companies in the Garden State, have kept their distance from the race.

The medical cannabis companies benefit from a stunted playing field in New Jersey. The state's medical marijuana program has ballooned in number of patients, enrolling more than 90,000. Yet only 12 companies hold licenses to operate, three of which have not yet opened their doors.

Legalization would bring some 1 million new customers to the dispensaries, but also usher in greater competition and likely a drop in prices. The longer the 12 can dominate the market, the more they stand to gain.

"Some of the pushback that we're getting is something to the effect of how there is that reluctance to expand the market," said Amol Sinha, executive director of the ACLU-NJ and member of NJ CAN 2020, a campaign coalition of doctors, activists and business interests in support of the question.

"That's just disingenuous, altogether," he said. "For people to say that they believe in cannabis and then not allow for the growth of cannabis or the growth of the industry is just hypocritical."

One medical company, Delaware-based Compassionate Care Research Institute, which does business as the medical marijuana dispensary Garden State Dispensary, did drop $10,000 into the NJ CAN 2020 campaign.

The biggest spending came from The Scotts Company, which makes gardening products like ScottsMiracle-Gro and has a marijuana product subsidiary, Hawthrone Gardening Company. It poured $700,000 into the group Building Stronger Communities Action Fund and gave another $100,000 to the NJ CAN 2020 campaign. The company did not respond to a request for comment about the donations.

California-based tech company Weedmaps, which has aligned itself with NJ CAN 2020, also donated $91,000. Still, the ACLU-NJ has funded the majority of NJ CAN's spending, putting $323,446 into the race.

Ballot questions are uncommon in New Jersey, as the state Legislature must place them to voters. In many other states, residents can petition to have propositions put on the ballot.

"New Jersey voters aren't used to this idea of referendum," Alvarez said, noting he believed spending will increase with the aim of capturing newer voters as Nov. 3 draws closer. "I think it's going to be targeted more on younger voters."

While New Jersey's infrequent questions have not drawn much funding in the past, the trend has begun to shift. Last year, a local referendum regarding short-term rental restrictions in Jersey City drew more than $5 million in spending.

With legal marijuana referendums in other states like Arizona, South Dakota and Montana, some industry insiders think pressure elsewhere may have moved spending out of New Jersey.

In South Dakota, committees seeking to pass the ballot question have raised $1 million. The state has about one-tenth the population of New Jersey.

By mid-July, groups had raised some $3.4 million in support of the ballot question in Arizona, while the opposition had $120,000. And groups supporting legalization in Montana raised nearly $7 million by the end of September, and the opposition had $70,000.

"I think a lot of people feel that this is a clear victory for the ballot initiative and therefore they may not feel the need to contribute to this campaign versus other campaigns across the country," said Scott Ruder, president of the New Jersey CannaBusiness Association. "The reality is this: It is nonetheless a campaign. There are fixed costs in running any campaign of any size."

New Jersey's all mail-in election has upended traditional campaigning. Most voters will cast their ballots before Nov. 3, and campaigns have to not just advocate for a question, but remind voters to turn the ballots over to find it.

Brindle says he thinks spending will continue to grow in the final weeks, but not by $20 million.

"I don't think it's going to anywhere come close to what originally was thought would," he said.

PATERSON

Rapper Fetty Wap mourns his brother, 26, killed in Paterson

Rebecca Everett *For The Star-Ledger*

New Jersey rapper Fetty Wap is mourning his younger brother who was shot to death Thursday in their hometown of Paterson.

Twyshon Depew, 26, died at St. Joseph's University Medical Center two hours after someone drove him to the hospital with a gunshot wound, authorities said. They believe he was shot on the 100 block of Lawrence Street about 9 p.m. Thursday.

The Passaic County Prosecutor's Office is investigating and had not announced any arrests as of Sunday.

Fetty Wap, whose real name is Willie Maxwell, posted tributes to his brother "Twy" on social media Sunday.

"I love you lil bro I really thought I could get you out before I ever had to make a post like this," the rapper wrote.

He called Depew his "twin" and shared several photos of them together.

Fetty Wap made it big in 2015 with his breakout hit "Trap Queen." In addition to his commercial success, he has made headlines over the years for throwing thousands in cash to people in Garden State Plaza and filming a racy music video at a Paterson high school.

Anyone with information about Depew's killing is asked to call the prosecutor's office at 1-877-370-PCPO or Paterson police at 973-321-1120. Email tips@passaiccountynj.org.

Fetty Wap at the MTV Video Music Awards in Newark on Aug. 26, 2019. *Getty Images*

EPA
United States Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) is extending the public comment period for the Riverside Industrial Park Proposed Plan, which identifies EPA's preferred cleanup alternatives for addressing contamination at the site. EPA's proposal addresses contaminated soil, groundwater, and vapor intrusion as well as waste removal and cleaning out an inactive sewer to prevent an uncontrolled release of contaminants to the environment. A 30-day public comment period on the Proposed Plan began on Wednesday, July 22, 2020 and will now be extended to Friday, November 20, 2020. As part of the public comment period, EPA held a virtual public meeting on the Proposed Plan on August 5, 2020 at 7:00-9:00 p.m.

The Proposed Plan, public meeting materials, and other site documents are available on EPA's website: www.epa.gov/superfund/riverside-industrial. The public can also contact Shereen Kandil, EPA's Community Involvement Coordinator at 212-637-4333 or kandil.shereen@epa.gov, with any questions. Written comments on the Proposed Plan must be postmarked no later than November 20, 2020 and may be mailed to Josh Smeraldi at EPA Region 2 Office, 290 Broadway, New York, New York 10007 or sent electronically to the following address: smeraldi.josh@epa.gov. The Administrative Record file containing the documents used or relied on in developing the alternatives and preferred cleanup plan is available for public review at the following information repository: USEPA Records Center, 290 Broadway, New York, New York 10007.

$109.48

10/19/2020

SYNOPSIS OF THE AUDIT REPORT OF THE
UNION COUNTY IMPROVEMENT AUTHORITY
FOR THE YEARS ENDED DECEMBER 31, 2019 AND 2018
AS REQUIRED BY N.J.S. 40A:5A-16

NET POSITION

	2019	2018
ASSETS		
Cash and Investments	$ 15,035,973	$ 16,189,718
Accounts Receivable	323,735	240,948
Prepaid Expense	6,343	
Accrued Interest Receivable	2,174,742	2,156,289
Loan Receivable	85,640,000	16,995,000
Mortgage Receivable	11,881,249	12,174,848
Minimum Lease Payments Receivable	186,175,497	204,282,524
Development Costs	3,278,202	3,804,791
Fixed Assets - Net	12,972,792	16,257,006
Deferred Outflows – Pension Related	666,067	914,716
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	$318,154,600	$273,015,840
LIABILITIES AND NET POSITION		
Accounts Payable and Accrued Liability	$ 723,053	$ 366,791
Interest Payable - Serial Bonds	2,174,742	2,156,289
Bonds Payable	260,971,249	206,219,848
Unearned Income	52,280,497	58,602,524
Development Liability	13,890,232	15,279,130
Loan Payable	4,230,000	4,230,000
Net Pension Liability	778,605	843,004
Deferred Inflows – Pension Related	285,982	281,802
TOTAL LIABILITIES AND DEFERRED INFLOWS	335,334,360	287,979,388
Net Position	(17,179,760)	(14,963,548)
TOTAL LIABILITIES, DEFERRED INFLOWS OF RESOURCES AND NET POSITION	$318,154,600	$273,015,840

STATEMENTS OF REVENUES, EXPENSES
AND CHANGES IN NET POSITION
FOR THE YEARS ENDED DECEMBER 31, 2019 AND 2018

	2019	2018
Revenue:		
Project Fees	$ 337,164	$ 336,583
Park Madison Rents	4,040,182	4,086,855
Renewable Energy Projects Rents	1,422,996	1,430,894
County of Union		161,236
Other		1,222,964
Interest Income	9,009,826	9,235,204
	14,810,168	16,473,736
Expenses:		
Operating	(2,669,942)	(2,724,557)
County of Union	(388,166)	
Interest Expense	(10,507,061)	(10,819,970)
Other	(176,997)	
Depreciation Expense	(3,284,214)	(3,464,314)
	(17,026,380)	(17,008,841)
Net Income (Loss)	(2,216,212)	(535,105)
Net Position January 1	(14,963,548)	(14,428,443)
Net Position December 31	$(17,179,760)	$(14,963,548)

COMMENTS AND RECOMMENDATIONS - NONE

The above summary or synopsis was prepared from the report of audit of the Union County Improvement Authority, County of Union, for the years ended December 31, 2019 and 2018. This report of audit, submitted by Suplee, Clooney & Company, Certified Public Accountants, is on file at the Authority's Office and may be inspected by any interested person.

SECRETARY

10/19/2020 $302.68

#NuestrosPaíses
#México

Pocos amigos
El Fideicomiso Fondo de Apoyo Social para Extrabajadores Migratorios Mexicanos 1942 – 1964 es uno de los 109 fondos y fideicomisos que desaparecerían. Aunque cuenta con simpatías entre los diputados, la mayoría tiene un discurso general en contra de esas asignaciones.

Los braceros aseguran que estan dispuestos a seguir peleando hasta las últimas consecuencias. /GETTY IMAGES

México dejará de pagar a los exbraceros al extinguir los fideicomisos

Gardenia Mendoza
MÉXICO

No es algo con dedicatoria especial por parte de Andrés Manuel López Obrador. Pero ocurrirá esta semana: finalizará el programa de pagos simbólicos que subsanaban el robo de dinero por parte del gobierno de México a los exbraceros. Eso si el senado aprueba y él firma la desaparición de los fideicomisos, como ya adelantó.

"El fideicomiso mantenía una esperanza", advirtió Efraín Arteaga, integrante del Movimiento Unificado de exbraceros.

Entre 1942 y 1964, cerca de cinco millones de mexicanos, de diversos estados, fueron contratados para laborar legalmente en los campos agrícolas y ferroviarios de la Unión Americana. En el convenio entre los gobiernos de México y Estados Unidos se determinó que éste último retendría el 10% del salario a los trabajadores y lo trasferiría a una cuenta bajo control del Estado mexicano y así ocurrió.

Luego el dinero desapareció y nadie supo dar cuentas de quién se lo quedó. Hasta la fecha es una deuda histórica tanto la causa como la consecuencia.

El gobierno de Vicente Fox ideó en 2005 el esquema de fideicomiso para dar un tipo de ayuda a los exbraceros y sus familiares que lograran comprobar su estancia en EEUU El proceso se burocratizó, los requisitos se volvieron tortuosos para muchos y la Secretaría de Gobernación sólo logró hacer dos listas de pago.

Luego llegó el sexenio de Enrique Peña Nieto y dejó de aportar desde 2012. Lo borró de una manera muy sencilla: no lo incluyó en el Presupuesto de Egresos de la Federación de cada año. AMLO siguió sus pasos a pesar de sus promesas de campaña de hacer justicia a los migrantes timados.

El fideicomiso creado para los exbraceros se quedó en suspenso con una bolsa de 158,000 millones de pesos (alrededor de $7,900 millones de dólares) en espera de más inyección de presupuesto por parte de la federación y una lista de nuevos beneficiados porque sólo se les había pagado a muy pocos.

Organizaciones de apoyo calculan que sólo se les dio el cheque simbólico por 38,000 pesos (alrededor de $1,900 dólares) al 6% de los afectados.

Efraín Arteaga dice que actualmente en la organización de la que es parte tienen a alrededor de 300,000 exbraceros, muy mayores o sus familiares sobrevivientes que tienen todos los papeles necesarios para reclamar el pago. Son de todas partes del país y están dispuestos a pelearlo ¡hasta las últimas consecuencias!

Rosa Marta Zárate, de la Red Binacional de organizaciones de exbraceros 1942-1964, cuenta que hay otros miles de víctimas que viven en EEUU en las mismas condiciones o peor porque no pueden viajar a México para cumplir con todas las exigencias de la burocracia mexicana.

Recuerda, por ejemplo, a una señora de Las Vegas a quien le detuvieron varias veces el proceso de recepción de documentos para reclamar el dinero de su esposo. "Yo la apoyé para presentar todos los papeles porque era muy complicado para ella. Le decían que llenado mal un formato, que si el nombre no estaba bien escrito y una vez la rechazaron porque en lugar de pagar 19 pesos pagó 18".

—¿Insistimos?— le preguntó.

—Claro que seguimos: cada centavo es una gota de sudor de mi marido.

Batalla decisiva

López Obrador, ha sido enfático en su postura. Para él, quienes están a favor de los fideicomisos en realidad "defienden la corrupción" porque argumenta que éstos eran esquemas de subsidios opacos, denunciados en su momento por la Auditoría Superior de la Federación. Había aviadores (gente que cobraba sin tener el perfil), dinero sin comprobar, sin entender de dónde provenía o de dónde salía…

El presidente ha ido más lejos aún en sus conferencias de prensa matutinas donde ha aprovechado los reflectores para comparar la posible cancelación de los fideicomisos a "una confiscación de bienes por parte de Hacienda".

"Les debería dar vergüenza, deberían ofrecer disculpas, pero es tanta su ambición del dinero, su prepotencia y malas costumbres que enseñan el cobre defendiendo lo indefendible", advirtió.

Con ese mensaje de trasfondo, la mayoría de Morena, su partido, lo respaldó en la Cámara de Diputados donde se aprobó su extinción y pasaron el paquete al Senado, donde se espera una actitud similar para la eliminación.

La semana pasada, activistas de apoyo a los exbraceros se congregaron a las afueras de la Cámara de Senadores en espera de audiencia. Eran unos 40. Desde el interior, algunos legisladores aceptaron el diálogo en grupos de 10 en 10. Pero sólo entró el primero de ellos. La senadora y exmigrante Nestora Salgado les dio un portazo.

En la calle, los braceros hicieron migas con los familiares de personas desaparecidas quienes también pelean su fideicomiso: el que les ha dado un poco de dinero para hacer personalmente las búsquedas ante la inacción de los ministerios públicos del país. Juntos, exbraceros y buscadores lograron interceptar a dos senadores.

José Narro y Noe Rocha les prometieron escucharlos, "ya ven que el presidente dijo que no se preocupen, que va a haber recursos".

Efraín Arteaga dice a que los senadores los van a "madrugar" porque ya están citando a las comisiones para discutirlo y mañana se aprobaría el decreto y la audiencia saldría sobrando. Por eso, los representantes de los braceros volverán a las calles y podrían acudir a la Comisión Interamericana de Derechos Humanos.

Dos discursos

El contrargumento de los exbraceros es que si el congreso extingue el fideicomiso como pretende, el dinero iría directamente a la Tesorería de la Federación para su uso discrecional. "Si antes no había transparencia, en adelante habrá menos".

Los recursos del fideicomiso para los braceros venían de cinco fuentes: el presupuesto de egresos, las aportaciones que a título gratuito realizaban los estados, los beneficios por la la inversión y administración de los recursos y bienes con que contaba dicho Fondo y otros aportes.

La Auditoría Superior de la Federación detectó durante varios años diversas irregularidades en el manejo de esos dineros, pero no se hizo una investigación judicial, ni antes ni ahora. AMLO optó por extinguir el fideicomiso como optó por desaparecer el Programa 3X1 con argumentos similares.

Rosa Marta Zárate, de la organización binacional de ex braceros, reconoce que había corrupción, pero no sólo desde el fideicomiso sino desde el interior de la Secretaría de Gobernación. "Se ponían de acuerdo entre los funcionarios y los abogados y representantes de los braceros y se les cobraba un porcentaje a los viejitos para ponerlos en las listas de beneficiados del programa".

"En una ocasión mandamos a una abogada de la organización a una reunión en un restaurante donde nos hicieron esa propuesta de que se partieran las ganancias entre ellos y nosotros", cuenta.

Zarate concluye que el reto va más allá del fideicomiso porque hay un saldo para los exbraceros y se les debe pagar, independientemente de la forma.

Entonces, dijo, se debe evitar a toda costa cualquier esquema que cueste dinero a los trabajadores, sea por fideicomiso o cualquier otra vía. Al final de cuentas es gente mayor, enferma, pobre y, para colmo, también abusada.●

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEWS RELEASE
WWW.EPA.GOV/NEWSROOM

EPA Provides Additional Time for Public Review of Proposed Cleanup Plan to Address Soil and Groundwater Contamination at the Riverside Industrial Park Superfund Site in Newark, New Jersey

Contact: Sonia Mohabir, (212) 637-3241, mohabir.sonia@epa.gov

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EPA held a virtual public meeting to explain and receive comments on the proposed plan on August 5, 2020 at 7:00 pm.

Written comments on EPA's proposed plan may be mailed or emailed until **November 20, 2020** to: Josh Smeraldi, Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 18th Floor, New York, New York 10007-1866 or smeraldi.josh@epa.gov.

To view EPA's proposed plan for the site or for more information, please visit www.epa.gov/superfund/riverside-industrial

Follow EPA Region 2 on Twitter at http://twitter.com/eparegion2 and visit our Facebook page, http://facebook.com/eparegion2

20-082

Gymnast Riley McCusker, left, is suing Maggie Haney, far right, pictured with Laurie Hernandez. McCusker and another teen say abusive coaching tactics led to serious injury. *Associated Press, Star-Ledger file photo*

Lawsuit

Continues from A1

McCusker and Liszewski previously shared their stories with USA Gymnastics during suspension hearings against Haney. Neither has spoken publicly about the allegations.

M.G. Elite is the team owned by Haney, and Monmouth Gymnastics is a gym owned by coach Levine's mother. During the day, M.G. Elite team members trained at Arena Gymnastics in Hamilton, and during after-school hours trained at Monmouth Gymnastics in Marlboro.

M.G. Elite, Monmouth Gymnastics, and Arena Gymnastics are all named as defendants in both suits, as well as Haney and Levine personally.

A woman who answered the phone at Arena Gymnastics declined to comment Monday morning. A message left at Monmouth Gymnastics was not returned.

Haney was suspended by USA Gymnastics in February; she received an eight-year ban from coaching in April. Levine was suspended pending the outcome of an investigation in March and is not allowed to have unsupervised contact with minors.

In a statement provided by a spokeswoman, Haney denied all allegations against her, and accused McCusker's mother, Jessica, of limiting her daughter's food intake and pushing her to overtrain.

"The timing of the initiation of the suit is not surprising as Haney and USA Gymnastics are expecting a decision shortly on her appeal of the unprecedented suspension previously imposed on her," Lisa Mercurio said.

"I hope Jess knows what she's doing because this situation isn't going to help calm Riley's nerves," Haney said in a statement, citing the upcoming Olympics.

Levine responded to a message left on her cellphone to ask for a reporter's email address, but did not send an emailed statement or respond to a follow-up text message.

Following Haney's suspension, most elite athletes with the M.G. Elite team moved to other gyms. McCusker now trains at Arizona Sunrays in Phoenix.

The alleged abuse plagued McCusker for her entire senior career at M.G. Elite, after her family moved from Connecticut so McCusker could train with one of the Northeast's top coaches, according to the lawsuit.

During the 2017 season, McCusker's first at the senior level, she was forced to train on an injured wrist, an injured hamstring and a fractured hipbone, the suit says. After winning the bronze medal at the National Championships that summer, McCusker was forced to withdraw from the World Championships team in the fall; at the time, Haney said it was due to the wrist injury.

The alleged abuse continued leading into the 2018 season, the suit says. McCusker was forced to train with multiple stress fractures in her foot, and in September 2018, Haney is accused of screaming so loudly into McCusker's ear that she fell on a backflip on the balance beam, causing another injury.

The only year of the Olympic cycle McCusker was healthy enough to qualify for the Worlds team was 2018, when she won a team medal.

Following her success at Worlds McCusker tore a ligament in her shoulder, the suit says, but was forced to train on the injury for several months.

In June 2019, McCusker was diagnosed with rhabdomyolysis, a serious muscle condition frequently linked to overtraining. She continued to train with Haney despite her diagnosis, the suit says, competing at the 2019 U.S. Classic and the Pan American Games in July. This continued training made her condition worse, the suit says.

Two weeks after the Pan American Games, McCusker withdrew from the second day of the 2019 U.S. National Championships after reportedly feeling sick. That would be the end of her season: McCusker withdrew from consideration for the 2019 Worlds team, citing a "mild" case of rhabdomyolysis.

Liszewski was a level 10 gymnast training on the M.G. Elite team when she fractured her skull training, the suit says. Level 10 is the highest level for gymnasts who are not competing on the elite and Olympic-level path.

Liszewski was training on the uneven bars at Arena Gymnastics in April 2016 when Haney and Levine pressured her into doing a skill beyond her ability, the suit says. As a result, Liszewski hit her head on carpet-covered concrete, leaving her unconscious for three days and resulting in a skull fracture and seizures, according to the suit.

Liszewski left M.G. Elite after her injury, training at another top New Jersey club before moving to California.

COUNTY OF ESSEX NEW JERSEY

NOTICE TO BIDDERS
COUNTY OF ESSEX
FAX REQUEST TO: 973 621-5109

Sealed **"Bids", "Request for Proposals" or "Competitive Contracts"** (under the provision of Local Public Contracts Law N.J.S.A 40: A-11-4.1 et seq.) will be opened on the date specified within each document's description by the Purchasing Agent or a designated assistant at 11:00 a.m. prevailing time in Room 348 on the 3rd Floor, Hall of Records, 465 Dr. Martin Luther King, Jr. Boulevard, Newark, NJ 07102;

CC#20-222-Provide 2021 Community and Family Empowerment Program for Essex County Citizen Services-A non-mandatory conference will be held on at Tuesday, December 1, 2020 at 2:30 PM at 50 South Clinton Street, East Orange, NJ 07018 -Due Date: December 8, 2020

Copies of these documents may be obtained by qualified potential bidders/respondents at the Office of Purchasing on the 3rd Floor, Room 335, Hall of Records, 465 Dr. Martin Luther King, Jr. Boulevard, Newark, New Jersey 07102 during regular business hours 9:00 am to 4:00 pm. Except when a fee for drawings and plans is required, **all bid opportunities are available for download at** http://purchasing.essexcountynj.org

Each response shall be submitted in a sealed envelope plainly marked to indicate the name and address of the proposer, the subject of the contract, bid number or Request for Proposal number and date of proposal opening. Responses may either be mailed or delivered in person. Mailed responses will be held and opened at the above specified time and date. Responses received by the Purchasing Agent after the time for opening proposals will be returned unopened. Competitive Contracts/Requests for Proposals are awarded on price and other factors.

The County is not responsible for late delivery by the United States Postal Service or any other carrier.

Bidders and proposers are required to comply with requirements of N.J.S.A. 10:5-31, et. seq., and N.J.A.C. 17:27.

These bids and/or proposals are being solicited through a Fair and Open process in accordance with N.J.S.A. 19:44A-20.4 et seq.

Julius N. Coltre
Director of Purchasing, QPA
County of Essex, Office of Purchasing

11/17/2020 5180.32

COUNTY OF ESSEX NEW JERSEY

ADDENDUM
BID FILE# 20-217

Pursuant to Section 23 of P.L. 1971, c 198 (C. 40A:11-23). Please be advised that an addenda to specifications for Bid#20-217, Provide Office Equipment Repair Service for all Essex County Using Agencies has been issued.

Sealed bids to be received by the County of Essex, Office of Purchasing on Tuesday, November 24, 2020 will now be received and opened on **Tuesday, December 1, 2020** at 11:00 a.m. prevailing time in Room #348, Hall of Records Building, 465 Dr. Martin Luther King Blvd., Newark, N.J. 07102.

Addendum No. 1

1) Additional Equipment Page to be added to bid specifications

11/17/20 $57.96

EPA
United States Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) is extending the public comment period for the Riverside Industrial Park Proposed Plan, which identifies EPA's preferred cleanup alternatives for addressing contamination at the site. EPA's proposal addresses contaminated soil, groundwater, and vapor intrusion as well as waste removal and cleaning out an inactive sewer to prevent an uncontrolled release of contaminants to the environment. A 30-day public comment period on the Proposed Plan began on Wednesday, July 22, 2020 and will now be extended to **Monday, December 21, 2020**. As part of the public comment period, EPA held a virtual public meeting on the Proposed Plan on August 5, 2020 at 7:00-9:00 p.m.

The Proposed Plan, public meeting materials, and other site documents are available on EPA's website: www.epa.gov/superfund/riverside-industrial. The public can also contact Shereen Kandil, EPA's Community Involvement Coordinator at 212-637-4333 or kandil.shereen@epa.gov, with any questions. Written comments on the Proposed Plan must be postmarked no later than **December 21, 2020** and may be mailed to Josh Smeraldi at EPA Region 2 Office, 290 Broadway, New York, New York 10007 or sent electronically to the following address: smeraldi.josh@epa.gov. The Administrative Record file containing the documents used or relied on in developing the alternatives and preferred cleanup plan is available for public review at the following information repository: USEPA Records Center, 290 Broadway, New York, New York 10007.

11/17/2020 $244.48

"We have to be sure that we create concrete pathways that will take someone from the street corner to the storefront."

State Sen. Teresa Ruiz, D-Essex

Bill

Continues from A1

the disproportionate impact on Black and brown communities who are arrested for marijuana?" she said.

State Sen. Nicholas Scutari, D-Union, noted that the bill does not decriminalize psilocybin mushrooms, but regrades the penalties. Under the legislation, a first-time offender could see a six-month jail sentence for possessing 1 ounce of mushrooms. It currently can carry a prison sentence of three to five years.

State Sen. Teresa Ruiz, D-Essex, who sponsored the bill, said she did not want to hold the bill any longer, and that language around expungement can be addressed at a later time.

"I still have to think about the person who is on the street corner who could get detained," she said, noting there have been arguments about how much marijuana the Legislature should decriminalize. "And yet, two blocks down, where there will be a legal storefront, that individual could push out pounds of (marijuana) once we determine what the process looks like."

"We have to be sure that we create concrete pathways that will take someone from the street corner to the storefront," she said.

The Assembly must pass the bill, too, before it heads to Gov. Phil Murphy's desk.

In June, the full Assembly passed a bill that would have stopped arrests for possessing up to 2 ounces of marijuana and instead levied a fine of $50 for those caught with the drug.

Another bill, which would have decriminalized possession of up to 1 pound of marijuana, was introduced to the Senate around the same time. But it never moved through the Senate Judiciary Committee, causing frustration among its sponsors.

Instead, the Senate Judiciary Committee chair, Scutari, had said he wanted to hold the bill until after voters considered a referendum to legalize marijuana. It began to move through committees after the Garden State came out overwhelmingly in support of legalizing marijuana via a referendum.

But that meant changes to the Assembly bill. The two met in the middle to decriminalize 6 ounces of marijuana.

Lawmakers have moved swiftly following the ballot question's passage, which did not immediately legalize marijuana. They must still pass a bill that will launch the marijuana industry, outlining its regulations on licenses, businesses and products.

And they must pass a separate bill to decriminalize possession of the drug to stop arrests as they await full legalization. For racial justice advocates, this is one of the key parts of reforming marijuana laws: Police arrest Black people 3.5 times more often than white people for marijuana offenses, according to the ACLU.

It's not clear how soon lawmakers can pass legislation to jump-start the marijuana industry. The sponsor of that bill, Scutari, had hoped to have a bill before both chambers of the Legislature on Monday as well.

But the one he introduced earlier this month did not earmark sales tax revenue from marijuana sales for programs in minority communities disproportionately affected by the drug war. In initial hearings last week, advocates criticized the bill for the oversight, and lawmakers delayed additional hearings scheduled for Thursday.

Scutari has said he will consider an additional tax on marijuana cultivators and explicitly direct funds to those communities.

A source in Murphy's administration who requested anonymity said Monday there is an agreement with top legislative leaders and sponsors to add a tax on cultivators. The tax would be broken down into four tiers that would rise as the price of cannabis drops, the source said.

"We are still working on it," said the source, "but there is agreement" that it will be included in the bill. This was one of Murphy's most significant concerns with the bill — that it did not raise enough revenue.

The postponed hearings have yet to be rescheduled.

NJ Advance Media staff writer Susan K. Livio contributed to this report.

Amanda Hoover, NJ Advance Media, ahoover@njadvancemedia.com

#Frontera
#AyudaHumanitaria

Para más información sobre la organización Border Angels y cómo hacer donaciones, visita su pagina web en: **www.borderangels.org/**

Los voluntarios muestran las bolsas de ropa que dejan en diversos caminos del desierto. / FOTOS: SUMINISTRADAS.

Ropa abrigadora que salva vidas

Organización busca donaciones para ayudar a los inmigrantes en la frontera a soportar las bajas temperaturas en su camino al 'norte'

Manuel Ocaño
ESPECIAL PARA IMPREMEDIA

Un grupo de activistas de San Diego, California, reúne ropa abrigadora para ir a dejarla a las montañas y desiertos en la frontera de California, donde la puedan encontrar migrantes que cruzan indocumentados desde México.

"Es una región de clima extremo", dijo Dulce García, la directora de la organización Ángeles de la Frontera. "Mientras que en el verano veíamos temperaturas por arriba de los 120 grados [Fahrenheit], ahora que comienza el frío bajan a niveles congelantes".

Por lo menos 8,300 migrantes han muerto en la frontera desde que la patrulla fronteriza coloca muros y ha desplegado operativos permanentes. La cifra es de la misma patrulla, pero el conteo comenzó en 1998 —años después de que los migrantes comenzaron morir a lo largo de la frontera.

El objetivo de la patrulla es disminuir los cruces fronterizos o hacerlos más difíciles, al desviarlos a zonas remotas e inhóspitas, como una manera e disuadir que los migrantes intenten cruzar.

No obstante, aunque la estrategia sí ha hecho más arduo el camino, no ha reducido los cruces, de acuerdo con Ángeles de la Frontera. En la época de frío, muchos quedan expuestos a heladas e incluso algunos perecen por hipotermia o congelamiento.

Para prevenir más fallecimientos, la organización reúne donativos para llevar a los 'corredores de migrantes' —término como se conoce a las rutas que recorren los indocumentados para tratar de evadir detenciones de parte de la patrulla.

Estos caminos, son precisamente algunas de las zonas más calurosas en el verano y más frías en el otoño e invierno.

¿Qué artículos llevan?

En los corredores de migrantes, "dejamos suministros para el clima frío, como gorros, guantes, calentadores de manos, calcetines, camisas de franela, camisas térmicas y chaquetas ligeras que los migrantes se pueden colocarse en capas, unas piezas sobre otras, para abrigarse", explicó dijo James Cordero.

Cordero, quien coordina el proyecto de Ángeles de la Frontera desde hace años, indica que a esos mismos sitios también se llevan galones de agua y suero oral, para que los migrantes encuentren esos suministros en su camino.

Ahora, en el mismo recorrido, el equipo comienza a llevar la ropa abrigadora que dona la comunidad —unas prendas que pueden salvar vidas.

Mediante ese plan de "prevención por disuasión" [de la patrulla fronteriza], la gente ha tenido que cruzar no solo en el calor extremo, sino también en el frío extremo", expresó.

Peor aún, "con el cambio climático, cada año las temporadas calientes o frías se ponen cada vez más intensas que el año anterior", dijo Jacqueline Arellano, una de las principales integrantes del equipo que lleva la ayuda a desiertos y montañas.

Dulce García explicó que por lo general los migrantes visten ropa ligera de algodón y calzado deportivo que es insuficiente para protegerse del clima frío y el viento helado, tanto en las montañas como en los desiertos.

Dulce García:

"Mientras que en el verano veíamos temperaturas por arriba de los 120 grados [Fahrenheit], ahora que comienza el frío, bajan a niveles congelantes".

"También pedimos, a quienes deseen apoyar, donativos de alimentos que ayuden a los migrantes a conservar energía y enlatados, pero que sean fáciles de abrir, que no necesiten de abrelatas", explicó.

El grupo confirma, cada vez que hace su recorrido, que los migrantes han logrado encontrar la ayuda que dejan a su paso en la frontera.

"Lo sabemos porque cada vez que llevamos la ayuda, de regreso traemos los desechos que los migrantes dejaron al comer y beber... Y [lo que dejan] al desempacar la ropa que llevamos", dijo García.

Una nueva Administración no garantiza nada

Ahora, con el cambio de administración —tras proyectar como presidente electo al demócrata Joe Biden— la migración indocumentada podría tenerse en un concepto un tanto más humanitario.

Sin embargo, el grupo advierte que aún con los cambios de gobierno, se sigue sin reducir la estrategia de prevenir con disuasión.

Cordero y Arellano consideran que "[así tengamos] una nueva administración presidencial o continuos acuerdos bipartidistas sobre operativos o la construcción de vallas fronterizas, no esperamos cambios".

"Por eso seguiremos saliendo, semana tras semana a llevar ayuda a las montañas y desiertos", dijo Cordero.

La directora de los Ángeles de la Frontera dijo temer que, después de 10 meses sin audiencias para asilo, muchos de los migrantes que aguardan en la frontera mexicana podrían desesperarse y tratar de cruzar la frontera con sus hijos.

Esa posibilidad, dijo, hace más urgente que la gente ayude con donativos para protegerlos del frío.•

Para ayudar

- Si deseas colaborar con los Ángeles de la Frontera a recaudar ropa abrigadora, puedes comunicarse a la oficina en San Diego al correo electrónico: admin@borderangels.org o al número telefónico 1(619) 487 0249.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEWS RELEASE
WWW.EPA.GOV/NEWSROOM

EPA Provides Additional Time for Public Review of Proposed Cleanup Plan to Address Soil and Groundwater Contamination at the Riverside Industrial Park Superfund Site in Newark, New Jersey

Contact: Stephen McBay, mcbay.stephen@epa.gov, (212) 637-3672

NEWARK, N.J. (November 20, 2020) – The U.S. Environmental Protection Agency (EPA) has extended the public comment period a fourth time to **December 21, 2020** on its proposed cleanup plan for the Riverside Industrial Park Superfund site on the bank of the Passaic River in Newark. The proposed plan includes a combination of technologies and methods to address the cleanup of contaminated soil, soil gas (gas trapped in the soil), groundwater, sewer water and waste at the site.

The Riverside Industrial Park Superfund site is located on a 7.6-acre active industrial property that includes both current and former manufacturing and packaging facilities. Beginning in 1903, industrial operations started at the site that included the manufacturing of paint, varnish, linseed oil and resins. After 1971, the site was subdivided into 15 lots, some of which have ongoing business operations. The sources of soil and groundwater contamination include historic site operations, accidental spills, illegal dumping, improper handling of raw materials and/or improper waste disposal.

In 2009, at the request of the New Jersey Department of Environmental Protection, EPA responded to an oil spill into the Passaic River that was eventually traced to two basement storage tanks in a vacant building on the site. The state and the City of Newark requested EPA's help in assessing the contamination at the site and performing emergency actions to identify and stop the source of the spill. EPA investigated and discovered that chemicals including benzene, mercury, chromium and arsenic were improperly stored at the site. EPA took immediate actions to prevent further release of these chemicals into the river in the short-term. The site was added to the Superfund National Priorities List of the country's most hazardous waste sites in 2013, and in 2014 an agreement was signed with PPG Industries, Inc., to perform the study of the site.

EPA held a virtual public meeting to explain and receive comments on the proposed plan on August 5, 2020 at 7:00 pm.

Written comments on EPA's proposed plan may be mailed or emailed until **December 21, 2020** to: Josh Smeraldi, Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 18th Floor, New York, New York 10007-1866 or smeraldi.josh@epa.gov.

To view EPA's proposed plan for the site or for more information, please visit www.epa.gov/superfund/riverside-industrial

Follow EPA Region 2 on Twitter at http://twitter.com/eparegion2 and visit our Facebook page, http://facebook.com/eparegion2

20-090

RETAIL SHIPPING

Storm may delay some Christmas gift deliveries

Mail services have been hampered by the storm across the Northeast. *Michael Mancuso, for The Star-Ledger*

Rebecca Everett *For The Star-Ledger*

If you're sending or receiving a lot of packages in the days before Christmas, you may have already been checking for delivery updates daily and reading with concern the news about possible delays due to overwhelming demand, all during a pandemic that has sickened essential workers.

Now add to that, a big nor'easter that dumped snow on Mid-Atlantic shipping hubs and highways a week before Christmas.

It's certainly not going to help things at all. But is the storm going to mean some of your holiday packages won't arrive on time?

So far, of the biggest shipping companies, only UPS has announced that the storm is negatively impacting their operations during the busiest time of year.

"Weather conditions around our regional hub in Philadelphia, Pennsylvania caused a disruption to operations. As a result, some shipments may experience unavoidable delays. Contingency plans are in place and UPS is working to move shipments to their final destinations as quickly as conditions permit," the company said in a service alert Thursday.

Amazon said shoppers in areas affected by the snow may see slower delivery estimates when they're checking out.

Satish Jindel, president of Pennsylvania-based ShipMatrix, which analyzes shipping package data, said he would expect to see the biggest problems for any shipping company that has their air operations impacted by snow or ice. For UPS, one of those hubs is in Philadelphia.

Travel restrictions also kept trucks and trailers off sections of seven major highways in New Jersey from 1 p.m. Wednesday till 11 a.m. Thursday.

Even without the travel restrictions, Jindel said ground transportation can be impacted just by drivers going slower in bad weather.

"What that means is a trip that would have taken 10 hours now takes 12, and it just snowballs from there," he said.

FedEx, which has shipping hubs in Newark and the Lehigh Valley, both of which got a lot of snow, has not announced any delays.

George Flood, a spokesman for the U.S. Postal Service in North Jersey, said mail services have been impacted by the storm across the Northeast.

"With 6 to 12 inches of snow on the ground here in Northern New Jersey, it is important to bear in mind that the Postal Service treats safety and service with equal priority," he said. "We are currently flexing our available resources as possible and advancing deliveries in the aftermath of the snowstorm in those Northern New Jersey communities and neighborhoods where it is safe to do so."

He said 358 of the 385 post offices in North Jersey were open Thursday. Residents can improve their chances of getting packages in a timely manner by making sure their mailboxes haven't been plowed in and are clear of snow.

Representatives of the postal service and shipping companies have urged people to keep an eye on shipping deadlines this year more than ever, due to the fact that more people are shopping online and sending gifts as they choose not to travel or go to brick-and-mortar stores.

Jindel said the USPS is doing its best to deal with the glut of packages that have been exacerbated by shipping companies limiting the number of parcels a company can ship with them. The postal service isn't allowed to do the same, so companies just send all those extra parcels via USPS, he said, adding to the crush of shipments at the holidays.

"While every year the Postal Service carefully plans for peak holiday season, a historic record of holiday volume compounded by a temporary employee shortage due to the COVID-19 surge, and capacity challenges with airlifts and trucking for moving this historic volume of mail are leading to temporary delays. These challenges are being felt by shippers across the board," the USPS said in a statement.

Many of those deadlines have already passed. For USPS Priority Mail Express service and First-Class Mail service should be sent by Friday, all Priority Mail by Saturday and any Priority Mail Express packages sent by Dec. 23.

UPS ground shipment deadlines vary and are listed on the company's website.

FedEx ground deadlines have past but other options are still available into next week.

COLLEGE SPORTS

Pay athletes, Booker proposes in new bill

Jonathan D. Salant *For The Star-Ledger*

If U.S. Sen. Cory Booker has his way, college athletes would be paid to play ball and could make money from endorsements.

Booker, who received an athletic scholarship to Stanford University to play football, introduced legislation Thursday to create a College Athletes' Bill of Rights, which would give athletes a share of the profits generated by their sport after accounting for the value of their scholarships. It would also allow them to endorse products and get paid for using their images and likenesses.

"As a former college athlete, these issues are deeply personal to me," Booker said. "The NCAA has exploited generations of college athletes for its own personal financial gain by preventing athletes from earning any meaningful compensation and failing to keep the athletes under its charge healthy and safe."

The New Jersey senator first outlined the measure in August.

Ramogi Huma, president of the National College Players Association, called the measure "an important avenue to fix all that is so broken in college sports."

"NCAA sports systematically strips generational wealth from predominantly Black athletes from lower income households to pay lavish salaries of predominantly white coaches, athletic directors, commissioners, and NCAA administrators," Huma said.

The bill was released as the fall sports seasons, some abbreviated due to the coronavirus pandemic, some with games in empty stadiums, come to an end. At least two college football bowl games have been canceled.

Sign up for Rutgers Sports Insider: Get exclusive news, behind-the-scenes observations and the ability to text message directly with beat writers

Booker's legislation would create a Commission on College Athletics, including former athletes, to make sure current athletes know of the rights and are able to take advantage of them.

The measure also would allow athletes to transfer to another college without penalties such as sitting out a year and extend their scholarships for as long as it takes them to receive a bachelor's degree even if they are no longer eligible to play sports.

It would prevent coaches from steering students into certain courses or majors in order to leave more time for athletics, and create a trust fund to help cover their medical expenses for a sports-related injury for five years after their eligibility expires and to treat long-term injuries such as chronic traumatic encephalopathy (CTE).

In addition, the NCAA would work with the U.S. Department of Health and Human Services and the Centers for Disease Control and Prevention to develop standards for health, safety, and wellness for athletes.

Booker had advocated for paying student-athletes during his unsuccessful campaign for the 2020 Democratic presidential nomination.

UNION COUNTY

New Jersey man stole a least $400K in benefits from Texans, feds charge

A 28-year-old Union County man stole at least $400,000 in unemployment benefits from about 20 people who live in Texas, authorities said.

Maurice Mills, of Union, applied for benefits with New York state in August and September and had the debit cards mailed to New Jersey, the U.S. Attorney's Office for New Jersey said Wednesday in charging him with wire fraud.

All the applications were traced to a single IP address in New Jersey and a telephone number associated with Mills, officials said. Surveillance footage also showed Mills using one of the debit cards mailed to New Jersey to make a withdrawal at a bank, according to court papers.

"The fact that one IP address in New Jersey is making (unemployment) claims to the State of New York for individuals residing in Texas but asking for the (benefits) to be sent to New Jersey indicates that the claims are fraudulent," charging documents state.

He obtained the benefits under the Pandemic Unemployment Assistance, which provided up to $600 a week to people who are not otherwise eligible for unemployment such as the self-employed, independent contractors and gig workers.

Among the items Mills bought with the stolen money was a 2017 Mercedez-Benz, according to court papers.

Jeff Goldman

#Negocios

Ana B. Nieto
Editora
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Cerco a tecnológicas
Texas y nueve estados más han demandado a Google, empresa a la que acusan de trabajar con Facebook de forma ilegal, para ser aún una presencia más dominante en el mercado de publicidad online.

Florida aprobó la subida del salario mínimo a $15 la hora el pasado 3 de noviembre. /ARCHIVO

Con 2021, vuelven las rondas de subidas de salarios mínimos

Los pequeños negocios argumentan que este aumento llega en el peor momento

Ana B. Nieto

El presidente electo, Joe Biden, se comprometió a subir el salario mínimo federal hasta $15 la hora. Es más del doble del actual que lleva siendo $7.25 la hora desde 2009. Según el Economic Policy Institute, esta subida, cuando llegue será una buena noticia para cada vez menos trabajadores. Solo el 5% de los empleados del país cobraban en 2019 menos de $9 la hora.

Estados, ciudades y empresas con presencia en distintos estados han subido sus salarios escalonada o directamente a $15 en los últimos años y en 2021 está previsto que llegue una nueva subida para muchos de ellos dentro de esta política de aumentos locales o sectoriales.

Según la firma legal Wolters Kluwer Legal & regulatory, 25 estados tienen previstas subidas de estos salarios de los cuales 21 lo harán el 1 de enero. Se trata, en general, de pasos previstos para alcanzar de forma escalonada la cantidad que ha prometido el próximo presidente o se queda cercano a ella. Es el caso de California, Colorado, Maine y Washington y en algunos casos una actualización a la inflación como en Alaska, Minnesota y Montana.

En Florida, el pasado 3 de noviembre se votó que en los próximos seis años suba gradualmente el salario mínimo. Actualmente está en $8.56 y el objetivo es que llegue a $15 la hora independientemente del sector y el número de empleados. En septiembre de 2021 se espera que se recorra el primer tramo del primer cambio: $10.

En estados como Nueva York se ha hecho la subida de forma regional y en los cinco condados de la Ciudad se llegó a los $15 la hora en 2020, ahora son el resto de los condados los que siguen este camino.

Para los pequeños empresarios esto es un reto en un año que ha sido difícil y lo seguirá siendo en 2021 debido a la pandemia.

Costos laborales

Tim Goodrich, director ejecutivo de relaciones con Gobiernos Estatales de la Federación Nacional de Negocios Independientes (NFIB) explica que un tercio de los dueños de pequeños negocios ha revelado en una encuesta publicada esta semana que tendrán que cerrar sus puertas "si las condiciones económicas no mejoran pronto, por lo que no puede ser un peor momento para hacer frente a un aumento en costos laborales".

Desde esta organización se explica que los próximos meses se espera que sean los más difíciles desde los primeros cierres de la primavera y se pide que el Congreso apruebe un alivio un alivio financiero para el invierno. "Los empresarios están lidiando con el mal tiempo y con los efectos de una pandemia que no solo no cesa sino que aumenta y ha reducido la demanda, obligando a cierres o limitaciones en la producción".

Goodrich explica además a este diario que la pandemia ha afectado a ciertos negocios muy duramente, como restaurantes, bares, tiendas al por menor y hoteles. "Estos negocios están apenas manteniéndose y son los que posiblemente estén más impactados por un incremento del salario mínimo lo que crea una tormenta perfecta", lamenta.

El director de esta organización que agrupa a pequeños negocios de todo el país explica que los empresarios pueden no tener más opción que rebajar los costos laborales rebajando las horas de trabajo de los empleados o eliminando empleos y si ninguna de esas dos opciones funciona "porque no puedan operar en esas condiciones, podrían tener que cerrar el negocio".

Si esa es la opción, Goodrich lamenta que sea malo para todos incluida la economía ya que estos negocios pequeños generan el 40% del PIB y dos tercios de los nuevos empleos cuando no hay pandemias, claro está.

Desde la NFIB se explica que elevar el costo de los negocios es inclinar la balanza a un mal lugar más en estos momentos.●

Aumentan muertes en el trabajo

Ana B. Nieto
ana.nieto@impremedia.com

A punto de cerrar 2020 la Oficina de Estadísticas Laborales, BLS, ha hecho público que el año anterior el número de fallecimientos por accidentes y heridas en el trabajo fue el más elevado desde 2007. Un trabajador murió cada 99 minutos por una herida relacionada con su labor en 2019.

En total fueron 5,333 trabajadores los que perdieron la vida el año pasado, un 2% más que el año anterior, de ellos 1,088 eran latinos, el mayor número desde 1992.

En la construcción, sector en el que trabajan muchos latinos se incrementaron un 5% los fallecimientos aunque la situación entre quienes manejan camiones o trabajan en transporte también se han elevado hasta retroceder a las cifras que se registraron en 2003.

Los suicidios y las sobredosis aumentaron también ligeramente con respecto al año anterior.

La confederación sindical AFL-CIO lamenta unas estadísticas que apuntan a que murieron 15 trabajadores cada día. "Esto no incluye el gran número de vidas que se pierden este año con COVID-19 que ha estado mayormente incontrolada en lugares de trabajo, o enfermedades como pulmones negros y silicosis que están al alza", explica el sindicato en un comunicado.●

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEWS RELEASE
WWW.EPA.GOV/NEWSROOM

EPA Provides Continued Time for Public Review of Proposed Cleanup Plan to Address Soil and Groundwater Contamination at the Riverside Industrial Park Superfund Site in Newark, New Jersey

Contact: Stephen McBay, mcbay.stephen@epa.gov, (212) 637-3672

NEWARK, N.J. (December 14, 2020) – The U.S. Environmental Protection Agency (EPA) has extended the public comment period to **January 20, 2021** on its proposed cleanup plan for the Riverside Industrial Park Superfund site on the bank of the Passaic River in Newark. The proposed plan includes a combination of technologies and methods to address the cleanup of contaminated soil, soil gas (gas trapped in the soil), groundwater, sewer water and waste at the site.

The Riverside Industrial Park Superfund site is located on a 7.6-acre active industrial property that includes both current and former manufacturing and packaging facilities. Beginning in 1903, industrial operations started at the site that included the manufacturing of paint, varnish, linseed oil and resins. After 1971, the site was subdivided into 15 lots, some of which have ongoing business operations. The sources of soil and groundwater contamination include historic site operations, accidental spills, illegal dumping, improper handling of raw materials and/or improper waste disposal.

In 2009, at the request of the New Jersey Department of Environmental Protection, EPA responded to an oil spill into the Passaic River that was eventually traced to two basement storage tanks in a vacant building on the site. The state and the City of Newark requested EPA's help in assessing the contamination at the site and performing emergency actions to identify and stop the source of the spill. EPA investigated and discovered that chemicals including benzene, mercury, chromium and arsenic were improperly stored at the site. EPA took immediate actions to prevent further release of these chemicals into the river in the short-term. The site was added to the Superfund National Priorities List of the country's most hazardous waste sites in 2013, and in 2014 an agreement was signed with PPG Industries, Inc., to perform the study of the site.

EPA held a virtual public meeting to explain and receive comments on the proposed plan on August 5, 2020 at 7:00 pm.

Written comments on EPA's proposed plan may be mailed or emailed until **January 20, 2021** to: Josh Smeraldi, Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 18th Floor, New York, New York 10007-1866 or smeraldi.josh@epa.gov.

To view EPA's proposed plan for the site or for more information, please visit www.epa.gov/superfund/riverside-industrial

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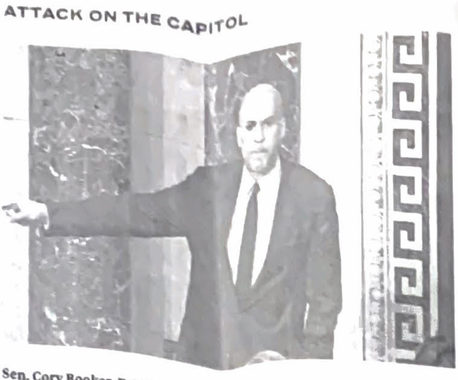
20-094

ATTACK ON THE CAPITOL



Sen. Cory Booker, D-N.J., speaks Jan. 6 as the Senate reconvenes after protesters stormed the Capitol. Associated Press

Booker pushes for Trump impeachment

Jonathan D. Salant For The Star-Ledger

U.S. Sen. Cory Booker said Sunday that the Senate needed to conduct an impeachment trial of Donald Trump even though the president will leave office on Wednesday.

"I believe it is constitutionally dangerous not to proceed," Booker, a Democrat, said on NBC's "Meet the Press." "We just had a president of the United States try to undermine the peaceful transition of power, tried to challenge a fair and free election. And him and his agents from the moments before, from his son to his lawyer, whipping up a crowd to go attack the Capitol. So I believe fundamentally the Senate has an obligation to act."

The Senate will begin the trial after the House sends over the article of impeachment passed last Wednesday, 232-197. No date has been set yet.

In the impeachment vote, 10 Republicans crossed party lines and voted yes. All 10 New Jersey House Democrats voted to impeach Trump, while the state's two Republican representatives voted no.

Booker and Democratic Sen. Robert Menendez are among the 100 senators who will form the jury during the impeachment trial.

"There must be accountability for actions that are this serious and this much of a threat, not just to our Constitution, but to the erosion of our nation," Booker said.

He said the arguments made by the House managers cannot be seen as political if they are to get the 17 Republican senators needed for a two-thirds majority for conviction.

"It has got to be a larger perspective," Booker said. "And the arguments have to come, as I imagine they will, from really the dire issues before us as a nation. Will a president be held accountable for what he did? And what he did was extreme. What he did was historic. What he did was certainly meriting impeachment, and now we have to have a fair trial that I hope the arguments rest, frankly, in the law and on the facts."

Registered voters were split on whether to impeach and convict Trump in an NBC News poll released Sunday, with 50% saying yes and 48% saying no — well within the survey's margin of error of 3.1 percentage points.

In a CNN poll of U.S. adults released Sunday, 54% said Trump should leave office before his term expires Wednesday, with 43% disagreeing, outside of that survey's margin of error of 3.7 percentage points.

Both the CNN poll (34%) and a Pew Research Center survey of U.S. adults released Friday (29%) gave Trump the lowest job approval ratings of his tenure in office.

Booker said the Senate needed to find the time to both conduct a trial and take up President-elect Joe Biden's agenda by confirming his nominees and debating his $1.9 trillion coronavirus stimulus bill.

"I can't think of a president in my lifetime that came to power with so many challenges," Booker said on NBC. "And I think the American people have a right to expect that we can work on a lot of different fronts, from an economic recession, to a pandemic, to national security threats, as well as holding a president accountable who persistently lied to the American people, whipped up far-right wing extremists and incited a riot, an assault and a siege on the United States Capitol."

How quickly the Senate can move on Biden's nominees and his proposals will depend, in part, on Senate Republican Leader Mitch McConnell, Booker said.

Under Senate rules, McConnell, R-Ky., can use parliamentary maneuvers to delay legislative action, just as the Democrats did in December when they tried to force a vote to increase the latest round of stimulus checks to $2,000 from $600.

VAN DREW

Van Drew's 'undying support' to president remains steadfast

Continues from A1

count because "some really, really — if everybody would clear their head and look at this — that some really wrong things did happen."

Trump's allegations of voter fraud, though, were rejected by dozens of judges, then-Attorney General William Barr, and election officials in all 50 states who certified their election results.

More than 50 House Democrats, including Reps. Albio Sires, D-8th Dist., Bill Pascrell Jr., D-9th Dist., and Donald Payne Jr., D-10th Dist., co-sponsored a resolution calling on the House Ethics Committee to investigate Van Drew and the other Republicans who opposed certifying the results and determine whether they should be expelled or face other sanctions.

"Any House members who tried to overturn the election and install a dictator violated the Constitution and should not sit in Congress," Pascrell tweeted.

In his speech opposing Trump's impeachment, Van Drew said: "Nearly half the country supports our current president. This takes their voice away. We must be bigger and better than the most instincts that have been driving our political discourse. It is destroying us."

After being one of only two House Democrats to vote against Trump's first impeachment, Van Drew met with the president in the Oval Office in December 2019 and announced he was switching parties. As photographers snapped away and the national media looked on, Van Drew told Trump that "you have my undying support."

The following month, Trump held a massive rally in Wildwood where he brought Van Drew out on stage and called him "courageous leader."

Van Drew was reelected in November despite being outspent by his unsuccessful Democratic challenger, Amy Kennedy, a member of the iconic political family.

"He really sold himself as someone who would work across party lines," Kennedy said.

On Election Day, Van Drew received a greater percentage of the vote than Trump in every county in the district except Ocean.

"Congressman Van Drew is a strong representative for the people of the 2nd Congressional District," state Republican Chairman Michael Lavery said. "South Jersey knows it can always count on Congressman Van Drew to stand up for what he believes in and fight for his constituents."

Van Drew wasn't exactly in the minority among Republicans who stayed loyal to the president. While 10 House GOP lawmakers voted for impeachment, 187 opposed it. However, an NPR/PBS NewsHour/ Marist Poll released Friday found 58% of Americans blamed the Capitol riot on Trump.

"He swore his dying support to a demagogue rather the Constitution," said Montclair State University political science professor Brigid Callahan Harrison, who unsuccessfully sought the Democratic nomination to take on Van Drew. "He's doubling down. That to me indicates a really baffling level of devotion to this individual. It's a kind of blind allegiance."

Van Drew's actions went "a little bit off-brand," according to John Froonjian, executive director of the William J. Hughes Center for Public Policy at Stockton University.

"How do you feel if you're a voter who always considered Jeff Van Drew as common sense, down to earth, reflecting basic values, and now he is voting on the premise that the election is stolen and there is massive fraud that overturned the real result?" Froonjian said.

"He immediately put out a statement during the siege decrying the violence and he still voted on the falsehoods that sparked it in the first place. Certain facts are now immutable. Certain votes can't be taken back."

Van Drew already is paying a price for his fealty to the president. Several corporations, including AT&T and Comcast, have announced that they are ending political action committee donations to the Republicans who voted to overturn the election results or pausing all contributions. They contributed $46,000 to Van Drew's 2020 re-election.

That doesn't include two Atlantic City casino owners, MGM Resorts and Caesars Entertainment, whose PACs gave $8,500 to Van Drew and are now under pressure from the casino employees' union, Unite Here, to stop funding the GOP lawmakers who voted to overturn the election.

Still, South Jersey is one of the most Trump-friendly areas of the state, said Ben Dworkin, director of Rowan University's Institute for Public Policy and Citizenship.

"He's overreached if he was running statewide but he's not," Dworkin said. "He's running in the 2nd Congressional District, which may be the hospitable place to take that stance."

But Micah Rasmussen, director of Rider University's Rebovich Institute for New Jersey Politics, pointed out that the last South Jersey representative to be so identified with an unpopular president was Republican Rep. Charles Sandman, a fierce defender of Richard Nixon's during Watergate.

Sandman lost reelection in 1974, the year Nixon resigned in disgrace, to Democrat William Hughes, who held the seat until he retired in 1995. A Republican, Frank LoBiondo, then represented the district until he retired and Van Drew was elected in 2018.

This time around, Rasmussen asked: "Has anyone more publicly hitched his wagon to Trump?"

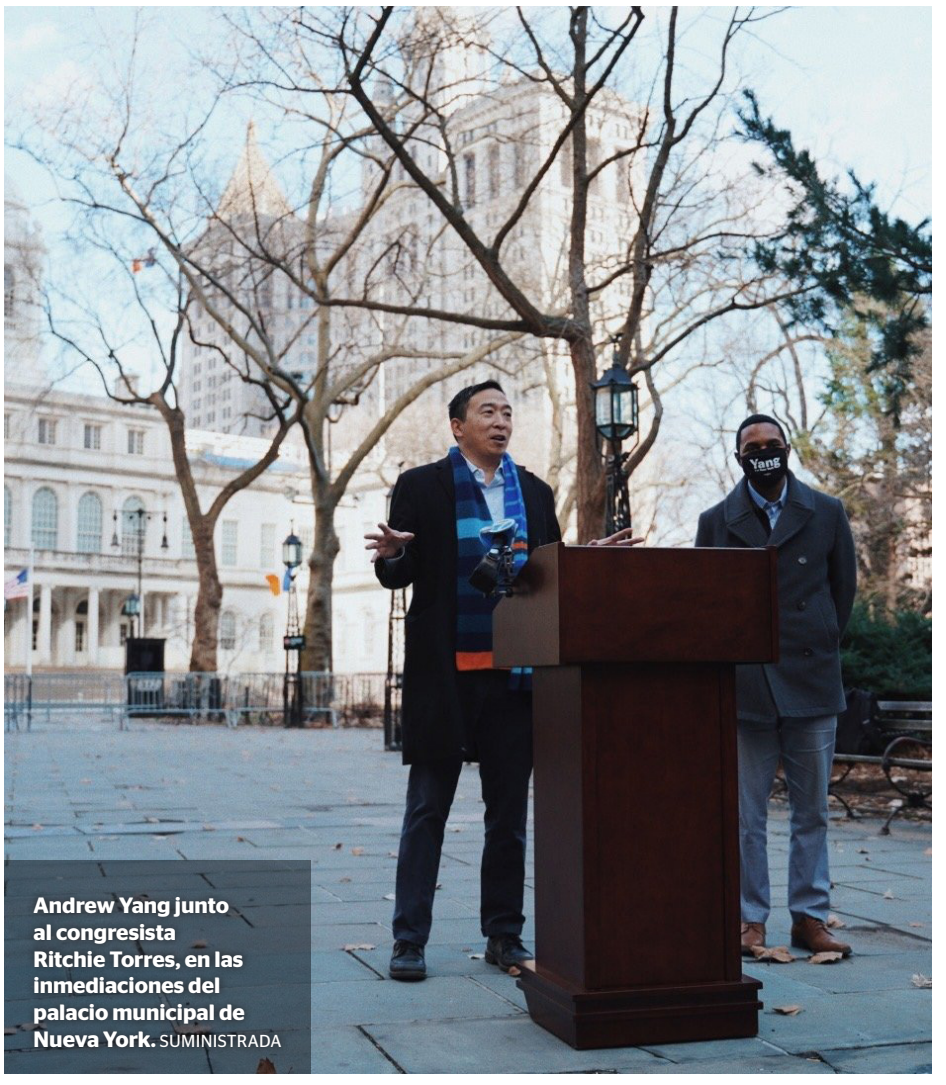
Jonathan D. Salant, NJ Advance Media, jsalant@njadvancemedia.com

#Metro

Hombre electrocutado en estación de Harlem
El NYPD reportó que un hombre desnudo y emocionalmente perturbado murió después de que se peleó con la gente en la estación de la calle 110 de la línea del metro 2/3 alrededor de las 4 p.m. en sábado.

Piden a los grandes bancos que brinden acceso a las comunidades de bajos ingresos e inmigrantes

El candidato a la alcaldía Andrew Yang y el congresista Ritchie Torres de El Bronx abogan para que las entidades financieras acepten el IDNYC como documento válido para abrir una cuenta bancaria



Andrew Yang junto al congresista Ritchie Torres, en las inmediaciones del palacio municipal de Nueva York. SUMINISTRADA

David Ramírez
david.ramirez@eldiariony.com

La ciudad de Nueva York tiene casi un millón de residentes que no tienen una cuenta de banco o no tienen acceso a servicios bancarios. Esta es una desventaja que el candidato demócrata a la alcaldía de la ciudad de Nueva York, Andrew Yang, junto al congresista de El Bronx Ritchie Torres, se han propuesto solucionar.

Yang y Torres plantean que los grandes bancos que permitan que las comunidades de inmigrantes y de bajos ingresos abran cuentas bancarias utilizando IDNYC, el documento de identificación que emite la ciudad de Nueva York.

De acuerdo con ambos líderes políticos, los neoyorquinos que no tienen acceso a los servicios bancarios, dependen en gran medida de servicios como cambio de cheques, tarjetas prepagas o transferencias de dinero. Estos servicios son anticuados y caros, y a menudo les cuestan a los neoyorquinos sin cuenta de banco hasta $ 3,000 en tarifas al año.

1 millón
de neoyorquinos
de bajos ingresos e indocumentados no tienen acceso a servicios bancarios.

Yang prometió que, como alcalde, utilizará el poder de depósito de la ciudad como palanca para hacer que los bancos rindan cuentas ante nuestras comunidades de inmigrantes, negándose a realizar operaciones bancarias con instituciones financieras que no permitan que los neoyorquinos indocumentados abran una cuenta bancaria.

También prometió expandir el IDNYC para que sirva como puerta de entrada a una miríada de servicios de la ciudad, como ayuda en efectivo y acceso a un 'Banco Popular' de la ciudad de Nueva York.

"Es indignante que, en la capital financiera del mundo, casi un millón de inmigrantes y neoyorquinos de bajos ingresos estén excluidos del sistema bancario", dijo el candidato demócrata a la alcaldía de la ciudad de Nueva York. "Como alcalde, prometo utilizar las decenas de miles de millones de dólares que la ciudad deposita en los grandes bancos cada año como palanca para exigir que esos bancos abran sus puertas a los inmigrantes, por lo general indocumentados, que viven en la Gran Manzana".

El candidato que oficializó su postulación la semana pasada, dijo que a medida que avanza sobre su la visión de un 'Banco Popular' en la ciudad de Nueva York, es conveniente garantizar que ningún neoyorquino sea dejado de lado.

"Nos aseguraremos de que, a todos los neoyorquinos, independientemente de su estado migratorio, se les recuerde que pertenecen a nuestros vecindarios, como parte de nuestra economía y como el tejido mismo de lo que hace grande a nuestra ciudad", agregó Yang,

Entre tanto, el flamante congresista Ritchie Torres destacó que para lograr el objetivo de que Nueva York sea vista como una ciudad inclusiva y equitativa, se debe asegurar que todos los neoyorquinos, independientemente de sus ingresos o estatus migratorio, tengan acceso a los servicios financieros que necesitan para prosperar.

"Necesitamos aprovechar el asombroso éxito del programa IDNYC, que ha permitido a los inmigrantes, especialmente, desarrollar un sentido más profundo de pertenencia como neoyorquinos. Sin embargo, los bancos más grandes de la ciudad de Nueva York continúan negándose a aceptar IDNYC como una fuente válida de identificación, excluyendo a los más vulnerables - los pobres y los indocumentados - de nuestro sistema financiero".

Andrew Yang
Candidato a la alcaldía de NYC

«Nos aseguraremos de que, a todos los neoyorquinos, independientemente de su estado migratorio, se les recuerde que pertenecen a nuestros vecindarios, como parte de nuestra economía y como el tejido mismo de lo que hace grande a nuestra ciudad».

Torres que fue concejal del Distrito 15 de El Bronx, una de las áreas más deprimidas económicamente de la ciudad de Nueva York, dijo que se ha unido a Yang para impulsar la iniciativa de que los bancos abran sus puertas a los más vulnerables.

"Necesitamos poner dinero en los bolsillos de los pobres en lugar de permitir que las instituciones financieras depredadoras se lo quiten. No hay lugar para la discriminación financiera en la capital financiera del mundo", subrayó Torres. ●

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEWS RELEASE
WWW.EPA.GOV/NEWSROOM

EPA Extends Public Review of Proposed Cleanup Plan to Address Soil and Groundwater Contamination at the Riverside Industrial Park Superfund Site in Newark, New Jersey

Contact: Stephen McBay, mcbay.stephen@epa.gov, (212) 637-3672,

NEW JERSEY (January 25, 2021) – The U.S. Environmental Protection Agency (EPA) has extended the public comment period to **February 19, 2021** on its proposed cleanup plan for the Riverside Industrial Park Superfund site on the bank of the Passaic River in Newark. The proposed plan includes a combination of technologies and methods to address the cleanup of contaminated soil, soil gas (gas trapped in the soil), groundwater, sewer water and waste at the site.

The Riverside Industrial Park Superfund site is located on a 7.6-acre active industrial property that includes both current and former manufacturing and packaging facilities. Beginning in 1903, industrial operations started at the site that included the manufacturing of paint, varnish, linseed oil and resins. After 1971, the site was subdivided into 15 lots, some of which have ongoing business operations. The sources of soil and groundwater contamination include historic site operations, accidental spills, illegal dumping, improper handling of raw materials and/or improper waste disposal.

In 2009, at the request of the New Jersey Department of Environmental Protection, EPA responded to an oil spill into the Passaic River that was eventually traced to two basement storage tanks in a vacant building on the site. The state and the City of Newark requested EPA's help in assessing the contamination at the site and performing emergency actions to identify and stop the source of the spill. EPA investigated and discovered that chemicals including benzene, mercury, chromium and arsenic were improperly stored at the site. EPA took immediate actions to prevent further release of these chemicals into the river in the short-term. The site was added to the Superfund National Priorities List of the country's most hazardous waste sites in 2013, and in 2014 an agreement was signed with PPG Industries, Inc., to perform the study of the site.

EPA held a virtual public meeting to explain and receive comments on the proposed plan on August 5, 2020 at 7:00 pm.

Written comments on EPA's proposed plan may be mailed or emailed until **February 19, 2021** to: Josh Smeraldi, Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 18th Floor, New York, New York 10007-1866 or smeraldi.josh@epa.gov.

To view EPA's proposed plan for the site or for more information, please visit www.epa.gov/superfund/riverside-industrial

Follow EPA Region 2 on Twitter at https://twitter.com/eparegion2 and visit our Facebook page, http://facebook.com/eparegion2

21-006

APPENDIX V-C

PUBLIC MEETING TRANSCRIPT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
----------X
PUBLIC MEETING
RE: Riverside Industrial Park
Superfund Site in Newark, New Jersey
----------X

Held Remotely Via Skype
August 5, 2020
7:00 p.m.

APPEARANCES:
FOR THE EPA:
JOSH SMERALDI, Remedial Project Manager
SHEREEN KANDIL, Community Involvement Coordinator
KATHRYN FLYNN, Hydrogeologist
MARIAN OLSEN, Human Health Risk Assessor
CHUCK NACE, Ecological Risk Assessor
WILL REILLY, ESQ., Site Attorney
MICHAEL SIVAK, Branch Chief
OSHEA SMITH
PATRICK McGINLEY

FOR WSP:

LEN WARNER
JEFF FREDERICK
ANN RYCHLENSKI

Reported by:
Kari L. Reed
Job #12637

Proceedings

MS. KANDIL: Okay, good evening and welcome to the Riverside Industrial Park Proposed Plan Public Meeting. My name is Shereen Kandil, and I'm the Community Involvement Coordinator for Riverside, and I'll be facilitating tonight's meeting. I do want to go over a couple of logistical information before we get into the actual presentation. And I also will be introducing the team shortly.

We do have a Spanish translation, so if you need it, there's a conference line specific to that. The number is 315-565-0493. The conference ID is 7960512. We've also added it in the chat box on the Skype platform.

We also have closed

captioning available. The link is on your screen, and we have also added it to the chat box.

For any technical issues dealing with Skype or your phone lines, please contact our IT specialist, Patrick McGinley. His email address is mcginley.patrick@epa.gov. It's on your screen, but for those of who you are not doing the presentation, it's M-c-g-i-n-l-e-y-.-p-a-t-r-i-c-k at EPA.gov.

For those of you who are looking at the screen and are on Skype, I just wanted to go over the Skype controls real quickly so that you know how to navigate.

On the top, on the top of your Skype platform there's a

blue control bar and it has like two arrows. That you can use to enlarge your Skype, the Skype meeting. The icon next to it is where you can change the layout between like speaker view and content view.

On the bottom of your Skype screen you have four buttons. There's like a videocamera, a microphone, a screen with an arrow and a red telephone button. The only ones that you really need to worry about are if you have to leave, you can just hang up by clicking on the red button. And then the microphone you'll use to unmute yourselves when we get to the question and comment portion.

Again, Patrick's information is on the screen.

Proceedings

Please do mute your lines. We will be locking the audio lines so that you can't unmute and mute during the presentation. But just for courtesy, please mute your lines so that we don't hear feedback.

So during the presentation, like I said, we're going to be muting the audio lines, and during the question and answer portion we'll unmute it again to allow you to ask your questions or make your comments. The chat box, however, will remain open for any questions or comments relating to the public meeting. When we get to the question and comments portion of our meeting, we'll be unlocking the audio lines, and at that time we'll turn to the chat box first for

questions.

As you may know, the public meeting is being transcribed, so we will need you to identify yourselves for the record. So when you, if you have a question or a comment, when you speak please state your first and last name, your affiliation, and then your question or comment. If you're speaking, you may need to, depending on your name, like my name I would to spell it out, so depending on your name, please spell your first and last name. For example, I would either type or say Shereen Kandil, resident of Staten Island, Where is Riverside located.

After we respond to the questions in the chat box we

Proceedings

will turn to the audio lines. You'll be able to unmute your lines after we unlock it by pressing *6. I will call on you by category and then alphabetically. So, for example, I'll say if there are any elected officials with the last name A through I that have questions or comments, please unmute your lines now. Then I'll go to any elected officials with the last names J to R, then S to Z. Then we'll turn to residents, then businesses, and finally, the general public. I'll go over these instructions again right before we begin that session of our meeting.

But now, to begin, we'll start with introductions. Let's get back to my Skype screen and

get to our team.

So, as I said, I'm Shereen Kandil, the community involvement coordinator for Riverside. We also have with us and presenting to you today Josh Smeraldi, who's our remedial project manager for Riverside. We have also a team of EPA staff who are available to answer questions. We have Kathryn Flynn, hydrogeologist. Marian Olsen, human health risk assessor. Chuck Nace, ecological risk assessor. Will Reilly, site attorney, and Michael Sivak, our branch chief. We also have our contractors available from WSP, AmyMarie Accardi-Dey, Len Warner, Jeff Frederick and Ann Rychlenski.

So now we're going to turn

to our presentation, so I'm going to ask you again to mute your lines. And I'll ask Josh to unmute himself so he can present. Thank you.

MR. SMERALDI: Thank you, Shereen. So thank you everyone for taking the time to come and listen to our presentation on Riverside Superfund Site. I will be walking you through the remedial investigations of the site. I'll talk about the remedial alternatives and EPA's preferred plan for cleaning up Riverside.

So we'll start the discussion on where the site is located. So this site is in the City of Newark in the North Ward, covering, it's kind of isolated and not really

known by too many people, in fact, sandwiched between the Passaic River on the east. Riverside Avenue and McCarter Highway border on the west side of the site. North and south are other industrial and commercial businesses. And Mount Pleasant Cemetery is probably the closest landmark to the site.

Okay, next slide. So, on this slide is a map of the site. The entire site is within the red line. Blue lines outline buildings that are on the site. White lines are the various lots on the site. Each lot has a different owner, and I'll discuss the lots more on the next couple of slides.

Overall this is a 7.6 acre

site that is primarily industrial/commercial. The north side of the site has active businesses. There are cars and trucks coming and going, there are deliveries being made, and there are people working.

On the south side of the site it's mostly vacant and abandoned. There's several buildings on this side, and generally there's just not much activity going on.

So, when evaluating a site, EPA determines the most anticipated future use of the property, because this will affect how it's to be done. If it's expected to be park, there are different requirements compared to an industrial area.

Proceedings

So the way we did this is we looked at the surrounding area, we took input from various organizations in the area, to evaluate what this area will be in the future. So for this site, historically it's been an industrial area for over a hundred years. The areas north and south continue to be used for commercial and industrial purposes. Additionally, Newark's redevelopment plan for the city and their current zoning established by the city is commercial/industrial. So, considering all these points, EPA believes that the most anticipated future use of the site will remain commercial and industrial.

Next slide. So now I'll

get into the history of the site and how it came to be the way it is now. So in the early 1900s this site was actually part of the river. Fill material was brought in to raise the elevation out of the river to create new land. Patton Paint then built their paint manufacturing plant on this piece of land and started their paint manufacturing operation. This plant was used for a variety of pigments and dyes to get the colors that they needed for their paint. Probably the most concerning components used in paint products at that time was lead-based materials. So you'll see lead come up in the future slides.

In 1920, Patton Paint

merged with Pittsburgh Plate Glass. They eventually became known as PPG. Then in 1971 PPG ceased operations at this location, and the site was split up into fifteen different lots.

Okay, next slide. Since 1971 until now there have been several business that have operated and/or continue to operate at each of the lots. These businesses are listed on the slide and I won't get into each one, but I will generally mention that these businesses range from packaging to cosmetics manufacturing to chemical manufacturing or storage. So it's a really wide variety of businesses that have operated at this site. And, like I mentioned before, some

are still active. Some of them went out of business, and the ones that went out of business, these lots may be vacant or abandoned.

The next slide. EPA first became aware of this site when a discharge was reported coming from the site and into the river. This discharge was coming from the southern portion of the site. EPA and the State of New Jersey came in and performed a couple of emergency actions to stop the discharge and remove the imminent threats. This included removing several tanks and containers and various materials.

In 2013 the site was listed on EPA's National Priority List. And in 2014 we came to an

agreement with PPG to study the site. This included a remedial investigation and a risk assessment. And, through these studies, we'll determine the nature and extent of the contamination and the magnitude of the risk.

For the remedial investigation we identified what the contamination is and how it is migrating or moving through the environment. This involved taking several soil and groundwater samples across the site. Indoor sampling was conducted at several occupied buildings. Waste containers, tanks, and sewer manholes were also sampled and analyzed.

So, in the figure on the slide is a -- so in the figure

is, again, a map of the site. But this time they indicated the sampling points and pointed out certain areas of concern. These are the highlighted yellow text dots in the picture. The soil samples are the yellow dots. The groundwater samples are the green dots. As you can see, these samples were collected all across the site in order to identify the nature and the extent of the contamination on the site.

In the pink highlighted area at the center of the site there are several underground storage tanks, and this is where NAPL was founded. NAPL stands for non-aqueous phase liquid, which is a type of liquid that does not mix easily with water.

An example of NAPL is diesel fuel. So PPG used these storage -- used these underground storage tanks to store materials or waste such as paint thinners when they operated at the site. After PPG left, the tanks appeared to have been used to store NAPL. And NAPL has likely leached from the tanks, since NAPL was found in the surrounding soil around the tanks.

NAPL was also found in the southern portion of the site, and it was also found in the basement of a building in the northern portion of the site.

Additionally, there were several containers of waste found abandoned at several points across the site. This is

indicated on the map. The wastes are currently contained, but there's potential for them to be released if they were knocked over or somehow spilled.

Also, there's an inactive sewer manhole. This is near the southern site. Sampling indicated that there is some hazardous substances in the manhole. The sewer line is inactive, and there's no water flowing through it, so right now the contaminated sewer water is contained, but again, there's potential for it.

And lastly, I wanted to talk about the pipe discharge to the river. This is noted in the northern portion of the site along the river. Primarily acetone was coming out of the

pipe and in the groundwater in this area. We determined that this is coming from a currently operating facility at that location, and this is an ongoing spill. So we reached out to the New Jersey Department of Environmental Protection and they took the lead in immediately addressing this concern and stopped the discharge. But we continue to work with New Jersey on ensuring that these concerns are properly addressed and that any actions to address the acetone does not affect the Superfund site going forward.

All right, next slide. So, under the Superfund program, EPA uses risk assessments as a means to assess potential health

effects from exposure to various media for various individuals, and uses this information to make determinations regarding the need to take action. So the risk assessment looks at potential cancer and non-cancer hazards for individuals who may be on the site and exposed to contamination of soil, groundwater or vapors from the contaminated media. The assessment looks at who may be exposed, for example, outdoor workers, construction workers, and others who may be exposed to soil while maintaining the property. Exposure may be through accidental ingestion, contact or dermal exposure, or inhalation of vapors. The information on exposure is then

combined with the chemical's specific toxicity information to calculate the cancer risk and the noncancer hazards. For those exposures that exceed the national contingency planned risk range, which is one in ten thousand, or the goal of protection for non-cancer hazards, which is the hazard coefficient of one, the action is -- then the action is needed to clean the site, and EPA will get options for remedial action.

So the results of the risk assessment show that there is currently unacceptable risk to outdoor workers, construction workers, trespassers and child visitors due to lead in the soil. Fortunately, the areas with unacceptable risk are paved

over, and the lots -- or the lots are abandoned and left to themselves, so exposure to these soils are limited.

A similar risk assessment was done looking at the future scenario where it was assumed the site was redeveloped. Under this scenario, unacceptable risk was found for similar populations due to metal and semi-volatile organic compounds found in the soil.

For indoor air we found that there is a potential for unacceptable risk due to volatile organic compounds that may travel through the ground and into the building. However, the indoor air sampling, during the indoor sampling -- during the indoor air sampling we did

not find unacceptable levels of air contamination inside currently occupied buildings. So the statement one more time. There are no unacceptable levels of contamination in currently occupied buildings; however, based on sampling results, there is a potential for unacceptable risk for indoor air in the future.

And then lastly, groundwater poses an unacceptable risk due to metals, volatile organic compounds, and semi-volatile organic compounds. Currently the groundwater is not used as a source of drinking water. New Jersey designated this area as a drinkable source of water and that's how we evaluated it, but there are no

wells on this site where someone is pumping out water for people to use or drink. The City of Newark provides drinking water from a different source.

So, in addition to human health risks we also look at ecological risk. An analysis was done to evaluate the ecological risk, and found that there is not much of an ecological habitat because this area has been industrial for over a hundred years. Much of the area is paved over or has a structure or building on it. However, unacceptable ecological risk was found for terrestrial exposure due to contaminated soils.

All right, next slide. Overall, the study concluded

that there is contaminated soil and groundwater which exceeded EPA's and New Jersey's acceptable levels for industrial/commercial property. Also, while there is no current risk, there's potential for contaminants to enter as vapors into buildings in the future. So, with these findings, EPA is required to take action at the site.

Next slide. So the contaminants of concern for -- so the contaminants of concern are the chemicals that we found in the soil, groundwater or air that need to be cleaned up because they exceed EPA's or the State of New Jersey's standards. The contaminants of concern for soil include metals,

polychlorinated biphenyls or PCBs, volatile organic compounds and semi-volatile organic compounds. Contaminants of concern for groundwater include, again, metals, volatile organic compounds, and semi-volatile organic compounds. Soil gas contaminants of concern includes only volatile organic compounds.

All right, next slide. So this slide shows our objectives for cleaning up the site. After remedial investigation we determined that we have five different categories, each with their own set of objectives. The five categories are waste, sewer water, Soil Gas, soil, and groundwater. I'll discuss each category in detail over the next several slides. For this slide

it has a lot of information for you to take in, and you can go back and read each in detail. But the objectives are generally repetitive for each category, so I'll discuss generally all of the objectives for all five categories.

So the objectives are to minimize exposure of contaminants to humans or environment; minimize migration movement or discharge of contamination; and minimize contaminant concentrations due to some remedial process.

All right, next slide. So now that we have established what the concerns are and what our objectives are for addressing those concerns, I will now discuss how we will

meet those objectives. To do this we evaluated several options or what we call remedial alternatives for cleaning up the site. I'll get into the alternatives next, but first, in order to analyze the various alternatives, EPA established nine evaluation criteria.

So the first two criteria are threshold criteria. If the alternative does not meet the criteria, then it is not an acceptable alternative and it is not carried through for comparison. However, one exception to this is the no action alternative, and I'll discuss this on the next slide.

So the threshold criteria includes overall protection of human health and the

environment, and compliance with ARARs. ARARs stands for applicable or relevant and appropriate requirements. And this generally refers to state regulations or other federal regulations and requirements that must be complied with. So compliance with ARARs addresses whether an alternative would meet all state and federal requirements. Overall protection of human health and the environment addresses whether an alternative provides adequate protection and if risks are eliminated, reduced or controlled.

So the next are the five balancing criteria. And they include long-term effectiveness and permanence, reduction of

toxicity, mobility or volume through treatment, short-term effectiveness, implementability, and cost.

So long-term effectiveness and permanence is the ability of an alternative to maintain reliable protection of human health and the environment over a long period of time.

Reduction of toxicity, mobility or volume through treatment is the anticipated performance of the treatment technology used to treat the waste. So if a technology is used that will reduce the toxicity or mobility or volume, or some combination of the three, then that alternative will rank higher than an alternative that does not do

those.

Short-term effectiveness is the time to achieve protection, such as building a treatment plant or treating the groundwater, or the time to dig up the wastes that are on the site. So short-term effectiveness also takes into account any adverse impacts on the community or the workers and the environment. So, as you know, there's active businesses on the site. If an alternative significantly interferes with these businesses, then that alternative may not rank very high in this category.

Implementability is the technical and administrative feasibility of an alternative. So an alternative that can be

completed tomorrow would rank higher than an alternative that requires months of work and requires specialized equipment.

And lastly is cost. This includes capital and operation and maintenance costs to conduct an alternative.

And, finally, we get to the last two criteria, which are modifying criteria, and they include state and community acceptance. For state acceptance, currently the New Jersey Department of Environmental Protection is reviewing the Proposed Plan and they will let us know if they concur with our preferred alternatives. Through the community acceptance the public has a chance to review and

provide input on these plans to clean up the site through the public comment period, which is occurring now. The EPA will review the comments and take these comments into account as we move forward to the Record of Decision.

All right, next slide. So, as I mentioned before, we have five categories of alternatives, and these categories have a set of remedial alternatives for cleaning up the site. The selected alternative for each category is EPA's preferred alternative for the Proposed Plan. On this site we'll start off easy and discuss the alternatives for the waste category.

So the waste category

includes the various containers we found at the site. It includes the underground storage tanks, the NAPL contamination around the tanks, and the NAPL found in the basement of the building in the northern portion of the site. So there are only two alternatives for this category. The first is no action, and the second is removal and off-site disposal.

So no action is required to be an alternative, so you'll see it in each set of alternatives. But no action is not protective of human health and the environment. It is as if EPA took no action at the site. And this is used primarily as a comparison purpose and to establish a baseline.

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Removal and off-site disposal includes taking all the wastes, packaging them up and shipping them off for disposal. So this would include removing all the various containers, the underground storage tanks. It would include removing the NAPL around the tank, and the NAPL in the basement of the one building.

So below you'll see a table that runs through the comparison of the two alternatives using the criteria that I discussed on the last slide. Additionally, the row highlighted in yellow identifies EPA's preferred alternative. In this case EPA's preferred alternative is Alternative 2, which is removal and off-site disposal.

So, looking at the table, the first two columns are threshold criteria that I discussed previously. So for this waste category, Alternative 1, no action would not be protective of human health and the environment, and it would not comply with ARARs. On the other hand, Alternative 2 is protective of human health and the environment, and it does comply with the ARARs.

The next five columns are the five balancing criteria. This comparison ranks each alternative against each other, and it ranges from poor to fair to good to excellent. So poor being the worst among the alternatives and excellent being the best among the alternatives.

However, since no action -- since the no action alternative does not meet the threshold criteria, then comparison notes of the five balancing criteria is not needed.

And then the last column mentioned cost. Alternative 1, which is no action, has no cost. Alternative 2 will cost about $1.5 million.

Okay, next slide. Okay. So moving on to the next set of alternatives, which again are fairly straightforward. This slide includes sewer water alternatives, which is the inactive sewer manhole where we found some contamination. As I mentioned before, there's no water running through the sewer system, so the sewer water is

contained where it is now. But there is potential for it to be released, so there's a need for it to be addressed.

So there are two alternatives for the sewer water, and they include no action and removal and off-site disposal. Like I mentioned before, no action is for comparison and to establish the baseline. Removal with off-site disposal for sewer water includes pumping out all the liquids and contamination from the manhole, and then power washing the walls and then plugging the inactive sewer line.

Looking at the comparison table at the bottom of the slide, it's similar to the waste

category. The row highlighted in yellow identifies EPA's preferred alternative, which is Alternative 2, removal and off-site disposal. So this is EPA's preferred alternative because it would be protective of human health and the environment, and it would meet ARARs. Alternative 1, no action, again, does not meet the threshold criteria and a further comparison is not needed.

The last column is cost. The cost for Alternative 2 is about $24,000.

Okay, next slide. So now it gets a little more complicated. For Soil Gas we have three alternatives. If you remember, Soil Gas is the potential for harmful vapors to

travel into buildings, and exposes a potential risk for indoor air.

Alternative 1 is no action. Alternative 2 includes deed notices to restrict the use of the entire property. It also includes air monitoring, which will be -- which will be conducted for all existing occupied buildings, to ensure that there are no unacceptable levels of contamination in the building. It will also include that any future buildings to be constructed will have engineering controls, which may include vapor barriers. This will prevent soil vapor from getting into the building. Also, there will be a continued

investigation on the vapor intrusion for any building within a hundred feet of a monitoring well where the exceedances were reported.

Okay. Soil Gas Alternative 3 is the same as Alternative 2, except contaminated soils within a hundred feet of an occupied building would be treated to remove the contamination. Buildings within the treated area would not need air monitoring or engineering controls.

Next slide. Like before, this slide has the table showing comparison of alternatives. EPA's preferred alternative is highlighted, and it's Alternative 2, which includes air monitoring and engineering

controls. Alternatives 2 and 3 are protective of human health and the environment, and they are in compliance with the ARARs. Alternative 2 does not rank as well as Alternative 3 for reduction of mobility, toxicity and volume, because Alternative 2 does not include any treatment. However, Alternative 2 does rank better for short term effectiveness and implementability, because air monitoring and deed restrictions is expected to be equally implemented, and it is not expected to cause a significant disruption to businesses. Alternative 3 would require equipment and handling of chemicals, and it may cause some disruption to businesses during

treatment. Additionally, Alternative 2 is nearly as protective in the long term as Alternative 3, even though it does not include treatment like Alternative 3. The cost for Alternative 2 is $449,000. Alternative 3 costs $4 million.

All right, next slide. So this is a map of Soil Gas Alternative 2, the preferred alternative. Deed restrictions will be implemented across the site, and buildings in yellow will have air monitoring to ensure that there are no unacceptable levels of contamination. The green circles indicate a hundred feet from where unacceptable levels of contamination was found.

Buildings within this area will warrant further investigation and may need air monitoring or deed restricted deed notices.

All right, next slide. So now moving on to soil, this again is a little more complicated. It has four alternatives. The first alternative is no action. Now, if you notice, there is no Alternative 2. When evaluating the alternatives, there are times where they don't get carried into the comparative analysis for various reasons. Alternative 2 is an example of that because it did not meet the two threshold criteria, so this alternative was not carried forward.

So, skipping Alternative

2 and moving to Alternative
3, this includes deed notices
4 to restrict land use for all
5 fifteen lots on the site,
6 and to ensure the most
7 anticipated use of the site
8 remains industrial/commercial.
9 Also, fencing would also be used
10 to prevent unauthorized access.
11 NAPL found in the soil in the
12 southern portion of the site
13 would be removed and disposed of
14 off-site.
15 Additionally, a cap would
16 be placed site-wide to prevent
17 contact with contaminated soil
18 and prevent a migration of
19 contaminated soil. This cap
20 would be primarily made of
21 asphalt and it will be
22 impermeable such that water
23 can't go through it. This will

reduce infiltration of water through the soil to the groundwater, which will reduce potential leaching or movement of contaminants from the soil to the groundwater.

Lastly, this alternative includes repairs and replacement of the bulkhead. Certain portions of the bulkhead are in poor condition and repairs are needed to prevent potential erosion of contaminated soil to the river. It's estimated approximately 800 of -- 800 feet of new bulkhead will need to be constructed.

All right, so now moving on to Alternative 4. This alternative is the same as three but it includes a focused removal of lead contaminated

soil around Building #7. I'll show a map of where Building #7 is. So, some of the highest levels of lead contamination at the Site are found in the soil around Building #7. So this alternative focuses on removing high levels of lead. By removing the soil we will address one of the more significant concerns we found at the Site. This alternative has the added benefit of removing any contaminants that are co-located with lead. So when the lead is removed, other contaminants in the same location will be taken with it. Another benefit is that since the contaminated soil is removed, it will no longer be a

source of contamination to the groundwater, and this will help the groundwater alternatives, which I'll discuss later.

So, Alternative 5 is the same as Alternative 3, except five includes stabilization or solidification treatment of the soil. So this basically includes or will, this will turn the site into a block, and it will lock the contaminants in place so they can't move or migrate. So this will stop potential exposure and this will stop migration of contaminants. A cap would still be required across the site to protect the treated areas.

Next slide. Okay, so comparing the four alternatives, as I mentioned before, the

highlighted row is EPA's preferred alternative, which is Alternative 4, the focused removal of lead. Alternatives three, four and five all protect human health and the environment, and they comply with the ARARs.

The preferred soil alternative provides the best overall protection and compliance, while also being relatively easy to implement. Alternative 5 would cause significant disturbances to businesses, and is not easily implemented because it requires huge augers to mix the soil, and there are several underground utilities that would need to be avoided. There's just simply not enough room and too many

utilities in the way to easily conduct this remedy for Alternative 5.

Alternative 3 would eliminate contact with the soil through capping. But the preferred soil alternative, Alternative 4, would offer better overall protection because it would remove the highest lead contamination at the site. Additionally, the preferred soil alternative would improve the effectiveness of the groundwater alternative by removing the highest levels of lead.

And then lastly, the cost. Alternative 3 is about $10 million, Alternative 4 is about $12 million, and Alternative 5 is about $13

million.

Okay, next slide. So this is a footprint of EPA's preferred Alternative 4 for soil. Deed restrictions will be site-wide. The blue shaded area is where the cap is expected to be. The red shaded area is where we expect the focused removal for the lead to occur. And this is where Building #7 is, and it's also primarily on lot 63. So this is the soil that would be removed from the area, from the site, and it will be sent off-site.

The areas outlined in green are the NAPL contaminated areas which would be removed and bulldozed. The orange lines along the river are the portions of the bulkhead that need to be

repaired or replaced. It is estimated about 800 feet of repairs or replacement bulkhead will be needed.

All right, next slide. Okay, so now this is the last set of alternatives. There are four groundwater alternatives. The first one is no action. The second one includes deed notices to restrict the use of groundwater. The next one includes a barrier along the river to prevent migration to the river. Lastly, this includes a pump and treat system to extract and treat contaminated groundwater. This will require extraction wells and a treatment facility to be constructed on the site.

Alternative 3 also

includes deed notices to restrict the use of groundwater, but rather than pump and treat, it includes injection to treat the groundwater. The treatment can include chemical treatment, biosparging or air sparging, which would be stripping to pull the contaminants out of the groundwater. This type of treatment and the specific location of the injections would be determined in the remedial design, which is the next phase of the Superfund process.

Alternative 4 is the last alternative. Again this includes deed notices to restrict the use, and it adds a combination of Alternative 2 and 3. This includes a pump and treat system, targeted

periodic injections to treat the groundwater as needed. The injections will be reevaluated every year, and pumping will be adjusted to provide the maximum containment or capture of contaminants in groundwater. In this alternative a barrier wall was determined to not be needed. And the pumping system will be designed to capture the groundwater contaminants.

All right, next slide. This slide compares the four groundwater alternatives. EPA's preferred alternative is Alternative 4, which is combined pump and treat and periodic injection. When comparing the Alternatives 2, 3 and 4, they are all protective of human health and the

environment, and they comply with ARARs.

The preferred groundwater alternative, which is Alternative 4, provides the best long term effectiveness and reduction in toxicity, mobility and volume through treatment. Groundwater Alternatives 2 and 3 provide less long term effectiveness and permanence due to their sole reliance on pump and treat or injection treatment at locations. Because of their sole reliance on one technology, they'll likely take longer to restore groundwater. Alternative 3 would be more disruptive to businesses and not easily implemented due to large scale injection treatments and reoccurring frequency of

injections. The injections for Alternative 4 would be only as needed, and they would be focused and likely on a smaller scale compared to Alternative 3.

And, lastly, the costs. Alternative 2 is $34 million. Alternative 3 is $20 million. Alternative 4 is $24 million.

Next slide. So this slide is a schematic of the preferred groundwater alternative. This is primarily an illustration. The extraction and the treatment areas will likely change during the design. So this schematic includes site-wide deed restrictions to prevent the use of groundwater. Groundwater is flowing towards the river, so

injections will be on the upgradient portions of the site, extractions will be on the downgradient. This will allow contact time for the injection treatment applications. The pink and purple circles are the extraction wells. Pink is for the shallow, purple is for the deep units. The green and blue lines indicate where injection treatments may occur. Blue is for metals, and green is for the organic contaminants.

All right, next slide. So this slide summarizes EPA's preferred alternatives for the five categories. For the waste category EPA prefers Alternative 2, which includes removal and disposal of underground storage tanks, NAPL removal and the soil

around the storage tanks, and removal of containerized waste found across the site.

For sewer, for the sewer category EPA prefers Alternative 2, which includes cleaning out the manhole and disposing of waste off-site, and then plugging and closing the manhole.

For Soil Gas we prefer Alternative 2. This includes air monitoring of buildings, and requires future buildings to be constructed with some type of engineering controls, such as vapor barriers, to prevent Soil Gas from entering the building.

For soil we prefer Alternative 4. This includes excavation of the high level of lead contamination --

contaminated soils around Building #7, with off-site disposal, with a site-wide cap and bulkhead repairs.

For the groundwater we prefer Alternative 4. This includes a site-wide pumping system to extract and treat the groundwater, and it includes periodic injections to treat -- to also treat the groundwater.

Okay, next slide. This slide summarizes the cost and construction times. Waste Alternative 2 costs $1.5 million and it will take one to two months. The sewer water alternative costs $24,000, and it will take one month. Soil gas Alternative 2 is about $449,000, and it will take one to two months. Soil Alternative

4 is $12 million, and it will take eight to twelve months. Groundwater Alternative 4 is about $24 million and it will take eight to ten months. So all the construction times will likely not occur at the same time. Each alternative will be designed and run on separate tracks, so the construction time may take longer than twelve months. The total cost of all five preferred alternatives is nearly $39 million.

So, that's the end of my presentation. And just to quickly discuss the next steps, once the comment period closes, EPA will review and consider all comments. EPA will then collect the alternatives to clean up the site and these will be

memorialized in the Record of Decision or the ROD. And within that EPA will include responses to the comments we received during the public comment period. So once is the ROD is signed, EPA will reach out to the responsible parties to negotiate the remedial design and the remedial action. And there are five components, so there will be five different tracks, each with their own schedule.

Okay, so I'll turn it over to begin the Q & A.

MS. KANDIL: Thank you, Josh. So at this time we have reached the questions and comments portion of our meeting. As I mentioned earlier this evening, we've unlocked the

audio lines and the chat box remains open for questions and comments. Please remember, whether you're typing or speaking in the audio line, to state your first and last name, your affiliation, and then your question or comment for the record. Again, as an example, I would write or say Shereen Kandil, resident of Staten Island, Where is Riverside located.

When we turn the audio line -- when we turn to the audio lines I'll call on you categorically and alphabetically. For example, I will say if there are any elected officials with the last name A through I that have questions or comments, please

unmute your lines now. Then I'll go to elected officials with the last names J through R, then S through Z. Then I'll go to residents, businesses, then the general public.

So, as I said, we'll turn to the comments box first. And then we'll go to the phone lines. So, Oshea?

MR. SMITH: This is Oshea Smith, EPA employee, and there are no questions in the chat box as of now.

MS. KANDIL: Okay, great. And we'll turn to the comment box later, to the chat box, to the phone lines, in case you have questions later on.

So to the phone lines, to the audio lines. I would like to ask any elected official with

the last name A through I to please unmute your lines, again, that's star 6, and ask your question or make your comment.

(No response.)

MS. KANDIL: Okay, any elected officials with the last name J through R, please unmute your phone lines, star 6, and speak your comment or question.

(No response.)

MS. KANDIL: Okay, any elected official with the last names S through Z?

(No response.)

MS. KANDIL: Okay, so we'll turn to residents. Any residents with the last name A through I, starting with A through I, please unmute your lines, star 6.

MS. FILION: Hi, can you

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hear me?

MS. KANDIL: Yeah, we hear you. Can you please state your --

MS. FILION: Hi, I'm Nathalie -- yeah. My name is Nathalie Agosto Filion, resident, City of Newark, also employee of the City of the Newark in the Office of Sustainability.

I'm sorry that I joined the call late so I wasn't able to watch most of the presentation, but I've downloaded the slide deck. Would you speak to any opportunities and whether or not EPA has considered ways in which Newark residents can be trained to participate in some of these cleanup activities for job opportunities? Thank you.

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MR. SMERALDI: So I'll turn it over to Michael, if he can -- has any thoughts on this.

MR. SIVAK: Sure. Thank you for the question. And, as I understand the question, it relates to possible employment opportunities during the remedial action.

We do have a program at EPA called the Superfund Job Training Initiative, we call it Super JTI. And we have used that successfully at some other Superfund sites in the region, and certainly at an action that was done along the Passaic River as well for another Superfund site that is nearby. What that program is, is that there is an application process, and applicants that are selected,

who are selected to enter the program, would be trained in specific environmental jobs and they would be hired to perform the remedial action at the site, and then they would have those skills that they could then carry with them into other opportunities. The challenge with that, is that because we are anticipating that this remedial action will be led by the potentially responsible parties at the site, is we would need to work with those responsible parties to pursue that, that job training opportunity program. But that is something that has been successful in the City of Newark at Superfund sites. And that certainly is something that we

will absolutely consider and work with whoever we reach agreement with to perform the remedial action at the site. So thank you for that question, that's a very important question.

MS. KANDIL: Thank you, Michael. Any other residents with the last names A through I?

(No response)

MS. KANDIL: Okay, I'm going to turn to residents with the last names starting with J through R. Please unmute your lines.

(No response.)

MS. KANDIL: Okay, any residents with the last names starting S through Z?

(No response.)

MS. KANDIL: All right,

we'll turn to businesses. Any businesses with the names beginning A through I?

(No response.)

MS. KANDIL: Okay, any businesses with their names starting from J through R?

(No response.)

MS. KANDIL: And any businesses with the names starting with S through Z?

(No response.)

MS. KANDIL: All right, we'll turn to the general public. So anybody, anybody who has any questions or comments, you can unmute your lines. We'll start with anyone with the last names A through I.

(No response.)

MS. KANDIL: Okay.

MS. FILION: May I?

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MS. KANDIL: Oh, yeah, sure.

MS. FILION: Nathalie Agosto Filion again, resident of the City of Newark and employee of the City of Newark. A question regarding the extent to which the project plan is looking to seek alignment with other planning activities taking place in the city, particularly around stormwater management and combined sewers.

MR. SMERALDI: I'm sorry, could you repeat the question?

MS. FILION: Sure. So I'll add a little bit more detail as well. The City of Newark and another couple dozen across the state that have combined sewer systems are going through a long term control process, permitting

process with the State of New Jersey. We're in the final phases with the expected selection of alternatives to take place within the next few months. And there are, you know, sewers located along 21 not far from this project site. So I'm just curious if the project team is at all reviewing some of those draft materials and making recommendations about the sewer component of this cleanup with this remedial action.

MR. SMERALDI: So I'm not super familiar with that, that's something that I think we would need to look into. As far as I know, we do have one sewer line that we are removing contamination from. And, as far

as we know, that's an inactive sewer line, there's no water running through it. But that's, that's something we can look at and evaluate when we do our response to comments.

I don't know if anybody else or Michael had any thoughts?

MR. SIVAK: Yeah, so I can add a little bit to that. As part of the design process we will, or whoever is performing the design, under EPA oversight, will need to comply with all requirements of all permits, including permits tying into or associated with things like utilities. So to the extent that there will need to be additional utility lines brought onto the site, they will need

to, those plans, those designs, those actions will need to comply with the requirements, the substantive requirements of all of those permits. We're a little bit early in the process for us to have more specific information than that, but we will reach that point when we get to the remedial design stage.

MS. FILION: Thank you.

MR. SIVAK: Does that answer your question?

MS. FILION: Yeah. I think it's really a timing -- a timing question, because that permit is due to the state in October. And then when the state adopted and approved it or how that syncs up with the timing of your -- of the process that you

just described is really the question, right, they would have to comply with the permit if the permit was in effect.

MR. SIVAK: Correct.

MS. FILION: And if it wasn't in effect, then it was just a matter of planning ahead for any potential construction disruptions that are happening in the community, to limit that as much as possible so that whatever is happening is in sync with one another.

MR. SIVAK: Correct. And also keep in mind that if there is redevelopment at the site that requires those types of permits, that, you know, if it goes, if the redevelopment or the need for permits goes beyond the scope of what our remedy

requires, then those would be requirements of the redevelopment, not necessarily requirements of our remediation. So those could possibly be two separate issues.

MS. FILION: I understand.

MR. SIVAK: Thank you.

MS. KANDIL: Thank you. So I'm just going to continue.

Anyone from the general public with the last name starting J through R?

(No response.)

MS. KANDIL: And anyone with the last names S through Z?

MR. YENNIOR: Can you hear me?

MS. KANDIL: Yes, we hear you.

MR. YENNIOR: This is David Yennior. I live in Bellville.

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I am a representative from the Sierra Club. And I've, you know, been following this presentation, and basically I like the EPA's preferred solutions. The only other thing I would like to see, there's going to be 800 feet of new bulkhead, and I think this is an opportunity to make this site an access to the river point. There's a tremendous lack of access to the river, particularly on the west side of the river. There's more on the east side. There's a boat ramp in Kearney, for instance. There is access right now at Riverside Park, I looked at -- it's a floating dock. There is a boat ramp in Nutley. But nothing in Bellville, nothing in north

Newark. There is a plan to eventually have floating docks just below Fourth Street in Newark, but I don't know what the timetable is on that. I don't know if anyone from Newark is on the line who has knowledge of this.

And then I guess the other kind of question is what other agencies, specifically I guess from Newark, would be interested in seeing that we get a river access point right here at this location.

MS. KANDIL: Thank you, David. Josh or Michael, do you want to chime in here?

MR. SMERALDI: Sure. So, as I mentioned in my presentation, the EPA goes through this analysis to figure

out the most anticipated use, and we look at, you know, various aspects of the site, historically what the site was. And we looked at EPA's -- or Newark's redevelopment plan, and they all seem to indicate that the most anticipated use of this site will be commercial/industrial. And I understand that you want a boat dock there, and that sounds nice, but that's not something that we could do. And I know you mentioned that it may be something that the City of Newark could do, so that might be a separate conversation to have with them. But as far as we are aware, it seems like the most anticipated use is commercial/industrial.

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I don't know if Michael wanted to add anything to that?

MR. SIVAK: No, I think, I think you summarized it quite nicely. The only -- well, I would like to add one other thing, which is that in addition to the resources that EPA coordinated with in order to conclude that the most reasonably anticipated future land use is as an ongoing industrial facility, we also spoke to the property owners. And all of that led EPA to conclude, as Josh said, that the most reasonably anticipated future use would be industrial, and that's what our plan addresses, that's how we will deliver the property when the remediation is completed. It

will be a property that will be available for commercial/industrial use, whatever that might be.

MS. KANDIL: Okay, thank you. I just want to ask one more time if anyone on the phone line wants to ask any questions or make any comments, please do so now, star 6 to unmute.

(No response.)

MS. KANDIL: Okay. I believe we had some questions come up, Oshea?

MR. SMITH: Yes, we have one question from Marylou Bongiorno, a Newark resident and filmmaker. And the question is specifically about air emissions during remediation. How will they be trapped so residents aren't effected by toxic fumes?

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MR. SMERALDI: So EPA has a lot of experience with remediating sites, and there's a variety of ways we can -- we can make sure that there's no toxic fumes exiting the site. I know they have air monitoring and they have dust suppression systems. And this will all be worked out during the remedial design to make sure that this -- any contamination doesn't travel off-site, and it's all making sure that the contamination is contained within the site and does not travel beyond the boundaries. Yeah.

MS. KANDIL: Great. Oshea, were there any other questions or comments that came in?

MR. SMITH: No, there were no other questions or comments

in the chat.

MS. KANDIL: Okay. So I'm going to do one last call for phone lines or chat box, if anybody has any final questions or comments. Yes?

MR. SMITH: It looks like there was a statement from Marylou Bongiorno, resident and filmmaker. And she says her concern is that the cleanup emissions from the Diamond Alkali site may travel quite a distance to her home.

MR. SMERALDI: So, I'm not sure I understand the question. And so this is a different site from the Diamond Alkali. Yeah, this is a different site from the Diamond Alkali Superfund site, so I'm not sure --

MR. SIVAK: Josh, can I,

can I add something to your response to the question?

MR. SMERALDI: Yes.

MR. SIVAK: So, I am not familiar with the health and safety plan that was developed for the Diamond Alkali site for that remediation project that was done several years ago, but we can certainly follow up with that.

Normally, as part of our process, the Agency develops what is called a community health and safety plan, and that is a plan that, as Josh said, develops a strategy to monitor the site and the work being performed at the site during the remediation to ensure that no contamination migrates off-site, and that the site can be

remediated in a safe way for the community. As Josh said, that option involves components like air monitors to measure the concentrations of dust that may be generated during intrusive activities. That may also include engineering controls such as dust suppression techniques like wetting the soil, which is simple yet very effective in controlling dust, or applying certain types of foams to suppress dust or to suppress odors if those are a concern as well.

So we do have a lot of experience in evaluating and developing remedies that can be implemented safely in populated areas. We have, the Agency has a lot of experience in

successful remediation projects throughout the very densely populated areas of both New York and New Jersey. So we are confident that we will develop plans that are protective of the community, and we are happy to share those plans with the community as we develop them.

MR. MORROW: Good evening. I have a question.

MS. KANDIL: Sure. Can you state your name and affiliation?

MR. MORROW: Yes. Robert Morrow, M-o-r-r-o-w, the Klonac Company, Kearny, New Jersey. And I wanted to get a sense of the volume of soil that would be removed during the soil removal portion of the project.

MR. SMERALDI: Hold on.

MR. SIVAK: Josh, that

information is in the feasibility study; correct?

MR. SMERALDI: Yeah. And I think it's in the Proposed Plan. I don't remember it offhand at this moment.

MR. SIVAK: Len, do you have that figure available, the volume of soil that would be removed under the preferred soil alternative?

MR. WARNER: If I, if I can just have a minute I can get that number.

MR. SIVAK: Sure.

MR. WARNER: And then we can move onto the comment, if somebody has it? I'll type it into the chat box in a moment.

MR. SIVAK: Thank you very much. And that was Len Warner. He is a contractor to EPA who

provided support to us through this process.

MR. INTINDOLA: Hi, I have a comment.

MS. KANDIL: Please go ahead. Please state your name and affiliation and then state your comment.

MR. INTINDOLA: Hi. My name is Dante Intindola, I'm a resident of Nutley, New Jersey.

I actually have a question first. Is the building of the bulkhead walls going to impact the navigable portion of the waterway in any way, shape or form? Because the river is used daily in the springtime by various high school sports teams for rowing, and I was just curious if there was going to be an impact there.

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MR. SMERALDI: So no, I don't believe there would be any kind of impact. If there is, it would be temporary to construct the bulkhead. But I don't think there would be any type of long term impact to the river.

MR. INTINDOLA: Okay. And I just wanted to add the comment that, to Mr. Yennior's comment from before from the Sierra Club, the land use before the industrial site was there, this is actually a boating center where various boat clubs of national prestige hosted their events. This water course was actually considered the, one of the best in America. And I think that if the EPA can do anything to forge a relationship with the City of Newark and the

property owners to provide some sort of access it would be a prime spot, because the waterway hasn't changed, the land use has changed, and it still could be fine.

And I would like to echo the fact that due to the construction of Route 21 from the 1920s to the 1970s, there is no access to the waterway from the western portion of the land mass to the west of the Passaic River, and it's a big impediment to many boaters. And a lot of people complain about it because the boat ramps throughout the area are in poor condition. So if that could be some -- something could be passed along to the City of Newark or the property owners when

constructing this bulkhead, I think that would be a really great situation. Also, most of the boating -- boat houses for recreational use are severely overcrowded on the eastern bank of the Passaic River, so there is a need for relief.

MR. SMERALDI: Okay. Yeah, thanks for your comment.

MS. KANDIL: Great, thank you. Were there any other comments or questions from the chat box?

MR. SMITH: Yes. We have a comment from Marylou Bongiorno, resident and filmmaker. And she states, I understand that this is different from Diamond Alkali site, but air emissions were an issue. The new site should be capped. And a question is, can

the site be tented so emissions aren't released into the air.

MR. SMERALDI: So I think this will all be evaluated in the remedial stages. Like what it says -- (inaudible).

MS. KANDIL: I'm sorry, can you all mute your lines just until --

MR. SMERALDI: I'm sorry, I think that's my line. Michael, can you just --

MR. SIVAK: Yes. Yes. So yes, we will evaluate all different kinds of engineering controls to assess which is the most appropriate mechanism to control emissions from the site. And certainly tenting is one option that will be evaluated. But, like I said, there are others that may be equally as

effective, such as dust suppression techniques through water or other types of sprays or foams that could be used to suppress dust and vapors. But we will be evaluating that to ensure the remedy can be implemented safely.

MS. KANDIL: Thank you, Michael. Oshea, anything else come in, any comments or questions?

MR. SMITH: No, that looks to be the last question.

MS. KANDIL: Okay.

MR. WARREN: Hello, this is Len Warner. I just, I typed in that answer to the question about soil removal. The planned soil removal for lead contamination in the vicinity of Building #7, the alternative

considers removal over an area of about half an acre to a depth of approximately six feet. So I think that works out to maybe about 5,000 cubic yards in-situ, roughly.

MS. KANDIL: Thank you so much, Len.

MR. WARNER: You're welcome.

MS. KANDIL: All right, so if there aren't anymore questions or comments in the chat box --

MS. SCHEAR: Excuse me.

MS. KANDIL: Yes?

MS. SCHEAR: Hi. I just have a question.

MS. KANDIL: Of course.

MS. SCHEAR: Susan Schear, I'm a resident. And I wanted to know of -- with your, the focus

on both industrial versus residents, you know, future focus, would there be an opportunity for access to the Riverwalk, because in Newark certainly there's the riverfront, and I know that part of the focus has been to continue it up, I don't know, you know, up the -- and if we look at, you know, New York, I don't know if the focus in Newark is to take it that far or not. But many times people look at that opportunity for, you know, to walk along the river. So would that be part of the options when you're looking at an industrial -- the site?

MR. SIVAK: So I will -- Josh, I will, I can reply to this. So yes, when we are

evaluating options for future land use and come up with a commercial/industrial end use for the property, there are certain assumptions that that includes. And that includes that people can be exposed to contamination under certain levels. EPA's preferred alternative for soils at the site includes a bank to bank cap or a cover. And so that would prevent any ongoing contact to the contaminated material that remains beneath it. So we would be isolating that material below the asphalt cap or cover that Josh mentioned as part of our preferred alternative. That's how we would deliver the site once the remediated -- or that's how the site would be delivered

once the remediation is completed. And then it is up to the property owners to determine how they would redevelop that site.

MS. SCHEAR: Thank you.

MR. SIVAK: Mm-hmm.

MS. KANDIL: Any additional comments, questions?

MS. FILION: This is Nathalie Agosto Filion, resident, City of Newark, and employee of the City of Newark. Can you describe, if you know, the process and even location where contaminated waste, whether it's soil or the, I think it's called NAPL, I'm sorry, I can't remember the acronym, you know, where that ends up and how that's treated to ensure safety of where it --

where it's disposed?

MR. SMERALDI: I don't know that. Would, Len, would you know, could you answer?

MR. WARNER: I can answer that question. I mean, during the detailed remedial design there would be a selection of disposal facilities for the various types of waste that would be removed from the site. And there could be different disposal facilities. For example, for the liquid waste removed from some of the containers that remain at the site or some of the sewer lines that have some waste in them that are to be closed out. You'll remember that Josh described that there's several underground storage tanks on the

site that still contain some product and waste in them. Those would be pumped out and taken to disposal facilities that are permitted to treat and dispose of that type of liquid waste. And then the soil that's removed from the site, for example, the NAPL contaminated soil or the lead contaminated soil again could be going to the same disposal facility or they could be going to different disposal facilities. The lead contaminated soil might require some pretreatment because of some of the higher concentrations detected before it's permitted to be disposed in a landfill.

So the remedial design worked out all the details of

materials, you know, the waste handling, what would be the appropriate facilities to manage that waste essentially in perpetuity. And I think the only, the only exception to that would just be, to make it clear for folks who are reading the FS, that some of the alternatives talked about in-situ treatment, and in that case those alternatives are describing the addition of chemical reagents to either stabilize the waste in place so it can no longer be mobile in the environment, or to effect a chemical reaction that would reduce the contaminant to a harmless by-product, like a groundwater injection. But the wastes that go off-site, EPA

would work with the -- with whoever was designing and carrying out the remediation to find appropriate disposal facilities so that that was safely managed.

Is that, does that answer the question?

MS. FILION: Thank you. Yes, I appreciate it.

MR. WARNER: Yeah, you're welcome.

MS. KANDIL: Okay, any other questions or comments?

(No response.)

MS. KANDIL: Okay. Well, as Josh mentioned, you still have an opportunity to send, submit comments. The public comment period is open until August 21st. You can send your comments to Josh via email or to

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290 Broadway, New York, New York 10007. The information is up on the screen right now, but it's also available on the website, on the Riverside website. And that is the next slide that I'm showing right now is the link to our Riverside website. It was posted on the chat box earlier this evening. You can contact me if you need any additional information. On the website you can find the fact sheet in Spanish, English and Portuguese. You can find our new and finalized community involvement plan also posted, as well as the Proposed Plan and this presentation.

So if there aren't any other final comments, I'll turn to Josh and Michael if you have

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any final words?

MR. SMERALDI: This is Michael. I would like to thank everyone for calling in to hear our presentation and to listen to EPA's preferred alternatives and our rationale for selecting these.

MS. KANDIL: Great. Thank you, Michael. Thank you, everyone. Please stay safe and have a great evening.

(Time noted: 8:19 p.m.)

C E R T I F I C A T E

STATE OF NEW YORK)
) SS:
COUNTY OF ORANGE)

I, KARI L. REED, a Shorthand Reporter (Stenotype) and Notary Public with and for the State of New York, do hereby certify:

I reported the proceedings in the within-entitled matter and that the within transcript is a true record of such proceedings.

I further certify that I am not related, by blood or marriage, to any of the parties in this matter and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 27th day of August, 2020.

_____

KARI L. REED

APPENDIX V- D

COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD

Smeraldi, Josh

From: Bob Romagnoli <[redacted]>
Sent: Wednesday, July 22, 2020 2:04 PM
To: Smeraldi, Josh
Subject: FW: [External] - U.S. EPA Public Meeting: Riverside Industrial Park Superfund Site, August 5, 2020
Attachments: ATT00001.txt; 2020-07-21-Riverside_Public_Meeting_flyer (Spanish).pdf; 2020-07-17-Riverside_Public_Meeting_flyer (English).pdf

Importance: High

Hi Josh….once a final remedy has been selected/finalized, who will be designing and then letting for construction? I'm hoping to stay informed of the site's status so that Abscope can be considered for the work.

Thank you!

Bob Romagnoli, PE
President & CEO
ABSCOPE ENVIRONMENTAL, INC.
7086 Commercial Drive
Canastota, NY 13032
[redacted]
www.abscope.com
PE License: NY, NJ, WA, OR

ENR Top 200 Environmental Contractors
EBJ National Award Winner
HUBZone Certified

From: Dante Intindola <[redacted]>
Sent: Wednesday, August 5, 2020 4:59 PM
To: Kandil, Shereen <Kandil.Shereen@epa.gov>
Subject: Re: U.S. EPA Riverside Industrial Park Public Meeting Information

Dear Ms. Kandil,

Thank you for the information. I have been following this site for several years as a historian of t he Lower Passaic River. I rowed past the Riverside Industrial Park every day in high school, and later wrote my undergraduate thesis in history at Rutgers University on rowing on the Passaic River. (It was awarded 2nd place departmentally / summa cum laude.) The site sits on the former home of several boat clubs, which I researched heavily for my thesis. This is the first scholarship on the specific land use of the property pre-1909 that I am aware of. Although it might be outside of the temporal scope of this project, I am attaching my thesis to this email in PDF format. Chapter 3 describes the environmental effects leading to the demise of watersport in the immediate area of the industrial park, and most of the rest of it deals with regattas held alongside it from 1865-1901.

Best regards,

Dante Intindola

On Wed, Aug 5, 2020 at 9:23 AM Kandil, Shereen <Kandil.Shereen@epa.gov> wrote:

Rowing on the Passaic River:

Boat Clubs and the Rise of Industry in Gilded Age Newark, New Jersey 1865-1901

Dante G. Intindola

An Honors Thesis submitted to the
History Department of Rutgers University

Written under the supervision of Professor Kristin O'Brassill-Kulfan

Rutgers University
New Brunswick, New Jersey
April 2020

This paper is dedicated to my father, Brian A. Intindola.
Thank you for instilling in me a passion for knowledge, and most especially, rowing.

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Preface

The impetus for this paper is rooted in a single event in the summer of 2015. I was vacationing in Belmar, New Jersey with a group of friends during that summer, leading into my senior year of high school. On a lark, we visited an antique shop in nearby Asbury Park. I was perusing a stack of mounted nineteenth century lithograph prints and was immediately drawn to an illustration of a grand regatta on the Passaic River. I was stunned. I had been rowing since 2013 as a member of Nutley High School's crew team. I knew that the team had been founded in 1942 but had no knowledge of its origins or any rowing activity on the Passaic before that. I bought that print and brought it home. It was attributed to *Frank Leslie's Illustrated Newspaper*, and I subsequently used digital tools to identify it as depicting a National Association of Amateur Oarsmen National Championship Regatta from 1883. I had no idea that there had ever been rowing events of that scale on the Passaic and had so many questions.

Where were these boathouses? Where were the racecourses? What became of the clubs who hosted tens of thousands of spectators? The answers did not come easily thanks to the passage of time and the obliteration of Newark's riverbank by 120-plus years of development, redevelopment, and highway construction. In 2017, I decided to turn the narrative of the championship races into my final paper for Dr. Kristin O'Brassill-Kulfan's New Jersey History course at Rutgers University in New Brunswick. In this process, I found that the tradition of rowing on the Passaic River as I knew it could be traced directly to the clubs of the nineteenth century. I had never thought much of the scope of the history of Passaic River rowing beyond what I knew from my father, who also rowed for Nutley High School between 1979 and 1981. The 75th anniversary celebration of Nutley Crew had shed some light on the sport's development,

but not beyond yearbook photos and anecdotes from rowers who graduated in the latter half of the twentieth century.

I also found out that there were no academic works I could reference to help to better understand this era in American sports history. So, I decided to take matters into my own hands and write this thesis. As a Business Analytics and Information Technology Major, I have not had as many opportunities to write as much as I would like. I hope that this thesis will help to fill in these gaps in the historical record and spur further analysis of the impact of rowing on American history.

Acknowledgements

Writing this thesis has been the most challenging yet fulfilling academic task I have undertaken at Rutgers. Firstly, I would like to thank Professor Leah DeVun, our Vice Chair for Undergraduate Education in History, for giving me permission to write this off-cycle using an abridged schedule. Thank you to Professor Kristin O'Brassill-Kulfan, for showing me I could still pursue my passion for history despite not majoring in it, and especially for advising me throughout this process. I would not have found a love for public history or have been able to pursue an education in New Jersey history, without her support. I am also indebted to Professor Paul Clemens, who provided me with various excellent secondary sources and agreed to be my second reader.

I am grateful for the keen assistance of several skilled archivists who helped me navigate myriad obscure manuscript collections: Kathy Kauhl and staff at the Essex County Parks Department Archives; Beth Cohen and the Charles F. Cummings New Jersey Information Center at the Newark Public Library; James Amemasor, Steve Tettamanti , and staff at the New Jersey Historical Society; Erika Gorder and her staff at the Rutgers University Special Collections and University Archives; and the staff of the Belleville Public Library.

I am also indebted to Erik King, re-founder and past president of the Nereid Boat Club. He led me to one of the oldest surviving Passaic River rowers, the ever-sharp Bob Watts, who was able to give me much-needed context concerning the history of scholastic rowing. Similarly, I must thank my grandparents, Gerard and Genevieve Tolve, for connecting me with Gerry Bissell and, in turn, Roland Worthington, two more original Nereid members. I am especially thankful to Mr. Worthington for his encouragement and inspiration during the early stages of this

paper. It was truly thrilling to gather their memories from the fringes of living memory, and to learn I had many experiences in common with men four times my age.

This paper would not exist without those in my life who have coached crew on the Passaic for decades. I must thank my Nutley High School crew coach, Judy McIntyre, for everything she has done for rowing over the last two decades. I am grateful for the opportunities to interview Kevin Smyth, Nutley's head coach and longest-tenured high school crew coach in New Jersey, as well as my father's crew coach, Ray Chapman. Without Mr. Chapman's and his father's efforts to promote rowing in New Jersey from the 1950s to today, I doubt I would even be able to write this paper.

Finally, I must thank the thousands of rowers who have braved the waters of the Lower Passaic River in pursuit of athletic glory over the last 150-plus years. Thank you for creating a story worth writing about, and may that tradition continue as long as the tide flows in from Newark Bay.

Introduction

The Passaic River is a serpentine body of water, traversing much of northern New Jersey in its twisting path. It begins as a trickle in someone's backyard in Mendham in Morris County, and travels southeasterly at first, making the border between Morris and Somerset Counties. It then makes a left turn, grazing the eastern edge of Union County, before outlining Essex County's border with Morris. It veers off course of creating county boundaries when it enters Passaic County, to which it lends its name. When it reaches Paterson, it crashes over the Great Falls, a source of wonder and industrial energy since colonial times. Then, the Passaic takes a nosedive, and travels north-south, an unusual direction, making up Essex County's western border. On this descent to the Newark Bay, the 80-mile river takes on a different character when it passes the Dundee Dam at Clifton.[1]

Below this landmark, the waterway becomes tidal for its final 17 miles. Known as the Lower Passaic River, this stretch has been ravaged by industrial and household effluent since the dawn of the Industrial Revolution. It changes direction with the tides, swirling around debris and pollution brought to it via storm drains and sewer outflows. During the late nineteenth and the majority of the twentieth century, it was regarded as a major public health threat. At its nadir in the context of public use, between approximately 1890 and the completion of the Passaic Valley Sewerage Commission's trunk sewer in 1924, much of the water in the river was actually sewage and industrial runoff.[2] This created an abhorrent stench known to peel paint off of houses.

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[1] Mary Bruno, *An American River: From Paradise to Superfund, Afloat on New Jersey's Passaic* (Vashon. WA: DeWitt Press, 2012), 19–21.

[2] A "trunk" sewer is a main line sewer that gathers effluent from multiple communities. In the case of the Passaic Valley Sewer system, it consists today of twin tunnels that intercept about two dozen municipal sewer outflows throughout the Passaic River watershed.

However, the identity of this part of the Passaic River as a soiled afterthought is opposite of what was true for the majority of its history.[3]

Little known is that, despite its appearance over the last century, the Passaic was once revered as a venue for aquatic sport and recreation. It ran crystal clear and was home to millions of fish. Wealthy New Yorkers and New Jersey aristocrats built their country manses along its banks from the start of colonization in the late seventeenth century through the first half of the nineteenth century. As New Jersey industrialized throughout the nineteenth century, population increased dramatically in the riverside towns. This accelerated rapidly thanks to European immigration and the arrival of railroads by mid-century. Newark's status as an industrial powerhouse city enriched many men and created both expanded upper and emerging middle classes by the late 1860s.[4]

After the Civil War, members of these classes founded amateur boat clubs along the river, partly to take advantage of increased leisure time resulting from the new industrial economy. Rowing, popularized initially by professional races, was quickly gaining a large following as an amateur sport at the beginning of the postbellum era. It captivated the nation, drawing spectators from all classes. The rowing regatta course these Newark-based clubs laid out on the Passaic between Belleville and central Newark was favored as one of the finest in America. Local clubs gained hundreds if not thousands of devoted fans, an early manifestation of American public sporting culture. Tens of thousands of spectators attended local, regional, and national regattas with regularity, representing a coming of age for the City of Newark and its

[3] Stuart Galishoff, "The Passaic Valley Trunk Sewer," *New Jersey History* LXXXVIII (88), no. 4 (Winter 1970): 197–214.
[4] Bruno, *An American River: From Paradise to Superfund, Afloat on New Jersey's Passaic*, 35–44.

river. Native rowers won national and international championships, as well as rapt attention from the public and press.[5]

In this paper, I aim to describe the narrative of the rise and fall of the Passaic River's amateur boat clubs in the context of the city's development through the Gilded Age into the Progressive Era. These dozen or so clubs served major social functions for Newark men outside of the sport itself and were bright spots of Victorian pageantry and grandeur. Rowing activities served as a show of masculinity, and much attention was given by boat clubs in the area of entertaining society women. I will highlight major regattas hosted on the Passaic River in Newark that demonstrate how the sport developed in America over this same period and document their demise at the turn of the twentieth century. These organizations and their events were a manifestation of the city of Newark's expansion of wealth and relevance in the late nineteenth century. The emergence of the American middle class and vastly improved means of communication and transportation created societal conditions that made this community relevant, even in the shadow of New York City. Local oarsmen became national heroes, and several generations of young men strove to equal their success. The impact of this period of athletic significance waned and all but disappeared at the turn of the twentieth century as the public abandoned it due to severe environmental deterioration of the Passaic.[6]

This pollution was a direct result of the same industrial and social forces that brought amateur rowing into public admiration. This narrative shows the significance and scale of rowing as a sport in 19th-century Newark and how it was truly a manifestation of the Gilded Age: those with "new money" from the city's industrial concerns both funded rowing and

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[5] Girard Michelson, "River's Rowing Days Live Only in Memory," *Newark Sunday Call*, September 17, 1932.
[6] Frank J. Urquhart, *A History of the City of Newark, New Jersey: Embracing Practically Two and a Half Centuries, 1666-1913* (New York: Lewis Historical Publishing Co, 1913), 670–72.

polluted their sterling venue with their factory wastes (and, indirectly, drew immigrants who drastically increased the sewage outflow of Newark). The "great white men" of Newark both built up and wiped out a community of oarsmen and dedicated fans over a few decades. Exploring how the recreational use of the Passaic River, particularly in the context of amateur rowing, evolved from the end of the Civil War to the turn of the twentieth century sheds light on the parallel development of Newark as a major industrial city during this period and the environmental and social consequences of that industrialization.[7]

Scholarship is scant on the sport of rowing on the whole, and no academic publication has ever been devoted specifically to the analysis of its significance in Newark. Few who currently row on the Passaic River even have any concept of the depth of the history of its use as a rowing venue. Why do hundreds of high school, college, and adult rowers risk spending time on America's most polluted waterway, the only one of its kind dedicated a federal Superfund site? The answer lies in a tradition of devoted enthusiasts who have kept the sport active, nearly uninterrupted for more than 150 years. The genesis of this community can be traced directly to the founding of the Passaic River's first clubs.

Newark industrialists made a fortune in the antebellum era selling cheap clothing and leather goods to Southerners who used those products to clothe and supply their enslaved people. The Civil War provided lucrative war contracts to an ever broader range of manufacturers, further enriching the city and lending it an air of patriotic prominence in the war effort.[8] Plentiful immigrant labor from Germany and Ireland fueled the unskilled labor needed by its tanneries,

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[7] Stuart Galishoff, *Newark: The Nation's Unhealthiest City, 1832-1895* (New Brunswick: Rutgers University Press, 1988), 11–29.
[8] Samuel H. Popper, "Newark, New Jersey, 1870-1910: Chapters in the Evolution of an American Metropolis" (Ph.D., New York, New York University, 1952), 11–15.

and the population of the city grew greatly between 1860 and 1910.[9] At the same time, the new class of wealthy men that emerged out of this industrial growth strove to heighten the profile of Newark, and ardently supported rowing as a refined sport destined to actualize Newark's status as a major American city. Using major regattas as a platform and draw, industrialists and politicians were able to show the power of Newark as a hub for trade, manufacturing, and innovation to visitors from all across North America.

The first rowing clubs were founded along the Passaic River beginning directly after the end of the Civil war in 1865. The sport grew rapidly, with over a dozen clubs forming in and around Newark over the next two decades, coinciding with a national fixation for rowing as a spectator sport. Newark held numerous championship regattas, with national ones hosted in 1878 and 1883 marking the height of the venue's significance. This activity waned in the 1890s, only to cease after 1901 due to extreme pollution of the Passaic through near-zero public health planning, industrial encroachment, and public repulsion to the resultant environment. However, the sport continues to thrive on the river in the vicinity of Newark today due to activism from enthusiasts who have kept the sport alive in the intervening twelve decades.

Rowing was revived on the river following the completion of the Passaic Valley Trunk Sewer in 1924, but would never reach the popularity it did in the Victorian Era likely due to the rise of more accessible sports such as cycling, baseball, and football.[10] Yet today, hundreds of high school, college, and adult amateur rowers ply the Passaic whenever it is unfrozen. Unbeknownst to most of them, all of the organizations that support these enthusiasts can trace their lineage directly to the heyday of amateur oarsmen in the nineteenth century. This paper will

[9] Popper, 20–25.
[10] Urquhart, *A History of the City of Newark, New Jersey*, 671.

aim to create a consolidated public record of the origin of this meaningful period, narrate its successes, and recount its demise in detail for the first time.

Chapter One: The Rise of Amateur Rowing in Gilded Age Newark

Contextualizing the Historiography of Passaic River as a Rowing Venue

While much attention has been given to the history of staple American sports in the nineteenth century, especially baseball, very little academic scholarship exists pertaining to rowing, despite its earlier advent. Many primary source texts exist from its brief period of popular prominence, but the majority deal with methods of training. These, such as Robert B. Johnson's *A History of Rowing in America* (1871), speak little of the social or economic facets of the sport, and mostly focus on cataloging race results. These are useful for gathering statistics, but do not provide a meaningful historic analysis of rowing. Some catch-all books have been published, mostly in the latter half of the twentieth century, that provide overviews of the history of the sport in America. Yale professor Thomas C. Mendenhall, the most noted rowing historian of this period, provides a meaningful discussion of American rowing history in his 1980 book *A Short History of American Rowing*, as well as a lengthy bibliography. The main focus of this work is intercollegiate rowing, which has a storied history dating back to 1852 when Harvard and Yale raced each other for the first time, marking the genesis of intercollegiate sports. The type of rowing discussed in this paper is that of amateur boat clubs not tied to any educational institution. While similar in their embrace of amateurism, these boat clubs served different interests and spectators. They faded from public memory at their demise, having no larger organization to sustain their heritage. In general, the vast majority of existing works referenced in rowing bibliographies solely concern rowing in England, where the sport originated and has held a much more prominent place in the public focus for several centuries. Despite not pertaining directly to American history, two social histories of English rowing were consulted for this paper in order to understand the differences between American rowing and the practices

across the Atlantic: *The Social History of English Rowing* and *Rowing in England: A Social History*, by Wigglesworth and Halladay, respectively. These works reveal how rowing is a deeply rooted social institution that often manifests itself in the highest form of pageantry at longstanding events such as the Royal Henley Regatta and The Boat Race. Rowing in America in the nineteenth century had its share of public display, but also was rooted in republican values of workmanship and physical exhibitions of masculinity rather than pomp and social statuses.

The city of Newark, New Jersey was chosen as a microcosm of study for the rise and fall of rowing in the United States due to its brief status as a major venue for the sport, and more simply because it has not yet been comprehensively addressed in any long-form publication. Additionally, rowing still exists as a sport on the Passaic River, a peculiarity on a body of water that has been greatly maligned for its abject pollution over the last century. The Passaic has been the subject of massive litigation over environmental responsibility, specifically concerning dioxin contamination as a by-product of the production of Agent Orange, a potent defoliant and volatile carcinogen used during the Vietnam War. The Lower Passaic is dedicated in its entirety as a federal Superfund site, a designation reserved for the most egregious abuses of the environment. As a result, the public is more concerned with avoiding contact with the river rather than spending time on it. The lack of scholarship pertaining to recreational activities on this portion of the Passaic is, therefore, understandable.[11]

The city of Newark itself, the epicenter of this discussion, has been largely defined by the African American rebellion that convulsed it in July of 1967. By that time, there had not been any rowing activity within its borders for two decades, and the troubled city that emerged has been largely divorced from its earlier history of "great white men" and Victorian pageantry. The

[11] Bruno, *An American River: From Paradise to Superfund, Afloat on New Jersey's Passaic*, 44–81.

built environment of Newark and its surrounding communities has also fully erased any trace or public access to the area where rowing was centered. Civic and societal progress may have banned grand Victorian regattas from public memory, but it has nonetheless been referenced in several works regarding river and its region's history.

Rowing on the Passaic River has been mentioned in several texts concerning both Newark history and histories of the river itself. The earliest apparent secondary source that discusses rowing in a past-tense context is *A History of the City of Newark, New Jersey*, a three-volume set published in 1913, in time for the city's 250th anniversary in 1916. At this point, rowing was considered a lost cause and a distant memory. Norman F. Brydon's 1974 book *The Passaic River: Past, Present, Future*, which provides a comprehensive history of the entire river, mentions the sport and its local significance in a few pages. These two major sources leave more questions than answers, a gap which this thesis aims to fill.

Some more recent attention has been paid to the aforementioned environmental disaster that the Lower Passaic became in the twentieth century. The most useful of these, drawing on many of the same archival sources used in this paper, can be found in environmental engineer Timothy J. Ianuzzi's 2002 book *A Common Tragedy: History of an Urban River.* This volume explains the reasons the river became so marred with contaminants, presenting it as a microcosm of ruined American industrial rivers. However, again, it does not address the historic implications of rowing as a sport, mostly cataloging its rise and fall as just one use of a once-bustling waterway. A similar environmental perspective can be found, including the story of the revival of the Nereid Boat Club, in Mary Bruno's 2012 book *An American River: From Paradise to Superfund, Afloat on New Jersey's Passaic*. Much of her writing on the Passaic River focuses on its environmental story through personal stories, again from the perspective of a scientist. One

would surmise that more-qualified sports or local historians could provide answers regarding the history of rowing in Newark, or even in New Jersey in general. However, the scarcity of rowers themselves points to why this assumption is incorrect.

There are several reasons for this dearth of scholarship, mostly stemming from lack of public participation is what has become a niche sport. Many writers on any given American sport either have experience playing that sport, are avid fans of it, or both. Fascination and reverence for a particular game begets serious scholarship. However, not many people in general are well-acquainted enough with rowing to produce reams of writing. This lack of public awareness and engagement are attributable to several traits inherent to rowing. There are relatively high barriers to entry for rowing when compared with more popular American sports (i.e. football, baseball, basketball). Rowing equipment is prohibitively expensive, with the cheapest single shells selling in the thousands of dollars as of today. Venues for rowing are similarly lucrative. Bodies of water used for rowing must be of sufficient depth, have a gentle or no current, and must not be too choppy or congested with larger boat traffic (i.e. powerboats, yachts, barges, or commercial vessels). Another significant issue is that rowing is innately difficult to commercialize in the age of mass communication. The sport is abundantly harder to televise than most common sports given the space needed for rowing courses and angles needed to display on-water progress. Finally, there is a distinct association between the upper class and rowing, which has been the domain of elite preparatory schools and Ivy League colleges. While these types of institutions have maintained rowing as a tradition since the 1850s, they had little competition for publicity within the sport after the demise of the type of amateur rowing discussed in this paper. This status has been changing in the 21st century, as more and more athletes turn to rowing as a high-impact, non-contact sport for all ages, but rowing still retains just a shadow of the status it

enjoyed in the latter half of the nineteenth century, a time when America was experiencing a slow rebirth after the devastation of the Civil War.

As the United States emerged from the carnage of its superlatively bloody war against itself, many facets of American life were being redefined. The most useful work concerning this era referenced for this paper is *Rebirth of a Nation: The Making of Modern America* by Rutgers historian T.J. Jackson Lears (2009). Railroads, telegraphs, and steamships greased the wheels of trade, begetting a second industrial revolution. Large corporations harnessed capitalism to enrich the few, while the many poor suffered in terrible conditions. This increased economic activity and wealth created the modern middle class. Many of those who belonged to this new social stratum were skilled workers somewhere between unskilled immigrant laborers and the robber barons who orchestrated vast enterprises that employed all of them. Just as their underlings toiled endlessly in obscurity, men at the top of the industrial food chain had their nerves frayed by the increasing complexity of the world. Bullish masculinity was propagated by public figures like Theodore Roosevelt, who championed physical activity as a means to fend off the perceived withering of Anglo-Saxons due to white-collar overwork in the new economy.

Newark was no stranger to the economic changes transforming American life. In fact, it was at the forefront of the innovation economy. Paul Israel's chapter on this era in *New Jersey: A History of the Garden State* describes how the city, already well-industrialized pre-war, became a hub of innovation after it. This thesis aims to connect the well-analyzed phenomena of capitalism and societal trends in the late nineteenth century to the emergence of Newark as a venue for rowing, and that venue's quick demise from the same forces that created it.

Origins of the Passaic River's Rowing Clubs

Rowing in America is rooted in its maritime cities, where able-bodied men created a sport out of their daily work. While boat racing among this group has been documented since the late eighteenth century, it was not until the mid-nineteenth that it spread from a handful of coastal cities. The first rowing clubs in America were organized in the 1830s, and its popularity increased through hotly-contested professional races held throughout the 1850s and 1860s.[12] Professional races were common yet irregularly scheduled in waterfront cities in the Early American era.[13] Races between American oarsmen and ship crews from England attracted considerable public attention. Most of this activity was centered in and around New York City, with several early amateur clubs organizing there in the 1840s and 1850s. Following the Civil War, amateur racing exploded in popularity, quickly becoming an important spectator sport across the country.[14]

At the 1876 Centennial Exhibition in Philadelphia, the only two sports showcased were sailing and rowing. "Boathouse Rows" emerged in major American cities such as Boston, New York, and Philadelphia, where clubs that had accumulated capital built elegant boathouses. This increased built permanence was an indication of the popularity the sport was quickly gaining. Mendenhall notes that "…[T]he 1870s saw rowing more widely enjoyed than at any time from then until today and more popular than ever before or since…More leisure, greater affluence and expanding cities combined to provide both participants and spectators…The railroad and the

[12] Johnson notes that the Castle Garden Amateur Rowing Association was established in New York City in 1834. As of 2020, the oldest boat club in America is the Detroit Boat Club, founded in 1839. He makes no mention of this club in his book, and names the oldest boat club in existence as of 1871 as the Atalanta Club of New York City, organized in 1848. That club participated in Newark regattas with regularity.

[13] An exception to this are annual regattas that were held in Newburgh, New York starting in the 1830s. By the late 1850s, annual regattas, usually held on the Fourth of July, were being held in Boston, Staten Island, and Poughkeepsie.

[14] Robert B. Johnson et al., *A History of Rowing in America* (Milwaukee: Corbitt & Johnson, 1871), 46–53.

telegraph worked to make this activity regional and even national…".[15] He goes on to note that, by 1873, 159 regattas were scheduled for the year, and 289 boat clubs were in existence. These regattas were extremely popular with city residents, who were afforded an opportunity to root for their favorite clubs, donning their colors. A betting market existed for these races, too. Men would place wagers on amateur oarsmen just as they would with professional oarsmen, pugilists, or horses, exponentially increasing the rapture and excitement of the sport. Publications such as *Outing* magazine sprang up to feed the public's ravenous desire for insights into boat racing on a national scale. At the same time, Americans developed a culture of rowing that was decidedly different from England's, as cities developed their own local competitive scenes.

Amateur oarsmen were celebrated for being "normal people" who used their leisure time to train, in contrast to professionals who made a career out of rowing for money. The National Association of Amateur Oarsmen was formed in 1872 to regulate this form of rowing, and quickly established a standard definition of what an amateur oarsman was (i.e. he did not participate in professional races, nor work with a paddle or oar) in order to facilitate inter-city championships. Newark was in a particularly ripe position to incubate an amateur rowing scene. The Lower Passaic was considered an ideal rowing course, as the surface is generally calm, and its tidal nature provides predictable changes in current that create variety when it came to training during oarsmen's leisure time. The city was experiencing rapid population and industrial growth, providing both wealth to support boat clubs and race prizes and a plethora of spectators at regattas. Recently linked by trade, railroads, ferries, and telegraph lines to New York City metropolitan area and America on the whole, Newark was in an advantageous position to host regattas and find competition with ease. New York City's rowing hub was the Harlem River,

[15] Thomas C. Mendenhall, *A Short History of American Rowing* (Boston: Charles River Books, 1980), 21.

which provided better conditions than the choppy Hudson. Many of the clubs located there would be regular participants in Newark regattas, thanks to ease of access. The start of Newark's organized rowing activity and tradition of hosting regattas coincided directly with the end of the Civil War, mirroring national trends in popular recreation.

The genesis of Newark's amateur boat club community is rooted in the founding of the Passaic Boat Club on July 5, 1865, less than two months of the end of the Civil War at Appomattox.[16] The city's first inter-club race that is readily documented occurred in September of 1866, between the Passaics and the Nereid Boat Club, which was organized May 15 of that year.[17] As competition grew and more boat clubs were organized, existing clubs sought higher levels of corporate recognition in order to expand their operations.

The Passaic Boat Club was granted an official charter by the New Jersey Legislature on March 4, 1867, and appears to be, upon inspection of previous years' legislative session laws, the first such organization in New Jersey to obtain one. This occurred in an era when most corporations in New Jersey required a special charter granted by the legislature to operate, as the state did not adopt a functional general statute for incorporation until 1875.[18] Given that boat club corporations existed solely for social and athletic purposes and not for profit, the granting of a charter was likely for the benefit of acquiring land as a corporation as well as the ability to benefit from the legitimacy of a corporate seal.

Following the Passaics and Nereids, the Triton Boat Club was organized on January 1, 1870. While the Nereids ended up folding and being revived by a different group of men in

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[16] Waters, Balch & Co., *The Annual Illustrated Catalogue and Oarsman's Manual for 1871* (Troy, N.Y: Waters, Balch & Co, 1871), 376.
[17] Urquhart, *A History of the City of Newark, New Jersey*, 671., Balch & Co Waters, *The Annual Illustrated Catalogue and Oarsman's Manual for 1871*, 375
[18] Christopher Grandy, "New Jersey Corporate Chartermongering, 1875-1929," *The Journal of Economic History* 49, no. 3 (1989): 681.

1875, the Passaics and the Tritons cemented themselves as the flagship boat clubs of Newark. Aristocratic scions of wealthy industrial families made up their active membership, while older non-athletes joined as honorary members for their social aspect. Just as the wealthy belong to country clubs today, joining a boat club as a supporting member afforded Newark businessmen a platform for extravagance and social display. This characteristic is evident in a Triton Boat Club scrapbook preserved in the manuscript collections of the New Jersey Historic Society. It is rife with blue-blood Newark names. Even their meeting invitation cards were extravagant, with fancy typefaces. Gold ink bedazzles dinner and regatta programs, and the comings and goings of members are documented in dozens of newspaper clippings. Despite the status of these early clubs, not all of them relished the privilege of Anglo-Saxon predominance. Some clubs were formed by members of different groups characteristic of a changing Newark.

One boat club was linked directly to one of the city's largest manufacturing concerns, the Clark Thread Mill. This monstrous industrial concern occupied factory buildings on both sides of the Passaic in Newark and modern-day East Newark. The Eureka Boat Club, organized in 1873, made its home in a boat club directly across the river road from the Clark buildings on the eastern bank of the river. Naturally, most of its members were employees of the factory, which itself would shut down production on regatta days.[19] Other boat clubs catered to different demographics. The Institute Boat Club was made up largely of Catholics, and the Mystic Boat Club was founded by a group of transplants from Mystic, Connecticut. It is not surprising that a Catholic group would found their own boat club, given that there was considerable anti-Catholic sentiment among the Newark establishment throughout the nineteenth century. However, all of these clubs received equal treatment on the racecourse.

[19] *Newark Morning Register*, June 14, 1875

Competition heated up throughout the 1870s with the proliferation of boat clubs along the Passaic. Apart from those previously enumerated, various other clubs were founded on the river near Newark between 1870 and the mid-1890s, including the Anneke Jans, Ariel, Atalanta, Eccentric, Essex, Excelsior, Newark, Riverside, and Woodside Boat Clubs. This development of boat clubs was not limited to Newark but was commonplace in cities with appropriate access to waterways following the Civil War. Similar rowing activities abounded in Detroit, Boston, Philadelphia, and New York City. The expansion of America's wealth, middle class, and the expansion of leisure time created a perfect environment in and around Newark for the rich and "workingmen" alike to form pride-filled clubs where they could flaunt their masculinity and gain public appreciation at regattas teeming with society ladies.

These regattas formed a high point in the social calendar of nineteenth century Newark and became national in scale by the late 1870s. However, it is important to note the origins of Newark's earliest clubs, as the Triton, Passaic, Institute, and Nereid boat club's members would make some of the greatest contributions to the promotion of the sport in Newark. The boat clubs of the Passaic River gained followings through their social aspects not just limited to grand regattas. Celebrations such as social outings on barges and celebratory dinners helped them build a network of supporters, both male and female. Surviving photographs, ephemera, scrapbooks, and logbooks provide a glimpse into the devotion and functions these clubs served beyond fielding rowing crews.

Day-to-Day on the River

An extant rowing log held by the Newark Public Library sheds light on the day-to-day operation of the Passaic Boat Club. Each row was logged in the book, and statistics were

compiled at the end of each season, giving river mileage totals for individual members as well as the club on the whole, covering rowing seasons from 1877 to 1884. Seasons usually started in late February or early March, depending on when the river was sufficiently unfrozen. The rowing season would commence as soon as the floating docks were installed. Most seasons would conclude after Thanksgiving in the first week of December, when the floats were removed. For each season, the longest row and shortest row would be recorded, and the total mileage per boat was also tallied. An individual rower would, on average, row over 200 miles per season, with some doubling that. For 1882, a J. R. Weeks, Jr. rowed 403½ miles on 96 separate outings. The same man would row 587 miles in 1883. Each member did not necessarily row every day, but some trips could consist of 10 miles or more. There are several points of interest that are listed in the front pages of the log, giving distances up and downriver from the Passaic boathouse. They include bridges, factories, pleasure parks, hotels, and towns. Of note is Rutherford Park, a hotel and resort complex in modern-day Rutherford that had facilities for rowing, marked 7½ miles to the north.[20] Stopping at these waypoints during practices could provide casual observers an opportunity to attain a sense of different clubs' strengths and weaknesses. In a more casual sense, these places provided venues for social gatherings aimed to please boat clubs' female guests.

The presence of women in the realm of sports had long been exulted as an enhancement of sport, and sport itself a noble activity that women should support. An 1859 article in the *New York Clipper* expounds on these benefits:

> "What we particularly wish to observe…is the fact that our female friends are positively interested in the general adoption of those social gatherings which are inseparably

[20] Passaic Boat Club, "Logbook, 1877-1885" (Book, Newark, NJ, 1885), 183, Miscellaneous items (B) relating to Newark (N.J.), 1856 - 2006, Charles F. Cummings New Jersey Information Center, Newark Public Library, Newark Miscellaneous Collections.

> connected with the pursuit of athletic sports…[O]ur lady friends have the power to train and decorate our most rude and tender sports with the tender vine of their refining good-will, and confer that sort of social sunshine in the way of approbation which must always make men grow better and better."[21]

This "social sunshine" undoubtedly augmented the experience of waterborne athletes, giving them motivations to perform and impress their wives or social suitors. Given that many of these men were white-collar workers, especially in the context of the Passaic Boat Club's upper-level social status, physical activity including women was likely seen to have mental benefits as well. As discussed more fully in Chapter Two, businessmen of this time period were prone to overwork and mental exhaustion, manifesting in nervous maladies bound to strain relationships. At the same time, American women suffered similar anxieties thanks to evolving society and the increasing complexities of keeping up with the Victorian home. Mutual enjoyment of rustic out-of-doors activities provided a respite from this perceived chaos, and boat clubs wholeheartedly enjoyed pastoral jaunts in the company of their female companions.

While large regattas served as major public displays of masculinity for society ladies, the Passaic Boat Club augmented these with more intimate "moonlight receptions" on the Passaic River. An entry from June 12, 1878 recounts one of these affairs:

> "June 12th Evening – first moonlight reception of the Club, since redecorating the house – Front room handsomely draped & universally admired. Music by the band; tripping of the light fantastic; spread by Allen, Chinese lanterns, moonlight barge parties, much flirtation. Presentation of prizes to Tritons &c. Guests from all the clubs with the exception of the Mystics. Voted a complete success by everybody."[22]

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[21] "A Few Signals to our Female Friends," *New York Clipper*, May 14, 1859, 28.
[22] Passaic Boat Club, "Logbook, 1877-1885," 35.

It appears that the Passaics were preoccupied with entertaining the public and their female companions just as much as they were concerned with the athletic pursuit of rowing. Similarly, another entry from 1878 notes a jaunt on a "barge with ladies to Hudson's Picnic. Very damp good time", possibly insinuating a considerable consumption of alcohol. Decorations and invitations were common purchases for boat clubs as evidenced by various receipts to merchants extant in the papers of the Passaic Boat Club housed at the New Jersey Historical Society. Music was also integral to the social function of each club.The Passaic Boat Club even went so far as to incur the considerable expense of renting a piano for the warm months. Orchestras were commonplace at major regattas, likely used to entertain guests of the clubs during the considerable wait times between races. One club even had a piece commissioned for them, as a score for a tune entitled the "Triton March" was included in the Triton Boat Club's program for the 2nd Annual Passaic River Amateur Rowing Regatta in 1876.[23] Although the clubs spent a considerable time on the water training and rowing for pleasure, they devoted significant resources to entertaining and exerting themselves in the pursuit of social status and female companionship.

Boating activities were not limited to the pursuit of female companionship but could also serve political purposes. The most documented of these activities occurred at the later incarnation of the Nereid Boat Club. By the 1890s, the club had secured a home just north of the Newark border near the Second River in Belleville. A series of photographs from this time period are preserved in the Belleville Public Library's manuscript collections. These shed light on the interior configurations of this club, and that not all of its activities were limited to waterborne pursuits. Figure 1.1 illustrates the billiards room that entertained members and guests

[23] This program is pasted in the Triton Boat Club's 1875-1877 scrapbook, Manuscript Group 1488 at the New Jersey Historical Society in Newark, NJ.

when not on the water. The two-story structure contained an upstairs meeting room where political and social business could be transacted, or simply be used as a sitting room due to its abundance of cushions, benches, and the presence of a wood-burning stove. As for political activities, Figure 1.2 shows club members with picket signs. One reads “For Surrogate / E.W. Jackson”, another reads “The Nereid Boat Club / Our Boys Win”. Another photograph in the collection shows a picket for A.F. Skinner for assembly, and “Belleville Honors Her Sons”. These show that the activities of the boat club in the late 1890s were inextricably linked to New Jersey’s Republican politics. Edward W. Jackson was the Essex County Surrogate at this time, and Alfred F. Skinner, an 1883 Rutgers College graduate, was a powerful Republican lawyer who served in the New Jersey Assembly from 1894 to 1897. Jackson is listed as a member in a 1901 Nereid regatta program, and an F. H. Skinner is as well, Alfred’s brother. It appears that this club participated just as much in politics as it did in rowing activities, showing the scope of the nineteenth century boat club’s role in society was not limited to sport and socialization but functioned as a political club as well.

Overall, the boat clubs of the Lower Passaic served their members not only as competitive sports teams but served as social outlets and political platforms. All of these functions appear to be rooted in the nineteenth century zeitgeist. As America was reborn out of the aberrative Civil War, the course it charted into the Gilded Age was full of anxieties concerning displays wealth, masculinity, and political allegiance. These themes will be explored further in the next chapter, documenting the evolution of Newark’s rowing community during this period.

Chapter Two: Regattas and Prominence as a National Venue

Regattas in Newark: Motivations and Organizations

As America was cobbling itself back together in the aftermath of the Civil War, Newark was manifesting its ambitions of becoming a metropolis in its own right, asserting its individuality through its industrial prowess, bolstered by immigration. At the same time, old-blood Anglo-Saxons were feeling threatened by societal changes and viewed their cohort as being under siege. Widespread nervous maladies and the perceived erosion of masculinity exacerbated these fears, with physical exercise viewed as a wholesome remedy. In Newark, regattas were viewed by municipal leadership as a display of civic pride through wholesome sport. In response to the first major inter-city regatta held in Newark in 1868, Mayor Thomas Baldwin Peddie (see Figure 2.2), a prominent industrialist, remarked that he "long desired to see this noble, manly and graceful recreation instituted on the beautiful Passaic".[24]

That 1868 regatta, the First Annual State Regatta held on October 10, 1868, is the first for which there is an extant visual representation. A large engraving was published in *Frank Leslie's Illustrated Newspaper* on October 31 (see Figure 2.1). It was sponsored by the New Jersey Boating Association, which was formed the same month of the regatta ostensibly to organize it and govern the rules before the advent of standard amateur racing definitions. This early association consisted of the Atlantic, Hudson, Passaic, and Dundee Boat Clubs based in Hoboken, Jersey City, Newark, and Paterson, respectively.[25] This regatta was the first well-documented attempt to create a major civic event out of the nascent rowing scene in Newark and apparently was a special project of Mayor Peddie. His aforementioned comments about the

[24] "The First Annual State Regatta," *Newark Daily Advertiser,* Oct. 12, 1868
[25] Waters, Balch & Co., *The Annual Illustrated Catalogue and Oarsman's Manual for 1871*, 469.

nobility, manliness, and grace of rowing hint at the context of the sport and this type of event at this time in American cultural and sports history.

Peddie's description of the sport was likely used to contrast rowing with baseball, which was extremely popular in the New York Metropolitan region at this time. Baseball historian Benjamin Rader notes that "…bankers, merchants, and industrialists…saw it as a waste of valuable time" in the late 1860s, a sentiment likely shared by Peddie.[26] As a token of his appreciation for the development of rowing, he provided the winners of the first race with a "Mayor's Cup". An example of this type of elegant and valuable award can be found in Figure 2.3. This event was, therefore, the brainchild of a man who appreciated the aesthetics and prestige of rowing and had the means to facilitate a regatta as a man of wealth and power. Peddie's mayoralty and his influence on the regatta signals that the "new money" of Newark's industry was held in high regard by the general public.

In the same vein, the easy accessibility of baseball to the masses enabled skilled oarsmen to stand out as members of an upper class of athletes. However, the rowers themselves might not have been individually financially responsible for financing their equipment and training. Instead, they depended on boat clubs with many non-rowers as dues-paying members to continue their activity. The clubs with the wealthiest members (i.e., the Passaic and Triton Boat Clubs) likely had the best equipment and largest houses, creating the ability both to surpass their competition from an efficiency standpoint and host many esteemed guests. In turn, this relationship between members and oarsmen engendered enhanced competition as more and more stakeholders invested in that genteel sport.

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[26] Benjamin G. Rader, *Baseball: A History of America's Game*, 3rd ed., Illinois History of Sports (Urbana: University of Illinois Press, 2008), 11.

The concept of rowing being a "noble" and socially beneficial sport can also be attributed to a line of eugenic thought prevalent at this time. The passage of the Thirteenth, Fourteenth, and Fifteenth Amendments, the Civil Rights Act of 1866 and 1877, plus the burgeoning women's' rights movement all threatened the white male American establishment. This perceived threat was not limited just to people of color and members of the opposite gender. With mass immigration from Europe drastically affecting the ethnic makeup and Anglo-Saxon order of American cities, the male Americans were feeling an assault on their identities from all angles. Theodore Roosevelt was the main proponent of a physical cure for the diminishment of white prominence, and viewed "making one's body" as a lesson to be taught to the class of leading men in his time. He believed "collegiate" sports such as football, rowing, baseball, and track could assist white (i.e. Anglo-Saxon) men in "building up the manhood" to avoid "physical degeneration", and in turn "race suicide". [27] As Newark became increasingly diverse through the latter half of the nineteenth century, organized rowing would work to stave off the seemingly impending decline of, what some believed, the race that produced America's great leaders. This racist and nativist line of thinking is somewhat manifested in the fact that the largest regattas were typically held on Independence Day and Decoration (Memorial) Day and were grand displays of patriotic pageantry. Rather living a life of leisure, regular physical exercise was viewed to improve the sharpness and strength of Anglo-Saxon men, the alternative being effeminacy and mental debility.

Aside from aesthetic and dubious class-based implications, activity like rowing was believed to be an antidote for "neurasthenia" a catchall diagnosis for various nervous

[27] Roberta J. Park, "Biological Thought, Athletics, and the Formation of a 'Man of Character': 1830-1900," in *Manliness and Morality: Middle-Class Masculinity in Britain and America 1800-1940* (Manchester: Manchester University Press, 1987), 22–24.

impairments associated with overstimulation from the world's quickening pace thanks to the telegraph, railroad, and the resultant expansion of media. As American society progressed, upper-class voices saw this new "modern civilization" as the chief cause of neurasthenia, a thief of mental resources. Newark's bustling "brain workers", whether they be skilled engineers or bankers and lawyers, likely feared this epidemic of "nervous invalidism" and joining a boat club or supporting one would be a prime remedy. At the same time, those not involved directly with the clubs could relish a day of stimulation outside the confines of the home, office, or factory at a crowded regatta: an escape from the rat race of advanced civilization.

In the same vein, this romantic idealism of masculine expression through sport is recorded in prominent artworks of the time, most notably in the works of Philadelphia painter Thomas Eakins. His paintings of rowers, including *The Biglin Brothers Turning the Stake Boat* (1873) and *Max Schmitt in a Single Scull* (1871) celebrate the masculine forms and out-of-doors elegance of rowers on his native Schuylkill River. Art historian Martin Berger posited that the former painting emphasizes "rowing's reliance on both physical and mental skills".[29] These two characteristics are manifested through two main skills required even in modern rowing. Physically, rowers must have the strength to maintain speed to stay ahead of their competition. Mentally, intense focus is required to balance brute force with careful timing and strategy in order to keep a steady pace and coordinate the actions of multiple rowers simultaneously. In the context of the *Biglin Brothers* painting, this need for mental acuity concentrated on just two people, navigating a tricky turning maneuver. While Eakins did not attain much recognition during his lifetime, his artwork does much to provide a visual representation of the

[29] Martin A. Berger, *Man Made: Thomas Eakins and the Construction of Gilded Age Manhood* (Berkeley, CA: Unviersity of California Press, 2000), 23.

characteristics of rowing that were so attractive to the people who vehemently supported it in post-Civil-War Newark.

However, this concept of physically exultant public affairs was still somewhat foreign to 1860s Newark.[30] The 1868 regatta came at a significant juncture in the history of the city, which was emerging from the period of immense wartime industrial activity on unsure footing, seeking new markets in the next decade. To further this purpose, the Newark Board of Trade was founded in the same year.[31] Newark's immigrant class, by then well-established citizens of Newark, were beginning to change the fabric of the city as their customs and patterns of recreation upended social norms established by its Puritan founders. Mere dancing was abhorred by Protestant ministers even into the 1870s, whose Anglo-Saxon parishioners, while not making up the majority of the city's population by that point, still held considerable power in Newark.[32] Tensions ran high between old-line Protestants and the Irish and German Catholic newcomers, even occasionally erupting into violence.[33] However, the boisterous and opulent nature of grand regattas signaled that the quaint mores of old Newark were beginning to pass away to the extravagances of the Gilded Age.

The 1868 regatta was slightly different in character when compared to later ones, which, for the majority, emphasized competition between clubs native to the Passaic. However, there were only two clubs in Newark in 1868: the Passaic Boat Club and the Nereid Boat Club's first incarnation. Instead, there was representation from clubs throughout New Jersey, including the nascent Rutgers College crew from New Brunswick, the Atlantics of Hoboken, and the Hudsons

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[30] T.J. Jackson Lears, *Rebirth of a Nation: The Making of Modern America, 1877-1920* (New York: Harper, 2009), 36, 67-71.
[31] Popper, "Newark, New Jersey, 1870-1910," 14.
[32] Popper, 200–202.
[33] Galishoff, *Newark*, 15.

of Jersey City. Based on local newspaper coverage, the public regarded this event as a success. It also set the standard of a mile-and-a-half course denoted by bridges as landmarks. Even at this early date, the gender dynamics of the regatta were clearly mentioned in the press, with Mayor Peddie remarking, in reference to the trophy he paid for, that "there is no better prize than the young ladies themselves".[34] Clearly, the races were meant to serve as displays of masculinity, albeit in a refined manner. While it is unclear what types of entry restrictions were enforced in amateur rowing in Newark in 1868, the term "amateur rower" would be more closely defined in succeeding years, effecting a standard system to keep established professionals and some classes of blue-collar workers out of the sport.

Development of the National Regattas

Up until 1872, there were no national criteria defining the meaning of the word "amateur" when considering rowing athletes. Each river had its own customs, and disputes surely arose between clubs who visited other rivers to compete and their hosts. It also precluded the organization of a title-bearing championship. By the early 1870s, amateur and college rowing clubs desired to remedy these two issues in order to advance the sport of rowing. While professional races caused great excitement, especially when English teams challenged their American counterparts, there was a desire by these non-professional clubs to organize in order curb the influence of those who rowed for money.[35] According to a historical sketch in Janssen's 1887 encyclopedic *History of Amateur Athletics*, a call for delegates was answered by 28 rowing clubs at a convention in New York City on August 28th and 29th, 1872. These delegates agreed on rules defining amateurs and setting up boat races and called for the establishment of an

[34] "The First Annual State Regatta," *Newark Daily Advertiser,* Oct. 12, 1868
[35] Davud C. Chubbuck, *The Book of Rowing* (Woodstock, NY: The Overlook Press, 1988), 17–19.

appropriate national organization to oversee and administer rowing in a uniform manner. They also agreed that an inaugural national championship regatta would be held in 1873. This first regatta was held the week of October 6 of that year. This would not be accomplished until October 1873, but the creation of the National Association of Amateur Oarsmen at that time made regattas with amateur athletes from multiple states feasible for the first time.

The definition of an amateur oarsman as propagated by the National Association of Amateur Oarsmen disqualified men under four different criteria. From a financial perspective, no oarsman would be admitted to an amateur race if he had ever received money for a race, defining those who had as professionals while also banning amateurs from racing said professionals. It also prohibited any theoretical monetary gain from being a member of a boat club, causing these clubs to essentially function as nonprofit entities. The broadest prohibition, however, was in regard to the occupation of prospective amateur rowers. The 1872 definition, as amended through 1884, barred anyone who had been employed anywhere "involving the use of an oar or a paddle".[36] This would have excluded anyone who worked on the river ferrying goods, and ostensibly anyone who crewed a steamboat.

It appears that the American definition of an amateur rower was, nonetheless, less restrictive than the rules established in England, long regarded as the seat of the sport. That country's amateur definition, adopted in 1878, added the further restriction of barring anyone who held the profession of "mechanic, artisan, or laborer".[37] When the Institute Boat Club's champion four-oared crew was invited to compete in the Royal Henley Regatta in 1895, the race officials stipulated that three of the four oarsmen were ineligible on the grounds that they were "mechanics". Those three worked in a factory, and the other man was a schoolteacher. Indignant,

[36] History of Amateur Athletics 157-158
[37] Mendenhall, *A Short History of American Rowing*, 23.

the crew named themselves champions regardless, and were celebrated as such at home.[38] Overall, the American definition of an amateur reflected distinctly American values. Mendenhall says "…[T]he American amateur was not seen as a gentleman whose independent income gave him the leisure to row for pleasure, but rather as a working man whose job or business would effectively prevent him from training as regularly or extensively as a professional".[39]

This sentiment comported well with the labor environment in late nineteenth century Newark, which was dominated by factory workers. Newark became a national hub of innovation following the Civil War, evidenced in Thomas Edison's choice to relocate to the city in 1870. He was drawn by the abundance of skilled machinists and its proximity to New York City, the hub of world trade. Many of the innovations that would define the era would be made or improved by Edison, like the electric light bulb, recorded sound, and the telegraph. Newark's population grew faster than any other city at this time, and its population was almost three times as large as the second-largest city, Jersey City.[40] The labor force in Newark between 1870 and 1880 was made up chiefly of factory workers. In 1870, 60.9% of persons employed in Newark forked for a manufacturer, and ten years later that share constituted 61.1%. Coupled with an increase in population, the actual number of people employed in factories increased 31.3% and would increase another 42.5% by 1890.[41] Overall, during this era, most Newarkers were employed in some sort of factory trade, and this characteristic defined the social and political atmosphere of the city.

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[38] Michelson, "River's Rowing Days Live Only in Memory."
[39] Mendenhall, *A Short History of American Rowing*, 23.
[40] Paul Israel, "The Garden State Becomes an Industrial Power: New Jersey in the Late Nineteenth Century," in *New Jersey: A History of the Garden State* (New Brunswick, NJ: Rutgers University Press, 2012), 175–81.
[41] Popper, "Newark, New Jersey, 1870-1910," 20.

The sport of amateur rowing was intimately linked to the industrial concerns of Newark. The Clark Thread Mill, situated on both banks of the river on the stretch used as the rowing course, produced somewhat of its own boat club. The Eureka Boat club was situated on the waterfront in front of the main factory building, and most of its members were employees or otherwise associated with the manufactory. The records of the Passaic Boat Club, housed in the manuscript collections of the New Jersey Historical Society, illustrate the financial link between Newark's titans of industry and the boat clubs. Edward H. Radel was a wealthy trolley car company owner, and was also a member of the club. He personally financed two mortgages totaling $8,000 for the improvement of the Passaics' facilities in 1890. There is also a link between his firm and another championship rower, Owen E. Fox, who later went into the leather business with Radel's son in the twentieth century while leading the Institute Boat Club in the last years of its existence.

By the mid-1870s, the rowing clubs of Newark were established social institutions that garnered rapt attention of the press and public, evidenced by a plea in a local newspaper begging that "Secretaries of rowing clubs are requested to send their address to this office, and to forward all elections of officers and other matters of interest to readers".[42] A scrapbook belonging to a Triton Boat Club member contains various news clippings and club ephemera from the years 1875 and 1876. Emphasizing the importance and gravity of the regattas at this point, one local newspaper writer penned that "The mere racing of a number of crews, without any unusual surroundings attendant upon it, as witnessed by a looker-on, is calculated to stir the pulse and excite the interest of the most indifferent."[43] Scores of articles like this are preserved in the

[42] Triton Boat Club "Scrapbook (1875-1877)." p. 94
[43] "The Regatta, A Gala Day on the Passaic," *Newark Sunday Call,* June 13, 1875

scrapbook, showing that even the smallest regattas would be covered by multiple Newark newspapers.

Around the same time, the wealthier clubs used their accrued membership dues and contributions from the well-to-do to erect opulent Victorian-style frame boathouses, creating a "boathouse row" for Newark. Photographs survive of the Triton (Figure 2.4 and 2.5) and Passaic (Figure 2.6) boathouses in the area adjacent to Riverside Avenue and the Erie Railroad Newark Branch tracks close to the foot of Chester Street on Newark's north side. As previously discussed, these were used for entertainment as much as they were for athletic activities.

In this same period, the Newark boat clubs decided to create an organization of their own, chartering the Passaic River Amateur Rowing Association in 1875. For Newark clubs, this superseded two prior organizations, the Hudson River Amateur Boating Association (1866), and the New Jersey Amateur Boating Association (1868). The former was mainly made up of New York City clubs who often raced in Hoboken, but initially included the Essex and (original) Nereid Boat Clubs of Newark. The latter was responsible for the aforementioned 1868 regatta and served boat clubs throughout New Jersey. While the two previous organizations appear to have had a more regional focus due to a dearth of clubs, the growth in popularity of amateur rowing enabled the Passaic River group to focus on local activities.[44]

The P.R.A.R.A.'s main activity was regulating and promoting rowing activity on the Lower Passaic River, and hosting an annual regatta. Their first regatta was held on June 12, 1875 and drew approximately 20,000 to 25,000 people to the banks of the Passaic.[45] It included three races, for six-oared gigs, single sculls, and a four-oared championship race. This event provided an opportunity for a Newark-based championship, and the Eureka Boat Club was victorious, to a

[44] Johnson et al., *A History of Rowing in America*, 159.
[45] "The Regatta, A Gala Day on the Passaic," *Newark Sunday Call*, June 13, 1875

multitude of laudations in local press. The existence of the Passaic River Amateur Rowing Association also provided the local clubs with more bargaining power in the context of national affairs, and likely contributed to Newark being chosen as the venue for the National Championship Regatta of 1878.[46]

An 1885 copy of the constitution and bylaws of the P.R.A.R.A. gives insight into some of the activities undertaken by and the structure of the local organization. The association's power was vested in a Board of Delegates, which was made up of three members from each constituent boat club. The main officers were the Commodore, Secretary, and Treasurer. The position of Commodore was most important because that man was charged with organizing and operating the annual regatta. Regular meetings were held three times a year, and clubs had to pay dues to maintain membership. The P.R.A.R.A. adopted all of the "laws of boat racing" as promulgated by the National Association of Amateur Oarsmen. The member clubs for 1885 were the Ariel, Eureka, Essex, Institute, Mystic, Passaic, and Triton Boat Clubs. Results published in this pamphlet reveal that the majority of local titles were won by Newark clubs, but several out-of-town clubs were victorious in the period from 1875 to 1884, mostly hailing from New York City.

The general success of these major regattas surely attracted the attention of members of the executive board of the National Association of Amateur Oarsmen, especially in the context of selecting a venue for their national championship regatta. The geography of the Lower Passaic in the late nineteenth century was germane to hosting large events for several reasons. The standard regatta course (see Figure 2.7), with some alterations depending on who was hosting it and the placement of the wooden grandstands, stretched from near the Paterson, Newark, and

[46] This organization, chartered in 1875 and largely defunct by 1902, should not be confused with the Passaic River Rowing Association, which was founded in 1999 as a splinter group of the Nereid Boat Club.

New York Railway Bridge[47] near the foot of Gouverneur Street northward to a point just south of the Midland Railroad Bridge.[48] This constituted a distance of 1.5 miles. Some races involved a turn, doubling the distance; others were in one direction only, depending on the category. All of the grandstands and barges situated themselves in the vicinity of the boathouses and finish line, in an approximately quarter mile area northward and southward of Mount Pleasant Cemetery, on both sides of the river. Steamships such as the *Passaic Queen* would follow the races as they progressed, as did spectators on the shoreline. Pedestrians, those on horseback, and later, cyclists, would travel along the riverbank to observe the race from start to finish, as visibility would be too poor at a distance to identify the progress of the races or readily indicate a winner.

The 1878 National Regatta

The National Association of Amateur Oarsmen selected Newark as the venue for the 1878 regatta, a symbol of the "arrival" of Newark as one of America's great cities. It was held over two days, Wednesday, August 21, and Thursday, August 22. This event was much anticipated, with local newspapers running articles concerning the preparations and the comings and goings of out-of-state boat clubs up to two weeks before the actual event. Preparations of the course of the races included Western Union erecting a telegraph system which enabled the races' progress to be relayed to the grandstand.[49] Stakes were driven into the river mud to denote

[47] This drawbridge has gone through several iterations since the beginning of rowing on the Passaic River. It can be inferred that the first bridge at this location was built in 1871 when the railroad was constructed. It was described as a Pratt through truss bridge. This aligns with its inclusion on a course map published in 1875 in the *Newark Morning Register*. Another bridge of the same type replaced this one at the same location in 1903. In 1922, this bridge was replaced again by a bascule bridge known as the NX Bridge that was later abandoned in 1977 and left upright. It is culturally significant for being a filming location of the 1980 movie *Annie*.

[48] The extant bridge at this crossing (as of 2020) is known as the WR Draw and was constructed of brown sandstone in 1897. The previous bridge, referenced here, was initially built for the alignment of the Midland Railroad, which eventually became the New York and Greenwood Lake Railway, owned by the Erie Railroad. This bridge would later be used by NJ Transit until 2002, when it was abandoned and welded shut in place. This bridge has cultural significance for being in the opening sequence of *The Sopranos*.

[49] "The National Regatta*," Newark Daily Advertiser*, Aug. 20, 1878

waypoints such as the start and finish lines. Colors were designated for each position on the river, which was able to accommodate four different boats per race. This enabled spectators to identify the boats from the shoreline, as each crew would wear a garment including that color. River police utilized rowboats and a steam yacht to patrol the busy course in order to keep it clear of obstructions.[50] The Mount Pleasant Cemetery Company, in existence since 1844, prohibited spectators in an effort to avoid the "possible desecration of their grounds by lawless parties", even enlisting a private police force to keep people out.[51] This provision underscores the sheer number of people expected, as well as boisterous nature of the regatta (see Figure 2.8 for an illustration of the crowds).

Much attention was given to the accommodations at the grandstands in the press. There was one official grandstand erected at the foot of Fourth Street in Newark, and tickets were capped at 3,000 persons. There was a fee for entry to the main grandstand, likely limiting the prime viewing point to those with financial means. Members of lower classes could observe from any of the lumber and stone yards near the finish, or simply follow along the river roads on each bank to follow the progress of the races, as previously described. See Figure 2.9 for an illustration of this type of race-tracking during the 1883 regatta.

The focal point of excitement for the press in Newark was the mere presence of boat clubs from throughout the country, affording an opportunity to show off the city of Newark. In addition, this event was reported via telegraph to the non-native boat clubs' home cities, garnering even more direct tele-publicity. Even more meaningful was a Passaic River course speed record set in the single sculls race, which would hold until the next national regatta in Newark. Single sculler George Lee finished in nine minutes and three-quarters of a second on the

[50] "The National Regatta," *Newark Daily Advertiser*, Aug. 20, 1878
[51] "Regatta Notes," *Newark Daily Advertiser*, Aug. 19, 1878

Passaic course.[52] Lee was a famous rower in Newark in the 1870s, and it is noted that a young Thomas Edison once challenged him to a race while he had a workshop in the city. Lee beat him so badly that he had to "row back from the finish to find him".[53]

During Newark's industrial growth, a large industry surrounding the production of jewelry developed. Newark was home to dozens of manufacturers specializing in watches, badges, ladies' accessories, and the like. The existence of this industry added to the spectacle of awarding champion rowers. Prizes would be displayed publicly in advance of regattas to drum up excitement. It appears that, a decade after the regatta of 1868, former mayor T. B. Peddie was still invested in the rowing scene. He is noted as being the main presenter of awards the day following the conclusion of the races, despite leaving office as mayor eight years prior.[54] This awards ceremony, held at Park Hall, was the capstone of a successful event marking the now-elevated national prominence of Newark. A local reporter remarked that the N.A.A.O. officials had "never had a [better] reception, and the Regatta of 1878 will remain a green spot in all the memories of the participants".[55] This measure of success undoubtedly led to an even grander affair, the 1883 National Regatta.

The 1883 National Regatta

The Eleventh Annual National Championship Regatta, held on August 7 and 8 1883, represents the pinnacle of rowing on the Passaic River. Newark's population had continued to grow in the intervening years, and rowing had continued to gain popularity as a socially

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[52] "Regatta Week," *Newark Sunday Call,* Aug. 5, 1883
[53] Michelson, "River's Rowing Days Live Only in Memory."
[54] Peddie, however, served at this time in the United States House of Representatives (1877-1879), representing New Jersey's 6th District, which covered the whole of Essex County from 1873 to 1893. Peddie is buried in Mount Pleasant Cemetery, with his plot overlooking the finish area of the rowing course (now fairly obstructed by New Jersey State Route 21).
[55] "The National Regatta," *Newark Daily Advertiser*, Aug. 22, 1878

important spectator sport in and around the city. With the 1878 Regatta noted as a resounding success, it was only natural that the city of Newark would be chosen to host the prestigious regatta a second time. It was not unheard of for the National Association of Amateur Oarsmen to repeat cities in its selection process, as several cities were chosen multiple times between 1873 and 1887, namely Philadelphia (three times), Troy, New York, and Detroit.[56] However, it would be the last time Newark would hold a regatta at this level, subsequent ones being limited to local and regional competitions.

Leading up to the 1883 National Regatta, a *Newark Sunday Call* writer explained that very few contestants from the 1878 Regatta would be returning as contestants in the upcoming one, noting that only seven out of 141 oarsmen entered were to be reprising their role as national contestants.[57] He also adds that the lifespan of an average amateur oarsman's career only lasted three to five years, illustrating the rigor and high level of competition ascribed to the sport at this point.

The characteristics and preparation of the 1883 Regatta were very similar to the 1878 one, with another large grandstand erected at the end of the Midland Bridge – Erie Bridge course. The anticipation by the public appears to have been amplified, given the excitement the previous regatta bestowed upon the city. An article in the *Newark Daily Advertiser* from the Sunday preceding the events noted a remarkable never-before-seen display of "hundreds of spectators watched the scene from the banks of the river and from the boat houses" as visiting crews practiced over the course that day.[58] The same article proclaims the arrival or presence of crews from New York, Massachusetts, Michigan, New Orleans, Toronto, Washington, D.C., and

[56] Frederick W. Janssen, *A History of American Amateur Athletics and Aquatics* (New York: Outing Co., 1887), 155.
[57] "Regatta Week," *Newark Sunday Call,* Aug. 5 1883
[58] "The National Regatta," *Newark Daily Advertiser,* Aug. 6, 1883

Philadelphia. Local newspapers published the lodging locations for each crew, as well as which Newark boat club would serve as their temporary headquarters.

The first day of races, August 7, consisted of trial heats for crews to qualify for final races the following day. During the trials, the Passaic course speed record set by George Lee in 1878 was broken, with independent junior single sculler John Killion of Somerville, Massachusetts clocking in at 8:52.25.[59] This feat was especially significant and exciting to the public because Killion had only started rowing two months prior and had never raced before. However, it would later be discovered that "John Killion" was actually the given name of Jake Kilrain, a popular bare-knuckle fighter. He was later supposedly disqualified because he was a professional athlete, in direct violation of amateur rules. However, the title remained in his name as late as 1894.[60] Estimates of the crows assembled on this first day of racing vary by publication, ranging from 15,000 in the *Morning Register* and 20,000 in the *Daily Advertiser*. Nonetheless, the crowd represented a significant portion of the 136,508 Newark residents enumerated in the 1880 United States Census. The final races, however, would exceed the first day's crowd, with the *Daily Advertiser* estimating that "over 25,000" spectators lined both sides of the river to view the races.[61]

As usual, the regatta afforded Newark an opportunity to show off its civic pride, with the awards ceremony being held in the Common Council chamber, the seat of Newark's municipal government. Summarizing the events of the last few days, it was noted in local papers that the results of the race showed that the Passaic River had cemented itself as one of America's best venues for rowing. Importance was given to the fact that both an international and a local crew

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[59] "Opening of the Eleventh Annual Regatta," *Newark Morning Register*, Aug. 8, 1883
[60] "Century Produces World of Sport, *Newark News*, Apr. 14, 1936; *The New York Clipper Annual for 1894* (New York: The Frank Queen Publishing Company, 1894), 43.
[61] "Close of the National Regatta," *Newark Daily Advertiser*, Aug. 9, 1883

won final heats. Specifically, the Eureka Boat Club of Newark won the four-oared junior four race, and Joseph Laing of Canada was victorious in the senior single sculls event. This would not be the last major regatta on the Passaic course, as various regional and local regattas would continue to be held over the next two decades. However, the National Association of Amateur Oarsmen would never return to Newark. The most notable of the lesser regattas held on the Passaic appears to be the inaugural Middle States Championship Regatta, held in 1890. Newark's boat clubs would find national success through the end of the 1890s (see Appendix B for a compilation of notable races), but the flagship clubs of the 1870s and 1880s were all extinct by 1902. Environmental degeneration and expansion of the city's industrial waterfront wiped out all but one functioning boat club, the Institute, by 1913. The river became unbearable to even stand near, thanks to an ever-increasing volume of sewage. Human and industrial waste repelled even the clubs' most loyal supporters, and only the most die-hard rowing enthusiasts stayed on the water, most of them champion rowers of the 1890s. The pageantry and entertainment associated with the previous decades became just a distant memory as Newark's march of progress smothered one of its cultural jewels.

Chapter Three: Gone, but Not Quite Dead

The Slow Death of Rowing on the Passaic

As Newark's boat clubs were cementing their place in national society, the river they rowed on was beginning to experience the ills of growing industrialization and urbanization. In the first half of the nineteenth century, the Passaic was regarded as a pristine stream that was home to millions of fish. It also provided drinking water in large volumes to the major cities of Newark and Jersey City. However, by 1887, there was a major environmental outcry underway. A pamphlet was published that year in Jersey City warning residents of the dangers of water then supplied through that city's municipal water works to homes and businesses. Albert R. Leeds was a Professor of Chemistry at the Stevens Institute of Technology in Hoboken. In this pamphlet, he applied a scientific analysis to locate the sources of pollution that were making the drinking water taken from the Passaic foul. The Jersey City intake was located on the Passaic River on the eastern shore opposite the populated portion of Belleville, and the Newark intake was located about a mile north on the western bank in a rural portion of Belleville. The pamphlet notes seven major sources of pollution of the river from the Great Falls in Paterson to Newark Bay. Raw, untreated sewage from the combined population of approximately 230,000 people in Newark and Paterson flowed directly into the river. Numerous mills dumped either directly into the Passaic or one of its tributaries. The Second and Third Rivers had a high concentration of these mills in the 1880s, and millions of gallons of acids, heavy metals, dyes, and oil were discharged into the watershed daily. Aggravating this alarmingly unsanitary environmental situation was the fact that the Passaic River is a tidal body of water, changing direction twice daily. This had the effect of intensifying the contamination of the river, because the pollutant could not be flushed fully out of the waterway without the tide bringing it back upstream. The

map included with this report notes that the tides would bring the sewage of Newark several miles upriver to approximately where the present-day border of Nutley and Bellville is located.

Rowing a boat does not require the consumption of the river water, so the activity continued through the 1890s. But even in 1887, it was noted that the situation was continually deteriorating. Leeds states that, even by the early date of 1872, the water was foul, and increased factory discharges made the water undrinkable by 1880. He even compares it to the water supply in Philadelphia, saying "as dangerously polluted as the Schuylkill water is, it is certainly of better average quality than that supplied to Newark and Jersey City".[62] Knowing this, one would assume that some public effort would be made to abate the pestilence of a sewage-infected waterway, especially in the city of Newark as its fortunes increased in the years following the Civil War. The greatest environmental tragedy lay at the hands of ineffectual public health planning in Newark in the nineteenth century.

Stuart Galishoff titled his 1988 book *Newark: The Nation's Unhealthiest City 1832-1895*, illustrating the dire situation of the city in this time period, terminating at the roughly the same time rowing began to lose its luster as a spectator sport on the Passaic. While the public health improved at this time, much of the human waste and contamination that plagued Newark's neighborhoods was simply disposed of into its largest natural waste receptacle: the Passaic River.

As of the 1890 census, Newark's death rate was the highest in the nation, with 27.40 per 100,000 residents.[63] Most of these deaths were directly attributable to the condition of the city's drinking water, which was drawn directly from the Passaic River. He notes that "Sewer construction in Newark proceeded without the benefit of a master plan and was nearly bereft of

[62] Leeds and Julius Bien & Co, 15-17.
[63] Galishoff, "The Passaic Valley Trunk Sewer," 202.

any planning whatsoever".[64] Most of the early efforts to remove sewage from the city were concerned with keeping it out of streets, cesspools, and privies for the benefit of the public health. Later, when the water quality of the Passaic became degraded in the 1880s, public focus was shifted to keeping it out of the river, and some interesting yet generally unsuccessful attempts were made to convey it into Newark Bay at this time. However, Newark abandoned the Passaic River as its water supply in 1889 after years of public outcry and epidemics of typhoid and cholera. Therefore, the public outcry concerning the river's filth was muted somewhat, given that the river was not literally killing thousands of people per year anymore.

Unyielding public clamor forced Newark's municipal government to take drastic action to correct the city's abhorrent sanitary conditions. By 1887, Newark's best option for a pure water source was over 25 miles away in northern Passaic County. Competition had already heated up between land speculators and other municipal water systems, further heralding immediate action. So, the city signed a contract in September of that year with the East Jersey Water Company, which would furnish 50 million gallons per day of pure water from reservoirs of the Pequannock watershed. This system was fully operational by 1893, and the typhoid death rate in Newark plummeted.[65] After this change, sewers that discharged directly into the river were built at a rapid pace, as consumption of Passaic River water was no longer a pressing public health concern. Newark only had 47 miles of sewers in 1880. By 1910, this had increased more than six-fold, with 310.6 miles of sewers discharging untreated raw sewage directly into the Passaic, much of it onto its famed rowing course. Neighborhood health standards may have improved, but the removed filth was simply concentrated in the Passaic River.[66]

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[64] Galishoff, *Newark*, 126.
[65] Galishoff, 182–87.
[66] Galishoff, 126–29.

Galishoff notes that, by the 1890s:

> "The fishing industry died and the stately homes and estates along the river were converted into junkyards and smoke-belching factories. Manufacturers utilized the river as a convenient receptacle for industrial wastes. The shortsightedness of this cavalier disregard for a natural resource became apparent during periods of hot weather, when the river emitted a stench so overpowering that factories were forced to stop production. Floating debris, murky water, and raw sewage made swimming unsafe, and the boathouses and bathhouses on the river had to close. The pleasure craft that had dotted the river were replaced by decaying boat hulks…"[67]

What was once a paradise for personal leisure had become an industrial hellscape. It is said that during a drought in the summer of 1894, there was more sewage in the water than actual river water, and its acrid stench was so strong that it peeled paint off of houses.[68] Factories regularly had to stop production in the summer months because their workers could not stand the stench. It is nearly appalling that rowing was able to continue at all on the river, and it is not surprising that the Passaic did not survive as a rowing venue for long into the twentieth century, save for die-hard adherents of the sport.

At the close of the 1880s, the public was made aware of germ theory, the concept that disease was spread by bacteria. This was in contrast to the previously-assumed miasma theory, which dictated that illness was spread by "foul air", especially fumes emanating from rotting organic goods, sewage, and industrial off-gasses.[69] Knowing the Passaic river was literally filled with agents of typhoid, cholera, and diphtheria, coupled with the once-commonplace assumption

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[67] Galishoff, "The Passaic Valley Trunk Sewer," 203.
[68] "They Hold Fast to Hope for a Beautiful Passaic," *Newark News*, April 22, 1956.
[69] Melanie A. Kiechle, *Smell Detectives*, Weyerhaeuser Environmental Books (Seattle: University of Washington Pres, 2017), 233–51.

that revolting odors could cause ill health, drove away prospective rowers to other sports, and kept the well-to-do and middle class public away from the river in general. As the nineteenth century drew to a close, foul-smelling industrial areas of American cities were relegated to the lowest classes of people. Immigrants and impoverished residents were left behind in the polluted areas, while the increasingly mobile middle and upper classes began developing suburbs away from contamination. Most men involved in amateur rowing on the Passaic were middle- or upper-class people, and their loyal supporters belonged to the same classes. It comes as no surprise that, as the river deteriorated, so did the public's relationship with the sport. [70]

Several boat clubs remained very active into the late 1890s, although it is clear through race results that the variety of successful Newark boat clubs dwindled to just the Institutes by 1898.[71] That club had always been an outlier among the boathouse row, made up predominately of Irish Catholics rather than Anglo-Saxon Protestants. Upper-class "old money" oarsmen from the Passaic and Triton clubs were apt to leave the open-sewer Passaic for greener pastures before the Institutes had the means to do so. This concentrated decline in competition and public engagement was capped by the 1901 Passaic River Amateur Rowing Association Regatta, the twenty-seventh occurrence of the local Memorial Day weekend tradition. About half of the article published in the *Newark Evening News* deals with the account of the races, and the rest is devoted to discussing the precipitous decline the sport of rowing was facing in Newark. The anonymous author wrote:

> "The crowds that lined the shores at previous regattas were not in evidence and the entries were less numerous than formerly…One of the most serious handicaps which the Passaic river Amateur Rowing Association has had to shoulder has been the condition of

[70] Kiechle, *Smell Detectives*, 233–51.
[71] See Appendix B.

> the stream. The water has not only served to keep recruits away and to disgust many of the seasoned oarsmen so that they have declined to risk health by training on it, but it was directly the cause of inducing one of the most liberal of the local patrons of the sport to withhold support heretofore given to the annual fixtures."[72]

By this time, the Triton Boat Club had folded, and its quarters were being used by the Newark Athletic Club's crew team. The Institute Boat Club flew their flag upside down as a signal of distress. Despite the dire condition of the venue, the event still drew several crews from New York and Philadelphia, but the local competition had apparently devolved to just the Nereids (of Belleville), the Institutes, and the Newark Athletic Club. It is to no surprise that the *Newark Sunday Call* published a poignant set of illustrations of ship figureheads holding their noses in early 1902 in order to drive home the fact that the river truly stunk (see Figure 3.1).[73]

Only the most die-hard oarsmen would continue daily rowing on the Passaic, and many champion rowers from the 1890s were the only people ever spotted participating in the activity over the next three to four decades. Even in the early stages of this fallow phase of the community, the fervent enthusiasm for the rowing that came from those who dared to continue training on the Passaic was noted.[74] Those who were still involved in the sport by 1901 were up against insurmountable odds to perpetuate the sport when the public and its greatest financial benefactors were simply abandoning it. Therefore, those who stuck it out on the river clearly had a very strong love of rowing in that they were risking their health with the possibility of feces-borne disease by even training on the river. The 1901 race featured a junior four gig fielded by the Nereids containing E. Schuyler Webster in the bow seat and C. Leverich Brett as coxswain.

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[72] "Spirited Rowing in Passaic Regatta," *Newark Evening News*, June 2, 1901
[73] Galishoff, "The Passaic Valley Trunk Sewer," 208.
[74] "Spirited Rowing in Passaic Regatta," *Newark Evening News*, June 2, 1901

Those two men would remain involved in the Nereid Boat Club into the 1950s and helped support the creation of high school rowing in New Jersey at the club in the 1940s, which will be discussed in the epilogue.

Newark's Built Environment Erases its Boathouse Row

It was no help to the Passaic that the population of Newark, as well as its industry, continued to grow and fan out from the city center. Between 1870 and 1900, the population of Newark more than doubled, from 105,059 in the former to 246,070 in the latter, driven largely by immigration from Europe. The waterfront suffered from industrial expansion, with industrial concerns building further upriver into the rowing area by the turn of the twentieth century.

A careful examination of fire insurance maps and atlases of the rowing district in northern Newark reveals a drastic change at the turn of the twentieth century. The federally regulated pierhead and bulkhead lines were located well away from the extant mean high-water line in the vicinity of the boathouses, and industrial concerns and land speculators were keen to capitalize on this sparsely-used waterfront property. The dredged channel of the Passaic River provided easy access for freight boats and barges carrying goods throughout the New York metropolitan area.

It is very difficult to discern the locations of the Victorian boathouses that were central to the Passaic River rowing community due to extensive landfilling and industrial development beginning in the early years of the twentieth century. On the 1892 Sanborn fire insurance map, the Triton Boat Club's complex is clearly shown, situated on a spit of land at the foot of Chester Street, as is the Passaic Boat Club in a similar configuration on the next block upriver (northward). By 1901, part of their large waterfront complex was being used by the Newark

Athletic Club as a rowing facility, the other half was run as a hotel by a man named Peter Kroll. Bath houses are also shown in close proximity to those structures, some as a component of Kroll's establishment, others further upriver. The next series of fire insurance maps of this area were published in 1909. They show no trace of the shoreline of 1892 in the vicinity of Chester Avenue, as it had been fully landfilled out to the federal bulkhead line, and a factory of the Patton Paint Company built up over it. This is supported by a deed from 1902 indexed in the Essex County Hall of Records noting a transfer from the Triton Boat Club to the Patton Paint Company. The Passaic Boat Club would also sell all of its land in that same year to the United Real Estate Company, and arm of the Lehigh Valley Railroad who proceeded to build a coal depot on the site.[75] In later years, this district along Riverside Avenue would become a hub for heating oil and other petroleum products, with various oil tanks still remaining but abandoned as of 2020. While the shoreline was highly irregular and filled with various coves and other indentations, it was filled in completely to the federal bulkhead line by the mid-twentieth century.

The Institute Boat Club procured land immediately to the north of the Passaic Boat Club boathouse site in 1904, constructing a boathouse there that would remain in that location until 1927. The Nereid Boat Club had occupied its boathouse just north of the Second River in Belleville since 1882 and would remain in that location until a fire destroyed that structure in 1962. After the foreboding 1901 Passaic River Amateur Rowing Association Regatta, no further events were scheduled by that group, whose numbers were dwindling as boat clubs went out of existence. The Eureka Club, which had been very successful in the 1870s and 1880s, was

[75] The records relevant to this paragraph are contained in numerous deeds maintained by the Essex County Register of Deeds and Mortgages, held at the Essex County Hall of Records in Newark. The Sanborn Map Company fire insurance maps published in 1892 (Volume 3) and 1909 (Volume 4) provide spatial reference. Also used to locate these properties and their owners are two atlas maps of Newark published by Elisha Robinson in 1901 and 1911.

expelled from the National Association of Amateur Oarsmen in 1903, ostensibly due to lack of activity. [76] They would apparently be reinstated, as the club is listed in the 1908 directory for the national organization. [77]

At least two clubs were hosting regattas on the Passaic River course until 1908. The Institute Boat Club is listed as having their annual regatta scheduled for September 26th of that year, and the Nereid Boat Club held theirs in June.[78] However, a history published by the Nereid Boat Club notes that a regatta was scheduled by them for 1909, but it had to be cancelled due to the condition of the river. No regattas would be held on the river for over a decade, although one was planned for Newark's sestercentennial celebration in 1916. This planning was overly optimistic, as no evidence has surfaced indicating that any regattas occurred between 1908 and 1924.

There would be little rowing activity on the Passaic River for the following decade and a half, save for some dedicated "old timers" who refused to let the condition of the river impair their daily devotion to rowing. The fortunes of the waterway changed around 1924, when the Passaic Valley Trunk Sewer was substantially completed. This project, conceived in the 1890s, diverted all municipal sewage in the Lower Passaic's watershed for treatment and outflow in New York Harbor, and remains operational as of today. It was a monumental undertaking and took many years of legal and legislative wrangling to even begin construction. Twenty municipalities signed on to connect their direct-outflow sewer systems to the trunk system. Immediately upon completion, the river's condition improved drastically. Enthusiastic civic leaders and members of the public embraced the possibility of a rowing revival, and rowing

[76] "Amateur Oarsmen's National Regatta on Worcester Course in October.," *New-York Tribune*, March 22, 1903.
[77] Fred R. Fortmeyer, ed., *Minutes of the Thirty-Fifth Annual Meeting* (National Association of Amateur Oarsmen, 1908), 140.
[78] Fortmeyer, 140–47.

regattas and canoe races were being held with regularity by 1927. The Institute and Nereid Boat Clubs, in northern Newark and southern Belleville, respectively, sponsored these races. "Old-timer" rowing "crackerjacks" who competed in the great regattas of decades before emerged from retirement to participate and promote the sport to a new generation. But this renewed public interest was unable to sustain both clubs in the face of further alteration of the Lower Passaic's built environment.

The Institute Boat Club's physical progression and later demise over the first half of the twentieth century provides a view of the challenges faced by non-industrial landowners along the Passaic River as land use patterns changed. The club stayed in the same location next to the former sites of the Passaic and Triton Clubs on Riverside Avenue near the foot of Chester Street until 1927, when, in a land swap deal with the Bellis Building Material Company, they moved their structure approximately a quarter of a mile upriver.[79] Their original quarters became shoehorned between several factories and oil depots, which would have impeded Institute rowers' access to the river given the large wakes produced by the oil tankers.[80] Aside from river traffic, the most dire threat was the automobile and twentieth century America's transformation into a divided world of wealthy suburbs and crumbling cities.

As interurban streetcars were phased out and car ownership became widespread, improved road access between Newark and Paterson was needed. The New Jersey Highway Department began planning to build a highway, State Route 21, along the Passaic's western river in the late 1920s. Some improvements were made in the 1930s, but the fate of the dwindling Institute Club was sealed by the time World War II was over. The State of New Jersey took a

[79] Essex County Deed Book V76 p. 421, I77 p. 17
[80] Timothy J. Iannuzzi et al., *A Common Tragedy: History of an Urban River* (Amherst, MA: Amherst Scientific Publishers, 2002), 142–44.

small parcel on the western side (away from the river) of their new property on February 13, 1930, for the first iteration of the state highway .[81] Their time was, however, limited in that location, as the State Highway Authority chose sometime after to develop Route 21 into a fully-fledged limited-access freeway. The Institute Boat Club was one of the first entities who owned property on the Passaic to surrender their property to the state, doing so on December 4, 1946 for the sum of $1.00.[82] In 1947, the club's assets were mournfully liquidated to nostalgic members and their families. The club's demise marked the "end of an era" for Newark, being the last one within the city's boundaries to shutter. The final president of the club was Owen E. Fox, an Irish immigrant who stroked the senior four championship boat at the 1895 Middle States Regatta. He later became the president of the Radel Leather Company of Newark, which is notable because trolley magnate Edward H. Radel, the father of Fox's partner in the leather business, helped finance the Passaic Boat Club in the 1890s.[83] Fox's 1951 obituary notes that he was a familiar sight around Newark, having rowed daily up until about 1941 to the bewilderment of local spectators.[84] The expiration of his cohort of late-stage nineteenth century rowers came at a time when a solution was finally being executed to bring new oarsmen to the water, even if there was only one remaining place to do it.

This left the Nereid Boat Club on Main Avenue in Belleville, founded in Newark in 1866, as the last boathouse functioning on the Lower Passaic. But they, too, faced challenges during World War II. While rowing was re-popularized locally throughout the late 1920s and early 1930s, interest waned significantly as America entered the war. Able-bodied men were all

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[81] Essex County, New Jersey, Deed Book X80, p. 99
[82] Essex County, New Jersey, Deed Book F108, p. 550
[83] Radel, Edward H. *Mortgage to Passaic Boat Club*. Document. From New Jersey Historical Society, *Manuscript Group 1035, Passaic Boat Club, Newark, NJ, Records, 1890 – 1893*
[84] "Owen E. Fox Dies; Was Noted Oarsman," *Herald-News* (Passaic, NJ), Sep. 20, 1951

serving, and the men who came of age during the last days of rowing's pre-eminence were scarce if not deceased. Rather than close up shop as the Institutes did, one of the few younger Nereid oarsmen introduced a concept completely foreign to New Jersey: a public high school rowing team. Starting in 1942, youth rowers began training at the Nereid Boat Club, and Nutley and Belleville High Schools had fully-fledged publicly funded crew programs by 1949, keeping the flame burning for subsequent generations, albeit in a different fashion.[85]

The slow decline of Newark's rowing community was not necessarily unique. Its counterpart clubs on the Harlem River suffered similar fates by the 1930s. Examinations of analogous Sanborn maps show that they, too, were hemmed in by industry and wiped out by a highway by mid-century. America's rivers suffered until environmental legislation like the Clean Water Act of 1972 helped restore urban waterways at least partially. While boathouse traditions continued in flagship cities like Boston and Philadelphia, other urban scenes like Newark's simply ceased to exist.

The same forces brought rowing to prominence in Newark and wiped it out, in just over 35 years. The expansion of capitalism allowed wealthy industrialists with an anxious interest in physical activity to promote and finance this "noble" sport. As their operations grew, so did the concertation of their river pollution. Immigrants flocked to Newark to provide labor under squalid conditions in their factories, increasing the population of the city well beyond its sanitary capacity. In turn, the Passaic River became a churning open sewer in lieu of better options. This drove the citizens who made regatta victories worthwhile away from the river and into suburban life. At the same time, physical industrial expansion rendered boat clubs' land too valuable to be used for pleasure purposes, and factories soon sat in their place. The "great white men" of

[85] These dates are not certain. Youth rowing among high schoolers may have started as early as 1941. It is also unclear when the teams became fully-fledged varsity sports. See Note 95, p. 55 for further information.

Newark unintentionally washed away once-cherished rowing from the city's culture. Just a few decades later, highways completely obliterated the riverbank, allowing them and their families to flee to the suburbs, leaving a smoke-belching, poverty-stricken Newark behind.

Conclusion

Newark's short yet brilliant period as a major venue for amateur rowing was a manifestation of major American societal changes following the conclusion of the Civil War. This narrative has attempted to shed light on, for the first time, an obscure chapter in American sporting culture that has had an outsize impact on rowing in New Jersey over a 150-year period. Wealth from industry and the new middle class fueled an early version of the now-commonplace American phenomenon of sports fanaticism centered around teams, each with their loyal supporters. Major regattas provided Newark with a means to flaunt its relevance as a rapidly growing industrial city in the national eye, despite its location in the shadow of New York City. The rowing community grew as a means for many white men to improve their physical strength to stave off mental ailments, display their masculinity in front of society women, and assert their dominance over non-Protestants and immigrants. Lavish regattas created a social scene that defined the recreational activities of all classes of Newarkers, whether they were simply spectators belonging to the lower classes, or wealthy benefactors of these multi-faceted institutions.

Despite rowing's popularity over the three and a half decades leading up to the twentieth century, changing tastes and environmental degradation drove the public away from the sport. Nonexistent public health policy turned Newark into America's unhealthiest city, and the unfortunate remedy to this problem was to discharge its filth onto the Passaic River. What was once a crystal waterway cherished for its recreational capabilities became a cesspool of human waste and industrial runoff that kept away all but the most obsessed oarsmen, well into the twentieth century. Boat clubs and regatta days became a distant memory that quickly faded as the march of progress moved Newark further away from its quaint past.

However, the little-known legacy of this community was able to continue in a different manner. It engendered the innovation of high school rowing in New Jersey through the efforts of the last of the great rowers produced by Passaic River-based clubs. At least ten teams now dot the Lower Passaic in the springtime, unknowingly continuing the legacy of their nineteenth century counterparts, and even host several large regattas per year. New Jersey is now home to the headquarters of USRowing in Princeton, the successor organization to the National Association of Amateur Oarsmen. The default location for the National Scholastic Championship Regatta is at Cooper River Park in Camden County, New Jersey. Contact sports like football and lacrosse's participation is slowly waning due to parental concerns over the long-term effects of repeated blows to the head. This has led to a resurgence in rowing by young men and women, with a steady increase in participation nationwide. America's rivers do not suffer today from the widespread industrial and human contamination that drove the public away in generations past, creating an environment welcoming to not just the most die-hard oarsmen and oarswomen.

Tracing the microcosm of Newark's amateur boat clubs provides a lens into social and economic trends as America was reborn into the Gilded Age following the end of the Civil War. Increased wealth, improved communications, and the market economy upended the lives of Americans from coast to coast. The middle class emerged, poised to enjoy increased leisure time through outdoors activities once limited to the elite. Out of these phenomena, rowing became America's first major modern spectator sport and first intercollegiate sport, defining milestones that are at the root of present popular culture. It is important to add this narrative to the historical record in order to understand that the deep tradition of amateur rowing is not limited just to places such as Philadelphia and Boston, but also enthralled mid-size cities like Newark. This

narrative aims to expose these threads of humanity, long covered over by more prominent layers of the patchwork quilt that is American culture.

Epilogue: The Passion of Few Sows Seeds for the Pastime of Many

The remnants of Newark's amateur boat club scene pressed on in pursuit of rowing greatness long after their river was unfit for use. One club was able to remain active into mid-century and served as a seed that would grow into all of the clubs and teams found on the Passaic today. After the Passaic Valley Sewerage Commission's trunk sewer became operational in 1924, there was a flurry of local excitement as to the revival of the grand regattas of the previous century. However, interest did not match the fervor of those bygone decades. Nevertheless, the challenge of recruiting able-bodied young men to take up the sport was met by a few who would have a lasting impact on the rowing community in the state of New Jersey. While the Institute Boat Club did not maintain interest for long, the Nereid Boat Club, founded in Newark in 1866, re-founded by a different group in 1875 in Nutley, and located in Belleville just above the Newark border starting in 1879, prevailed in remaining active. As likely the most active surviving boat club in New Jersey, the impact of its members has touched nearly every extant crew team in the state whether directly or indirectly.[86]

The first notable extension of the Nereid Boat Club's influence came at the very end of Newark's original rowing era when one of its youngest members attended Rutgers College from 1901 to 1905. C. Leverich Brett, a Nereid coxswain who joined as a teenager, attempted to re-start rowing at his college. Rutgers Crew, founded in 1864 and often cited as the school's first intercollegiate sport, did not exist between 1881 and 1933. Due to a series of demoralizing losses and incidents in 1881 that culminated in the literal explosion of the Rutgers boathouse, the sport was abandoned.[87] While "Lev" Brett's attempts to re-start the sport in 1903 and 1904 were

[86] Nereid Boat Club, "History," September 23, 2017, https://web.archive.org/web/20170923225437/http://nereidbc.org/history/.
[87] Rutgers Crew Association, "Rutgers Heavyweight Crew History," rutgerscrew.com, accessed April 7, 2020, https://www.rutgerscrew.com/index.php?option=com_content&task=view&id=21&Itemid=31.

apparently futile, he would be instrumental in providing financial support when there was enough interest to make it happen in 1933.[88] At the same time, the Nereids were enjoying a period of regular competition amidst a steady stream of young members.

One of these young men who took up the sport was William "Bill" Bennett, Jr., a Belleville native. He raced in several regattas in the 1930s in the double sculls.[89] Later on, he owned and operated a machine shop in Belleville. The Nereid Club faced a shortage of able-bodied rowers at the outset of World War II, and its numbers began to dwindle as men were called up for service. Bennett proposed that Nereid recruit local high school students to begin a "schoolboy" rowing program. His hours as a self-employed machinist were flexible, and he volunteered to coach them for free. The first mention of this on record is from 1942, when a local newspaper ran a photograph of several young men with a boat at Nereid.[90] However, it would be several more years before his group of boys would constitute an official, school-sanctioned sport.

According to one of his early rowers, Bob Watts, he solicited local school districts to fund a rowing program for high school students during this time.[91] Rowing had never been fielded as a sport by any public high school in New Jersey at this time. The Boards of Education of Belleville and Nutley assented, and the first official crews were fielded in either 1945 or 1946.[92] Bennett coached both teams in his spare time, practicing six days a week, Monday

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[88] "Raritan Ideal for Sports Says Leverich Brett," *The Daily Home News*, New Brunswick, NJ, Oct. 13, 1934, 4.
[89] "New Yorkers are Winners, Rutgers Race," *The Courier-News* (Bridgewater, NJ), Oct. 13, 1934
[90] "Youngest of the Nereid Oarsmen," *Belleville* (NJ) *Times,* May 12, 1942
[91] Mr. Watts was graduated from Nutley High School in 1953. His father was Ivor Watts, then the President of the Nutley Board of Education. He began rowing for Coach Bennett his freshman year, and was the same age as Joseph King, the father of Erik King. The younger King would go on to revive the Nereid Boat Club in the early 1990s.
[92] These dates are unclear. Various sources refer to a range of years as the founding date of Belleville and Nutley Crews. Both organizations currently use 1942 as their founding date. Rowing did not appear in the Nutley High School Yearbook (*Exit*) until 1949, but the members of the "Belleville-Nutley Nereid Boat Club" are shown with a slew of trophies in the 1948 edition of the Belleville High School yearbook (*Monad*). Therefore, it is likely that Bill Bennett started a rowing club for teenagers in the early 1940s, which morphed into a publicly-funded program by the end of the decade. Nutley Board of Education minutes are currently lost from this time period.

through Saturday. Rower Roland Worthington recalled both teams rowing together at each practice, racing each other from the Route 3 bridge between Rutherford and Clifton all the way back to the Nereid clubhouse in Belleville.[93] In 1952, crews consisted of a single scull from Nutley, several junior and senior coxed fours, and two senior eights, one from each school. The water was still foul, but not unbearable. He remembered one teammate getting blood poisoning after dipping a blistered hand into the water. The presence of human feces floating in the river was also commonplace in the early 1950s.

Despite the filth they rowed in, the teams were very successful in their early years. Numerous articles in local newspapers referred to the joint teams as the "Goodwill Ambassadors". It is clear from the existence of constant coverage that these teams were a point of great local pride. The lack of any other high school rowing programs in the entire state created a challenge for the Passaic oarsmen. They made up for it in the early years by racing college freshman boats from Columbia and Rutgers and traveled extensively to away races outside of New Jersey. They also raced some private schools such as the Kent School in Connecticut and the Hun School in Princeton.

In the first few years of this unique program, no suitable eight boats were available at Nereid, so they raced in fours and quads. The crews were fortunate enough to be within reasonable driving distance of Philadelphia, where many high schools, mostly private, fielded crew teams. They were able to compete in the annual Stotesbury Cup Regatta, a championship competition still held today on the Schuylkill River near Boathouse Row. At this event, the Nutley senior quad won the Sonzogni Cup in 1948, 1949, and 1950. Likewise, the Belleville

[93] Mr. Worthington was graduated from Belleville High School in 1953. His father had been a Nereid Boat Club Member in the 1930s.

senior four won the King's Club Cup in 1949 and 1950.[94] These accomplishments were significant in that to win these cups, the teams had to defeat prominent and established crews from schools with greater resources. Worthington remembers his Belleville boat not caring about the competition, simply knowing that they were good. However, he acknowledged that Belleville, and to a lesser extent, Nutley, were blue-collar towns competing in a world of elite prep schools' crews of young men destined for places like Harvard and Princeton.

Belleville's greatest accomplishment came about in 1952 at the National Schoolboy Regatta, which was held on the Potomac River in Washington, D.C.[95] The Belleville senior eight (pictured in Figure E.1) won the championship title in that category, considered the most prestigious division of high school rowing even today. Worthington related a challenge the team faced when transitioning from the preliminary heats to the finals. Washington-Lee High School of Arlington, Virginia, had been narrowly defeated in the heats, and petitioned the referees to let them into the finals. This, apparently, was being seriously considered based on the tradition and prestige associated with Washington-Lee as an established Southern crew team. Characteristic of his usual temper, Coach Bennett launched into a verbal tirade that dissuaded the officials from considering Washington-Lee, and Belleville went on to win the championship and respect of the greater rowing community.

The proliferation of suburban development and American car culture would deal the next great blow to the Lower Passaic River's rowing community in the form of an extremely destructive proposition: the construction of a highway. As early as 1929, plans were drawn up to improve the ancient river road between Newark and Paterson into a highway suitable for rapid

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[94] Schuylkill Navy, "Winners: Previous Years," Stotesbury Cup Regatta, February 19, 2015, https://stotesburycupregatta.com/winners/.
[95] Zed, Martie. "Belleville N.J. Wins Rowing; GW High 3rd," *Washington Post*, June 1, 1952

automobile transport as State Route 21. At the same time, the Essex County Park Commission was planning to acquire as much of the riverbank in their jurisdiction (between Newark and Nutley) as possible, in order to create a parkway linking Branch Brook Park in Newark with Yanticaw Park in Belleville. The land along the riverbank was decidedly blighted, since the public had generally abandoned it for leisure in the years prior. The succeeded in acquiring and improving sections of the western riverbank in Belleville and Nutley, but this park would be short-lived. Route 21 remained a designation for the river road at this time, but by the mid-1950s, the New Jersey State Highway Department would move forward with plans to improve it into a limited-access freeway.[96]

The Nereid Boat Club was directly in the path of the proposed highway and could not prevent eminent domain from taking their land. To make matters much worse, a fire broke out on the evening of August 27, 1962, leveling the nineteenth-century boathouse home to New Jersey's only two high school crew teams and the Passaic's last surviving boat club.[97] The teams would relocate for one season to the Newark Motor and Yacht Club half a mile south, until that property was also vacated to make way for the highway. The plight of the Nutley and Belleville teams became a public issue, and local residents assembled a committee to raise funds for the construction of a new boathouse on the other side of the river. A deal was struck between the two districts, the Kearny Board of Education, and the Town of Kearny to erect a boathouse on public land adjacent to the Belleville Turnpike Bridge on the eastern riverbank. The deal included a stipulation that Kearny High School would start a rowing program when the facilities were

[96] This timeline is based on the dates found on General Property Parcel Key Maps for New Jersey State Route 21 acquired by author from the New Jersey Department of Transportation via an Open Public Records Act request.
[97] "100-Year Boat Club Burns," *Belleville* (NJ) *Times-News,* Aug. 28, 1962.

complete in order to realize a public benefit from them. These three teams (Belleville, Nutley, and Kearny) still use this boathouse, completed in 1969, as of 2020.[98]

Homer Zink, Jr. was a contemporary of Bill Bennett, rowing at Nereid in his youth, and later as an undergraduate at Rutgers College. As an adult, he assumed a management role at the Nereid Boat Club and was its president at the time of its destruction in 1962. He sold the riverfront land to the State of New Jersey, and the rest of it to the adjacent water purification firm Wallace and Tiernan. In the mid-1980s, several rowers from the local high school teams who did not attend college, or had returned from school, were looking to find a way to continue rowing as adults. A woman outside of this community, Cate Comerford, had started a new iteration of the Triton Boat Club in 1982. However, its main objective morphed into becoming a vehicle for her fellow Boston University rowers to enter regattas. While this effort represents the first time an amateur boat club existed on the Passaic since the destruction of the Nereid boathouse, the reconstituted Tritons did not maintain a permanent presence on the Passaic.

Erik King had been a Belleville High School oarsman and became interested in starting a rowing club in order to provide a venue for his peers to continue rowing. His father, Joseph King, had rowed for Bill Bennett at Nutley High School (Class of 1953) and was also a member of Nereid Boat Club in the off-season. He made contact with Homer Zink, who had relocated to Princeton, and discovered that he had been completing the paperwork and making nominal payments in order to keep the original 1868 charter of the club active. Zink initially balked at King's proposal to revive the club. After securing nearly 100 members and a commitment from the Borough of Rutherford for the use of a derelict boat house there, he returned to Princeton. By

[98] "New Boathouse Dedicated Saturday," *Belleville* (NJ) *Times-News*, Apr. 12, 1969.

this time, Zink's health had deteriorated. On his deathbed, he signed over the club to King's group, allowing it to survive into the twenty-first century.[99]

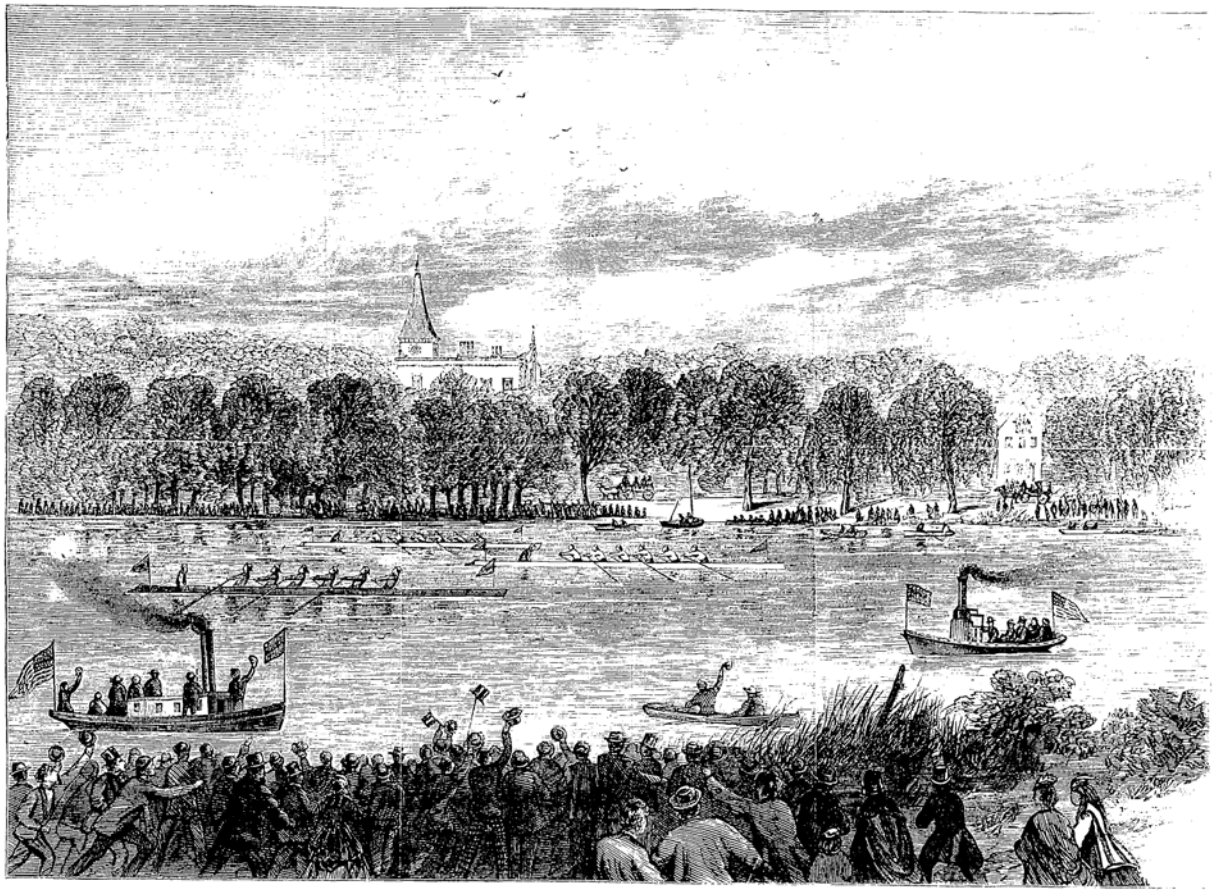
The reconstituted Nereid Boat Club spawned rowing programs for Montclair and Ridgewood High Schools in the early 2000s, as well as the Passaic River Rowing Association in 1999. In turn, that group incubated programs for St. Peter's Preparatory School, Don Bosco Preparatory School, and North Arlington High School in the 2010s, and is also home to the New York University crew team. Therefore, there is a direct link between the heritage of a nineteenth century boat club and all of the myriad high school teams that host large regattas on the Lower Passaic today. As of 2020, three USRowing-sanctioned regattas are held there (USRowing is the immediate corporate successor to the National Association of Amateur Oarsmen). The Metropolitan Youth Speed Order is a time-trial 2000-meter sprint held in the spring. The Head of the Passaic and the Tail of the Passaic are 5000-meter races held every fall. Each of these attracts hundreds of rowers from boat clubs across the New York metropolitan area, in the same tradition of the amateur races of bygone years, bringing the tradition of rowing on the Lower Passaic full circle.

[99] Bruno, *An American River: From Paradise to Superfund, Afloat on New Jersey's Passaic*, 238–49.

Appendix A: Illustrations

Figure 1.1

Figure 1.2



THE FIRST NEW JERSEY STATE ROWING REGATTA, ON THE PASSAIC RIVER, AT NEWARK, N. J., SATURDAY, OCT. 10TH—FROM A SKETCH BY JAS. E. TAYLOR—SEE PAGE 103.

Figure 2.1

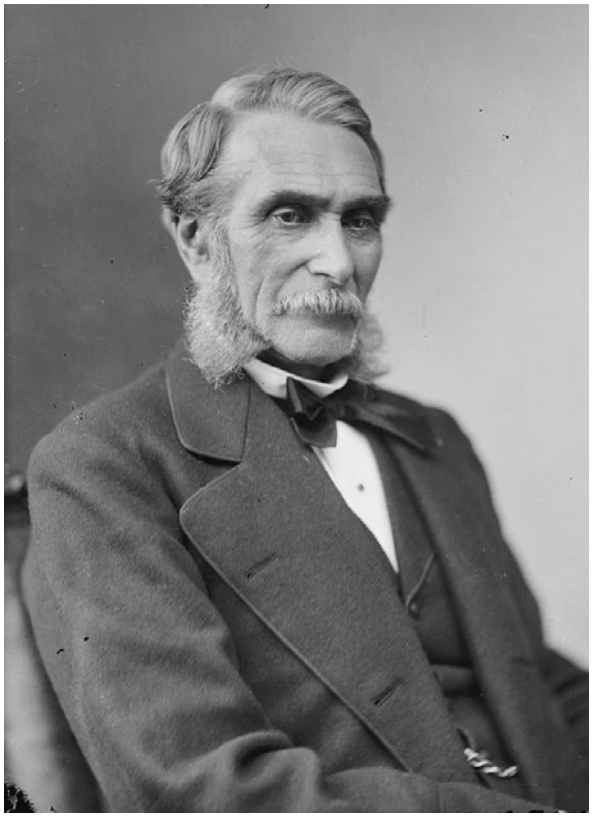


Figure 2.2 – Newark Mayor T.B. Peddie

Figure 2.3 – N.A.A.O. Trophy for Triton Boat Club

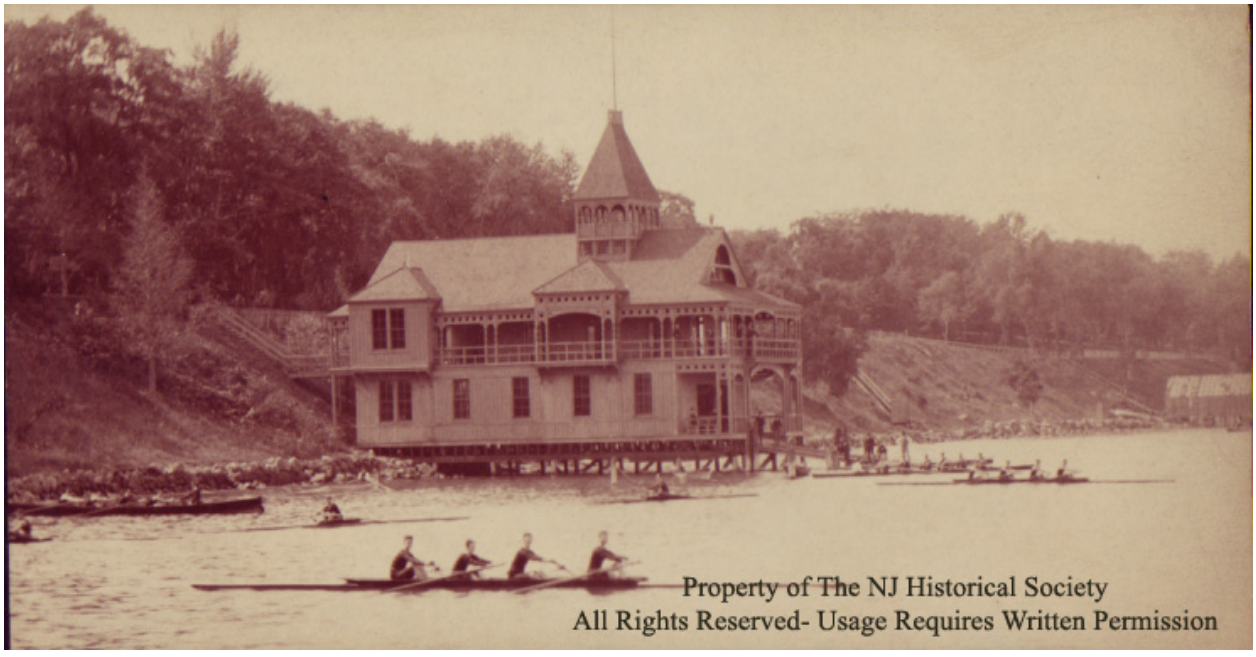


Figure 2.4 – Triton Boat Club ca. 1870s-1880s

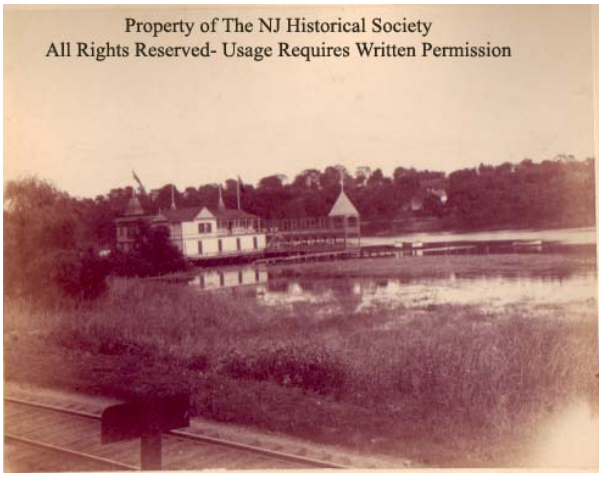


Figure 2.5 – Triton Boat Club ca. 1890s

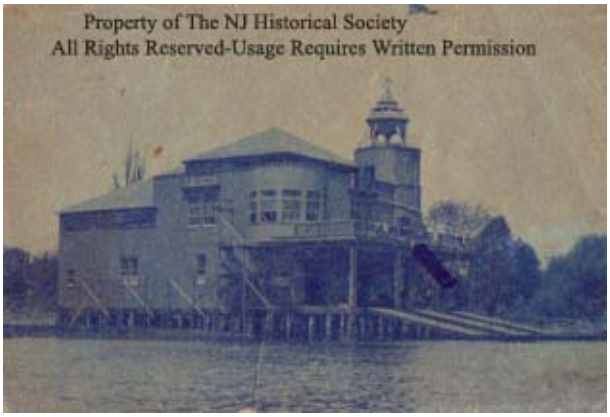


Figure 2.6 – Passaic Boat Club ca. 1870s-1890s

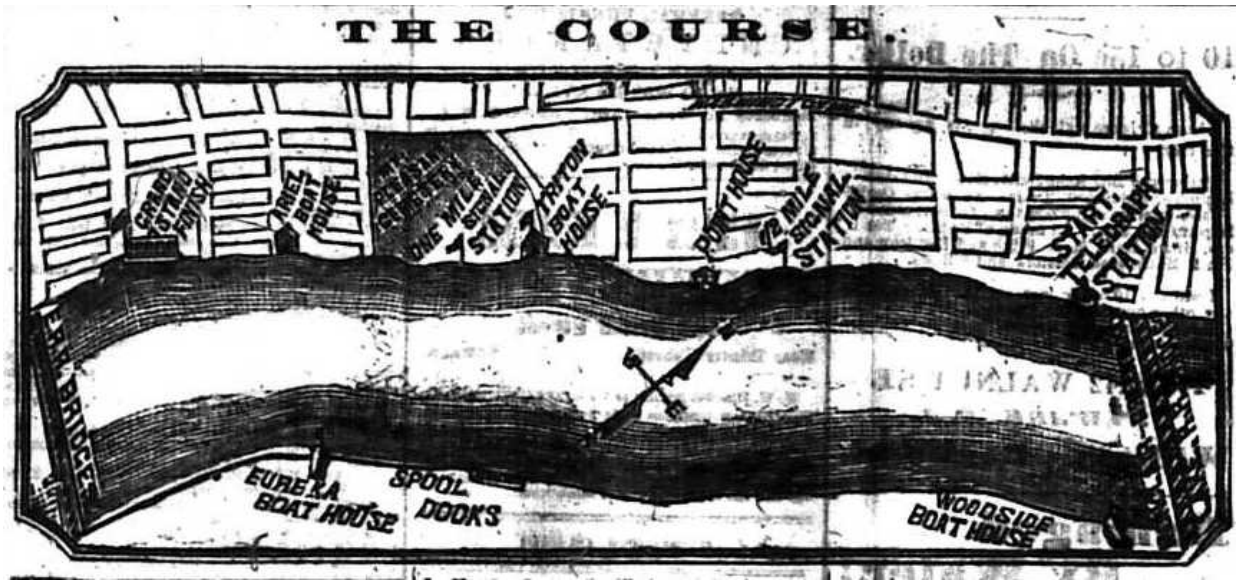


Figure 2.7 – Passaic River Racecourse for 1878 National Regatta

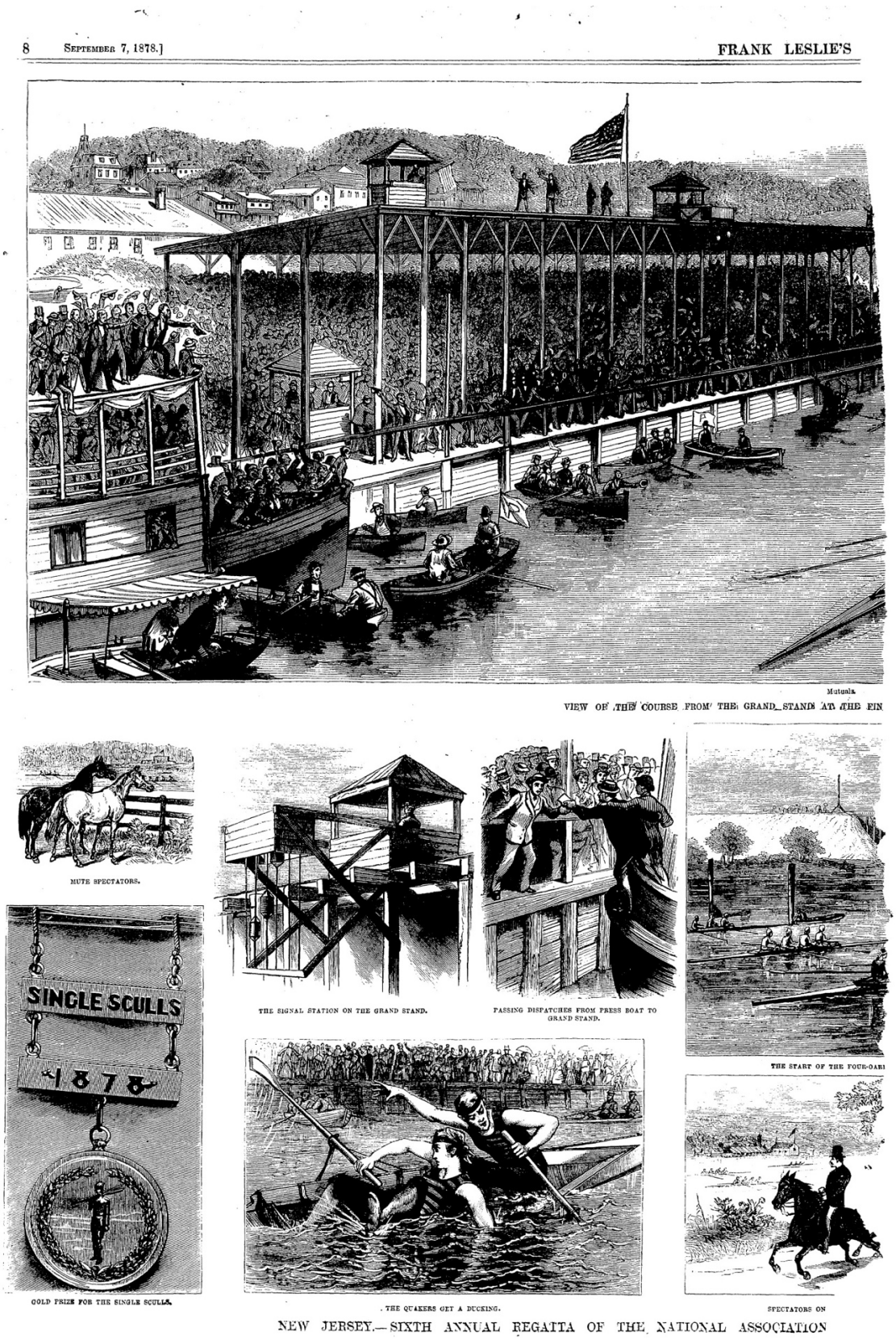


Figure 2.8a – *Frank Leslie's Illustrated Newspaper* Engraving, 1878 National Regatta

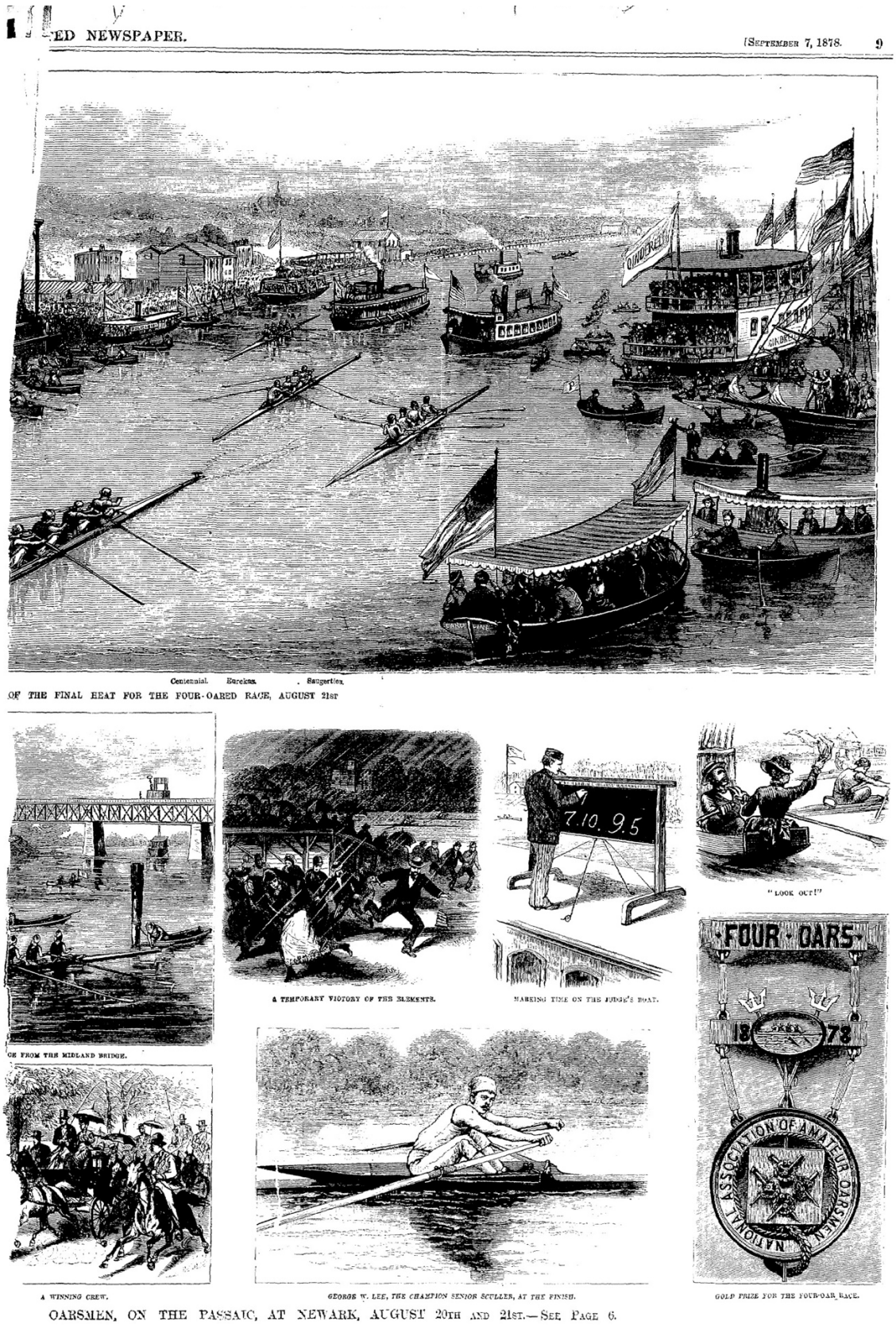
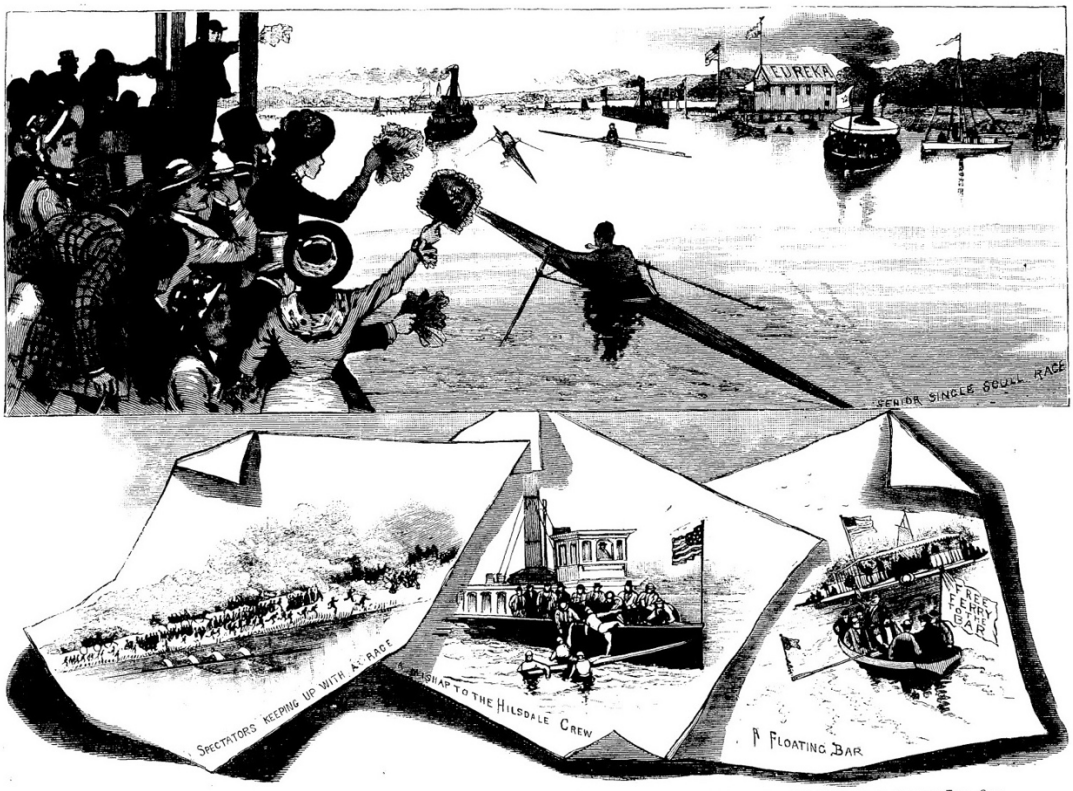


Figure 2.8b – *Frank Leslie's Illustrated Newspaper* Engraving, 1878 National Regatta



NEW JERSEY.—THE ELEVENTH ANNUAL REGATTA OF THE NATIONAL ASSOCIATION OF AMATEUR OARSMEN, ON THE PASSAIC, AT NEWARK, AUGUST 7TH–9TH.
FROM SKETCHES BY C. UPHAM.

Figure 2.8b – *Frank Leslie's Illustrated Newspaper* Engraving, 1883 National Regatta

Figure 3.1 – *Newark Sunday Call* Figurehead on the Polluted Passaic, 1902

Figure E.1 – 1952 National Champion Varsity Eight, Belleville High School
(Left to right: Bill Dunleavy, Allen Riggin, Ed Gray, Charley Crane, Harold Sutphen, Roland Worthington, Nick Cristos, George Plosa, Coach Bill Bennett. Kneeling: Coxswain Jimmy Kant)

Key to Illustrations

Figure 1.1

Photograph, Nereid Boat Club members with political picket signs, c1895, Nereid Boat Club Collection, E. Schuyler Webster Photographs: Belleville Public Library Archives

Figure 1.2

Photograph, Nereid Boat Club upstairs interior, Circa 1895, Nereid Boat Club Collection, E. Schuyler Webster Photographs: Belleville Public Library Archives

Figure 2.1

Engraving, “The First New Jersey State Rowing Regatta,” Frank Leslie’s Illustrated Newspaper, Oct. 31, 1868, Gale Primary Sources: Nineteenth Century American Newspapers.

Figure 2.2

Brady, Mathew, photographer. “Thos. Baldwin Peddie, M. of C. of N.J.; b. Edinburgh, Scotland 1808; d. Newark 1889; emigrated to America in 1833; located in N.J., served 2 terms in state legislature; twice elected Mayor of Newark; M.C. 1877-1879” Photograph. Washington, D.C.: Mathew Brady, c1865-1880. From Library of Congress: Brady-Handy Photograph Collection. https://www.loc.gov/pictures/item/2017894423/ (accessed February 1, 2020).

Figure 2.3

Photograph, N.A.A.O. trophy presented to Triton Boat Club, Newark, N.J, c1890s, Newark, New Jersey Photographs Collection, MG 1362, Box 19, Folder 2: Passaic River.

Figure 2.4

Photograph, View of Triton Boat Club from Passaic River, Newark, N.J, c1870s, Newark, New Jersey Photographs Collection, MG 1362, Box 19, Folder 2: Passaic River.

Figure 2.5

Photograph, View of Triton Boat Club from Erie Railroad tracks, Newark, N.J, c1890s, Newark, New Jersey Photographs Collection, MG 1362, Box 19, Folder 2: Passaic River.

Figure 2.6

Photograph, View of Passaic Boat Club from Passaic River, Newark, N.J, c1870s-1890s, Newark, New Jersey Photographs Collection, MG 1362, Box 19, Folder 2: Passaic River.

Figure 2.7

Engraving, “The Course”, Newark Morning Register, Aug. 20, 1878, Newark Public Library Microfilm Collections.

Figure 2.8

Engraving, “New Jersey—Sixth Annual Regatta of the National Association of Amateur Oarsmen,” Frank Leslie’s Illustrated Newspaper, Sep. 7, 1878, Gale Primary Sources: Nineteenth Century American Newspapers.

Figure 2.9

Engraving, “New Jersey—The Eleventh Annual Regatta of the National Association of Amateur Oarsmen,” Frank Leslie’s Illustrated Newspaper, Aug. 18, 1883 Gale Primary Sources: Nineteenth Century American Newspapers.

Figure 3.1

Drawing, “How would you enjoy being a figurehead on the polluted Passaic?” Newark Sunday Call, Jan. 5, 1902, Newark Public Library Microfilm Collections.

Figure E.1

Photograph, “Belleville High School Varsity National Senior Schoolboy Champions 1952,” Courtesy Roland Worthington.

Appendix B: Major Regatta Champions of Passaic River Boat Clubs 1875-1898

Event	Year	Category	Club	Rower Name(s)	Time	Distance
PRARA	1875	Senior Four Oared Shells	Eureka		19:34.00	3 miles
PRARA	1875	Senior Single Sculls	Triton	George D. Small	10:41.00	1.5 miles
PRARA	1875	Six Oared Gigs	Eureka		09:59.00	1.5 miles
PRARA	1876	Senior Four Oared Shells	Eureka		20:17.00	3 miles
PRARA	1876	Senior Single Sculls	Triton	George D. Small	09:07.00	1.5 miles
PRARA	1876	Six Oared Gigs	Mystic		08:24.00	1.5 miles
PRARA	1877	Pair Oared Gigs	Triton	H.C. Rommel, G. D. Small		1.5 miles
PRARA	1877	Senior Four Oared Shells	Eureka		19:01.25	3 miles
HRA (Fall)	1877	Senior Single Sculls	Triton	G.W. Lee	05:37.50	1 mile
NAAO	1877	Senior Single Sculls	Triton	G.W. Lee	09:11.00	1.5 miles
PRARA	1877	Senior Single Sculls	Mystic	J. Wood Adams	09:47.00	1.5 miles
PRARA	1877	Six Oared Gigs	Eureka		08:29.00	1.5 miles
PRARA	1878	Junior Single Sculls	Triton	Franklin Phillips		1.5 miles
PRARA	1878	Pair Oared Gigs	Eureka	P. Young-Angelman	12:34.00	1.5 miles
PRARA	1878	Senior Four Oared Shells	Eureka		08:24.00	1.5 miles
NAAO	1878	Senior Single Sculls	Triton	G.W. Lee	09:00.75	1.5 miles
PRARA	1878	Senior Single Sculls	Triton	George D. Small	09:57.00	1.5 miles
HRA (Fall)	1878	Six Oared Gigs	Ariel		06:38.00	1 mile
PRARA	1878	Six Oared Gigs	Eureka		08:24.00	1.5 miles
PRARA	1879	Junior Single Sculls	Eureka	R. Laiblin	10:34.50	1.5 miles
PRARA	1879	Pair Oared Gigs	Mystic	Frelinghuysen-Dunning	11:09.75	1.5 miles

HRA: Harlem Rowing Association, **KVKRA**: Kill Von Kull Rowing Association, **LIARA**: Long Island Amateur Rowing Association, **MSARA**: Middle States Amateur Rowing Association, **NAAO**: National Association of Amateur Oarsmen, **NARA**: Northwestern Amateur Rowing Association, **NEARA**: New England Amateur Rowing Association, **PAR**: People's Amateur Regatta, **PRARA**: Passaic River Amateur Rowing Association, **PRR**: Potomac River Regatta, **SIACC**: Staten Island Athletic Club Cup

Event	Year	Category	Club	Rower Name(s)	Time	Distance
PRARA	1879	Senior Four Oared Shells	Eureka		09:40.00	1.5 miles
PRARA	1879	Senior Single Sculls	Triton	E.L. Phillips	09:53.50	1.5 miles
HRA (Fall)	1879	Six Oared Gigs	Ariel		05:31.25	1 mile
PRARA	1879	Six Oared Gigs	Eureka		08:15.50	1.5 miles
HRA (Fall)	1880	Pair Oared Gigs	Triton	H.C. Rommel, G. D. Small, Willis Bristol (coxswain)	06:34.00	1 mile
PRARA	1880	Pair Oared Gigs	Mystic	Dunning-Adams	09:43.00	1.5 miles
HRA (Fall)	1880	Six Oared Gigs	Eureka		05:15.00	1 mile
PRARA	1881	Pair Oared Gigs	Triton	H.C. Rommel, G. D. Small	11:03.25	1.5 miles
NAAO	1881	Six Oars	Eureka		08:21.50	1.5 miles
PRARA	1882	Double Sculls	Institute	Hogan-Sheik	09:51.75	1.5 miles
PRARA	1882	Junior Single Sculls	Triton	H.C. Rommel	11:57.00	1.5 miles
PRARA	1882	Pair Oared Gigs	Ariel	Freeman-Oakley	11:48.00	1.5 miles
PRARA	1882	Senior Four Oared Shells	Eureka		09:06.00	1.5 miles
PRARA	1882	Senior Single Sculls	Ariel	Theodore Keer	10:31.25	1.5 miles
PRARA	1882	Six Oared Gigs	Ariel		08:28.00	1.5 miles
PRARA	1882	Six Oared Gigs	Ariel		08:18.00	1.5 miles
PRARA	1883	Double Sculls	Ariel	Kerr Brothers	10:33.50	1.5 miles
PRARA	1883	Pair Oared Gigs	Eureka	Jury-Sexton		1.5 miles
NAAO	1883	Senior Fours	Eureka		08:16.25	1.5 miles
HRA (Spring)	1883	Six Oared Gigs	Ariel		05:45.25	1 mile
PRARA	1883	Six Oared Gigs	Ariel		08:40.00	1.5 miles
PRARA	1884	Junior Four Oared Shells	Passaic		08:52.00	1.5 miles

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Event	Year	Category	Club	Rower Name(s)	Time	Distance
PRARA	1884	Junior Single Sculls	Institute	E.J. Carney	09:56.00	1.5 miles
PRARA	1884	Pair Oared Shells	Ariel	Freeman-Weldon		1.5 miles
PRARA	1884	Six Oared Gigs	Ariel		08:31.00	1.5 miles
PRARA	1885	Junior Four Oared Shells	Institute		08:59.75	1.5 miles
NAAO	1885	Pair Oars	Ariel	J. Freeman, J. Weldon	09:33.00	1.5 miles
PRARA	1885	Six Oared Gigs	Ariel		08:41.75	1.5 miles
PRARA	1886	Junior Four Oared Shells	Institute		08:43.00	1.5 miles
HRA (Spring)	1886	Pair Oared Gigs	Institute		06:00.25	1 mile
PRARA	1886	Pair Oared Gigs	Institute		10:10.25	1.5 miles
NAAO	1886	Pair Oars	Ariel	J. Freeman, J. Weldon	09:33.50	1.5 miles
HRA (Fall)	1886	Six Oared Gigs	Institute		05:56.00	1 mile
PRARA	1886	Six Oared Gigs	Triton		08:16.50	1.5 miles
PRARA	1887	Four Oared Barges	Active		09:11.75	1.5 miles
PAR	1887	Four Oared Shells	Institute		09:46.00	1.5 miles
PRR	1887	Junior Fours	Ariel		08:17.75	1.5 miles
PRARA	1887	Pair Oared Gigs	Eureka		10:29.50	1.5 miles
PRARA	1887	Six Oared Gigs	Institute		10:15.00	1.5 miles
LIARA	1888	Eight Oared Shells	Passaic			1.5 miles
SIACC	1888	Eight Oared Shells	Passaic		04:41.40	1 mile
PAR	1888	Four Oared Gigs	Triton		10:10.75	1.5 miles
PRARA	1888	Junior Four Oared Shells	Mystic		08:57.75	1.5 miles
NAAO	1888	Senior Fours	Passaic		08:47.25	1.5 miles
PRR	1888	Senior Fours	Passaic		Foul	1.5 miles

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Event	Year	Category	Club	Rower Name(s)	Time	Distance
PRARA	1888	Six Oared Gigs	Institute		08:24.50	1.5 miles
SIACC	1889	Eight Oared Shells	Triton		05:02.00	1.5 miles
PRARA	1889	Four Oared Gigs	Triton		09:29.00	1.5 miles
PRARA	1889	Junior Four Oared Shells	Passaic		08:53.50	1.5 miles
PAR	1889	Senior Single Sculls	Institute	E.J. Carney	09:13.50	1.5 miles
PRARA	1889	Six Oared Gigs	Triton		08:51.00	1.5 miles
PRARA	1890	Four Oared Gigs	Triton			1.5 miles
PRARA	1890	Junior Eight Oared Shells	Passaic		Foul	1.5 miles
PRARA	1890	Senior Four Oared Gigs	Triton			1.5 miles
NAAO	1890	Senior Single Sculls	Institute	E.J. Carney	01:22.25	440 yards
PAR	1891	Four Oared Gigs	Institute		09:35.00	1.5 miles
MSARA	1891	Intermediate Eight Oared Shells	Passaic		07:51.00	1.5 miles
KVKRA	1891	Junior Eight Oared Shells	Eureka		05:00.25	1 mile
PAR	1891	Junior Eight Oared Shells	Institute		09:01.00	1.5 miles
PRARA	1891	Pair Oared Gigs	Triton		09:34.00	1.5 miles
LIARA	1891	Senior Single Sculls	Institute	E.J. Carney	06:47.00	1.5 miles
MSARA	1892	Intermediate Four Oared Gigs	Institute		08:59.00	1.5 miles
PRARA	1892	Intermediate Single Scull Shells	Ariel	C. Donegan	09:32.75	1.5 miles
MSARA	1892	Intermediate Single Sculls	Ariel	R. E. L. Vansant	Row Out	1.5 miles
KVKRA	1892	Junior Double Scull Shells	Institute		06:13.00	1 mile
MSARA	1892	Junior Double Scull Shells	Triton	D.R. Ward, J.S. Vinson	08:26.75	1.5 miles
PRARA	1892	Junior Double Scull Shells	Institute	J Gleason, J. Cavanagh	09:13.38	1.5 miles
KVKRA	1892	Junior Four Oared Gigs	Triton		05:42.50	1 mile

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Event	Year	Category	Club	Rower Name(s)	Time	Distance
PRARA	1892	Junior Four Oared Shells	Institute		08:39.25	1.5 miles
NAAO	1892	Junior Four Oared Shells	Ariel		09:25.00	1 mile
KVKRA	1892	Junior Single Sculls	Passaic	W.H. Van Belthuysen	06:29.25	1 mile
MSARA	1892	Junior Single Sculls	Institute	H. H. Seaton	09:55.00	1.5 miles
PRARA	1892	Junior Six Oared Gigs	Passaic		08:11.00	1.5 miles
PAR	1893	Four Oared Gigs	Institute		09:13.50	1.5 miles
MSARA	1893	Intermediate Eight Oared Shells	Passaic		08:43.00	1.5 miles
LIARA	1893	Intermediate Four Oared Gigs	Institute		06:33.40	1.5 miles
PRARA	1893	Junior Double Scull Shells	Passaic	J.H. Greenhalgh, F. Gaisel	09:26.00	1.5 miles
MSARA	1893	Junior Eight Oared Shells	Institute		07:40.00	1.5 miles
PAR	1893	Junior Eight Oared Shells	Passaic		08:12.25	1.5 miles
MSARA	1893	Junior Four Oared Shells	Eureka		08:41.50	1.5 miles
PRARA	1893	Junior Four Oared Shells	Institute		09:45.75	1.5 miles
PAR	1893	Senior Single Scull Shells	Passaic	E. Hedley	09:39.00	1.5 miles
MSARA	1893	Senior Single Sculls	Passaic	E. Hedley	08:46.50	1.5 miles
NARA	1893	Senior Single Sculls	Passaic	E. Hedley	12:43.00	2 miles
NEARA (Fall)	1893	Senior Single Sculls	Passaic	Edwin Hedley	11:55.00	2 miles
PAR	1894	Eight Oared Shells	Triton		08:32.00	1.5 miles
PAR	1894	Four Oared Gigs	Triton		09:58.20	1.5 miles
MSARA	1894	Intermediate Four Oared Gigs	Institute		05:27.00	1 mile
MSARA	1894	Intermediate Single Sculls	Passaic	O. J. Wirtz	06:03.00	1 mile
MSARA	1894	Junior Double Scull Shells	Triton	C. McD. Willis, G.E. Clifford	05:38.50	1 mile
PRARA	1894	Junior Single Sculls	Passaic	Oscar J. Wirtz	09:00.80	1.5 miles

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Event	Year	Category	Club	Rower Name(s)	Time	Distance
MSARA	1894	Senior Eight Oared Shells	Triton		07:40.75	1 mile
PRARA	1894	Senior Eight Oared Shells	Triton		08:29.00	1.5 miles
LIARA	1894	Senior Four Oared Gigs	Triton		06:35.00	1.5 miles
PRARA	1894	Senior Four Oared Gigs	Triton		08:41.00	1.5 miles
PRARA	1894	Senior Four Oared Shells	Institute		09:30.00	1.5 miles
PAR	1895	Eight Oared Shells	Triton		08:06.50	1.5 miles
MSARA	1895	Intermediate Double Sculls	Institute	W.F. Kelly, O.E. Fox	05:37.25	1 mile
PRARA	1895	Intermediate Single Scull Shells	Institute	F. J. Coburn	06:38.00	1.5 miles
PRARA	1895	Junior Eight Oared Shells	Passaic		08:06.00	1.5 miles
MSARA	1895	Senior Double Sculls	Passaic	E.A. McCoy, C. Donegan	06:06.50	1 mile
PRARA	1895	Senior Four Oared Shells	Institute		09:45.75	1 mile
NAAO	1895	Senior Four Oared Shells	Institute		08:43.50	1 mile
PRARA	1895	Senior Single Sculls	Passaic	C.T. Donnegan	06:06.50	1 mile
PAR	1896	Four Oared Gigs	Newark		10:13.40	1.5 miles
PRARA	1896	Junior Eight Oared Shells	Institute		08:15.00	1.5 miles
PAR	1896	Junior Single Scull Shells	Newark	Jas. Patrick	11:09.00	1.5 miles
MSARA	1896	Junior Single Sculls	Passaic	A.F. Weizenegger	06:25.00	1 mile
PRARA	1896	Senior Double Scull Shells	Passaic		09:13.38	1 mile
PRARA	1896	Senior Four Oared Gigs	Institute		06:53.00	1 mile
PRARA	1896	Senior Four Oared Shells	Passaic			1 mile
PAR	1897	Four Oared Gigs	Ariel		09:46.50	1.5 miles
MSARA	1897	Intermediate Four Oared Gigs	Newark		05:33.50	1 mile
PRARA	1897	Intermediate Single Scull Shells	Passaic	A. Weissenegger	Foul	1.5 miles

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Event	Year	Category	Club	Rower Name(s)	Time	Distance
PRARA	1897	Junior Single Sculls	Institute	John J. Coburn	07:17.25	1 mile
PRARA	1897	Senior Double Scull Shells	Passaic		09:26.00	1 mile
MSARA	1897	Senior Eight Oared Shells	Institute		05:21.75	1 mile
PRARA	1897	Senior Eight Oared Shells	Institute		08:06.50	1.5 miles
PRARA	1897	Senior Four Oared Gigs	Institute		05:42.25	1 mile
NAAO	1897	Senior Four Oared Shells	Institute		09:07.00	1 mile
PAR	1898	Intermediate Single Sculls	Institute	G.B. Hooper	10:34.50	1.5 miles
PRARA	1898	Senior Eight Oared Shells	Institute		08:13.25	1.5 miles
PRARA	1898	Senior Four Oared Gigs	Institute		06:10.00	1 mile

NAAO race wins listed represent national champions for the year listed.

These statistics are compiled from the 1882, 1894, and 1899 editions of the *New York Clipper Annual*, and the 1885 manual of the Passaic River Amateur Rowing Association (PRARA). They represent all regional and national association regattas, but do not include those hosted by individual clubs. **Note: Statistics for races other than those sponsored by the PRARA are missing for 1882, due to lack of access to intervening editions of the *Clipper Annual*.**

If there is no time listed, none was taken and/or published. Variations of rower names are presented as published.

HRA: Harlem Rowing Association, **KVKRA**: Kill Von Kull Rowing Association, **LIARA**: Long Island Amateur Rowing Association, **MSARA**: Middle States Amateur Rowing Association, **NAAO**: National Association of Amateur Oarsmen, **NARA**: Northwestern Amateur Rowing Association, **NEARA**: New England Amateur Rowing Association, **PAR**: People's Amateur Regatta, **PRARA**: Passaic River Amateur Rowing Association, **PRR**: Potomac River Regatta, **SIACC**: Staten Island Athletic Club Cup

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LATHAM & WATKINS LLP

August 7, 2020

VIA EMAIL

Dr. Josh Smeraldi
USEPA – Region II
Emergency and Remedial Response Division
290 Broadway, 19th Floor
New York, NY 10007

Re: Request for Extension of Proposed Remedial Action Plan Public Comment Period
Riverside Industrial Park Superfund Site - Essex County, Newark, New Jersey
CERCLA Docket No. 02-2014-2011

Dear Dr. Smeraldi:

On behalf of PPG Industries, Inc. ("PPG"), I am writing to request that the United States Environmental Protection Agency ("USEPA") extend the public comment period for the Proposed Remedial Action Plan (the "PRAP") issued on July 22, 2020 for the Riverside Industrial Park Superfund site (the "Riverside Site") by 30 days. [40 CFR § 300.430(f)(3)(c) ("Upon timely request, the lead agency *will* extend the public comment period by a minimum of 30 additional days") (emphasis added).] USEPA currently intends to close the public comment period on August 21, 2020, giving PPG, potentially responsible parties, and the public only 30 days to comment on USEPA's $38.9 million proposed plan. A 30-day extension would move the current public comment period deadline to September 21, 2020. An extension is necessary to give the public the opportunity to review and comment on the proposed plan.

USEPA's PRAP proposes a $38.9 million remedy with remedial alternatives addressing contamination in wastes, sewer water, soil gas, soil/fill and groundwater. Each proposed alternative in turn contains multiple components, and each component has implications for the different factors USEPA and the community consider in evaluating the PRAP. In sum, USEPA has proposed a very complex remedy for the Riverside Site, and it will take time for stakeholders to evaluate this remedy. This is especially true at the Riverside Site, which consists of 15 separate lots with different owners, and dozens of ongoing and former industrial operations. All of these stakeholders need time to evaluate USEPA's proposed plan. Moreover, as USEPA knows, multiple parties have expressed interest in potential commercial redevelopment of the Riverside Site (and there may be others unknown to USEPA). USEPA's proposed plan likely has implications for site redevelopment, which may be addressed through public comment. Rushing through a 30-day comment period does not give the public sufficient time for review and comment on USEPA's technically complex and expansive proposed remedy.

LATHAM & WATKINS LLP

In addition, PPG requires additional time to evaluate the PRAP. While the Remedial Investigation/Feasibility Study ("RI/FS") has been an ongoing, collaborative process with USEPA spanning several years, USEPA's unilateral actions in modifying the feasibility study report have material implications for the evaluation of USEPA's preferred remedy in the PRAP. PPG will require additional time to adequately review and evaluate these material modifications to the feasibility study report and their effects on the PRAP.[1]

* * *

For the foregoing reasons, PPG requests that USEPA extend the public comment period for the PRAP by 30 days to September 21, 2020.

Sincerely,

Gary P. Gengel, Esq.
of LATHAM & WATKINS LLP

cc: Mr. Scott Krall (PPG)
Mr. Kenneth Bird (Woodard & Curran)
Mr. Thomas Pearce, Esq. (Latham & Watkins LLP)
Mr. William Reilly, Esq. (USEPA)

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[1] Additionally, USEPA's changes to the feasibility study report are currently the subject of an administrative dispute resolution process. Given that material aspects of the feasibility study report, and therefore the PRAP, are currently disputed and may ultimately need to be significantly revised, it would be premature – and potentially a waste of agency resources – for USEPA to close the comment period and proceed with the issuance of a Record of Decision prior to the resolution of these disputes.

Smeraldi, Josh

From: FHCA07104 <f[redacted]>
Sent: Monday, August 17, 2020 9:35 AM
To: Smeraldi, Josh
Subject: Re: Riverside Industrial Park Superfund Site

Greetings,

The Forest Hill Community Association (FHCA) is writing to respond to the U.S. Environmental Protection Agency's (EPA) proposed plan to clean up the **Riverside Industrial Park Superfund Site** located at 29 Riverside Avenue in the North Ward of Newark, NJ. This site raises issues of environmental justice by which the poor and communities of color have already been disproportionately exposed to industrial pollution and now, during remediation, could be exposed to more industrial pollution in the form of air emissions.

The FHCA requires that prior to any site remediation, the EPA provides the FHCA and the public with a written plan for approval that details how the EPA will ensure that, during soil and other remediation, all air emissions from this toxic superfund site will be completely trapped, i.e. cannot escape into the air of the surrounding community.

NOTE: During 2012, FHCA members reported strong chemical odors in the air in Newark and surrounding communities during clean-up of the Diamond Alkali Superfund Site. These odors were so powerful they seeped into residences. Since these emissions weren't being trapped, FHCA members met with NJ DEP Director Edward M. Choromanski and his staff. These air emissions put the Newark and surrounding communities at great risk, possibly equivalent to or exceeding 9/11 ground zero conditions, since they contained Agent Orange chemicals from the Diamond Alkali Company. In response to these horrific conditions, on 5/25/12, NJDEP Field Agent Mark Burghoffer visited Tiffany Blvd. in Newark during a strong chemical smell event. He witnessed the odor and stated that he "might call it a 2 or more out of a possible 5," and that "the air smelled like xylene or toluene or chlorine."

We don't know what impact this exposure will have on the long-term health of Newarkers and surrounding communities. That has yet to be determined. In a community already heavily burdened with air emissions from multiple airports and industry that tax our health, the proposed clean-up shouldn't threaten us further. Thank you for listening to our concerns.

Sincerely,

Paul A. Agostini
President/Communications Director
Forest Hill Community Association, Inc.
[redacted]

Smeraldi, Josh

From: maryloutb <[redacted]>
Sent: Monday, August 17, 2020 12:42 PM
To: Smeraldi, Josh
Subject: Response to EPA's Proposed Cleanup of Riverside Industrial Park Superfund site in Newark, NJ

Dear Josh Smeraldi, Project Manager, EPA Region 2 Office-

We're writing to respond to the U.S. Environmental Protection Agency's (EPA) proposed plan to clean up the Riverside Industrial Park Superfund Site located at 29 Riverside Avenue in the North Ward of Newark, NJ. This site raises issues of environmental justice by which the poor and communities of color have already been disproportionately exposed to industrial pollution and now, during remediation, could be exposed to more industrial pollution in the form of air emissions.

We require that prior to any site remediation, the EPA provides us and the public with a written plan for approval that details how the EPA will ensure that, during soil and other remediation, all air emissions from this toxic superfund site will be completely trapped, i.e. cannot escape into the air of the surrounding community.

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We don't know what impact this exposure will have on the long-term health of Newarkers and surrounding communities. That has yet to be determined. In a community already heavily burdened with air emissions from multiple airports and industry that tax our health, the proposed clean-up shouldn't threaten us further.

Kindly confirm receipt.

Thank you for your attention to this matter, -Marylou & Jerome Bongiorno Forest Hill Newark residents/filmmakers

Smeraldi, Josh

From: maryloutb <[redacted]>
Sent: Friday, August 21, 2020 12:45 PM
To: Smeraldi, Josh
Cc: Paul A. Agostini
Subject: p.s. Re: Response to EPA's Proposed Cleanup of Riverside Industrial Park Superfund site in Newark, NJ

Dear Josh Smeraldi - Forest Hill Community Association (FHCA) is cc-ed-

p.s. to our earlier comments:

Re: Response to EPA's Proposed Cleanup of Riverside Industrial Park Superfund site in Newark, NJ

During EPA remediation, off-site removal and management of contaminated soils (or source removal) is the most protective. Plus, this off-site has to be far enough from anyone being affected by it.

Another concern is that the EPA remediation may run out of funds and therefore leave the site in a condition where it now poses more of a hazard than before the EPA started the remediation. So the EPA has to carefully: set goals, budget with contingency, and explore all possible derailments, so the process is fully completed and poses no additional environmental threats to the community.

Kindly confirm receipt.

Thank you for your attention to this matter, -Marylou & Jerome Bongiorno Forest Hill Newark residents/filmmakers

> On Aug 17, 2020, at 12:53 PM, Smeraldi, Josh <Smeraldi.Josh@epa.gov> wrote:
>
> Received. Thank you for your comment! We will provide a response to your comment in the responsiveness summary.
>
> Josh
>
> -----Original Message-----
> From: maryloutb <[redacted]>
> Sent: Monday, August 17, 2020 12:42 PM
> To: Smeraldi, Josh <Smeraldi.Josh@epa.gov>
> Subject: Response to EPA's Proposed Cleanup of Riverside Industrial Park Superfund site in Newark, NJ
>
> Dear Josh Smeraldi, Project Manager, EPA Region 2 Office-
>
> We're writing to respond to the U.S. Environmental Protection Agency's (EPA) proposed plan to clean up the Riverside Industrial Park Superfund Site located at 29 Riverside Avenue in the North Ward of Newark, NJ. This site raises issues of environmental justice by which the poor and communities of color have already been disproportionately exposed to industrial pollution and now, during remediation, could be exposed to more industrial pollution in the form of air emissions.
>

> We require that prior to any site remediation, the EPA provides us and the public with a written plan for approval that details how the EPA will ensure that, during soil and other remediation, all air emissions from this toxic superfund site will be completely trapped, i.e. cannot escape into the air of the surrounding community.
>
> NOTE: During 2012, we reported strong chemical odors in the air in Newark and surrounding communities during clean-up of the Diamond Alkali Superfund Site. These odors were so powerful they seeped into residences. Since these emissions weren't being trapped, we met with NJDEP Director Edward M. Choromanski and his staff. These air emissions put the Newark and surrounding communities at great risk, possibly equivalent to or exceeding 9/11 ground zero conditions, since they contained Agent Orange chemicals from the Diamond Alkali Company. In response to these horrific conditions, on 5/25/12, NJDEP Field Agent Mark Burghoffer visited our home on Tiffany Blvd. in Newark during a strong chemical smell event. He witnessed the odor and stated that he "might call it a 2 or more out of a possible 5," and that "the air smelled like xylene or toluene or chlorine."
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> We don't know what impact this exposure will have on the long-term health of Newarkers and surrounding communities. That has yet to be determined. In a community already heavily burdened with air emissions from multiple airports and industry that tax our health, the proposed clean-up shouldn't threaten us further.
>
> Kindly confirm receipt.
>
> Thank you for your attention to this matter, -Marylou & Jerome Bongiorno Forest Hill Newark residents/filmmakers
>
>

Smeraldi, Josh

From: Ramon Rivera <[redacted]>
Sent: Friday, August 21, 2020 2:54 PM
To: Smeraldi, Josh
Cc: Kandil, Shereen; William Sullivan; Irsab@aol.com; frank@valvanoequity.com
Subject: Riverside Industrial Park Superfund Site, Newark New Jersey

Good Afternoon Mr. Smeraldi,

My office represents Frank Valvano and Irwin Sabloski, 123-131 Riverside Urban Renewal, LLC, the designated developers of the Riverside Industrial Park site as set forth by the City of Newark. As you know, the USEPA recently, at its public meeting on August 5, 2020, set forth certain remedial alternatives to in effect clean up the site at an amount of approximately $39 million. In addition, the USEPA established a public comment period that began on July 22, 2020 and ends today, August 21, 2020. As noted in the proposed plan for this site, the preferred alternative may change based upon information provided in the public comment period. Given the magnitude of the clean up and the amount invested by my clients in this project, we request an extension of the public comment period deadline of sixty (60) days.

Please consider granting this request to provide an opportunity for full public comment on this major project in the City of Newark.

Thank you,

Ramon

RAMON E. RIVERA | **Partner** | **Chair, Labor and Employment Law Group**
[redacted]

SCARINCI | HOLLENBECK
1100 Valley Brook Ave. | P.O. Box 790 | Lyndhurst, NJ 07071 | map
[redacted]

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PASSAIC RIVER
Community Advisory Group

Comments to the EPA on the Riverside Industrial Park Superfund Preferred Alternative Cleanup Plan

October 21, 2020

The Passaic River Community Advisory Group (CAG) appreciates the opportunity to provide comments to the EPA regarding the preferred alternative cleanup plan for the Riverside Industrial Park Superfund site in Newark, NJ.

The Passaic River CAG has been working to understand and provide community input on the Superfund Cleanup since 2009. We represent a broad spectrum of stakeholders from throughout the region. Our core values (attached) center on the protection of public health and the environment and the restoration of the Passaic River to its full environmental, community, economic, and recreational potential. We have always worked with EPA with a spirit of respect and collaboration and approach this input accordingly.

In preparation of these comments, the CAG was provided a public presentation and a 31-page written summary of the preferred alternative plan. The CAG appreciates the opportunity to share the community's observations, concerns, and questions based on what we know and understand to date. Based upon the information provided and the CAG's familiarity with the Riverside site, we submit the following comments to EPA.

Riverside Site History and Public Access

Historically, the Riverside Industrial site was a hub for local rowing and boating clubs on the Passaic River in the late 1800s. While much has changed since then, both physically and culturally, we would still like to encourage EPA to coordinate with the City of Newark to incorporate river access into the future of the Riverside site. Public access to our waterways is an important key to building stewardship and reconnecting communities to natural resources.

Contaminants of Concern/Human Health Risks

As per the USEPA remedial investigation the site has following concerns:

- Volatile organic compounds (VOCs)/ chlorinated VOC impacts to soil, groundwater, and soil gas;
- Light Non-Aqueous Phase Liquid (LNAPL) associated with petroleum constituents impacted soil and groundwater;
- Site-wide historic fill (i.e. PAHs, Metals) specifically Lead (Pb). Pb is also associated with former industrial operations;
- Ecological concerns/Human Health risks (specifically inhalation/dermal exposure).

Future Site Plans

We agree with the proposed future land use remaining commercial/industrial. It would be difficult and expensive to remediate impact at the Site for residential use due to the potential for exposure to occupants. We also agree with the preliminary selected remedial alternatives by EPA, but would like clarification (or additional information) on the following points to better understand the cleanup plan and potential impacts:

- Has a pilot study been completed to confirm that a pump and treat system would contain impacted groundwater onsite?
    - It seems that a containment barrier, such as a slurry wall or reactive barrier wall, would enhance effectiveness in preventing further migration to the Passaic River.
- There is a lack of data to confirm there were no impacts to Environmentally Sensitive Natural Resources (i.e. Passaic River).
    - At our last in person meeting, the EPA indicated that any ecological receptors impacted would be addressed through the Passaic River Remedial Action activities. Is this still the case? Is there data available associated with the ecological evaluation conducted at the Site.
- In order for the institutional and engineering controls to be effective for groundwater including the implementation of a monitored natural attenuation program, any free/residual product would require remediation. In addition, any wastes that could pose a risk to further impacting onsite/offsite media would have to be removed for offsite disposal.
- Are there conceptual site models available for each impacted media?
    - Specifically, it would be beneficial to review the proposed engineering controls to address impacted soils. As mentioned in EPA's proposed plan, any future utility work would allow for the potential dermal exposure of workers within the subsurface. Does EPA plan to utilize a demarcation barrier to mitigate these risks? This would call for the removal and disposal of impacted soils in order to allow for the installation of a clean barrier/buffer layer to conform with the Presumptive Remedies guidance pursuant to the NJDEP Technical Requirements for Site Remediation (7:26E).
- Is there a specific demolition plan for the site that identifies which building will be razed and which will be preserved?
    - Some buildings are currently severely derelict, while others remain in use.
- Do site models exist that elaborate on proposed cap thickness?

Community Concerns

Our familiarity with the Riverside site has highlighted a concern for issues regarding homeless occupancy in some buildings and trespassing among other buildings at the site over the last several years. What is EPA's plan to address these issues at the site? Will institutional controls be installed to control trespassing over time? This might include security cameras or patrols to prevent future trespassing,

Additionally, it is vitally important to include the appropriate social services departments for whomever needs them in order to assist transitioning the site from vacant to occupied/active. This includes assistance rehoming any persons residing within the buildings to local shelters and the documentation and/or relocation of the artwork adorning buildings at the site before demolition occurs.

Sincerely,

Members of the Passaic River CAG

Smeraldi, Josh

From: Damon, Jim <[redacted]>
Sent: Tuesday, November 3, 2020 7:03 PM
To: Smeraldi, Josh
Subject: Riverside Industrial Park, Newark, NJ

Hi Josh,

I see USEPA has extended the time for comments on the Proposed Plan for the Riverside Industrial Site. I'm interested in learning the project managers/points of contact for the PRP group and individual lead PRPs.
Please let me know if there is a central PRP representative for the group and their contact information. It appears the site ownership originates with PPG. Please let me know the PPG project manager and their contact information. Additionally, it's helpful to know the PRP's engineering consultant for this project and their contact information.

Sevenson is a long-established remedial construction and environmental dredging contractor experienced in executing remedial construction on 139 USEPA Superfund sites. Sevenson is executing 8 projects in New Jersey at this time.

Please call me any time convenient for you if you wish to discuss this, or would like information on Sevenson, at [redacted]

Thanks

Jim

James Damon
2749 Lockport Road
Niagara Falls, NY 14305
[redacted]
[redacted]
[redacted]
Sevenson Environmental Services, Inc.
Niagara Falls, USA | Established 1917

November 20, 2020

Josh Smeraldi
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 18th Floor
New York, New York 10007-1866
[Submitted Electronically to smeraldi.josh@epa.gov]

Re: Comments to the EPA on the Riverside Industrial Park Superfund Preferred Alternative Cleanup Plan

Dear Mr. Smeraldi,

Hackensack Riverkeeper and NY/NJ Baykeeper appreciate the opportunity to provide comments to EPA regarding the preferred alternative cleanup plan for the Riverside Industrial Park Superfund site in Newark, NJ.

Hackensack Riverkeeper and NY/NJ Baykeeper have long worked along the Passaic River and within its local communities to advocate for Natural Resource Damage Restoration and the restoration of the Passaic River from Superfund site to healthy river for decades. We represent a wide array of stakeholders across the region, including many recreational users of the Passaic River. Our missions center on the protection, preservation, and restoration of the Hackensack and Passaic River watersheds, Newark Bay, and the Hudson-Raritan Estuary, into which these waterbodies flow. We hope to see the Riverside Industrial Park Superfund project worked on with the spirit of collaboration and mutual respect we have shared with EPA in the Region.

After reviewing the public presentation and 31-page written summary of the preferred alternative plan, we have drafted the following comments. We appreciate the opportunity to echo the community's observations, concerns, and questions based on what we know and understand to date. Based upon the information provided, our knowledge of the Riverside site, and our participation in the Passaic River CAG, we submit the following comments to EPA.

Riverside Site History and Public Access
Historically, the Riverside Industrial site was a hub for local rowing and boating clubs on the Passaic River in the late 1800s. While much has changed since then, both physically and culturally, we would still like to encourage EPA to coordinate with the City of Newark to incorporate river access into the future of the Riverside site. Public access to our waterways is an important key to building stewardship and reconnecting communities to natural resources.

Contaminants of Concern/Human Health Risks
As per the USEPA remedial investigation the site has following concerns:

- Volatile organic compounds (VOCs)/ chlorinated VOC impacts to soil, groundwater, and soil gas;
- Light Non-Aqueous Phase Liquid (LNAPL) associated with petroleum constituents impacted soil and groundwater;
- Site-wide historic fill (i.e. PAHs, Metals) specifically Lead (Pb). Pb is also associated with former industrial operations;
- Ecological concerns/Human Health risks (specifically inhalation/dermal exposure).

Future Site Plans

We agree with the proposed future land use remaining commercial/industrial. It would be difficult and expensive to remediate impact at the Site for residential use due to the potential for exposure to occupants. We also agree with the preliminary selected remedial alternatives by EPA, but would like clarification (or additional information) on the following points to better understand the cleanup plan and potential impacts:

- Has a pilot study been completed to confirm that a pump and treat system would contain impacted groundwater onsite?
    - It seems that a containment barrier, such as a slurry wall or reactive barrier wall, would enhance effectiveness in preventing further migration to the Passaic River.
- There is a lack of data to confirm there were no impacts to Environmentally Sensitive Natural Resources (i.e. Passaic River).
    - At our last in person meeting, the EPA indicated that any ecological receptors impacted would be addressed through the Passaic River Remedial Action activities. Is this still the case? Is there data available associated with the ecological evaluation conducted at the Site.
- In order for the institutional and engineering controls to be effective for groundwater including the implementation of a monitored natural attenuation program, any free/residual product would require remediation. In addition, any wastes that could pose a risk to further impacting onsite/offsite media would have to be removed for offsite disposal.
- Are there conceptual site models available for each impacted media?
    - Specifically, it would be beneficial to review the proposed engineering controls to address impacted soils. As mentioned in EPA's proposed plan, any future utility work would allow for the potential dermal exposure of workers within the subsurface. Does EPA plan to utilize a demarcation barrier to mitigate these risks? This would call for the removal and disposal of impacted soils in order to allow for the installation of a clean barrier/buffer layer to conform with the Presumptive Remedies guidance pursuant to the NJDEP Technical Requirements for Site Remediation (7:26E).
- Is there a specific demolition plan for the site that identifies which building will be razed and which will be preserved?
    - Some buildings are currently severely derelict, while others remain in use.
- Do site models exist that elaborate on proposed cap thickness?

Community Concerns

Our familiarity with the Riverside site has highlighted a concern for issues regarding homeless occupancy in some buildings and trespassing among other buildings at the site over the last several years. What is EPA's plan to address these issues at the site? Will institutional controls

be installed to control trespassing over time? This might include security cameras or patrols to prevent future trespassing,

Additionally, it is vitally important to include the appropriate social services departments for whomever needs them in order to assist transitioning the site from vacant to occupied/active. This includes assistance rehoming any persons residing within the buildings to local shelters and the documentation and/or relocation of the artwork adorning buildings at the site before demolition occurs.

Sincerely,

Captain Bill Sheehan
Riverkeeper & Executive Director

Gregory Remaud
Baykeeper & CEO

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Via Electronic Mail

January 20, 2021

Dr. Josh Smeraldi
USEPA – Region II
Emergency and Remedial Response Division
290 Broadway, 19th Floor
New York, NY 10007

Re: Public Comment on Proposed Remedial Action Plan
Riverside Industrial Park Superfund Site - Essex County, Newark, New Jersey
CERCLA Docket No. 02-2014-2011

Dear Dr. Smeraldi:

On behalf of PPG Industries, Inc. (PPG), I am writing to submit public comments and raise serious concerns with the United States Environmental Protection Agency's (USEPA) Proposed Remedial Action Plan (PRAP) for the Riverside Industrial Park Superfund site (the Site), published on July 22, 2020. The PRAP is the result of a rushed Remedial Investigation/Feasibility Study (RI/FS) process in which USEPA arbitrarily and capriciously ignored relevant Site data for the sake of meeting an accelerated schedule. This letter is written pursuant to the National Contingency Plan (NCP) which allows for the submission of comments on the PRAP and the supporting analysis and information in the RI/FS. [40 Code of Federal Regulations (CFR) § 300.430(f)(3)(i)(C).]

I. EXECUTIVE SUMMARY

USEPA has proposed a $38.9 million remedy for the Site based on a flawed conceptual site model (CSM) regarding the source and fate and transport of lead in soil/fill and groundwater at the Site. By adding this CSM into the feasibility study report (FSR) over PPG's objections, and then relying on this CSM to justify its selection of remedial alternatives in the PRAP, USEPA acted arbitrarily, capriciously, and not in accordance with law. The remedial investigation (RI) for the Site determined that historic fill is ubiquitous across the Site, and that lead contamination at the Site is attributable to historic fill. USEPA ignored these facts in violation of the NCP's requirement that USEPA consider relevant Site information in developing the FSR and remedial alternatives. Instead, USEPA incorrectly concluded that lead concentrations in the soil/fill and groundwater at the Site are solely the result of Site operations. In fact, as discussed below, Fault Tree Analyses show that USEPA's CSM has only a 0.003% to 2.3% likelihood of correctly describing Site data. This error infects the FSR, the PRAP that relies on it, Site remediation goals, and USEPA's selected remedies.

With respect to soil/fill, USEPA seeks to impose a remedy that requires the replacement of the bulkhead at the Site to prevent potential erosion of historic fill into off-Site surface water. As for USEPA's groundwater remedy, USEPA fails to account for impacts of historic fill to groundwater and does not even attempt to show that the selected pump and treat (P&T) remedy will be effective. Instead, USEPA has myopically focused on preventing the potential migration of groundwater impacted by historic fill off-Site. In each instance, USEPA's preferred remedy alternative fails to account for Site data that show USEPA's preferred remedies

are not appropriate under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) because they address background conditions attributable to historic fill, not releases. USEPA should reverse course on its unilateral changes to the FSR and revise its PRAP to reflect soil/fill and groundwater remedies actually justified by Site conditions. In doing so, USEPA could retain most aspects of its preferred soil/fill alternative other than the unnecessary bulkhead wall. The selection of a groundwater remedy must be deferred for further evaluation given the flaws in USEPA's CSM and the possibility that the implementation of the soil/fill remedy will obviate any potential need to address groundwater impacts. This approach is particularly appropriate for the Site, given that USEPA is proposing a multimillion dollar groundwater remedy based on only three shallow groundwater sampling events and a single deep groundwater sampling event that showed sporadic exceedances of preliminary remediation goals (PRG). Shallow groundwater shows decreasing levels of contaminants, likely a result of natural degradation and active steps to remove and reduce recent illegal dumping at the Site. USEPA has dismissed this data, claiming it is insufficient to demonstrate Site conditions – yet relies on the same data in justifying a $24 million groundwater remedy.

PPG has repeatedly raised these issues and concerns with USEPA as part of what PPG thought was a collaborative process to complete a defensible RI/FS that complies with CERCLA and the NCP. PPG has long cooperated in good faith with USEPA as the *only* party to commit to undertake the work for the RI/FS (out of at least 17 potentially responsible parties), at a cost of millions of dollars to PPG. When USEPA wanted to implement an "aggressive" new schedule for the RI/FS in January 2020, including a September 30, 2020 Record of Decision (ROD), in order to support potential redevelopment at the Site, PPG agreed to work with USEPA to do so. Despite this history of good faith collaboration, the last few months have seen USEPA prioritize its arbitrary, accelerated schedule over the technical accuracy of the RI/FS process and compliance with the NCP. PPG raised multiple concerns with USEPA's CSM and USEPA's proposed drafts of the FSR in May, June and July, recognizing that USEPA was ignoring the presence of historic fill at the Site and proposing to remediate historic fill, in violation of CERCLA and the NCP. As these comments would have required revisions to the FSR – revisions that would have meant USEPA could not meet its arbitrary, self-imposed September 30 deadline for the ROD – USEPA chose to ignore the deficiencies in its analysis and did not even wait to consider PPG's concerns. Instead, on July 21, 2020, USEPA sent PPG a letter stating that USEPA was unilaterally finalizing the FSR. USEPA's FSR, dated July 20, 2020, leaves the various flaws identified by PPG unaddressed. In finalizing the FSR without properly assessing the relevant Site data and PPG's technical concerns, USEPA acted arbitrarily and capriciously. USEPA went on to issue its proposed plan just one day later, producing a technically flawed PRAP that relied on erroneous information from the defective FSR.[1] The PRAP also misstates other material aspects of the FSR.

In short, the process leading up to the issuance of the PRAP has been fraught with arbitrary and capricious behavior from USEPA. USEPA's rush to meet the arbitrary deadline it set for itself in January has resulted in a materially flawed FSR, and consequently, an arbitrary and capricious PRAP. The current PRAP must therefore be revised to account for the material technical information USEPA has ignored.

[1] On July 30, 2020, with all other avenues exhausted, PPG invoked dispute resolution procedures under the Administrative Order on Consent to challenge USEPA's unilateral finalization of the FSR. The dispute resolution proceedings are currently ongoing.

II. USEPA'S SELECTION OF ITS PREFERRED SOIL/FILL REMEDY IS ARBITRARY AND CAPRICIOUS

A. USEPA's Selected Remedy Does Not Comply with CERCLA or NCP Requirements Regarding Site Data

The NCP states that the "primary objective of the feasibility study . . . is to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected." [40 CFR 300.430(e)(1).] Therefore, "[t]he development and evaluation of alternatives shall reflect the scope and complexity of the remedial action under consideration and the site problems being addressed." [*Id.*] Critically, "development of alternatives *shall be fully integrated with the site characterization activities of the remedial investigation*". [*Id*. (emphasis added).] The alternatives must take "into account the scope, characteristics, and complexity of the site problem that is being addressed." [40 CFR 300.430(e)(2); 40 CFR 300.5 (noting that the feasibility study "emphasizes data analysis . . . using data gathered *during the RI*" which "are used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives.") (emphasis added).] In short, the NCP dictates that remedial alternatives must be based on the *relevant Site data*, primarily as identified in the RI.

Site data are crucial in determining whether a remedy is even warranted, as CERCLA remedies address releases, not background contamination from historic fill or other sources. [42 U.S.C. 9621(d) ("Remedial actions . . . shall attain a degree of cleanup of hazardous substances, pollutants, and contaminants *released* into the environment and of control of further release at a minimum which assures protection of human health and the environment.") (emphasis added); USEPA, Role of Background in the CERCLA Cleanup Program (April 26, 2002) at 3 ("[T]he CERCLA program . . . does not clean up to concentrations below natural or anthropogenic background levels").] Yet, as described below, USEPA did not consider relevant Site information in selecting its preferred remedies.

B. USEPA Ignored Relevant Site Data Showing that Bulkhead Replacement is an Inappropriate Remedy when Finalizing the FSR and PRAP

USEPA's preferred soil/fill remedy, Soil/Fill Alternative 4, incorporates engineering controls in the form of capping, bulkhead replacement, non-aqueous phase liquid (NAPL) removal, and focused excavation and off-Site disposal of lead-impacted soil/fill. [PRAP at 17.] In selecting this remedy, however, USEPA failed to consider that historic fill is the dominant source of lead in Site soil/fill, not Site operations. The result is that the bulkhead replacement required by USEPA's preferred remedy does not address releases or Site-related contamination. Instead, the bulkhead serves to prevent the potential of migration of historic fill off Site. This remedy does not comply with the NCP or CERCLA.

As provided in the FSR, "fill material is present in surface soil throughout the Site and in subsurface soil. This material is considered 'historic fill' as it complies with the NJDEP definition of historic fill and, therefore, is impacted by chemicals and metals as shown by RI data and NJDEP historic fill designations." [FSR at 2-21; Remedial Investigation Report (RIR) at ES-2; RIR at 3-3.][2] Lead is a known contaminant in historic fill in

[2] Per NJDEP, "Historic fill material is material . . . which was contaminated prior to emplacement and was used extensively throughout the State, particularly along industrialized water front areas in North-Eastern and South-Western New Jersey." [NJDEP Historic Fill Material Technical

New Jersey, and lead levels at the Site were consistent with previously published data on historic fill contaminants. [*See* New Jersey Department of Environmental Protection (NJDEP) Historic Fill and Diffuse Anthropogenic Pollutants Technical Guidance, Table 4-2, at 5 (November 16, 2011), attached as Appendix A (showing lead concentration levels in historic fill as ranging from an average of 574 parts per million [ppm] to a maximum of 10,700 ppm).] In addition, the FSR states that "Historic fill ***may*** also have been impacted due to historical and/or current operations and recent and illegal disposal." [FSR at 2-21 (emphasis added).] The RI/FS did not identify any on-Site releases of lead that could have contributed to the presence of lead in soils/fill, and USEPA has not been able to point to any Site-specific information indicating such a release occurred on-Site. In discussions with PPG, USEPA has not been able to point to affirmative evidence of releases by PPG, despite generic assertions that PPG is responsible for lead on-Site. The only Site-specific information USEPA has identified is the presence of what USEPA calls "flapper doors" on specific Site buildings, which USEPA asserts were used to discharge materials. This assertion demonstrates USEPA's lack of understanding of the Site, as the device identified by USEPA is not a "flapper" or used for discharge of waste. Rather, the identified device is "windshield scupper," a component of standard fire water management systems at warehouses and other facilities used only to drain water in event of fire:

Typical "windshield scupper" located on Building #9 at the Site.

In summary, the evidence USEPA has cited misstates the record, is not Site-specific, or amounts only to speculation. Instead, USEPA's allegation boils down to a general assertion, without evidence, that PPG's operations were somehow "inherently dirty."

Despite this lack of evidence, USEPA has asserted that lead was released to the surface soil/fill at the Site. Of course, USEPA has not identified any signatures of PPG's operations demonstrating that elevated lead concentrations in the surface soil/fill at the Site are the result of Site-related releases and not due to the presence of historic fill, a known source of elevated metal concentrations in New Jersey. USEPA attempts to remedy this by presenting an observed linear correlation between lead and zinc in soil/fill across all concentrations (*i.e.*, for the elevated concentrations as well as for the low concentrations) as evidence that former operations at the Site are the source of the lead and zinc contamination. However, the opposite is true – the correlation between zinc and lead at the Site actually disproves the very point USEPA is attempting to make. This correlation does not support the agency's assertion, for the following reasons:

Guidance (April 29, 2013) at 4.] In other words, it is commonly accepted that historic fill material in New Jersey contains contaminants not attributable to releases from site operations.

- The relationship between lead and zinc levels measured at the Site is linear over the entire concentration range reported (Figure 1). No change in this relationship (as would be seen by a change in slope) has been observed in areas of the Site that are alleged to have been impacted by former Site operations (such as Lots 63 and 64) and those areas that have not. Likewise, a correlation between lead and zinc levels for the northern and southern portions of the Site yields similar slopes, even though southern portions of the Site are alleged by USEPA to have been impacted by paint pigment-related releases. USEPA's model would require concluding that Site-related surface releases contributed lead and zinc to the soil/fill in "contaminated" areas in the exact same manner and ratio as have been found in the soil/fill with low lead and zinc levels in "non-contaminated" Site areas – a conclusion that makes no sense. Despite USEPA's assertions, this correlation provides no support for identifying different lead sources to these areas. Instead, it shows that either the source of lead and zinc in the soil/fill is consistent across the Site, such as from historic fill, or that the lead-zinc ratio is not useful for identifying this difference.

- The relationship between these metals is consistent over the entire concentration range in large part due to the similar geochemical natures of lead and zinc. The dynamics of these metals in soil, including their affinity for adsorption to clays and organic matter and low mobility over near-neutral pH levels, are similar, so it is only natural for concentrations of both metals to be elevated in the same types of soils and under the same geochemical conditions. It is therefore completely unsurprising that the highest lead concentrations are found in the same samples with the highest zinc concentrations.

In apparent recognition of the fact that it has no evidence supporting its claims, USEPA relies on the PRAP to generate a record by misstating the FSR. The PRAP states that "the fill material ***may*** have been contaminated prior to placement at the Site and ***was*** further impacted by accidental spills, illegal dumping, improper handling of raw materials, and improper waste handling/disposal". [PRAP at 2.] Of course, this is the exact opposite of the conclusion provided in the FSR, in order to support USEPA's assertion that lead "is a site-related contaminant." [*See* FSR at 2-21; PRAP at 16.][3] Once stripped of this support, however, it becomes apparent that USEPA's proposed bulkhead replacement addresses historic fill. This is a fundamental error, as CERCLA remedies are only meant to address releases, not background contamination like historic fill. [42 U.S.C. 9621(d) ("Remedial actions . . . shall attain a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment"); The Role of Background in the CERCLA Program at 3 (USEPA guidance document explaining that "the CERCLA program . . . does not clean up to concentrations below natural or anthropogenic background levels").] That being the case, USEPA's proposed soil/fill remedy, Alternative 4, is inappropriate because it addresses background levels and not lead releases.

USEPA appears to consider a localized area of relatively higher lead concentrations in soil/fill around Lot 63 and Lot 64 as potentially attributable to on-Site releases. [*See* PRAP at 5 ("Of all the contamination at this Site, lead is one of the primary contaminants of concern. A significant amount of lead contamination was found in soil/fill material on Lots 63 and 64 around Building 7.").] Even accepting this as true, USEPA's

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[3] In addition to this misstatement, the PRAP contains other material errors. In numerous places, the PRAP references light non-aqueous phase liquid (LNAPL) in Lot 64 underground storage ***tanks*** (plural). Per the RIR and FSR, LNAPL was only in one UST. The PRAP also states that the RI identified "an aqueous solution on Lot 64." [PRAP at 4.] This is not a finding of the RI. Likewise, the PRAP identifies "an aqueous solution on Lot 64" as a waste being addressed. [*Id.*] There is no mention of this "waste" in the RIR and FSR.

Soil/Fill Alternative 4 proposes the excavation of soil/fill in this area, as well as removal of underground storage tanks (USTs) (associated with volatile organic compound [VOC] and NAPL detections arising after PPG vacated the Site) and NAPL in soil/fill. Once these areas have been removed from the Site, there are no further impacts purportedly associated with Site operations. Requiring a bulkhead replacement on top of excavation is therefore arbitrary and capricious because it does not serve any purpose under CERCLA to address on-Site releases. Because purportedly Site-related contaminated soils and wastes will have been removed, the bulkhead's only purpose is to prevent the erosion of historic fill off-Site (erosion that the RI/FS did not establish as containing chemicals of concern [COCs]). Such a remedy is inconsistent with the NCP and CERCLA. Ultimately, there is no justification for the inclusion of bulkhead replacement in Soil/Fill Alternative 4.

III. USEPA'S SELECTION OF ITS PREFERRED GROUNDWATER REMEDY IS ARBITRARY AND CAPRICIOUS

USEPA's preferred Groundwater Alternative 4 prescribes both a P&T system and in-situ treatment to attain, among other PRGs, a groundwater lead PRG of 5 micrograms per liter (µg/L). [PRAP at 19.] This alternative, however, is arbitrary and capricious because—just as it did in its selection of its preferred soil/fill alternative—USEPA has failed to consider material Site data in its selection of this alternative. This violation of the NCP goes back to USEPA's decision to unilaterally revise the FSR to incorporate a CSM that ignores the fact that historic fill is the dominant source of lead in groundwater. USEPA did so despite PPG repeatedly raising concerns that USEPA's version of the FSR disregarded material Site data and improperly evaluated alternatives based on a flawed CSM. The result is an arbitrary and capricious remedy selection.

The Site data USEPA disregarded show that USEPA's CSM for the Site is materially flawed. USEPA presents a CSM that is based on a theory that metal pigments used in paint manufacturing are present in surface soil/fill and are being mobilized into subsurface soil/fill and then into saturated soil/fill, which then results in elevated lead concentrations in groundwater. However, as PPG has repeatedly raised, USEPA's CSM and remedial alternatives, including USEPA's preferred alternative, are fundamentally flawed for multiple reasons. *First*, USEPA's CSM does not take into account or explain the lack of relationship between surface soil/fill lead concentrations and groundwater lead concentrations observed on Site, as well as additional factors relating to variability of groundwater detections and other lead sources. *Second*, USEPA's proposed alternative ignores the fact that soil/fill with lead concentrations at soil/fill PRGs can contribute to lead in groundwater at concentrations significantly exceeding USEPA's PRG for groundwater. *Third*, modeling and other analyses of USEPA's preferred alternative shows its proposed P&T system will be ineffective and impracticable. These issues are discussed in further detail below.

In summary, USEPA's selection of its preferred groundwater remedy, Groundwater Alternative 4, is arbitrary and capricious. Restoration of groundwater quality is both unwarranted, as the RI/FS has not demonstrated a link between lead in surface soils/fill attributable to potential releases and groundwater, and impracticable, as detailed in the FSR and as USEPA admits in the PRAP. The limited detections of VOCs and SVOCs likewise do not support the selection of USEPA's preferred groundwater remedy. Instead, USEPA should recognize that its preferred alternative does not address Site conditions and defer its groundwater remedy selection. This is particularly true in light of the fact that USEPA is pressing a groundwater remedy based on a single deep groundwater sampling event and just three shallow groundwater sampling events that show significant variability in concentrations between sampling events and decreasing contaminant levels. Further, USEPA's sewer water, waste and soil/fill alternatives address identified and potential sources of contamination to groundwater (in addition to historic fill). USEPA can evaluate the necessity for a groundwater remedy once these other remedies are implemented.

A. USEPA is Required to Consider Relevant Site Data when Selecting its Groundwater Remedy

As discussed above, the NCP requires USEPA to consider relevant Site data—primarily the data identified during the RI—when selecting remedial alternatives during the FS. [40 CFR 300.430(e)(1) ("[t]he development and evaluation of alternatives shall reflect the scope and complexity of the remedial action under consideration and the site problems being addressed . . . development of alternatives *shall be fully integrated with the site characterization activities of the remedial investigation*") (emphasis added); 40 CFR 300.5 (noting that the feasibility study "emphasizes data analysis . . . using data gathered *during the RI*" which "are used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives.") (emphasis added).] However, just as it failed in considering relevant data in its soil/fill remedy selection, USEPA has failed in accounting for material Site data in its groundwater remedy selection. As noted in Section II above, USEPA continues to work under the erroneous and unfounded belief that lead in groundwater at the Site is all Site-related. The evidence gathered through the RI, however, demonstrates otherwise, showing lead in groundwater is consistent with background levels from historic fill at the Site. [*See* RIR at ES-2; 3-3.]

B. PPG Repeatedly Informed USEPA that USEPA was Failing to Consider Relevant Site Data in its Remedy Selection

Over several months, PPG informed USEPA that USEPA's CSM failed to adequately consider crucial Site data, particularly in regards to lead contamination in soils/fill and groundwater. PPG also sent USEPA detailed letters with technical information showing USEPA the relevant RI findings and other Site data that USEPA was failing to consider in its remedy selection. Instead of considering this information, USEPA unilaterally finalized the FSR without ever addressing the material concerns PPG had pointed out throughout the FSR drafting process. USEPA then immediately followed the finalization of the FSR with the issuance of the PRAP, suggesting that USEPA had been drafting the PRAP weeks in advance, with no intention of ever examining the relevant Site data PPG had relayed concerns about.

The relevant facts are as follows:

1. On June 23, 2020, USEPA conditionally approved PPG's draft FSR, providing a mark-up with several revisions for PPG to incorporate (the "June 23 Revisions"). Many of these revisions were arbitrary and capricious because they were unsupported by the record and were premised on the erroneous assumption that lead concentrations in soil/fill and groundwater on Site were attributable to Site operations. PPG informed USEPA of these problems during a June 25, 2020 call and explained that it would submit a revised FSR that would incorporate USEPA's changes to the extent they were scientifically and technically defensible. That same day, USEPA asked PPG to "***send back a redline with your text/comments by Tuesday 6/30***." [Email from J. Smeraldi (USEPA) to S. Krall (PPG) (June 25, 2020) (emphasis added).]

2. On June 30, PPG submitted a revised FSR to USEPA as directed. Along with this revised FSR, PPG provided a letter identifying material issues with USEPA's attribution of lead in soil/fill and groundwater to Site operations rather than the historic fill that is a known source of lead to soil/fill and groundwater at the Site, as recognized by the findings of the RI.

3. On July 10, 2020, USEPA responded to PPG's revised FSR with an email containing a second mark-up (the "July 10 Revisions"). The July 10 Revisions still failed to address the material technical concerns regarding the attribution of lead in groundwater to Site operations and USEPA's proposed remedies to address this lead (which is attributable to historic fill as recognized by

relevant Site data and RI findings). USEPA asked PPG to "***review and let us know your response by Friday 7/17***" and to "***raise any concerns as soon as possible."*** [Email from J. Smeraldi (USEPA) to S. Krall (July 10, 2020) (emphasis added).] USEPA also committed to provide a letter explaining why remedial action for lead in groundwater at the Site was not arbitrary and capricious. USEPA provided this letter on July 14, and the parties agreed PPG would have seven days to respond (*i.e.*, by July 21).

4. On July 17, 2020, PPG and Woodard & Curran reached out to USEPA to discuss USEPA's arbitrary and capricious July 10 Revisions and July 14 letter, which still failed to address the material flaws in USEPA's June 23 Revisions. Shortly thereafter, USEPA reversed course on its previous request for PPG's review and comment on the July 10 Revisions. Instead, USEPA asserted that "PPG is proposing certain changes to the FS that are inconsistent with EPA's June 23, 2020 conditional approval of the FS, which stipulated that the FS was approved provided that EPA's markup and comments were incorporated." [Email from J. Smeraldi (USEPA) to S. Krall (PPG) and K. Bird (Woodard & Curran) (July 17, 2020).] USEPA also wrote demanding that PPG "let EPA know immediately whether PPG will incorporate all of EPA's July 10 comments into the FS" and concluded with a threat that "[i]f PPG does not accept EPA's comments, EPA will consider its other options under paragraph 41 of the settlement agreement." [*Id.*] This position was a complete reversal from USEPA's directions on June 23 and July 10, which asked PPG to review and comment on USEPA's revisions to the FSR. PPG responded that it would be providing a revised draft of the FSR that was technically and scientifically accurate, as instructed by USEPA on July 10. [Email from K. Bird (Woodard & Curran) to J. Smeraldi (USEPA) (July 17, 2020).] PPG provided a revised draft of the FSR on July 17.

5. On July 21, USEPA responded with a letter invoking Paragraphs 41(c) and 44 of the Administrative Order on Consent (AOC) to unilaterally modify and finalize the FSR. USEPA issued this letter – and the FSR, which is dated July 20 – before receiving, let alone considering, PPG's July 21 letter. Regardless, PPG submitted its July 21 letter to USEPA. That letter provided additional technical and scientific analyses demonstrating that USEPA's CSM is materially flawed and that USEPA's revisions to the FSR were arbitrary and capricious.

6. On July 22, just one day after the finalization of the FSR, USEPA issued the PRAP, which still premised its remedy selection on the faulty assumption that lead in soil/fill and groundwater is attributable to Site operations. Discarding the remote possibility that USEPA drafted the entire PRAP in one night, the extremely fast turnaround time suggests that the PRAP had been drafted weeks in advance, and that USEPA had never intended to seriously consider the material technical issues that PPG repeatedly raised in the preceding weeks. USEPA's rush to issue the PRAP resulted in errors in the PRAP and discrepancies from the FSR. For instance, PRAP Groundwater Alternative 4 (PRAP Figure 5) indicates metals in deep groundwater need to be remediated via extraction wells, reflecting an error USEPA made in an earlier version of the FSR. Metal concentrations were not above PRGs in deep groundwater and thus do not warrant remediation. This was corrected in the FSR, but USEPA apparently did not revise the PRAP it had already drafted to incorporate this simple but material correction.

The facts therefore show that PPG repeatedly raised concerns with USEPA's revisions to the FSR, on the basis that USEPA disregarded material Site data established during the RI. While USEPA seemed amenable to exploring these technical concerns at the start, at some point USEPA realized that addressing the inconsistencies between its desired remedies and the actual facts regarding the Site as established during the RI would require additional time, thereby putting USEPA's aggressive RI/FS schedule in jeopardy. Rather than genuinely considering the relevant RI findings flagged by PPG, USEPA acted arbitrarily and

capriciously in modifying and approving a flawed FSR.[4] The PRAP followed a mere day later, and—by virtue of being based on a flawed FSR—is also arbitrary and capricious.

C. The Site Data USEPA Chose to Ignore Show Groundwater Alternative 4 is Inappropriate for the Site

1. Site data do not support USEPA's theory that lead in groundwater is attributable to releases to surface soil/fill

USEPA asserts that lead groundwater contamination is the result of releases of lead to surface soil/fill rather than historic fill. As a result, USEPA believes that groundwater contamination requires active remediation. USEPA's approach is premised on a CSM where:

- Lead in soil/fill is attributable to releases from historical operations;
- Lead is migrating from releases to surface soil/fill to subsurface soil/fill; and
- Lead that has migrated to subsurface soil/fill beneath the water table is desorbing into groundwater.

However, an unbiased review of the available Site data demonstrates that it does not support USEPA's CSM. This review begins with the understanding that the movement of lead through the soil column is controlled by adsorption to soil, and the extent of adsorption is influenced by factors including the soil type (and available binding sites), organic matter content and pH (USEPA, 2013). At near neutral pHs, lead adsorption is greatest and therefore transport is typically extremely limited. Lead tends to be more mobile with increasing availability of organic carbon. Lead can form colloids with organic matter, namely organic acids, and the formation of these colloids helps keep lead dissolved in groundwater. Taking these factors into account, a review of Site data supports the conclusion that groundwater lead concentrations generally do not reflect surface soil/fill concentrations (and are therefore disconnected from potential Site-related releases). A more appropriate CSM would reflect and rely on the following observations that USEPA has disregarded:

- **Differences in surface and subsurface soil/fill lead concentrations.** These differences reflect the heterogeneous nature of the historic fill and the lack of material impact attributable to surface soil/fill lead concentrations at the Site. USEPA has divided the Site into three areas for purposes of comparing lead concentrations – northern, southern and Lot 63 (Building #7). A comparison of the soil/fill lead concentrations in these portions of the Site (as described by USEPA Region 2 [Smeraldi, 2020]) shows that more samples with elevated soil/fill lead concentrations have been collected from within Lot 63, where the Site sampling was also more concentrated (Figure 2), than from other areas of the Site. However, across the three areas of the Site, the greatest lead concentrations in soil/fill are typically found in subsurface soil/fill (approximately 3 feet below ground surface [bgs]). This directly conflicts with USEPA's CSM. Under USEPA's CSM, the greatest soil/fill lead concentrations would be found at the surface, reflecting purported releases, and decrease as the contamination moved from the top down. Instead, the maximum lead

[4] PPG submitted a Freedom of Information Act request to USEPA in order to obtain documents and communications from USEPA during this time period regarding its consideration (or lack thereof) of PPG's material technical concerns. To date, USEPA has not provided documents in response to this request.

concentrations are found in the subsurface, indicating historic fill, not releases, is the source of these detections.

- **Distribution of groundwater lead concentrations.** The groundwater lead concentration distribution is similar in all three Site areas, and there are multiple instances in which groundwater lead concentrations do not reflect nearby soil/fill concentrations. A comparison of the soil/fill lead concentrations in the three portions of the Site with concentrations measured in nearby monitoring wells reveals similar distributions of groundwater lead concentrations in each area, even though USEPA acknowledged that the northern portion of the Site was unaffected by the paint pigment-related operations that took place at the Site (Figure 2). Further, moderate (5-25 µg/L) lead concentrations were detected in wells throughout the Site in at least one sampling period, which suggests that a spatially consistent source of lead is present at the Site, such as would be found in historic fill (Figure 3).

  In addition, using the soil/fill PRG of 800 milligrams per kilogram (mg/kg) as the criterion for identifying Site areas where groundwater lead concentrations are expected to be elevated above the groundwater PRG of 5 µg/L, PPG has identified 15 out of the 31 shallow monitoring wells in which detected lead concentrations are "mismatched" with nearby surface soil/fill lead concentrations. As shown in Table 1 and on Figure 4, surface soil/fill lead concentrations are low near some wells with elevated lead concentrations, and surface soil/fill lead concentrations are high near some wells with low lead concentrations. This suggests that nearby surface soil/fill lead concentrations are not the primary factor contributing to groundwater lead concentrations.

  USEPA has suggested that a point-by-point spatial correlation of soil/fill and groundwater lead concentrations is not possible, due to the lack of co-located samples, and that up- or side-gradient location of soil/fill samples relative to the closest wells are not useful. However, there is more than enough data to evaluate USEPA's "top down" infiltration CSM. Numerous soil/fill depth profiles have been taken near various groundwater monitoring wells; 19 of the 31 shallow monitoring wells have a soil profile within 15 ft (the profiles presented as examples on Figure 4 are all located within 55 feet of a monitoring well, and most are within 20 feet). In addition, the complex groundwater flow patterns at the Site would suggest that soil/fill located below the water table are reasonably well connected with adjacent areas, both "upgradient" and "sidegradient" of the dominant groundwater flow direction, due to tidal influence. Figure 5 shows tidal influence at the Site relative to groundwater monitoring wells. In actuality, PPG's spatial analysis of soil/fill and groundwater concentrations is scientifically valid – USEPA simply has no substantive response. Instead, USEPA has taken its position further, arguing that the RI/FS field sampling program, which USEPA approved, was not explicitly designed to allow for point-by-point spatial correlation analyses.

  USEPA's positions ultimately rebut its own CSM. In arguing the data do not allow for a spatial correlation analysis between soil/fill samples and groundwater results, USEPA admits that it cannot point to a single groundwater well with elevated lead concentrations correlated with elevated soil/fill concentrations above the soil/fill PRG. In other words, USEPA has no evidence to support its

CSM.[5] To get around this problem, USEPA points to what it calls a "positive correlation of elevated groundwater lead concentrations with areas [of] elevated soil lead concentration" on Lot 63.[6] USEPA has presented no figures or statistics in support of this "correlation." Put a different way, USEPA saw an area with higher lead soil/fill concentrations and higher groundwater lead concentrations, and assumed they were related without actually examining the data. Notably, USEPA does not address the fact that the highest soil/fill lead concentrations on Lot 63 occur in the subsurface, ***not*** the surface – the opposite of a fate and transport model where surface soil/releases migrate to the subsurface (see Figure 2). USEPA also does not address the multitude of other Site conditions showing why surface releases would not migrate to groundwater. In failing to do so, USEPA shows that its CSM is nothing more than a guess that hypothetical releases to surface soil/fill are impacting groundwater. The science shows that is wrong.

Moreover, monitoring wells and soil/fill samples on Lot 63 are particularly closely situated and contradict USEPA's CSM. Figures 6 and 7 show several wells on Lot 63 and soil/fill samples located between 1.5 and 8 ft from the wells; only MW-112 is further than approximately 8 feet from the closest soil/fill profile, but has 5 soil/fill profiles located up- and sidegradient of it. These soil/fill concentrations are above the soil/fill PRG, but they do not correspond with surface soil/fill impacts to groundwater – the higher lead concentrations in soil/fill occur in the subsurface (historic fill) rather than the surface. Further, in each of these wells, though transient exceedances of the groundwater lead PRG were observed, groundwater in every well was also at or below the groundwater lead PRG in at least one sampling event. These six wells demonstrate that USEPA's CSM does not describe actual site conditions.

- **Transient exceedances during RI/FS sampling.** Lead groundwater concentrations are not consistently elevated at the Site as would be expected if elevated soil/fill concentrations were driving the groundwater concentrations. In many monitoring wells, exceedances of the groundwater PRG are transient, with the highest concentrations being found in limited locations, and typically during just one sampling period. However, USEPA asserts that there are insufficient data available to evaluate time trends of lead concentrations at the Site, choosing instead to completely ignore the variable nature of the elevated lead concentrations in groundwater to simplistically focus only on maximum concentrations and declare that widespread contamination is present at the Site. In fact, lead concentrations have been consistently higher than 25 µg/L only in one well, MW-107.

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5 USEPA has also stated that subsurface soil samples "were sampled with a bias to indications of volatile organic compounds" so that "monitoring wells with elevated lead concentrations cannot be connected geographically to nearby subsurface soil samples". USEPA does not explain the basis for this statement or why sampling in areas with VOCs would prevent spatial comparisons. The data was generated during the RI/FS and must be considered under the NCP. USEPA's position also begs the question of why USEPA would approve such a sampling program, since under USEPA's argument, the sampling data could establish the presence of lead – which was already known to be present as part of historic fill – but could not be used for any spatial or fate and transport analysis.

6 USEPA has focused on Building #7 (Lot 63) as the only area where there is evidence of releases to surface soils during manufacturing, based on the so-called "correlation" between surface soil/fill lead and groundwater. However, per the USEPA-approved SCSR and RIR for the Site, paint was not manufactured in Building #7.

- **Temporary exceedances observed during prior investigations of organic contamination.** Additional available groundwater lead concentration data from several of the Industrial Site Recovery Act (ISRA) cases on Site and the recent remedial action on Lot 57 demonstrate that elevated groundwater lead concentrations (greater than 150 µg/L) are limited to discrete points in time, with later sampling measuring concentrations near or below the groundwater PRG. The transient detections of elevated lead levels in these wells (E-3, E-4, E-8 and MW-118) are not consistent with USEPA's CSM based on "top down" releases of lead where groundwater lead concentrations are controlled by elevated subsurface soil/fill concentrations. Instead, these data support a CSM where lead in historic fill may be mobilized by changing groundwater conditions, including by co-located organics, temporarily elevating lead detections in groundwater before they drop back below the groundwater PRG. Later rounds of sampling showed significant reductions in lead concentrations occurring in parallel with significant reductions in organics in groundwater.

An appropriately evaluated CSM would consider the "mismatched" soil/fill and groundwater lead concentrations along with the variations in groundwater chemistry at the Site noted above. These observations challenge the assumption that the source of the lead detected in groundwater within Lot 63 or within the entire southern portion of the Site (*i.e.*, purportedly Site-related releases) is somehow distinct from that of the lead detected in groundwater in the northern portion of the Site (which USEPA has not attributed to paint pigment-related releases), or that lead in groundwater can be explained by migration of lead releases in surface soils. Rather, lead has been detected in groundwater across the Site, both inside and outside of the areas of the Site where potential lead-related operations formerly took place, at elevated concentrations that are consistent with those expected in historic fill material in New Jersey. In addition, groundwater lead concentrations at the Site have varied over time in response to changes in groundwater characteristics, including changes in pH and the presence of other contaminants. These observations suggest that elevated groundwater lead concentrations can result from short-term, localized mobilization of lead from historic fill materials in response to groundwater changes, and do not suggest widespread contamination of the aquifer below the Site at lead levels above those expected in historic fill. These observations are explored in further detail below.

a. Spatial analysis of soil/fill and groundwater lead impacts

Groundwater and soil/fill lead concentration distributions within the three portions of the Site are shown on Figure 2. USEPA has characterized the northern portion of the Site as an area that "has not been substantially impacted by lead contamination" (Smeraldi, 2020). In this portion of the Site, surface and subsurface soil/fill lead concentrations range from 1 to 3,540 mg/kg, and the lead concentrations measured in groundwater range from non-detect (less than 1 µg/L) to 25.3 µg/L (excluding data collected from Well MW-118).[7] Because groundwater lead in the northern portion of the Site has not been attributed to

[7] USEPA excluded data collected from MW-118 from its comparison of monitoring wells and nearby soil lead concentrations in its July 14, 2020 letter due to the known impact of an acetone spill on this well (Smeraldi, 2020). Note, however, that lead concentrations in MW-118 decreased from 568 µg/L in March 2018 to 13.8 µg/L in February 2019 in RI/FS sampling events. Recent (August 2020) sampling data taken in connection with the ongoing NJDEP-supervised ISRA process on Lot 57 showed groundwater total lead level of non-detect at 1 µg/L and thus below the PRG. [*See* August 2020 Sampling Data, attached as Appendix B.] Likewise, groundwater lead levels in MW-116 have also fallen to non-detect. The data demonstrate both the variability of groundwater lead levels and suggest that actions taken by the Lot 57 owner/operator to address potential sources of VOC impacts to groundwater on Lot 57 (including ceasing use of acetone

operations, other potential factors influencing the presence of lead in this area of the Site include historic fill and/or changes in the groundwater chemistry that have enhanced lead's mobility in this Site area.

Figure 3 shows three subsets of monitoring wells across the Site – those with any lead measurements less than 5 µg/L, those with lead measurements between 5 and 25 µg/L, and those with any measurements over 25 µg/L. Low (<5 µg/L) and moderate (5 to 25 µg/L) lead groundwater concentrations have been detected across the Site and in many monitoring wells during at least one sampling period. These results suggest that a consistent source of lead is present at the Site (*i.e.*, historic fill). The highest groundwater lead concentrations have been detected in only limited locations across the Site and typically during only one sampling period. Lead concentrations have been consistently higher than 25 µg/L only in Well MW-107. Lead has only been measured above 40 µg/L in three Site monitoring wells (MW-105, MW-107, and MW-108), and none of these wells had more than one measurement over 40 µg/L. These observations do not support USEPA's view that there is contamination of the aquifer below the Site at lead levels above those expected to result from the presence of historic fill.

b. No relationship between elevated lead in surface soils/fill and elevated lead in groundwater

USEPA's CSM suggests that lead in certain areas of surface soil/fill (levels of which USEPA assert are elevated due to Site-related releases) infiltrates into the subsurface and below the water table during precipitation events, resulting in elevated groundwater lead concentrations. Based on this CSM, groundwater monitoring wells in which elevated lead concentrations have been detected would be expected to be located near areas where elevated lead concentrations have been measured in surface soil/fill (indicating a surface release), and elevated soil/fill concentrations would be expected to be present throughout the soil/fill depth profile. There are ample soil/fill depth profiles taken near groundwater monitoring wells that can be used to evaluate USEPA's CSM (Tables 1 and 2).

A careful review of the available data reveals multiple instances of "mismatched" surface soil/fill and groundwater lead concentrations that do not conform to USEPA's CSM. In some of the wells with "mismatched" groundwater and nearby surface soil/fill lead concentrations, the groundwater concentrations are below the corresponding PRG, even though surface soil/fill concentrations measured adjacent to the well are elevated above the corresponding PRG; in others, groundwater lead concentrations are significantly elevated above the corresponding PRG, while the nearby surface soil/fill concentrations are similar to or below the corresponding PRG. Soil/fill depth profiles for comparison to the groundwater data were selected based on their proximity to each monitoring well (all depth profiles are within 55 feet of a well, and many are within 20 feet), with consideration given to the groundwater flow direction. However, given the nature of the groundwater flow directions at the Site, groundwater lead concentrations are influenced not only by locations directly upgradient of the sampling point.

In the northern portion of the Site, lead concentrations higher than the groundwater PRG have been detected in five of the area's 14 monitoring wells (excluding MW-118). Only one of these wells (MW-119) is in a location noted in the RIR (Woodard & Curran, 2020) to have known elevated soil/fill lead levels. Measured soil/fill lead concentrations near the other four wells (E-4, MW-117, MW-120, and MW-122) are less than 500 mg/kg. Six monitoring wells in the southern portion of the Site (MW-102, MW-103, MW-104, MW-105,

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and ethyl acetate) have contributed to lower groundwater lead concentrations. [*See* Groundwater Sampling and River Wall Pipe Inspection – Davion Newark Facility (Sept. 29, 2020), attached as Appendix C (acetone and 1-ethyl acetate decreased to non-detect in MW-116; MW-118 detections decreased to 1,600 µg/L for acetone and 91 µg/L for ethyl acetate in August 2020 sampling).]

MW-106 and MW-109) have also had detections of lead above the groundwater PRG and nearby soil/fill concentrations of approximately 800 mg/kg or below. Five other wells in the southern portion of the Site (E-1, E-6, E-7, MW-114, and MW-123) have had lead detections that are lower than the groundwater PRG but are close to areas with elevated surface soil/fill concentrations (up to 2,000 mg/kg) (Table 1).

Table 1: Comparison of Groundwater and Nearby Soil/Fill Lead Concentrations

Well	Nearest Soil Sampling Location(s)	Relative Location[a]	Concentrations Above PRG?		Maximum (Average) Groundwater Concentration (µg/L)[b]	Soil/Fill Concentration Range (mg/kg)
			Groundwater?	Soil/Fill?		
E-1	B-59, B-77	Both locations are 30 ft from the well. B-77 is down- or sidegradient, depending on tides. B-59 is upgradient.	No	Yes	1.3 (1.0)	35-2,530
E-4	B-27	B-27 is 20 ft sidegradient.	Yes	No	7.4 (6.1)	213-421
E-6	B-4	B-4 is 10 ft sidegradient.	No	Yes	3.3 (2.3)	650-1,070
E-7	B-4	B-4 is 10 ft sidegradient.	No	Yes	2.0 (1.6)	650-1,070
MW-102	B-44, B-77	B-77 is 35 ft upgradient and B-44 is 40 ft side-gradient.	Yes	No	12.8 (6.4)	152-483
MW-103	B-53	B-53 is 10 ft up- or sidegradient, depending on tides.	Yes	Barely	18.7 (11.0)	297-803
MW-104	B-78, B-84	B-78 is 55 ft upgradient. B-84 is 15 ft downgradient.	Yes	No	10.4 (8.5)	30-470
MW-105	B-38	B-38 is 15 ft upgradient. l.	Yes	No	47.6 (32.1)	18-794
MW-106	B-35, B-36, B-37, B-91	MW-106 is located on a groundwater mound. Soil locations were chosen in each direction. All are between 30 and 55 ft from the well.	Yes	No	26.5 (21.2)	19-504
MW-109	B-94	B-94 is located within 6 ft the well.	Yes	Barely	21 (14.9)	97-850
MW-114	B-12, B-13	B-12 is 15 ft upgradient and B-13 is 15 ft downgradient, depending on tides.	No	Yes	0.28 (0.4)[c]	171-2,000
MW-117	B-10, B-105	B-10 is 40 ft downgradient. B-105 is 50 ft sidegradient or upgradient, depending on the tides.	Yes	No	17.7 (9.5)	31-211
MW-120	B-61, B-62	B-61 is 20 ft sidegradient. B-62 is 15 ft upgradient.	Yes	No	25.3 (16)	44-333
MW-122	B-102	B-102 is located 10 ft from the well and the gradient is highly variable with the tides.	Yes	No	7.0 (3.8)	174-264
MW-123	B-56, B-82	B-56 is located 25 ft sidegradient. B-82 is 25 ft up- or sidegradient, depending on the tides.	No	Yes	1.2 (0.7)	17.5-838

Notes:
Source: Woodard & Curran (2020).
(a) Soil/fill depth profiles for comparison to the groundwater data were selected based on their proximity to each monitoring well (many depth profiles are within 20 feet of the well, and all are within 55 feet), with consideration given to the groundwater flow direction. Given the tidal nature of the groundwater flow directions at the Site, soil/fill locations may fluctuate between being up-, down- or sidegradient from well locations during the course of the changing tidal cycles. Therefore, groundwater lead concentrations are influenced not only by locations directly upgradient of the sampling point. Distances given are approximate.
(b) Based on the maximum groundwater lead concentration at listed well. Non-detected values were included at half the reporting limit (1 µg/L) in the average. Duplicate samples were averaged before calculating the well average.
(c) At MW-114, lead was not detected twice, and had an estimated value of 0.28 µg/L reported once. Therefore, the maximum detected value is 0.28 µg/L and yet the average is 0.43 µg/L.

Table 2: Groundwater and Nearby Soil/Fill Locations for Additional Wells

Well	Nearest Soil Sampling Location(s)	Relative Location[a]
E-2	B-51	B-51 is located approximately 30 ft sidegradient of the well.
E-3	B-36	B-36 is located approximately 12 ft upgradient of the well.
E-5	B-79	B-79 is located within 3 ft of the well.
E-8	B-22, B-23	B-22 is located approximately 30 ft upgradient and B-23 is located approximately 9 ft sidegradient of the well.
MW-101	B-39, B-76	B-39 is approximately 50 ft upgradient and B-76 is located within 35 ft down- and sidegradient of the well.
MW-107	B-69, B-70, B-85	B-69 is located within 40 ft and B-70 is located within 55 ft upgradient of the well and B-85 is located 20 ft downgradient.
MW-108	B-29	B-29 is located with 2 ft of the well.
MW-110	B-32	B-32 is located approximately 8 ft sidegradient of the well.
MW-111	B-87	B-87 is located approximately 7 ft sidegradient of the well.
MW-112	B-74, B-30, B-25, B-24, B-88	B-88 is closest to the well at approximately 40 ft, the other 4 locations are within 50 to 60 ft of the well. All are up- to sidegradient.
MW-115	B-16	B-16 is located approximately 12 ft upgradient of the well.
MW-116	B-7	B-7 is located within 22 ft downgradient of the well.
MW-118	B-9	B-9 is located approximately 4 ft from the well.
MW-119	B-65	B-65 is located within 3 ft of the well.
MW-121	B-63, B-64	B-63 is located within 14 ft sidegradient and B-64 is located with 40 ft upgradient of the well.
MW-124	B-14	B-36 is located approximately 12 ft downgradient of the well.

Notes:
Source: Woodard & Curran (2020).
(a) Soil/fill depth profiles for comparison to the groundwater data were selected based on their proximity to each monitoring well (many depth profiles are within 20 feet of the well), with consideration given to the groundwater flow direction. Given the tidal nature of the groundwater flow directions at the Site, soil/fill locations may fluctuate between being up-, down- or sidegradient from well locations during the course of the changing tidal cycles. Therefore, groundwater lead concentrations are influenced not only by locations directly upgradient of the sampling point. Distances given are approximate.

Five examples of wells with “mismatched” groundwater and nearby soil/fill lead concentrations are presented on Figure 4. These wells demonstrate that the surface soil/fill concentrations are not indicative of locations that will have elevated groundwater concentrations. The soil/fill depth profiles do not show the “top down” infiltration of lead from the surface resulting in elevated groundwater concentrations that would be consistent with USEPA’s CSM. Three of the wells shown on Figure 4 (E-1, MW-114, and MW-123) provide examples of a situation in which elevated surface soil/fill lead concentrations have been found, but the nearby groundwater lead concentrations were low.

The potential “top down” infiltration of lead can be evaluated at the soil/fill profile sampling location B-59. In discussions with PPG, USEPA has identified this sampling location and groundwater Monitoring Well E-1 as an example of a pairing that rebuts the correct Site CSM based on the presence of historic fill advanced by PPG. Instead, this shows USEPA’s failure to consider Site data or understand PPG’s position, and in fact perfectly demonstrates the flaws in USEPA’s CSM. The highest soil/fill concentration (2,150 mg/kg, average of duplicates) at B-59 was measured at 2 to 4 feet bgs (after correcting for the presence of a soil mound). Under USEPA’s “top down” model, this elevated lead concentration should be the result of elevated lead concentrations from the surface infiltrating down, which were not found, and then result in elevated groundwater lead concentrations in Well E-1. Instead, the groundwater lead concentration measured in Well E-1 was low (<1.5 µg/L), reflecting lower lead concentrations in subsurface soil/fill near the well (34.9 mg/kg), ***not*** the elevated lead concentrations closer to the surface. Contrary to USEPA’s view, these data show that the elevated soil/fill lead concentration in soil/fill closer to the surface at this location had no evident influence on the deeper soil/fill or groundwater lead concentrations. Similar patterns are apparent at MW-114 and MW-123.

In contrast, data from two other monitoring wells, MW-106 and MW-120, show “mismatched” data in the opposite way. At these well locations, lead concentrations in the nearby soil depth profile are generally at or below the soil/fill PRG, but some groundwater concentrations are significantly elevated above the groundwater PRG. Thus, Figure 4 shows that nearby elevated surface soil/fill lead concentrations alone are not sufficient indicators of elevated lead groundwater concentrations.

The "mismatched" well provides one kind of example where USEPA’s CSM cannot describe conditions in a groundwater well. However, USEPA’s CSM also does not describe conditions in wells with elevated lead concentrations in soil/fill and groundwater. The highest observed groundwater concentrations on site were found at MW-108 and MW-118 (Figure 6). MW-108 had a maximum groundwater concentration of 109 µg/L and B-29 is located within 2 feet of MW-108. MW-118’s maximum groundwater concentration was 568 µg/L and B-9 is located within 4 feet of the well. At both locations the soil/fill concentrations at all depths are near the PRG of 800 mg/kg. As described in Section III.C.2, the Kd analysis shows that groundwater concentrations ranging from 44.4 µg/L to 890 µg/L would be possible at the soil/fill concentrations in the subsurface observed in borings B-9 and B-29. USEPA’s CSM also has no explanation for the significant variability observed in these wells. The soil/fill concentrations are stable at the PRG, yet groundwater varies, with low concentrations being present in each well within months of elevated samples. The maximum at MW-108 was in the last sampling round and the prior samples had concentrations of 6.6 (average of duplicates) and 15.4 µg/L. The maximum at MW-118 was in the first sampling event in March 2018 and it steadily decreased to 26, then 13.8 and recent sampling found non-detectable levels of lead (see footnote 6 in Section III.C.1.a). This demonstrates that groundwater lead concentrations are not adsorption controlled – groundwater lead concentrations vary despite the fact that lead concentrations in the soil/fill are not changing over this time. USEPA's CSM relies on elevated groundwater resulting from lead being released from soil/fill, and that is not the case in the two wells with the highest concentrations at the site.

Deficiencies in USEPA's CSM are also apparent in the wells located near to some of the highest soil/fill lead concentrations. MW-110 is located within approximately 8 feet of B-32, MW-111 is located within 8 feet of

B-87 and MW-119 is located with 3 feet of B-65. MW-112 is in proximity (40 to 60 feet) to multiple soil/fill borings with elevated lead concentrations. Each of these areas has at least one sample over 2,000 mg/kg (Figure 7). USEPA's CSM would suggest that these areas would have the most impacted groundwater – that the elevated lead concentrations in surface samples would infiltrate into the subsurface and further into the groundwater. However, that is not apparent in these locations. In all of these profiles, the lead concentrations are highest in the subsurface and ***not*** in the surface soil/fill. More importantly, the groundwater concentrations near these elevated soil samples are relatively low. Several groundwater concentrations are below the PRG of 5 µg/L, and all but one are below 15 µg/L (PPG's conservative estimate of background is 25 µg/L, see Section III.C.3 and Table 4). Taken together, these six wells – all from the Lot 63 area that USEPA identified as the area explained by its "top down" infiltration CSM – demonstrate that USEPA's CSM does not describe actual site conditions. The soil/fill profiles with elevated concentrations do not support USEPA's "top down" infiltration model, and surface soil/fill concentrations do not correspond with groundwater impacts. Instead, these observations support the correct Site CSM that the historic fill is the source of lead at the site and that groundwater concentrations do not reflect infiltration from surface releases.

The examples given above demonstrate that surface soil/fill is not the primary source of elevated groundwater concentrations of lead at the Site, contrary to USEPA's CSM that elevated groundwater concentrations are the result of "top down" infiltration of lead from surface releases. This is not surprising. Lead is considered to be nearly immobile in oxidizing conditions at near neutral pH, which describes the surface soil/fill conditions at the Site, and is unlikely to migrate in significant amounts from surface to subsurface soil (USEPA, 2013). NJDEP also considers lead to be an "immobile chemical," and NJDEP's simulations of a generic immobile contaminant with a K_d of 200 liters per kilogram (L/kg) show an infiltration of only 3.6 inches in 100 years (NJDEP, 2008). Moreover, USEPA Region 2 has presented a range of lead K_d values of 5,000 to 100,000 L/kg (log 3.7 to log 5) for this Site,[8] which indicate that infiltration will be negligible. Using ***USEPA Region 2's own*** K_d value of 5,000 L/kg, estimated infiltration of lead from the surface due to precipitation is less than a quarter of an inch in 100 years (0.4 centimeter [cm]) and infiltration to a depth of 3 feet would require 25,000 years. In other words, USEPA's own numbers show that its "top down" infiltration model is baseless and physically impossible. Instead, lead in groundwater is attributable to historic fill already present below the water table.[9]

Within the zone beneath the water table, which has more reducing conditions, lead can be somewhat more mobile (though still relatively immobile compared to many metals, such as iron). All except one of the groundwater samples with lead concentrations greater than 25 µg/L was collected from groundwater with reducing conditions, as indicated by negative oxidizing-reducing potential (ORP) measurements. Only one sample collected from Well MW-107 had an elevated lead concentration under oxidizing conditions, and this was likely due to the lower pH (5.94) of this sample compared to the other measurements taken at this well. Other important factors that influence lead mobility include more acidic pH levels and the presence of binding ligands, like organic matter, that work to keep dissolved lead in solution rather than resorbing. These observations suggest that changes in groundwater chemistry play a more significant role in mobilizing lead in groundwater at the Site than desorption from the adjacent soil/fill alone.

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[8] USEPA did not describe the source of, or the calculations used to derive, this wide range of lead K_d values, but a K_d value of 100,000 L/kg does not appear to be technically defensible or appropriate for this Site.

[9] Both USEPA and NJDEP use USEPA's K_d of 900 L/kg to represent lead's mobility in typical soils. Using this K_d, estimated infiltration of lead from the surface due to precipitation is less than an inch in 100 years (2.1 cm) and that infiltration to a depth of 3 feet would require 4,500 years.

c. Temporal variability

USEPA has also focused on the maximum groundwater lead concentrations in its review of the Site groundwater data and has ignored the significant temporal variability that is present in the dataset. USEPA has gone so far as to suggest that there are insufficient data to even evaluate the variability of detected lead concentrations at the Site over time. If elevated lead concentrations in groundwater were caused by elevated soil/fill lead concentrations alone, then lead concentrations in groundwater at the Site should reflect the concentrations in the soil/fill through which it travels. At the Site, soil/fill lead concentrations are stable, and yet, the groundwater lead concentrations measured in many wells have been remarkably variable over time (Figure 8). One reason for this variability may be that the mobility of lead is very sensitive to changes in pH, and significant changes in groundwater pH have been observed across the Site and over time (Figure 9). However, USEPA has willfully ignored the available groundwater data that can be used to evaluate the dominant factors that may contribute to lead mobility at the Site and has failed to incorporate it into its CSM or remedy selection.

Figures 10 through 14 show five example monitoring wells (MW-105, MW-106, MW-107, MW-108, and MW-110),[10] which were chosen to demonstrate some of the possible factors that have driven the highest lead concentrations in groundwater at the Site. These wells are all located in the southern portion of the Site, and lead has been detected in all of them at >25 µg/L at least once. Groundwater in these wells has reducing conditions (indicated by negative ORP measurements) and near-neutral pH (ranging from 5.9 to 7.1).

Long-term monitoring is necessary to better understand the lead mobility in the aquifer at the Site, but several broad observations can be made based on the analysis shown on Figures 10 through 14. Across the five monitoring wells, the highest groundwater lead concentrations were most often measured during the third sampling period, which took place in February 2019 (Figures 10 to 14). In some of these wells, the highest groundwater lead concentrations were measured during the second sampling period, which took place in June 2018, but the concentrations measured during the third sampling period were similarly elevated (Figures 10 to 14). In many wells, the sample with the highest lead concentration also had the lowest measured pH and specific conductivity. In both MW-105 and MW-107, significant decreases in groundwater pH from 6.8 to below 6 over time resulted in increasing groundwater lead concentrations (up to maximum concentrations above 40 µg/L), while pH changes in the other three wells were more subtle. Most of these wells experienced an over 50 millivolt decrease in ORP and an increase in specific conductivity between March 2018 and June 2018, with a rebound closer to the March 2018 measurement in February 2019. Concentrations of aluminum, which, like lead, is found in only one oxidation state and is barely mobile at near-neutral pH, were low in all five wells, and generally followed a similar trend as the lead concentrations. In contrast, iron concentrations were very high in all the wells, reflecting its higher mobility at neutral pH. The similar trends in field parameters and the correlation between aluminum and lead concentrations in these wells suggests that broader changes in groundwater geochemistry across the Site are likely influencing lead mobility within the historic fill. However, typical groundwater lead concentrations across the Site have been moderate (and within the expected range estimated using the soil/fill PRG and NJDEP's approach to calculating resulting groundwater concentrations from soil; see Table 4), even in wells with occasional elevated concentrations.

The highest observed groundwater lead concentration at the Site is 109 µg/L at MW-108, which was measured in February 2019 and corresponded to a groundwater aluminum concentration of nearly

[10] The only other wells in which lead has been detected at higher than 25 µg/L were MW-118 and MW-120, located in the northern portion of the Site.

2,000 µg/L, a level 32-fold greater than the previous aluminum measurements in this well (Figure 13). Other metal concentrations were also anomalously high in this sample, and the turbidity was moderate (20 nephelometric turbidity units [NTU]), suggesting that metals concentrations in this sample may be biased high due to fine particles in the sample and are not a true reflection of the groundwater quality at this well at that time.

In summary, measured groundwater lead concentrations at the Site have varied over time, far more than can be attributed to analytical method or seasonal variability. This strongly suggests that lead mobility is being influenced by other currently undefined factors that USEPA's CSM does not attempt to address. Potential factors that can alter adsorption dynamics and influence lead mobility that should be considered include pH, redox, salinity, or the presence of organic matter (including organic contamination). Instead of considering these factors or the cause of variable groundwater lead concentrations observed at the Site, USEPA has stated that there are insufficient data to conduct such an analysis. And yet, confusingly, USEPA is confident enough in its understanding of the lead mobility at this Site to select Groundwater Alternative 4 as its preferred remedy.

In contrast, PPG evaluated the factors that may be contributing to short-term increases in lead mobility in the monitoring wells with the highest concentrations. Both low (<5 µg/L) and moderate (5-25 µg/L) lead concentrations were detected in wells throughout the Site in at least one sampling period, which suggests that a spatially consistent source of lead is present at the Site, such as would be found in historic fill, and that elevated groundwater lead concentrations are the result of short-term, localized mobilization of lead from historic fill materials in response to groundwater changes. No one factor has been identified that sufficiently describes the observed temporal variability, including changes in groundwater pH, reducing-oxidizing conditions or the presence of other contaminants. Unlike USEPA's CSM, the correct Site CSM accurately describes the current Site conditions – widespread occurrence of moderate lead concentrations, temporal variability of lead concentrations, and the mismatches between soil/fill and groundwater lead concentrations – and suggests that elevated groundwater lead concentrations are localized (and temporally limited) occurrences due to historic fill that will not readily respond to a P&T remedy.

d. Temporary exceedances observed during prior investigations of organic contamination

USEPA's CSM is further contradicted by the available groundwater lead concentration data from several of the ISRA cases on Site as well as the recent remedial action on Lot 57, which is being conducted under NJDEP's jurisdiction. In each of these cases, elevated (greater than 150 µg/L) groundwater lead concentrations have been identified at a discrete point in time and later sampling has measured concentrations near or below the groundwater PRG (and below background, as discussed below). These observations demonstrate that elevated groundwater lead concentrations are transient and are not, in fact, driven by historic releases of lead to surface soils migrating into the subsurface and then groundwater. USEPA failed to account for this data, which indicates a P&T remedy for lead in groundwater is not appropriate, in its CSM and remedy selection.

Further details on past groundwater exceedances for each lot are given below in Table 3 and on Figure 15.

- The ISRA case for Lot 60 was opened in 2008 and the related investigations focused on two areas: aboveground storage tanks (AOC-A) and historic fill (AOC-E). The monitoring well assigned as E-8 in the RI (MW-1 in the ISRA case) was located near an aboveground storage tank area and had a groundwater lead concentration of 330 µg/L and several groundwater VOCs detections. Nearby soil samples had elevated concentrations of TCE, PCE and benzene. In groundwater sampling in 2012 VOCs were non-detect, and organic soil contamination appeared to be resolved

by 2017 (First Environment, 2017 Figure 3). In recent (2018-2019) groundwater sampling, lead concentrations in this well dropped below groundwater PRGs, ranging from non-detect (< 1) to 0.55 µg/L, and VOCs were detected at low levels. These observations do not support a CSM based on surface lead releases causing elevated groundwater lead concentrations that require active remediation for lead in groundwater. Instead, the data show significant declines in lead concentrations over time, and suggest that that the past elevated lead concentration in groundwater at this well may have been linked to the organic contamination impacts on historic fill.[11]

- An ISRA investigation on Lot 62 focused on two areas: historic fill (AEC-G) and groundwater (AEC-I). Groundwater lead concentrations were reported to be 197 µg/L in MW E-3 and 392 µg/L in MW E-4 as part of the AEC-I investigation in 2008. Several organic compounds were also reported above their respective Groundwater Quality Standard (GWQS) during this sampling event, including benzene and VOC tentatively identified compounds (TICs). The area was subject to further remedial investigation, which was completed by 2012. The recent maximum groundwater lead concentrations were only 2.1 and 7.4 µg/L, at E-3 and E-4, respectively. The significant decrease in lead groundwater concentrations is not consistent with USEPA's "top down" CSM. Instead, the results show significant declines in lead concentrations over time. The data also suggests that the organic contamination present in the groundwater may have contributed to the transient, elevated groundwater lead concentrations driven by historic fill, as lead concentrations are dramatically lower now that the organic groundwater contamination has been resolved. NJDEP approved a historic fill classification exception area (CEA) (CEA ID G0000004354) in 2015 for Lots 62, 66, and 67.

- Groundwater lead concentrations have dramatically dropped at MW-118 from 568 to 26 to 13.8 µg/L (in March 2018, June 2018 and February 2019, respectively). Recent sampling from August 2020 reported that current groundwater lead concentrations are non-detect at 1 µg/L. The change in groundwater lead concentrations represents a 500-fold decrease over 2.5 years, during which time no soil/fill remediation for lead has occurred. This indicates that surface soil/fill lead concentrations are not driving groundwater lead concentrations. Further, the decrease in lead concentrations to non-detect occurred as the Lot 57 property owner/operator addressed known acetone and ethyl acetate contamination in the groundwater. The maximum acetone groundwater concentration was 71,000 µg/L in March 2018. Sampling in August 2020 reported no VOCs present above NJDEP GWQS (acetone was reported at 1,600 µg/L, see Appendix B and Appendix C). That the decreases in lead concentrations occurred in parallel with reductions in organic groundwater contamination suggests that this organic groundwater contamination contributed to lead mobilization from historic fill into the groundwater and the resulting elevated groundwater concentrations.

These four monitoring wells contradict USEPA's CSM that elevated groundwater lead concentrations are driven by elevated lead concentrations in surface soil/fill. Instead, these wells show transient elevated groundwater lead detections that have materially decreased over time. The fact that these decreases occurred in parallel with reductions in similarly transient elevated groundwater organics detections suggests that nearby organic contamination in soils and groundwater may have contributed to elevated groundwater

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[11] NJDEP did not require further groundwater metal analyses during 2012 or 2017 sampling events, accepting the presence of historic fill. NJDEP approved a historic fill CEA in 2018 (CEA ID E20080157). Lead concentration listed in the CEA is 330 µg/L.

lead concentrations, and that the groundwater lead concentrations are significantly reduced after the organic contamination is largely resolved.

The transient groundwater lead concentrations seen in these wells demonstrate that surface soil/fill concentrations are not the dominant factor controlling groundwater concentrations. Instead, a spatially consistent source of lead is present in the subsurface on Site, as would be expected in historic fill, and changing groundwater conditions, including from organic contamination, can result in transient changes in groundwater lead concentrations. As described above, no one factor has been identified that explains groundwater lead concentrations across the site. Indeed, some wells with significant organic contamination do not have elevated groundwater lead concentrations. These inconsistencies further indicate that USEPA's CSM is overly simplistic, that further evaluation is required, and that the selection of a groundwater remedy must be deferred.

Table 3: Monitoring Wells with Significant Changes in Groundwater Lead Concentrations

Well (Prior)	Nearest Soil Boring[a]	Groundwater Lead Concentration (µg/L)		ISRA Investigation and Current Concentrations of Selected Organic Contaminants	Source/Status
		Prior (Collected)	Current (2018-2020)		
E-8 (MW-1) Lot 60	Located within 10 ft sidegradient from B-23, lead concentrations range from 243 to 350 mg/kg	330 (June 2012)	ND (<1) to 0.55	**ISRA** Exceedances of benzene, TCE and PCE were found in soil (and in a temporary well) in 2009, but not in 2017. VOC concentrations were ND in groundwater in 2012. **RI/FS (2018-2019):** PCE: 0.17 µg/L TCE: 5.8 µg/L VC: 0.083 µg/L VOC TIC: 130 µg/L	Final remediation document issued on June 8, 2018, with Institutional controls and engineering controls (capping) for historic fill (entire parcel). Historic fill CEA (CEA# E20080157) approved by NJDEP on August 9, 2019 during RI/FS.
E-3 (MW-3) Lot 62	Located within 15 ft downgradient from B-36; lead concentrations range from 157 to 182 mg/kg	197 (May 2008)	1.4 to 2.1	**ISRA (2008):** Benzene: 4.04 µg/L VOC TICs: 2,730 µg/L **RI/FS (2018-2019):** Benzene: 0.42 µg/L VOC TICs: 82 µg/L	Historic fill CEA (CEA# G000004354) approved by NJDEP on June 15, 2015.
E-4 (MW-4) Lot 62	Located within 20 ft side- or up-gradient from B-27; lead concentrations range from 213 to 421 mg/kg	392 (May 2008)	3.7 to 7.4	**ISRA (2008):** Benzene: ND VOC TICs: 1,670 µg/L **RI/FS (2018-2019):** Benzene: 0.04 µg/L VOC TICs: 80 µg/L	Same as E-3 (MW-3)
MW-118 Lot 57	Located within 4 ft of B-9, lead concentrations range from 243 to 350 mg/kg	None	568 decreasing to ND	**RI/FS (March 2018):** Acetone: 71,000 µg/L **LSRP (August 2020):** Acetone: 1,600 µg/L	Building #10 operations undergoing changes to address groundwater contamination by VOCs.

Notes:
Source: Woodard & Curran (2020).
(a) Soil/fill depth profiles for comparison to the groundwater data were selected based on their proximity to each monitoring well. Distances given are approximate.

2. USEPA's proposed alternative ignores expected impacts from soil/fill at cleanup PRG to groundwater

USEPA's CSM is predicated on lead impacts in groundwater being attributable to releases of lead due to operations on-Site, but USEPA and NJDEP methods for estimating groundwater concentrations from soil concentrations indicate that groundwater lead concentrations are consistent with the presence of historic fill at the Site. Moreover, the same analysis shows that historic fill in soil/fill with lead concentrations at the soil/fill PRG will contribute lead to groundwater at levels that will remain above USEPA's selected groundwater PRG.

USEPA selected the lead soil/fill concentration of 800 mg/kg as the soil/fill PRG for the Site; this value is widely used and established (including by USEPA) as a protective level for lead exposure in industrial (non-residential) contexts. USEPA has also selected the lead groundwater concentration of 5 µg/L to be the groundwater PRG for the Site, in line with the New Jersey Class IIA groundwater quality criterion for lead (NJDEP, 2019). However, using parameters identified by USEPA, NJDEP, and USEPA Region 2 for this Site, it is expected that lead soil/fill concentrations that meet the Site PRG (800 mg/kg) may result in groundwater concentrations higher than 5 µg/L, and potentially significantly higher than that. In other words, the background lead levels in historic fill present at the Site, even at USEPA's soil/fill PRG, will make it impossible to achieve USEPA's lead groundwater PRG.

Using the approaches that USEPA and NJDEP took for setting lead soil standards that are protective of groundwater (described in detail in Appendix D), one can estimate a lead groundwater concentration for a given lead soil/fill concentration. In summary, as presented in Table 4:

- Using USEPA's Regional Screening Level (RSL) approach, with no consideration of dilution or attenuation of lead concentrations in the aquifer, if the Site soils/fill meet the associated PRG for lead of 800 mg/kg, one can conservatively estimate that the Site's lead groundwater concentration could be 890 µg/L.[12]

- When calculated using NJDEP's approach that incorporates a dilution and attenuation factor (DAF) of 20 to account for the dilution or attenuation of lead concentrations in the groundwater aquifer, the Site's lead groundwater concentration would be 44.4 µg/L assuming that the Site soils/fill meet the soil/fill PRG for lead.[13] Using a Site-specific DAF of 5 (estimated from current, average conditions at the Site and incorporated into the calculation using NJDEP's approach), the groundwater lead concentration would be 178 µg/L.

- In discussions with PPG, USEPA Region 2 has presented a similar analysis as USEPA's RSL approach above (*i.e.*, with no DAF incorporated into the calculation of expected groundwater lead

[12] USEPA's approach, described in its "Regional Screening Level (RSL) User's Guide" (USEPA, 2020a) used in the associated RSL tables (USEPA, 2020b), for deriving its lead Soil Screening Level (SSL) assumes there is no dilution or attenuation of the lead concentration in the groundwater aquifer (i.e., uses a DAF of 1 in its calculation), although the RSL User's Guide does permit the use of a site-specific DAF to calculate a site-specific SSL.

[13] NJDEP has developed a modified approach for establishing its Impact-to-Groundwater Soil Remediation Standard (IGWSRS) that includes consideration of a default DAF of 20 and also permits the use of a site-specific DAF (NJDEP, 2013). Both agencies incorporate a lead soil-water partition coefficient (K_d, described further below) of 900 L/kg into their calculations.

concentrations based on soil concentrations), but has suggested a lead K_d value of 5,000 L/kg (log 3.7) for this Site.[14] USEPA used this approach to demonstrate that soil/fill concentrations at or below the soil/fill PRG would result in groundwater concentration above the PRG, with an estimated concentration of 160 µg/L at the soil/fill PRG (Table 4).[15]

Table 4: Estimates of Site Lead Groundwater Concentrations Calculated Using USEPA, NJDEP, and Region 2 Approaches

Approach	DAF	DAF Type	K_d (L/kg)	Groundwater Concentration at the Soil PRG (800 mg/kg) (µg/L)
USEPA	1[a]	Default	900	890
NJDEP	20	Default	900	44.4
	5	Site-specific	900	178
Region 2	1	Default	5,000	160

Notes:
DAF = Dilution and Attenuation Factor; K_d = Soil-Water Partition Coefficient; NJDEP = New Jersey Department of Environmental Prevention; Region 2 = USEPA Region 2; USEPA = United States Environmental Protection Agency.
Sources: NJDEP (2013); USEPA (2020a).
(a) USEPA uses a DAF of 1 in its Soil Screening Level (SSL) calculations. USEPA notes that a site-specific DAF may be calculated, and a DAF of 20 may be used specifically for source areas less than 0.5 acre in size (USEPA, 2020a). Because "historic fill" is present over the entire 7.6-acre Riverside site, the default DAF of 20 should not be used in the calculation of a Site-specific SSL.

At the Site, lead has been detected at levels above 40 µg/L in only 3 out of 31 shallow groundwater monitoring wells, and these detections each occurred only once (no well had two measurements over 40 µg/L). This suggests that the current lead groundwater concentrations observed at the Site fall well within the expected range of groundwater concentrations for a Site constructed on top of what NJDEP terms "historic fill materials" and does not support the conclusion that the observed groundwater lead concentrations are due to Site-related releases. Further, the lead groundwater concentrations estimated above, using USEPA's, NJDEP's, and USEPA Region 2's own methods, show that a lead soil/fill concentration at 800 mg/kg (a level that is widely established as being health protective for exposure by incidental ingestion of and direct contact with soil) and a lead groundwater PRG of 5 µg/L are incompatible because lead soil/fill concentrations of that level would be expected to result in much higher lead groundwater concentrations (*i.e.*, likely over 40 µg/L). At no point does USEPA's CSM incorporate or address this material issue, nor does USEPA attempt to address it in evaluating or selecting groundwater remedies. Groundwater sampling results as compared to lead concentrations of 5 µg/L, 25.3 µg/L, 44.4 µg/L

[14] USEPA Region 2 asserts that its Kd "calculation is intended to demonstrate that it is possible for lead in the aquifer solids to migrate to the groundwater". That is an incorrect description of the Kd, which does not describe migration or the ability to move from contaminated soils into clean soils. Kd describes how lead desorbs and is present in groundwater. Instead, the Kd can be used to estimate the retardation factor (R) and, at this Kd, the R would be 32,610, meaning that the movement of lead would be over 32,000-fold slower than water infiltration.

[15] USEPA Region 2 has suggested a range of K_d values from 5,000 to 100,000 L/kg (log 3.7 to log 5) for this Site. USEPA Region 2 has not described the technical basis for, or calculations supporting, the Site-wide application of this range of lead K_d values. Reported K_d values in the literature are available; values near to 5,000 L/kg are routinely observed, however, a K_d as high as 100,000 L/kg does not appear to be appropriate or defensible.

and 178 µg/L are shown on Figures 16A through 16E and demonstrate that groundwater lead concentrations do not require active remediation.

In fact, USEPA's efforts to defend its CSM demonstrate the critical flaws underlying its selection of Groundwater Alternative 4. USEPA has told PPG that the lead source in the soil/fill below the water table is controlled *via* adsorption and has presented a K_d value of 5,000 L/kg for the Site. As discussed further below, this value implies that lead is highly adsorbed to the soil/fill at this Site and that the transport of lead in the aquifer at the Site would be highly retarded (retardation factor [R] of greater than 30,000) – meaning a P&T remedy would be completely ineffective in addressing lead in groundwater. Despite this, USEPA Region 2 has selected P&T as the preferred remedy for the Site groundwater and has only acknowledged that this remedy would be "challenged" by current Site conditions. USEPA has refused to consider that this remedy is not practicable and completely at odds with its proposed CSM for the Site. Instead, the agency selected a remedy that, if its CSM is correct, will require centuries to millennia of pumping to reduce the quantity of lead in the soil/fill below the water table.

3. USEPA failed to consider other sources of lead in groundwater

Historic fill on-Site contributes metals, including lead, to groundwater. Metals attributable to historic fill are not the result of releases or operations at the Site, and therefore constitute background concentrations (USEPA, 2002). Even if USEPA had demonstrated a nexus between elevated lead in soils/fill and groundwater lead concentrations, groundwater lead concentrations in areas with soil/fill lead concentrations below the soil/fill lead PRG would constitute background.

Table 5 presents examples of monitoring wells where soil/fill concentrations are below lead soil PRG and lead groundwater concentrations are above the PRG (5 µg/L).

Table 5: Background Lead Levels in Groundwater

Monitoring Well	Maximum Lead Concentration (µg/L)	Nearest Remedial Investigation Soil/Fill Location	Soil/Fill Lead Concentration (mg/kg)[1]
MW-102	12.8	B-44, B-77	152 to 424
MW-103	18.7	B-51, B-53	159 to 803
MW-104	10.4	B-84	29.7 to 236
MW-117	17.7	B-10, B-105	31.2 to 211
MW-120	25.3	B-61, B-62	43.7 to 333
MW-122	7	B-102	174 to 264

[1] mg/kg – milligram per kilogram

The data show that historic fill in areas with soil/fill concentrations of lead lower than the soil/fill PRG is contributing lead to groundwater above the proposed lead PRG. Based in Table 5 above, the groundwater lead PRG should be at least 25 µg/L to account for groundwater contamination due to historic fill. Only 6 of the 31 shallow wells have lead in groundwater present above background in one sample (out of three sampling rounds), and only two of the wells have lead above background in two samples (excluding MW-118). These two wells (MW-105 and MW-107) are in spatially distinct portions of the Site, further indicating localized influences, and MW-105 is upgradient of Building #7. Therefore, the area supposedly impacted by Site operations is extremely limited (if it exists at all). Moreover, using USEPA's presented K_d value for the Site of 5,000 L/kg and NJDEP's average concentration of lead in historic fill (574 mg/kg), groundwater lead concentrations are estimated to be 115 µg/L, and NJDEP has established that concentrations as high as 10,700 mg/kg may be present in historic fill (Appendix A). Based on these values,

groundwater lead concentrations found at the Site are consistent with historic fill, not releases, and therefore are not actionable. USEPA's CSM, PRGs, and revisions to the FSR must take background into account.

In addition, USEPA's PRAP does not account for releases of lead-containing drinking water by USEPA in 2012. City of Newark water was released on Site in 2012 when USEPA ruptured an active water line while digging test pits around USTs on Lot 64, in the area USEPA has asserted to have been impacted by Site operations. In the City of Newark's 2012 Water Quality Report, the year of the release, the 90th percentile concentrations of lead are reported as 9.0 parts per billion (ppb) in the Pequannock System and 3.4 ppb in the North Jersey District Water Supply Commission (NJDWSC) system. Recent water quality reports for the City of Newark show lead present in city water at concentrations of 17.8 ppb to 47.9 ppb. [City of Newark Department of Water and Sewer Utilities, 2018 Water Quality Report at 6; City of Newark Department of Water and Sewer Utilities, 2017 Water Quality Report at 7.] USEPA therefore released lead-containing drinking water at the Site, though USEPA has not accounted for this release in the PRAP.

4. USEPA's CSM disregards Site data regarding detections of lead beneath impervious surfaces

USEPA's CSM does not account for elevated lead concentrations (above the PRG) in soil/fill samples collected from areas that were covered by impervious surfaces during the operational history of the Site through the present. USEPA has disregarded that an extensive impervious cover has existed in the areas USEPA has asserted have been impacted by lead releases, which directly conflicts with their CSM. Under USEPA's CSM, the greatest soil/fill lead concentrations would be found at the surface, reflecting purported releases, and subsurface lead concentrations reflect the top down infiltration of surface releases. However, the presence of impervious cover means that lead concentrations in soil/fill in this portion of the Site cannot be derived from top down infiltration and, instead, reflect a source of lead present at depth (*i.e.*, historic fill).

Based on an analysis of land cover at the Site (described in detail in Appendix E), the operational areas of the Site have been mostly covered in impervious surfaces at least as of 1924, if not earlier,[16] throughout to 1971 and into the current day. Impervious surfaces include, but are not limited to, buildings, concrete roads and walkways, asphalt roadways, gravel or stone parking areas, and compacted earthen material (*e.g.*, gravel) (USDA, 1986; NJDEP, 2018, 2020; VADCR, 1999; WSDOT, 2020; WCCA, 2011; VTDEC, 2015; Durham DPW, 2020; Falls Church DPW, 2014; HRC, 2016). Based on the land cover analysis, there have been two general eras of land cover during PPG operations of the Site. Figure 17 shows the composite of the extent of impervious cover that existed in operational areas of the Site from 1901 through 1924. Figure 18 shows the composite of the extent of impervious cover that existed in the operational areas of the Site from 1926 through 1971. As can be seen on these figures, many of the fill/soil samples with elevated lead concentrations collected from the operational areas of the site as part of the RI activities (Woodard & Curran, 2020) are located on areas of impervious materials, and nearly 100% of the operational areas are covered by impervious materials. Table 6 summarizes the soil/fill sampling locations located within the operational area subcategorized by the two general eras of land cover at the Site. As can be seen in Table 6, a majority of the soil/fill sample locations were collected from areas that had some kind of impervious cover throughout the operational history of the site.

[16] The operational areas of the Site are defined as the Courtyard area and associated access roads bounded generally by Buildings #1, #2, #6, #7, and #12, the area south of Buildings #12 and #7, and the entry area and associated access roads between Buildings #1, #2, and #10.

Table 6: Summary of Soil/Fill Sample Locations in General Composited Areas of Impervious Cover as Interpreted from Aerial Photographs, Historical Maps, and On-Site Surveys

Surface Soil/Fill Sample Locations (<2' BGS)	1901-1924	1926-1971
Total Number of Sample Locations in the Operational Areas	43	43
Number of Sample Locations Under Impervious Cover	29	40
Number of Sample Locations Under Impervious Cover with Lead Concentrations >800 mg/kg	8	13
Number of Sample Locations Under Pervious Cover with Lead Concentrations >800 mg/kg	7	2

Subsurface Soil/Fill Sample Locations (≥2' BGS)	1901-1924	1926-1971
Total Number of Sample Locations in the Operational Areas	30	30
Number of Sample Locations Under Impervious Cover	22	30
Number of Sample Locations Under Impervious Cover with Lead Concentrations >800 mg/kg	7	8
Number of Sample Locations Under Pervious Cover with Lead Concentrations >800 mg/kg	1	0

In addition, representative soil/fill samples from the area around Building #7 – the area USEPA asserts was impacted by operations – are provided in Appendix E. These soil/fill samples were taken in areas covered by impervious materials, meaning that any elevated soil/fill sampling results could not be the result of releases since impervious cover would prevent releases from reaching surface soil/fill. Boring B-31, for instance, was taken from beneath the 1 foot thick concrete slab of Building #7, with soil/fill lead concentrations of 3,880 mg/kg in surface soil/fill and 3,980 in subsurface soil/fill. Because the concrete slab prevents releases to soil/fill, the lead concentrations must be attributable to underlying historic fill.

In summary, since releases onto impervious cover would not reach surface soil/fill, and because impervious cover inhibits infiltration of water (*e.g.*, precipitation, stormwater) into soils and groundwater, soil/fill could not have been impacted by releases during the operational history of the Site. That samples beneath impervious surfaces have soil/fill concentrations of lead exceeding the PRG of 800 mg/kg (Woodard & Curran, 2020) is consistent with the presence of historic fill at the Site.

5. USEPA's CSM conflicts with NJDEP determinations of historic fill impacts on groundwater

USEPA's CSM disregards historic fill as the dominant source of lead impacts in groundwater, yet NJDEP has consistently recognized the impact of historic fill on groundwater. NJDEP has approved groundwater CEAs for historic fill for nine lots as follows:

Lot	NJDEP Program Interest Number	CEA ID	NJDEP Approval Date[a]
1	563216	E20110199	August 9, 2019
60	467682	E20080157	May 2, 2018
61	G000005586	E88434	November 30, 2019
62	G000004354	G000004354	June 23, 2015
63	G000005586	E88434	November 30, 2019
66	G000004354	G000004354	June 23, 2015
67	G000004354 & G000005586	G000004354 & E88434	June 23, 2015 & November 30, 2019
68	G000005586	E88434	November 30, 2019
70	G000026933	E200000550	June 15, 2018

* a. per NJDEP's Data Miner as of October 12, 2020.

NJDEP's approval of CEAs for historic fill indicates that NJDEP determined that the source of metals in groundwater, including lead, was historic fill and not a site release. Notably, NJDEP approved certain of these CEAs during the RI, including while NJDEP and USEPA were reviewing the RIR – approvals that occurred while USEPA had jurisdiction over these lots under CERCLA Section 122(e)(6). In conjunction with historic fill CEAs, NJDEP has approved institutional controls (deed notice) and engineering controls reflecting the presence of historic fill on Lots 1, 60, 61, 63, 66, 67, 68, and 70. Capping was the approved engineering controls at these lots. The remaining lots at the Site have not completed the ISRA process, thus historic fill on these parcels has not been addressed yet.

In summary, NJDEP has consistently recognized the presence of historic fill and its impact on groundwater and soil. USEPA's CSM disregards this and instead proposes a new source of metals impacts to groundwater inconsistent with Site data.

D. USEPA Has Not Shown Groundwater Alternative 4 Is Feasible at the Site

1. USEPA admits its preferred remedy will not achieve groundwater PRG

Pursuant to the NCP, USEPA must assess the cost-effectiveness, technical feasibility, and administrative feasibility for each remedy alternative. [40 CFR § 300.430(e)(9); 40 CFR § 300.430(f)(1)(ii)(C)(3).] USEPA has not shown that Groundwater Alternative 4 is appropriate for the Site or that it meets these requirements. Indeed, USEPA has not yet developed key components of the Groundwater Alternative 4, including the number of extraction wells, pumping rate, treatment processes, and extent of groundwater to be treated by on-Site applications. [FSR at 5-11.] Without having assessed these various components, USEPA cannot accurately gauge the cost of the alternative, or its technical or administrative feasibility.

Moreover, the FSR itself, which USEPA unilaterally modified, recognizes the technical infeasibility of this remedy. The FSR provides that, while the P&T system and in-situ treatment included in Groundwater Alternative 4 may eventually reduce lead concentrations in the groundwater over time, the timeframe for such a reduction is potentially "indefinite." [FSR at 6-17.] Further, the FSR notes that Groundwater Alternative 4 may not meet the groundwater PRG due to the "on-going dissolution of residual COC in the soil/fill to groundwater." [FSR at 5-11; FSR at 6-17 ("[t]he timeframe for achieving compliance with these ARARs has not been estimated at this time . . . on-going dissolution of residual COC in the soil/fill will be a continual source to groundwater that will need to be treated").] In other words, the remedy would not achieve the lead PRG, with residual soil/fill COCs from historic fill constantly undoing any progress made through the remedy itself.

2. 1D modeling of USEPA's proposed groundwater alternative shows it is likely ineffective or impracticable

USEPA has ignored Site data showing that Groundwater Alternative 4's proposal for reducing lead concentrations in groundwater is not practicable or implementable. Though USEPA's PRAP at least acknowledged that attempting to use a P&T system to reduce groundwater lead concentrations at the Site would be "challenged" by the elevated lead concentrations in the historic fill material present across the Site, simple modeling shows that USEPA's proposed remedy is in fact impracticable. [PRAP at 19; FSR at 5-11.]

The feasibility of this alternative was evaluated using a simplified 1D modeling approach, which quantified the potential for achieving the groundwater PRG for lead using a P&T system with groundwater-protective estimates of lead adsorption (the USEPA-recommended K_d for lead of 900 L/kg), meaning that higher desorption was estimated than is likely to occur, thus overestimating the efficiency of the P&T system. Even with this best-case estimate, the retardation factor (R, which, as described in Appendix F, approximates how much adsorption slows the transport of lead relative to groundwater flow) calculated as part of the modeling indicates that lead will travel through groundwater approximately 5,870-fold slower than the groundwater flow at the Site. Thus, the aquifer at the Site needs to the flushed with clean water nearly 6,000 times in order to reduce the groundwater lead concentrations below the groundwater PRG. If the higher K_d of 5,000 L/kg is used to calculate R, which USEPA Region 2 has suggested may be appropriate for this Site, the retardation is estimated to be even greater (R of nearly 33,000), and the remedy would take even longer to produce the desired results under this scenario. This modeling analysis calculated that it would take centuries to millennia to reduce groundwater lead concentrations at the Site to below the groundwater PRG using best-case assumptions about pumping conditions and the size of the lead source in the aquifer at the Site.

The 1D modeling approach used for this calculation relied on the following assumptions, as further detailed in Appendix F:

- The model assumes that lead mobility is governed by adsorption and saturated soil/fill concentrations alone, and that other factors that may influence lead concentrations in groundwater will remain unchanged.

- The remedy was evaluated at two observation points at 5 feet (1.5 meters [m]) and 10 feet (3 m) downgradient of the start of the "source" area, which had a starting groundwater lead concentration of 55 µg/L and is located 50 feet from the P&T extraction well. Initial groundwater lead concentrations were conservatively assumed to decrease linearly toward the P&T well, even though there is no evidence of plume-like concentration gradients of lead at the Site. Thus, Observation Point 1 was assumed to have a starting groundwater lead concentration of 50 µg/L, and Observation Point 2 was assumed to have a starting groundwater lead concentration of 44 µg/L.

- Groundwater flowing into the areas undergoing remediation was assumed to have a lead concentration of 5 µg/L.

- The base P&T scenario was designed to replicate a single well extracting water at a rate of 6.5 gallons per minute (gpm) based on the scenario presented in the Pumping Rates Assessment attached as Appendix G. The horizontal velocity at the source area was estimated to be 5.0 feet per day (ft/day) (1.5 meters per day [m/day]) from the pumping and natural groundwater flow

combined, thus representing an approximate doubling of the natural groundwater flow velocity (calculated to be 2.1 ft/day from Site-specific parameters).

- Two further scenarios were also modeled: one in which no P&T system is used and groundwater flow is based on the natural velocity alone (2.1 ft/day) and one in which the modeled groundwater velocity is 1.5 times the natural groundwater flow velocity (3.2 ft/day), which approximates a lower pumping rate of ~2.5 gpm.

Groundwater lead concentrations at the two observation points over time using the USEPA-recommended K_d of 900 L/kg are shown on Figure 19. After 30 years of constant pumping, the benefit of operating this system is marginal compared to the natural flushing of the aquifer that occurs over time (which is modeled in the "no pumping" scenario). This model estimated that groundwater lead concentrations at the Observation Point 1 after 30 years of pumping would only be reduced from 50 µg/L to 17.1 µg/L using a base P&T system and from 50 µg/L to 22.6 µg/L using a lower pumping rate. For comparison, the estimated concentration after 30 years under the no pumping scenario is 27 µg/L, which demonstrates the reduction in groundwater lead concentrations that would occur due only to the natural flow of the aquifer (Table 7). In other words, after 30 years of continuous operation at a cost of millions of dollars, USEPA's preferred alternative would not meet the PRG and would only reduce groundwater lead concentrations by 5 to 10 µg/L more than natural flushing processes alone.

The P&T remedy was shown to be even less effective at Observation Point 2 as higher lead groundwater is drawn through this location. Using the base P&T system parameters, the initial concentration of 44 µg/L at Observation Point 2 is only reduced to 22.7 µg/L after 30 years of pumping at the base rate and to 28.7 µg/L after pumping at the lower rate. In the no pumping scenario, lead concentrations were reduced to 33.8 µg/L after 30 years.

Table 7: 1D Modeling Results After 30 Years Using a K_d of 900 L/kg

Scenario	Observation Point 1: Initial Lead Concentration = 50 µg/L	Observation Point 2: Initial Lead Concentration = 44 µg/L
No Pumping	27.0	33.8
Lower Pumping Rate: ~2.5 gpm	22.6	28.7
Base Pumping Rate: 6.5 gpm	17.7	22.7

Note:
gpm = Gallons Per Minute; K_d = Soil-Water Partition Coefficient.

In contrast to the USEPA-recommended K_d for lead, USEPA Region 2 has suggested that a lead K_d of 5,000 L/kg (log 3.7) may be appropriate to use for this Site. Using a K_d of 5,000 L/kg results in an R of 32,610 and will thus result in a significantly slower rate of reduction for lead levels in the aquifer under every modeled scenario (Figure 20). After 30 years of continuous pumping at the base rate, the groundwater lead concentration is estimated to be only 8.2 and 2.9 µg/L lower than concentration following 30 years of the natural flushing of the aquifer (*i.e.*, under the no pumping scenario) at Observation Points 1 and 2, respectively (Table 8). After 30 years of pumping at the lower rate, the groundwater concentration is estimated to be only 3.5 µg/L and 0.7 µg/L lower than concentrations under the no pumping scenario at Observation Points 1 and 2, respectively (Table 8).

Table 8: 1D Modeling Results After 30 Years Using a K_d of 5,000 L/kg

Scenario	Observation Point 1: Initial Lead Concentration = 50 µg/L	Observation Point 2: Initial Lead Concentration = 44 µg/L
No Pumping	44.6	45.0[a]
Lower Pumping Rate: ~2.5 gpm	41.1	44.3
Base Pumping Rate: 6.5 gpm	36.4	42.1

Notes:
gpm = Gallons Per Minute; K_d = Soil-Water Partition Coefficient.
(a) The lead concentration at Observation Point 2 increases slightly from the initial concentration under the no pumping scenario using a higher K_d, due to the flow of groundwater from the source area, which has a higher initial lead concentration, to this point.

To provide additional context, the following analysis demonstrates the expected timeframe to achieve USEPA's PRGs. The base P&T scenario assumed that pumping at 6.5 gpm is able to more than double the natural groundwater velocity and the model predicted that the groundwater PRG for lead could be achieved at Observation Point 1 in approximately 124 years (Table 9). Under the lower pumping rate scenario (and a resulting groundwater velocity that is 1.5 times the natural rate), the model predicted that the time required to reach the groundwater PRG for lead would be 195 years. As described above, the model predicted that the P&T remedy would be less effective at Observation Point 2, at which the time required to reach the groundwater PRG for lead under the base pumping and lower pumping rate scenarios is predicted to be 146 and 230 years, respectively. The no pumping scenario predicts that the natural flushing process of the aquifer would need 300 years to reduce groundwater lead concentrations below the groundwater PRG.

Table 9: 1D Modeling Results: Time to Reach PRG Using a K_d of 900 L/kg

Scenario	Velocity (ft/day)	Observation Point 1: Initial Lead Concentration = 50 µg/L (years)	Observation Point 2: Initial Lead Concentration = 44 µg/L (years)
No Pumping	2.1	292	344
Lower Pumping Rate: ~2.5 gpm	3.2	195	230
Base Pumping Rate: 6.5 gpm	5.0	124	146

Note:
gpm = Gallons Per Minute; K_d = Soil-Water Partition Coefficient.

Using the lower end of the range of USEPA Region 2-recommended K_d values for the Site (5,000 L/kg, resulting in an R of 32,610), the model predicted significantly longer times to achieve the groundwater PRG for lead at both observation points (many centuries to over a millennium). Under the base P&T scenario, the model predicted that the groundwater PRG for lead could be achieved at Observation Points 1 and 2 in approximately 684 and 808 years, respectively (Table 10). Under the lower pumping rate scenario, the model predicted that the time required to reach the groundwater PRG for lead would be over 1,000 years at either observation point. The no pumping scenario modeled using the higher K_d predicts that the natural flushing process of the aquifer would need nearly 2,000 years to reduce groundwater lead concentrations below the groundwater PRG.

Table 10: 1D Modeling Results: Time to Reach PRG Using a K_d of 5,000 L/kg

Scenario	Velocity (ft/day)	Observation Point 1: Initial Concentration = 50 µg/L (years)	Observation Point 2: Initial Concentration = 44 µg/L (years)
No Pumping	2.1	1,618	1,910
Lower Pumping Rate: ~2.5 gpm	3.2	1,080	1,274
Base Pumping Rate: 6.5 gpm	5.0	684	808

Note:
gpm = Gallons Per Minute.

This simplified 1D modeling demonstrates that USEPA Region 2's CSM for the Site (that there is widespread lead in saturated soil/fill that results in elevated groundwater lead concentrations due to adsorption dynamics), coupled with a remedy that includes a P&T system, is not only "challenged" by the conditions at the Site, but simply cannot reduce Site groundwater lead concentrations to the PRG or below even when best-case assumptions are used.[17] Groundwater Alternative 4 is not practicable by any definition of the term.

3. USEPA did not account for material issues with locating proposed groundwater wells by the river

One of the main problems with the location of the proposed groundwater wells is the high likelihood of extracting significant amounts of river water from the wells as opposed to groundwater as intended. Indeed, the current locations of proposed shoreline pumping wells coincide with a shallow unit that displays tidal influence in measured responses of groundwater elevations and/or temperatures and salinities (including near MW-118, which displayed a near-match with the timing and magnitude of water-level change observed in the river gauge). The limited saturated thickness of the shallow unit (roughly 4 to 10 feet, average about 6 feet) makes it particularly challenging to design a system that will pump enough water for capturing Site groundwater without either dewatering the shallow soils/fill or drawing excessive water from the river itself. The direction of flow (to the river or from the river) also varies significantly with the tidal cycle and along the shoreline, creating further difficulties in designing the system to bias operations to low tide or low groundwater levels, as these two don't necessarily coincide.

While USEPA has neglected to quantify the exact proportion of the river contribution to water to be extracted, it is expected to be significant. Hydrographs suggest tidal influence on the relative elevation of river water and groundwater at multiple monitoring well locations. At high tide, river water elevation exceeds groundwater; at low tide, river water elevation is lower than groundwater. This dynamic fluctuation in inferred flow direction, coupled with the pumping wells being proposed near the shoreline, may result in varying quantities of river water entering the treatment system. This fluctuation in influent water quality will likely lead to treatment system upsets. Indeed, the presence of river water stands to create additional work that

[17] To the extent USEPA seeks to justify its remedy selection on the basis of achieving groundwater (remedial action objectives (RAOs), that justification is unfounded. The relevant groundwater RAO is to "Minimize contaminant concentrations and restore groundwater quality." [FSR at 3-9.] This RAO does not require achieving Class IIA drinking water standards given the presence of historic fill at the Site and elevated levels of naturally occurring contaminants in groundwater. Restoration in the context of the Site constitutes restoring groundwater to levels of contaminants present in the absence of any releases actionable under CERCLA. A P&T system (which has been shown to be ineffective) is not appropriate or necessary to accomplish this objective.

has little relation to the improvement of groundwater quality. For example, because the treatment system will invariably receive river water, the system design will have to account for the variations of river water quality and temperature compared with groundwater. Not only will the influent temperature change between river water and groundwater (as noted in the RI) and naturally promote system fouling along with high groundwater constituents such as iron and manganese, but the brackish nature of river water (which contains chloride and dissolved solids) will also add significant capital costs and long-term operation and maintenance (O&M) to USEPA's preferred alternative's cost without improving Site groundwater quality.

In short, USEPA's failure to account for the issues associated with the location of the proposed groundwater wells by the river stands to create significant problems with the treatment system, increasing both the work that will need to be done, and the costs associated with it.

4. Other groundwater conditions make remediation of Site groundwater to Class IIA standards impracticable

Site groundwater is designated by the state of New Jersey as Class IIA, indicating it is potable or potentially potable. In reality, Site data indicate that groundwater underneath the Site cannot be used for potable purposes. The FSR provides that "Groundwater is not currently used as a source of potable water, and future groundwater use at the Site is unlikely because Site-specific conductivity readings of the shallow groundwater indicate brackish conditions due to tidal influence of the adjacent Passaic River." [FSR at 2-31.][18] Levels of naturally occurring constituents in groundwater at the Site likewise are at levels well above New Jersey's groundwater standards, particularly iron, manganese and sodium. [FSR at 3-20; RIR Table 2-15C.] Regardless of whatever remedy is implemented under CERCLA, these naturally occurring constituents will remain in place, preventing use of groundwater underneath the Site regardless of its classification. The application of Class IIA groundwater quality standards for lead as the Site PRG is therefore inappropriate.

5. The presence of groundwater classification exception areas eliminates the need for Site groundwater to meet Class IIA standards

The presence of groundwater CEAs at nine lots at the Site is an additional factor indicating that Site groundwater will not be used for potable surfaces. [FSR Figure 2-2.] These CEAs, previously authorized by NJDEP under its Site remediation program for individual lots at the Site, serve as institutional controls that prevent potable use of affected groundwater.

These CEAs also provide a statutory rationale for why achievement of Class IIA standards is unnecessary at the Site. Under the NCP, remediation need not achieve an ARAR where that ARAR is based on State requirements and those State requirements are applied inconsistently. [40 CFR § 300.430(f)(1)(ii)(C)(5).] USEPA had selected its groundwater PRG for lead on the basis of New Jersey groundwater standards; however, review of multiple lots at the Site indicates that New Jersey did not require remediation under identical circumstances as those here. Instead of requiring groundwater remediation, NJDEP permitted responsible parties to apply CEAs for historic fill constituents, including lead, at nine lots at the Site. [RIR Figure 1-4; FSR Section 1.4.] Given the inconsistent application of groundwater standards at the Site, in combination with all the other factors showing USEPA's preferred alternative is impracticable, USEPA should not require compliance with a 5 µg/L lead PRG at this Site.

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[18] In addition to brackish conditions, surface water samples taken up- and down-river from the Site show lead concentrations of up to 42.4 µg/L (RM 8.4) and 33.4 µg/L (RM 6.4-6.7) reflecting widespread, known lead contamination in the river from non-Site sources.

6. USEPA cannot justify applying a drinking water PRG to a remedy designed to prevent off-Site migration

It is clear that USEPA's preferred groundwater alternative cannot achieve USEPA's groundwater PRG. The only other rationale that USEPA provides for its preferred alternative is that it would "provide hydraulic containment at the river's edge to capture groundwater COCs at concentrations exceeding ARARs." [PRAP at 19.] This rationale reflects USEPA's arbitrary and capricious decision-making with respect to the groundwater remedy at the Site because the PRG selected has no relation to USEPA's objective for the hydraulic containment. The 5 µg/L lead PRG USEPA has selected is driven by *drinking water* standards, as are other groundwater PRGs. USEPA provides no scientific or technical basis for why groundwater potentially migrating off-Site to *surface water* would need to meet drinking water standards. Moreover, at no point did the RI/FS establish concentrations of contaminants present in groundwater potentially migrating to off-Site surface water, or that such concentrations would be the result of anything other than historic fill at the Site. And even if some contaminants at the Site were potentially related to releases, the removal/capping of potential sources of these contaminants (NAPL removal, UST removal, soil/fill capping and excavation) would eliminate the possibility of off-Site migration of these contaminants via groundwater.

In summary, USEPA has selected a $24 million remedy to pump groundwater indefinitely to achieve a cleanup standard with no relation to the remedial objective USEPA is seeking to achieve. Such a remedy selection is the definition of arbitrary.

E. The Detections of VOCs/Semivolatile Organic Compounds (SVOCs) at the Site do not Justify USEPA's Proposed Groundwater Remedy

1. VOC/SVOC sampling results do not support a P&T remedy

While USEPA has been primarily focused on lead, deferring remedy selection would also allow for a remedy more appropriate for VOCs and SVOCs. USEPA is currently proposing a $24 million groundwater remedy based on three shallow groundwater sampling events and a single deep groundwater sampling event. With respect to shallow groundwater, USEPA's remedy decision in effect relies on even less data, since USEPA has focused on the maximum detection from each groundwater well. When all groundwater data are considered, however, VOC and SVOC detections in groundwater across the Site are sporadic and at low levels across sampling events. In fact, in the most recent groundwater sampling event, many groundwater wells had contaminant detections below Site PRGs. This is likely the result of some combination of: (1) USEPA twice removing recently illegally dumped surface debris, (2) a property owner (City of Newark) allowing establishment of measures reducing additional illegal surface dumping, (3) Newark's police enforcement actions resulting in the discontinuation of automotive dismantling activities on Site, and (4) natural degradation. When PPG brought these issues to USEPA's attention, however, USEPA dismissed the groundwater data as insufficient to support changes to USEPA's evaluation of remedial alternatives. Yet USEPA seeks to implement a $24 million groundwater remedy based on this same data. USEPA cannot pick and choose what Site data to consider. Such an action is arbitrary and capricious.

The Site data that USEPA failed to evaluate shows that USEPA's selected remedy is not appropriate for the Site. Representative examples demonstrating why active remedial action for groundwater is not warranted at this time are presented below:

a. 1,1,2-Trichloroethane

As shown on FS Figure 3-15, 1,1,2-trichloroethane (TCA) concentrations vary during the RI with most concentrations below the PRG as noted below. Based on the 1,1,2-TCA results, the selected groundwater alternative is not warranted.

- MW-108 (Lot 63). The most recent sample was non-detect for 1,1,2-TCA. The average RI result was below the PRG (3 µg/L) at this location. Because the average is below the PRG and the last detection was below the PRG, no active remedial action is necessary.

- E-4 (Lot 62). The average 1,1,2-TCA result at this well is below the PRG. No active remediation is warranted.

- MW-114 (Lot 58). The average 1,1,2-TCA result at this well is below the PRG, therefore, no active remediation is warranted.

- MW-124 (Lot 58). Only one sample was collected at this location, and its concentration was above the PRG. As demonstrated at other site wells, VOC concentrations vary and one result slightly over a PRG is not sufficient for selecting a groundwater remedy. At most, additional monitoring would be needed to determine if remediation is warranted at MW-124 for 1,1,2-TCA.

b. Acetone

As shown on FS Figure 3-17, acetone concentrations vary during the RI with most results below the PRG as noted below. As summarized below, only two monitoring wells had acetone concentrations above the PRG. Based on the results and these variations, the selected groundwater alternative is not warranted.

- MW-122 (Lot 69). The last two RI samples were non-detect for acetone. Two consecutive results below the PRG show that active remedial action is not warranted.

- MW-118 (Lot 57). Groundwater at this monitoring well is being addressed under ISRA Case #20-04-09-0923-04. As reported to the USEPA, an August 2020 sample collected under this case contained acetone below the PRG. The Licensed Site Remediation Professional (LSRP) has determined that actions undertaken by the Lot 57 owner have resulted in MW-118 being in compliance with New Jersey standards, and no additional remedial action is needed.

c. Benzo(a)pyrene

As shown on FS Figure 3-21, benzo(a)pyrene concentrations vary during the RI with most concentrations below the PRG and/or non-detect. As summarized below, only two wells had benzo(a)pyrene concentrations above the PRG. Based on the results and these variations, the selected groundwater alternative is not warranted. This is particularly true as this SVOC is commonly found in, and attributable to, historic fill at the Site.

- MW-104 (Lot 66). Two of the three RI results including the most recent result are below the PRG. The average benzo(a)pyrene concentration is below the PRG. No active remedial action is warranted based on the average and the most recent result.

- E-2 (Lot 66). Two of the three results including the last two results are below the PRG. The average benzo(a)pyrene concentration is below the PRG. No active remedial action is warranted based on the average and the most recent results.

d. Benzo(a)anthracene

As shown on FS Figure 3-23, benzo(a)anthracene concentrations vary during the RI with most results either non-detect or below the PRG. As summarized below, only four wells had benzo(a)anthracene concentrations above the PRG. Based on the results and these variations, the selected groundwater alternative is not warranted. This is particularly true as this SVOC is commonly found in, and attributable to, historic fill at the Site.

- MW-104 (Lot 66). Two of the three results including the most recent result are below the PRG. The average benzo(a)anthracene concentration is below the PRG. No active remedial action is warranted based on these results.

- MW-108 (Lot 63). Two of the three results were non-detect or below the PRG. The third result slightly exceed the PRG. No active remedial action is warranted based on these results.

- MW-118 (Lot 57). Two of the three results were non-detect or below the PRG. The third result slightly exceed the PRG. Groundwater at this monitoring well is being addressed under ISRA Case #20-04-09-0923-04.MW-124 (Lot 58). Only one sample was collected at this location, and its concentration (0.17 µg/L) was slightly above the PRG (0.1 µg/L). As demonstrated at other site wells, SVOC concentrations vary and one result slightly over a PRG is not sufficient for selecting a groundwater remedy. Additional monitoring is needed to determine if remediation is warranted at MW-124 for benzo(a)anthracene.

e. Ethylbenzene

As shown on FS Figure 3-24, ethylbenzene concentrations vary during the RI with most results either non-detect or below the PRG. As summarized below, only two wells had ethylbenzene concentrations above the PRG. Based on the results and these variations, the selected groundwater alternative is not warranted.

- MW-106 (Lot 64). Ethylbenzene concentrations were below the PRG (700 µg/L) in the last two samples. Also, the average of the three samples is below the PRG. These findings demonstrate active remedial action is not warranted.

- MW-124 (Lot 58). Only one sample was collected at this location. Additional monitoring would be needed to determine if remediation is warranted at MW-124 for ethylbenzene.

f. Indeno(1,2,3-cd)pyrene

As shown on FS Figure 3-25, indeno(1,2,3-cd)pyrene concentrations vary during the RI with most results either non-detect or below the PRG. As summarized below, only two wells had indeno(1,2,3-cd)pyrene concentrations above the PRG. Based on the results and these variations, the selected groundwater alternative is not warranted. This is particularly true as this SVOC is commonly found in, and attributable to, historic fill at the Site.

- MW-108 (Lot 63). Indeno(1,2,3-cd)pyrene was not detected in two of three samples. The third sample concentration was 0.26 µg/L which is slightly above the PRG (0.2 µg/L). The non-detect samples had elevated detection limits, which indicates additional monitoring would be appropriate to determine if remediation is warranted at this location.

- MW-124 (Lot 58). Only one sample was collected for this well. The indeno(1,2,3-cd)pyrene concentration (0.29 µg/L) was slightly above the PRG (0.2 µg/L). Additional monitoring would be needed before a remedial action determination can be made.

g. m,p-xylene

As shown on FS Figure 3-27, m,p-xylene concentrations vary during the RI with most results below the PRG. As summarized below, only four wells had m,p-xylene concentrations above the PRG. The RI results impose the finding that the selected groundwater alternative is not warranted.

- MW-106 (Lot 64). The most recent sample was below the PRG. m,p-xylene concentrations at MW-106 have decreased from 4,000 µg/L to 1,900 µg/L to 410 µg/L (below PRG). No active remedial action is required.

- MW-114 (Lot 58). The last two samples were below the PRG (1,000 µg/L). No active remedial action is required.

- MW-115 (Lot 58). The two most recent results and the average concentration are below the PRG. These results indicate active remedial action is not required.

- MW-124 (Lot 58). Only one sample was collected for this well. Additional monitoring would be needed before a remedial action determination can be made.

h. Methyl Ethyl Ketone (MEK)

As shown on FS Table 3-6, MEK concentrations vary during the RI. Also, many of the results were rejected by the data validation process. Because of concentration variation as noted below and rejection of data, the selected groundwater alternative is not warranted for MEK in groundwater.

- MW-117 (Lot 60). This is the only well with a MEK concentration (330 µg/L) above its PRG (300 µg/L). One MW-117 result was rejected by the validation process. One of the two remaining samples was non-detect for MEK. The average result was below the PRG. MEK concentrations indicate that active remedial action as detailed in the PRAP is not warranted.

i. Pentachlorophenol

As shown on FS Figure 3-30 and noted below, pentachlorophenol concentrations vary during the RI with most samples having non-detect results. Based on the pentachlorophenol results, the selected groundwater alternative is not warranted.

- MW-107 (Lot 63). This is the only well with an exceedance of pentachlorophenol. Two of three samples from this well were non-detect for pentachlorophenol. The third sample was slightly above the PRG (0.3 µg/L) at 0.42 µg/L.

j. p-Cresol

As shown on FS Figure 3-29, p-Cresol concentrations vary during the RI with only one well exceeding the p-Cresol PRG.

- MW-118 (Lot 57). This is the only well with p-Cresol PRG exceedances. Groundwater at this well is being addressed by the current owner/operator under ISRA Case #20-04-09-0923-04. The USEPA selected groundwater remedy at this lot/location is not warranted.

k. Toluene

As shown on FS Figure 3-31, toluene concentrations vary during the RI with toluene being below its PRG in every sample, with the exception of one sample as noted below. Based on the toluene results, the selected groundwater alternative is not warranted.

- MW-124 (Lot 58). Toluene was not detected above the PRG (600 µg/L) in any wells except MW-124. MW-124 was sampled only once. Additional monitoring would be needed before a remedial action determination can be made.

l. Trichloroethylene (TCE)

As shown on FS Table 3-6 and noted below, TCE concentrations vary during the RI with TCE being non-detect or below its PRG in most samples.

- MW-106 (Lot 64). The most recent sample was non-detect for TCE and thus below the PRG. The decreasing TCE concentrations at this well (35 µg/L to 11 µg/L to non-detect) and the most recent sample being non-detect indicate active remedial action is not required.

- E-4 (Lot 62). Two of the three results were non-detect (below PRG) for TCE in this well. These results indicate active remedial action is not required, or that additional monitoring would be needed before a remedial action determination can be made.

m. Deep Groundwater

Deep groundwater was sampled only once with four VOCs being detected in a well slightly above the PRG as shown below.

VOC	Well	Result (µg/L)	PRG (µg/L)
1,1,2-TCA	MW-203	7.6	3
1,1,2,2-TCA	MW-203	1.1	1
Benzo(a)pyrene	MW-204	0.12	0.1
PCE	MW-205	1.2	1

Benzene and 1,4-dioxane were reportedly slightly above the PRG in more than one well:[19]

VOC/SVOC	Well	Result (µg/L)	PRG (µg/L)
Benzene	MW-201	1.3	1
	MW-202	23	1
	MW-205	1.1	1
1,4-Dioxane	MW-201	5.5	0.4
	MW-202	1.4	0.4

[19] Both shallow and deep groundwater detections of 1,4 dioxane appeared primarily along the eastern boundary of the Site, indicative of an off-Site source. [RIR Figure 4-24; RIR Figure 4-48.] In shallow groundwater, detections varied across sampling events and generally were at low levels near or below the PRG. [RIR Figure 4-24.]

	MW-204	0.64	0.4

Additional monitoring would be needed before a remedial action determination can be made. This is particularly appropriate at this Site, where detections and exceedances in shallow groundwater have been sporadic and below selected PRGs on average. Selecting a groundwater remedy based on one result is arbitrary and capricious.[20]

2. VOCs/SVOCs have and will likely continue to decrease

Implementation of the waste and soil/fill remedies will address potential sources of contamination, allowing for further reduction of contaminants via removal and biodegradation. The most common VOCs detected at the Site have biodegradation half-lives of less than one year as listed below:[21]

- Acetone - 0.06 year
- Ethyl benzene – 0.625 year
- Toluene – 0.577 year
- Xylene – 1 year

Exceedances of organic contaminant PRGs are primarily limited to benzene in the area around the USTs around Lots 63/64; benzene, toluene, ethylbenzene, and xylenes (BTEX) at Lot 58; and acetone at Lot 57, all of which would be addressed by waste and soil/fill remedies, such as the proposed UST and NAPL removal, or actions being separately undertaken at Lot 57 under NJDEP oversight. [FSR at 2-23, 2-25, 3-8, 3-19.] As for detections of SVOCs (polycyclic aromatic hydrocarbons [PAHs]), they were random, infrequent, slightly above PRGs and reflect the presence of historic fill or asphalt pavement, not releases. [FSR Table 3-6.] These data support deferring the groundwater remedy for the implementation of waste and soil/fill remedies. They do not support USEPA's multimillion dollar groundwater remedy.

Finally, USEPA's proposed groundwater remedy does not match groundwater areas with PRG exceedances. There are no shallow groundwater PRG exceedances that support organic in-situ treatment on Lot 1 and Lot 64 (Buildings #3, #4 and #5) shown on PRAP Figure 5. Likewise, the in-situ treatment area on Lots 58, 59 and 69 is too large to be supported by groundwater results, as the PRG exceedances it addresses are limited to MW-124. Likewise, there are no PRG exceedances near Monitoring Wells E-6 and E-7 that support placement of a P&T well as proposed by USEPA. For deep groundwater, concentrations from a single round of sampling do not support P&T wells, particularly where removal of NAPL, USTs, and the cessation of recent illegal dumping will result in PRG compliance.

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20 The RI also did not determine if these VOCs are Site-related or from an off-Site upgradient source. Several deep wells with VOCs above PRGs are in upgradient groundwater flow positions. These well's positions are on-Site but near the upgradient property line. The lack of offsite upgradient monitoring wells prevents any conclusion that the deep VOCs noted above are Site-related.

21 C7-C12 petroleum hydrocarbon mixtures have similar biodegradation rates to the aromatic hydrocarbons, due to similar chemical structure and the presence of ethyl benzene, toluene, and xylenes in these mixtures.

F. USEPA Should Determine the Appropriate Groundwater Alternative After Other Remedies are Implemented

1. Site data support deferring selection of the groundwater remedy

USEPA's proposed groundwater remedy is arbitrary and capricious. Though there is no affirmative evidence of on-Site lead releases to surface soils/fill, USEPA has predicated its CSM and remedy selection on its effectiveness in addressing lead in soils/fill and groundwater.[22] In order to justify its CSM and remedy selection, USEPA had to disregard material, relevant Site data established during the RI/FS that demonstrates that lead in groundwater is driven by the ubiquitous presence of historic fill across the Site. Indeed, an unbiased evaluation of these data shows that groundwater lead concentrations across the Site contradict, rather than support USEPA's CSM positing that lead from operational releases is migrating from surface soils into groundwater. Moreover, Site data and analyses show that USEPA's proposed groundwater alternative is impracticable and unwarranted. All analyses point to the conclusion that USEPA is seeking to remediate lead attributable to historic fill at the Site.

Rather than continue to force this issue, USEPA should defer selection of a groundwater remedy pending further analysis and implementation of soil/fill remedies on Site. If USEPA's CSM is correct, NAPL removal, UST removal, and soil/fill capping and excavation as part of the proposed waste, sewer and soil/fill remedies would address potential sources of lead, VOC, and SVOC impacts to groundwater. USEPA could then evaluate potential changes in groundwater contaminant concentrations to determine whether any groundwater remedy is necessary or appropriate for the Site.

2. Deferring selection of groundwater remedy is consistent with USEPA approach at other sites

The approach to defer selection of a groundwater remedy would be consistent with other, similar Region 2 Superfund sites. For example, at the Imperial Oil Superfund Site, located in Morganville, New Jersey, USEPA's original selected groundwater remedy for lead, VOCs, SVOCs and polychlorinated biphenyls (PCBs) contamination, which called for several years of extraction of the contaminated groundwater and treatment via carbon absorption, was never implemented. [Imperial Oil 2020 Amended ROD (attached as Appendix H) at 3.] Instead, USEPA decided to defer the groundwater remedy until the removal of the source material was completed. [Imperial Oil 2020 Amended ROD at 7 ("Implementation of all the elements of the OU2 ROD [addressing groundwater] was deferred while the contaminated soil, which was the source of the groundwater contamination, was removed as part of the OU3").] Notably, since source removal was completed, sampling data revealed that contamination levels in the site groundwater had dramatically decreased. [*Id.* at 9-12 ("sampling has shown that contamination levels in the groundwater are declining due to natural attenuation processes . . . ten of the fourteen COCs identified in the 1992 ROD are now present at levels that are below their cleanup goals."] In light of the reduced contamination levels in the site

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[22] During the drafting of the FSR, USEPA rejected some of PPG's suggested alternatives based solely their ability to address lead in groundwater. In the June 8, 2020 draft of the FSR, PPG included a groundwater alternative (Groundwater Alternative 5 in USEPA's June 23 comments), which combined institutional controls, containment at the Site perimeter, and in-situ remediation focused on VOCs. [USEPA June 23 Comments at 5-16.] USEPA rejected Groundwater Alternative 5 because it "will not address lead, which is a Site-related contaminant." [USEPA June 23 Comments at 5-11.] Given that lead in groundwater is not in fact "Site-related," USEPA was incorrect to screen out this alternative on this basis.

groundwater, and as required by the NCP, USEPA changed the groundwater remedy from extraction and treatment to monitored natural attenuation (MNA) [*Id.* at 12 ("The levels are currently low and will continue to decline. Therefore, MNA is effective and the extraction and treatment system chosen in the 1992 OU2 ROD is no longer necessary"); 40 CFR 300.435(c)(2)(ii).] In retrospect, this should have been an unsurprising result. Groundwater contamination is frequently indirectly remediated through removal and control of contaminants in other media.

Similarly, in the August 2020 ROD for the Sherwin-Williams/Hilliards Creek Superfund Site located in Gibbsboro, New Jersey, USEPA explicitly prioritized the remediation of soils on Site over groundwater. USEPA deferred the groundwater remedy, reasoning that the removal of contaminants from on-Site soils would likely reduce contamination in groundwater: "[t]his selected remedy will also remove contaminated saturated soil, which acts as a source to shallow groundwater contamination. By removing these saturated soils, the concentrations of contaminants in groundwater that exceed ground water quality standards are anticipated to be reduced . . . [f]uture operable units will address site-related groundwater contamination." [Sherwin-Williams ROD at 2 (attached as Appendix I).]

Ultimately, it would make little sense for USEPA to rush into selecting a groundwater alternative for the Site before evaluating the potential effects that other remedies, like NAPL removal, UST removal, sewer water removal, soil/fill excavation and soil/fill capping, may have on groundwater concentrations. Indeed, by first implementing other remedies, more cost-effective groundwater remedies may become available for selection. USEPA should follow the example of the Imperial Oil and Sherwin-Williams/Hilliards Creek Superfund Sites and defer the selection and implementation of the groundwater remedy at the Site until after other remedies are implemented.

IV. QUANTITATIVE ANALYSIS OF USEPA'S CSM

A. Statistical Analyses of Surface, Sub-Surface and Groundwater Lead Concentrations Contradict USEPA's CSM

Statistical analyses also rebut USEPA's assertions that lead groundwater contamination is the result of releases of lead to surface soil/fill. USEPA has divided the Site into southern and northern areas and posits that the northern Lots on the Site did not involve paint manufacturing while some—but not all—southern Lots may have been affected by paint manufacturing. Differences would be expected among Lots within the southern portion of the Site, as paint was historically manufactured only on certain Lots, and between the northern and southern Lots. Statistical analyses were conducted to compare the non-operational northern Lots and southern Lots.[23] The statistical analyses among southern Lots and between northern and southern Lots are summarized below; additional details are provided in Appendix J. Results pertaining to the northern Lots are also summarized in Appendix J (Tables 4 and 5). Based on the available lead concentration and Site data, there was no convincing statistical evidence that paint manufacturing affected surface, sub-surface or groundwater lead concentrations at the Site.

[23] USEPA has divided the Site into three areas – northern, southern and Lot 63. Historical site information shows that paint was not manufactured in the building on Lot 63 (Building #7), so Lot 63 was excluded from the analyses, and in any case statistical analyses limited to Lot 63 were not feasible due to the small number of data points and the lack of variability.

1. Comparisons among Southern Lots

a. Soil/fill sampling results

Under USEPA's "top down" model, maximum surface soil lead concentrations and the proportions of boring holes with surface soil lead levels above the soil fill PRG of 800 mg/kg should have been higher among southern Lots where paint was made than among southern Lots not affected by paint manufacturing. This was not supported by the statistical evidence: clear patterns were not observed and differences among the Lots were not statistically significant (Appendix J, Table J.1).

Similarly, under USEPA's "top down" model, maximum sub-surface soil lead concentrations and the proportions of boring holes with sub-surface soil lead levels above the soil fill PRG of 800 mg/kg should have been higher among southern Lots where paint was made than among southern Lots not affected by paint manufacturing. This was not supported by the statistical evidence: clear patterns were not observed and differences among the Lots were not statistically significant (Appendix J, Table J.1).

Under USEPA's "top down" model, the proportion of boring holes with greater maximum lead concentrations in surface than in sub-surface soil samples should have been higher in southern Lots where paint was made than in southern Lots not affected by paint manufacturing. This was not supported by the statistical evidence: clear patterns were not observed and differences among the Lots were not statistically significant (Appendix J, Table J.2).

b. Groundwater sampling results

Under USEPA's "top down" model, groundwater is controlled by surface and sub-surface lead concentrations. Because there were no statistically significant differences in surface or sub-surface lead concentrations among the southern Lots, there should also not have been any significant differences in groundwater lead levels among the southern Lots. However, statistically significant differences in groundwater lead levels were seen among the southern Lots which must have resulted from factors other than surface or sub-surface soils (Appendix J, Table J.1).

Further, under USEPA's "top down" model, groundwater lead concentrations should have been consistently correlated with sub-surface and surface lead concentrations. This was not supported by the statistical evidence: clear patterns were not observed and differences among the Lots were not statistically significant (Appendix J, Table J.2).

2. Comparisons of southern lots to non-operational northern lots

Under USEPA's "top down" model, lead concentrations should have been different between the southern Lots and the northern non-operational Lots. This was not supported by the statistical evidence. For example:

- The proportions of boring holes with maximum surface lead concentrations above the soil fill PRG of 800 mg/kg should have been higher among the southern than the non-operational northern Lots. This was not supported by the statistical evidence (Appendix J, Table J.3).
- The proportions of maximum groundwater lead concentrations in the low, medium and high groupings (≤5 µg/L vs. >5 µg/L to ≤25 µg/L vs. >25 µg/L) should have been different in the southern and the non-operational northern Lots. This was not supported by the statistical evidence (Appendix J, Table J.3).

The statistical evidence does not support USEPA's "top down" model. Conversely, based on the available lead concentration and Site data, there was no convincing statistical evidence that paint manufacturing affected surface, sub-surface or groundwater lead concentrations at the Site.

B. Fault Tree Analyses Show USEPA's CSM Cannot Explain Site Data, Unlike the Correct Site CSM Based on Presence of Historic Fill

CSMs can be evaluated using a Fault Tree Analysis, which assesses the likelihood of the model being able to correctly describe Site data. As described in more detail below and in Appendix K, USEPA's CSM has only a 0.003% to 2.3% likelihood of correctly describing Site data. In contrast, the likelihood estimate for a CSM based on the presence of historic fill is 63%. The fact that USEPA's CSM has only, ***at most***, a 2.3% chance of correctly describing Site data demonstrates the arbitrary and capricious nature of USEPA's CSM.

1. USEPA's CSM has a 0.003% to 2.3% likelihood of correctly describing Site data

USEPA has presented a top-down infiltration model to describe the conditions present at the Site. This CSM can generally be described as:

- Lead in soil/fill is attributable to releases from historical operations;
- Lead is migrating from releases to surface soil/fill to subsurface soil/fill; and
- Lead that has migrated to subsurface soil/fill beneath the water table is desorbing into groundwater.

These components of USEPA's CSM can be quantified using a threshold analysis (*i.e.*, each well is assigned a yes or no, depending on if it fits USEPA's CSM), or a correlation analysis (correlation, or r^2, is used to evaluate how each component of USEPA's CSM fits Site data). These correlation estimates were derived from linear regressions of available Site data designed to test the fundamental assumptions of the CSM.

Table 11: Quantifying USEPA's CSM using the Threshold Analysis

USEPA's CSM	Potential Supporting Data	Site Observations
Lead in soil/fill is attributable to releases from historical operations	Elevated soil/fill in areas with pervious land cover in operational areas	Limited pervious land cover by 1926
		Prior land cover has 7 elevated samples in pervious areas and 8 in impervious areas (surface samples)
Lead is migrating from releases to surface soil/fill to subsurface soil/fill	Lead levels are greater in surface and show downward migration	Decreasing soil/fill concentrations from surface to next sample in only 56% of profiles
	Matched results – elevated surface concentrations indicative of wells with elevated groundwater	16 of 31 wells have "matched" soil/fill and groundwater (9 are in low soil/fill areas)
Lead that has migrated to soil/fill beneath the water table is desorbing into groundwater	Groundwater concentrations controlled by saturated soil/fill concentrations and remain relatively stable over time	Only 5 of 30 wells with multiple samples have variability attributable to analytical variation (+/- 20%)

Each approach is described in detail in Appendix K. The threshold analysis shows that USEPA's CSM only has a likelihood of 2.3% of correctly describing the available data. The correlation analysis shows the likelihood of USEPA's CSM correctly describing Site data is only 0.003%.

2. Correct Site CSM based on the presence of historic fill has a 63% likelihood of correctly describing Site data

In contrast to USEPA's CSM, the likelihood that the CSM based on the presence of historic fill can correctly explain Site data is 63%. This CSM is based on:

- Lead concentrations in soil/fill are attributable to a single source (historic fill) and that there was no quantitative indication that an additional source of lead was present;
- Lead distribution across the site is heterogeneous and does not show correlations with depth regardless of the type of analysis or the section of the site evaluated; and
- Soil/fill concentrations from nearby soil bores located within 20 feet of a monitoring well are not related to groundwater concentrations.

As described in Appendix K, each component of PPG's CSM correctly describes between 72% and 99% of the Site data evaluated. These estimates were derived from linear regressions of available Site data designed to test the fundamental assumptions of the CSM.

Table 12: Quantifying Historic Fill CSM using the Correlation Analysis

Historic Fill CSM	Potential Supporting Data	Site Observations
Lead in soil/fill is attributable historic fill	A single Pb- Zn ratio (slope) across the site would suggest a single source (historic fill) is present across the site.	Strong correlation of log-transformed concentrations is supportive of historic fill (r2= 0.72)
		Uncorrelated portion = 0.28, represents the unexplained variability (e.g. heterogeneous fill material)
Lead distribution is heterogeneous, no correlation with depth regardless of location on Site	Lack of correlation between surface and sub-surface sample pairs	Correlation of surface and subsurface soil/fill log-transformed concentrations is 0.09 Lack of correlation is therefore 0.91
	Lack of correlation in the depth distribution across the Site	Correlation of lead with depth is 0.0131 Lack of correlation is therefore 0.99
Lead in groundwater is not related to surface soil/fill concentrations	Lack of correlation between groundwater concentrations and surface soil/fill concentrations	Correlation of soil/fill at any depth to groundwater in wells within 20 ft is 0.0197 Lack of correlation is therefore 0.98

Taken together in the Fault Tree Analysis, the Historic Fill CSM has a 63% likelihood of correctly describing the Site as a whole – orders of magnitude better than USEPA's arbitrary and capricious CSM.

V. APPLICATION OF REMEDY SELECTION CRITERIA

A. The Application of NCP Remedy Selection Criteria to Actual Site Conditions Demonstrates USEPA's Soil/Fill Remedy is Inappropriate.

The Site data USEPA disregarded is critical to properly weighing the remedy evaluation criteria required by the NCP. Incorporating the Site conditions and data discussed above results in significant changes to USEPA's evaluation of NCP criteria for its soil/fill remedy. These changes show that USEPA's selection of

its preferred remedy for soil/fill and groundwater was flawed, arbitrary, and capricious, particularly with respect to the bulkhead enhancement USEPA has proposed. Each of the NCP balancing criteria is discussed in detail below.

- **Overall Protection of Human Health and the Environment.** The FSR and PRAP do not explain how bulkhead enhancement specifically will protect human health and the environment, though it appears that USEPA's rationale is that the bulkhead will prevent potential off-Site transport of soil/fill containing contaminants. [FSR at 6-10; PRAP at 22 (describing benefits of engineered cap, not bulkhead).] However, this is predicated on contaminants – particularly lead as "one of the primary contaminants of concern" – being attributable to releases. [PRAP at 5.] As demonstrated above, historic fill is the dominant source of lead in soils/fill, and there is not affirmative evidence of releases of lead (or contaminants that the PRAP describes as co-located with lead). [PRAP at 5.] Evaluating the bulkhead on how it prevents potential off-Site transport of lead attributable to historic fill is not appropriate under CERCLA, since CERCLA remediates releases. Even assuming the limited area of lead exceedances that USEPA has identified is attributable to operational releases, this area is addressed through soil excavation as part of Soil/Fill Alternative 4. The same goes for VOCs and SVOCs associated with NAPL and USTs, both of which will be removed. Because contaminants associated with purported releases will have been removed, the bulkhead does not address any contaminants actionable under CERCLA.

- **Compliance with ARARs.** The FSR and PRAP provide that removal and appropriate disposal of soil/fill exceeding established PRGs complies with ARARs, and "site-wide cap and deed notices" would eliminate direct contact with contaminant exceedances. [FSR at 6-10; PRAP at 22.] Bulkhead enhancement does not contribute to this compliance.

- **Long-Term Effectiveness and Permanence.** Long-term effectiveness and permanence is achieved by targeted removal of soil/fill containing contaminants attributable to non-historic fill sources (if any). [FSR at 6-11.] The level of residual contamination remaining would be the same with or without the bulkhead. In addition, contaminants remaining are attributable to historic fill, not releases, and therefore should not factor into evaluation of the adequacy and reliability of controls at the Site. In other words, how the bulkhead addresses potential off-Site transport of contaminants relating to historic fill is irrelevant to evaluation of the remedy under CERCLA. Selecting bulkhead enhancement on this basis is arbitrary and capricious.

- **Reduction of TMV Through Treatment.** Toxicity, mobility and volume (TMV) of contaminants are addressed through other aspects of Soil/Fill Alternative 4, including soil/fill and NAPL removal. [FSR at 6-11; PRAP at 22.] Bulkhead enhancement does not play a role in reduction of TMV.

- **Short-Term Effectiveness.** Based on the record and Site data, it is unnecessary to incur the risks and disruptions associated with installation of the replacement bulkhead. In addition, removal of soil/fill can occur more quickly than bulkhead enhancement.

- **Implementability.** Even without factoring in the fact that the proposed bulkhead addresses historic fill rather than contaminants associated with releases, there are significant barriers to implementability. These barriers include (1) administrative coordination with the U.S. Army Corps of Engineers, NJDEP, and USEPA; (2) technical challenges presented by the limited space between the shoreline and existing Site buildings; (3) necessity of a water-side operation to install the bulkhead; (4) a geotechnical investigation; (5) disruptions to ongoing business activities; and (6) use of specialty contractor for installation of the enhanced bulkhead sections, using either land-based or water-based equipment. [FSR at 6-10.]

- **Cost.** The bulkhead adds millions of dollars to USEPA's Soil/Fill Alternative 4 without remediating any contaminants actionable under CERCLA, and therefore is not cost-effective.

By taking all Site conditions and data into account in evaluating the NCP's balancing criteria, it becomes clear that the inclusion of bulkhead enhancement in USEPA's preferred soil/fill remedy is arbitrary and capricious. The bulkhead does not address contaminants attributable to releases, nor does it help achieve any of the NCP's balancing criteria.

B. The Application of NCP Remedy Selection Criteria to Actual Site Conditions Demonstrates USEPA's Groundwater Remedy is Inappropriate

As with evaluating the soil/fill alternatives, the Site data USEPA disregarded is critical to properly weighing the NCP evaluation criteria for the groundwater remedy. Incorporating Site conditions and data discussed above results in significant changes to USEPA's evaluation of these criteria for its groundwater remedy. These changes show that USEPA's selection of its preferred remedy was flawed, arbitrary, and capricious. Each of the NCP balancing criteria is discussed in detail below.

- **Overall Protection of Human Health and the Environment.** Given that the presence of lead and other metals in groundwater is attributable to historic fill, rather than releases, an evaluation of alternatives based on how lead is addressed is not appropriate under CERCLA. USEPA acted arbitrarily and capriciously when it rejected remedies such as MNA because they are "not readily effective for lead" or because observed reductions in contaminant levels "do not necessarily support MNA as an ongoing process capable of reducing all COCs (particularly lead) to acceptable concentrations." [FSR at 5-17.] It also acted arbitrarily and capriciously when it selected Groundwater Alternative 4 as its preferred alternative even though it only "***may*** reduce concentrations of COCs in groundwater over time, although the timeframe for such reduction is indefinite, particularly with respect to metals." [FSR at 6-17 (emphasis added).] Indeed, USEPA's statement in the PRAP that Groundwater Alternatives 2, 3 and 4 "would be protective of human health because all of these alternatives would restore the groundwater quality to meet the standards applicable for a Class IIA aquifer" is demonstrably false, as discussed above. [PRAP at 23.]

- With respect to VOCs and SVOCs, USEPA's Groundwater Alternative 4 does not match Site data. As mentioned, USEPA has selected a multimillion dollar groundwater remedy on the basis of three shallow well sampling events and a ***single*** deep well sampling event. The deep well samples show almost no exceedances, and the shallow wells show sporadic exceedances and decreasing concentrations over time. VOCs exceeding PRGs are limited to discrete areas. Likewise, there are random infrequent detections of SVOCs (PAHs) slightly above PRGs that reflect historic fill or deteriorated asphalt pavement. These trace concentrations and inconsistent detections are not associated with a Site release. In contrast, USEPA has placed P&T wells and identified in-situ treatment areas that essentially cover the entirety of the Site, without apparent regard to locations or extent of exceedances. USEPA's disregard for VOC/SVOC data can only be described as arbitrary and capricious.

  As for USEPA's other rationale, the RI/FS provides no basis for the statement that an "extraction system along the downgradient portion of the Site would reduce the discharge of groundwater containing COCs to surface water." [FSR at 6-17.] There is no evidence that groundwater containing contaminants is migrating to surface water, nor is there evidence that such contaminants would be related to releases rather than historic fill. Pumping and treating groundwater indefinitely to prevent potential migration of groundwater is an arbitrary and capricious remedy.

Ultimately, the only effective component of USEPA's preferred alternative appears to be institutional controls, which prevent exposure to contaminants in groundwater. [FSR at 6-17.] Indeed, this is the remedy already implemented at multiple portions of the Site under NJDEP's site remediation program.

- **Compliance with ARARs.** The FSR states it is unknown whether the major components of Groundwater Alternative 4 will meet ARARs: "In the short-term, this alternative ***would not comply*** with chemical-specific ARARs (PRGs) associated with the restoration of groundwater; however, over time, in-situ treatment and the extraction of impacted groundwater ***may*** eventually reduce COC concentrations to meet ***certain*** chemical specific ARARs." [FSR at 6-17 (emphasis added); PRAP at 23.] This does not provide any basis for the selection of this remedy, particularly where USEPA has failed to consider important Site data that show Groundwater Alternative 4 is not effective at reducing contaminant concentrations. Again, it appears that institutional controls are the only aspect of Groundwater Alternative 4 that comply with ARARs. [FSR at 6-17.] In such a scenario, there is no reason to select a groundwater remedy that does not comply with ARARs. Deferring the groundwater remedy for further evaluation is appropriate instead.

- **Long-Term Effectiveness and Permanence.** USEPA reasons that "extraction wells along the river would reduce discharge of Site groundwater to the river." [FSR at 6-18.] This does not justify a $24 million P&T and in-situ treatment remedy, particularly as there is no evidence that groundwater containing contaminants is discharging to surface water or that such contaminants are attributable to anything other than historic fill. Moreover, Groundwater Alternative 4 faces significant hurdles with respect to capture of river water by extraction wells.

- **Reduction of TMV Through Treatment.** To the extent USEPA evaluated Groundwater Alternative 4 on the basis of how it addresses TMV in lead in groundwater, it was arbitrary and capricious to do so since lead in groundwater is not attributable to releases. Also, USEPA's rationale that "operation of a groundwater extraction and treatment system would effectively reduce the TMV of COCs captured by the extraction system" is disingenuous at best, given the demonstrated ineffectiveness of this system discussed above. [FSR at 6-18.]

- **Short-Term Effectiveness.** Based on the record and Site data, it is unnecessary to incur the risks and hazards identified in the FSR associated with installation of the P&T system or in-situ treatment. [FSR at 6-18.] In short, there is no short-term effectiveness.

- **Implementability.** Groundwater Alternative 4 would require the designation of 5,000 to 7,500 square feet of the Site for a treatment building indefinitely, create significant business disruptions, and would be constrained by the presence of underground utilities at the Site. [FSR at 6-18.] Moreover, USEPA's suggestion that "[s]ince Groundwater Alternative 4 is likely to achieve the RAO [in] the shortest time, the challenges associated with implementation over a long duration are less" is not supported by the record. [PRAP at 24.] Site data show that Groundwater Alternative 4 is not effective and will not achieve cleanup goals (lead and potentially others), is not necessary for other contaminants (VOCs/SVOCs), and will go on indefinitely (preventing groundwater migration). Not only is Groundwater Alternative 4 not justified based on Site data, it is not implementable.

- **Cost.** Groundwater Alternative 4 has a present value of approximately $24 million for 30 years; however, this does not reflect the true cost of the remedy. As USEPA indicated, treatment will continue indefinitely, not 30 years, in order to meet its PRGs. Even so, Groundwater Alternative 4 will not return groundwater to Class IIA standards. If USEPA's purpose for the P&T system is to

prevent groundwater from potentially interacting with surface water, that system will have to run forever, given the Site location and presence of historic fill. In short, Groundwater Alternative 4 is not cost-effective.

By taking all Site conditions and data into account in evaluating the NCP's balancing criteria, it becomes clear that USEPA's selection of Groundwater Alternative 4 is arbitrary and capricious. Evaluating the alternative on the basis of how it addresses lead was not in compliance with the NCP and CERCLA, since lead in groundwater is not attributable to releases. In any event, Groundwater Alternative 4 fails to achieve PRGs, is impracticable, and costs tens of millions of dollars without providing any discernable benefit. Based on the RI/FS and its own evaluation, USEPA should defer selection of a groundwater remedy pending implementation of the waste and soil/fill remedies at the Site.

Though USEPA's evaluation of NCP criteria with respect to aspects of its preferred soil/fill remedy and groundwater alternatives was arbitrary and capricious, certain aspects of its selected remedies appear at least potentially appropriate for the Site. The selected waste, soil gas and sewer water alternatives appear to be compliant with CERCLA and the NCP, as do most aspects of USEPA's preferred soil/fill remedy. The groundwater remedy is the most seriously flawed, but institutional controls and continued monitoring appear to be potentially compliant with CERCLA and the NCP and are logical steps as USEPA defers further evaluation of a groundwater remedy to a later phase.

VI. CONCLUSION

USEPA's actions in finalizing the FSR were arbitrary and capricious. USEPA's version of the FSR is technically flawed and in violation of the NCP due to ignoring relevant Site data. Consequently, the PRAP issued by USEPA, which itself contains errors and which necessarily relies on USEPA's flawed FSR, is similarly flawed, arbitrary, and capricious. Specifically, USEPA's remedial alternatives were selected upon a faulty premise—that lead in the soil/fill and groundwater at the Site was the result of Site operations. The relevant data gathered in the RI, however, dispels this assumption, and instead demonstrates that the lead contamination on Site is attributable to historic fill. CERCLA remedies address releases, not background contamination, and as such, the selection of remedies for lead on Site are misguided and unsupported by the factual record. In any case, given the presence of historic fill and naturally occurring contaminants well in excess of drinking water standards, already implemented institutional controls, and the demonstrated impracticability of USEPA's proposed remedy, restoration of Site groundwater to the PRGs imposed by USEPA is not achievable, nor is it necessary. The remedial action objective (RAO) for the Site requires restoration of groundwater only to quality that would exist in the absence of releases, not drinking water standards. Moreover, Site groundwater data show sporadic and decreasing VOC exceedances of PRGs at the Site, and VOC and SVOC exceedances were typically limited to a single sampling event. In many cases, these exceedances were slightly above the PRG with differences within analytical variability. This indicates that that an active groundwater remedy may not be necessary. USEPA arbitrarily disregarded this data – three rounds of shallow groundwater sampling data and a single deep groundwater sampling event – characterizing it as insufficient despite relying on it in selecting its $24 million groundwater remedy. All of these factors compel deferring selection of a groundwater remedy at the Site until the waste, sewer water, and soil/fill alternatives are implemented.

While PPG repeatedly brought these technical concerns to USEPA's attention, USEPA ultimately decided to ignore the relevant Site data in an effort to meet its arbitrary September 30 deadline for the issuance of

the ROD. The PRAP and FSR should therefore be set aside or revised to meet the requirements of the NCP and to properly account for the findings of the RI which USEPA ignored the first time around, and which indicate that lead contamination on Site is attributable to historic fill.

Sincerely,

WOODARD & CURRAN, INC.

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Enclosures

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FIGURES

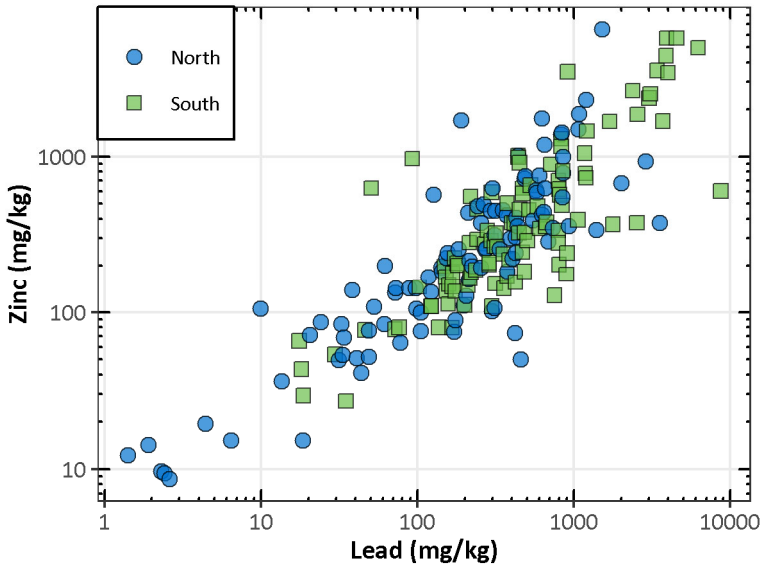


Figure 1: Correlation of zinc and lead in soil/fill (mg/kg). Samples from the northern and southern portions of the Site are shown in blue and green, respectively. Despite the different potential sources of the zinc and lead contamination, the correlations identified similar slopes.

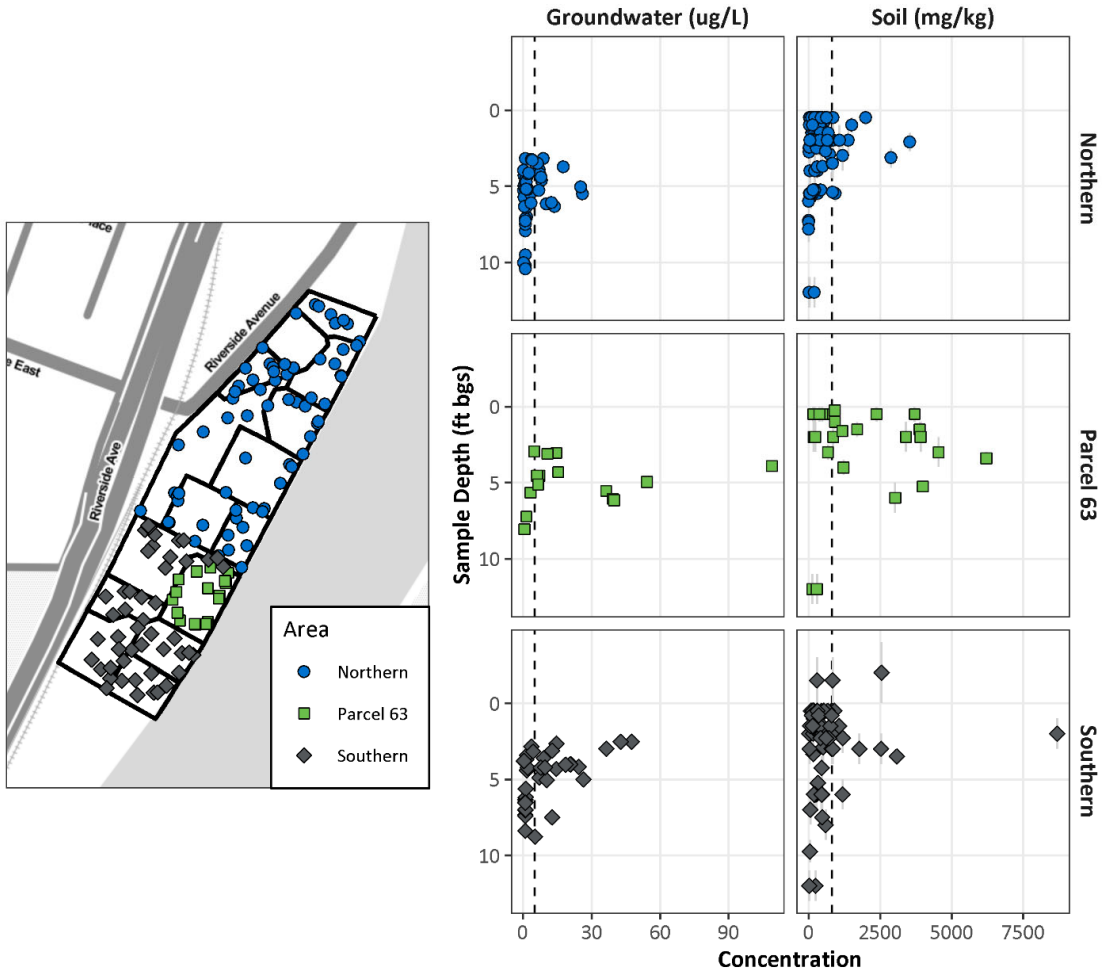


Figure 2: Groundwater and Soil/Fill Lead Concentration Distributions Within the Three Portions of the Site. Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. The map in the upper left-hand portion of the figure shows the distribution of samples in the northern, southern, and Parcel 63 (Building #7 lot) portions of the Site. The groundwater data shown are from shallow monitoring wells and exclude the March 2018 sample from MW-118, which USEPA has also excluded from its analysis (Smeraldi, 2020). Groundwater depths are the reported depths to the water table, and most wells were screened over a 10-ft interval. The soil/fill data are from the boring locations from the Remedial Investigation (RI), and the sample start and end depths are shown as error bars on the sample depth data points. Duplicate samples are shown in both the groundwater and soil/fill graphs.

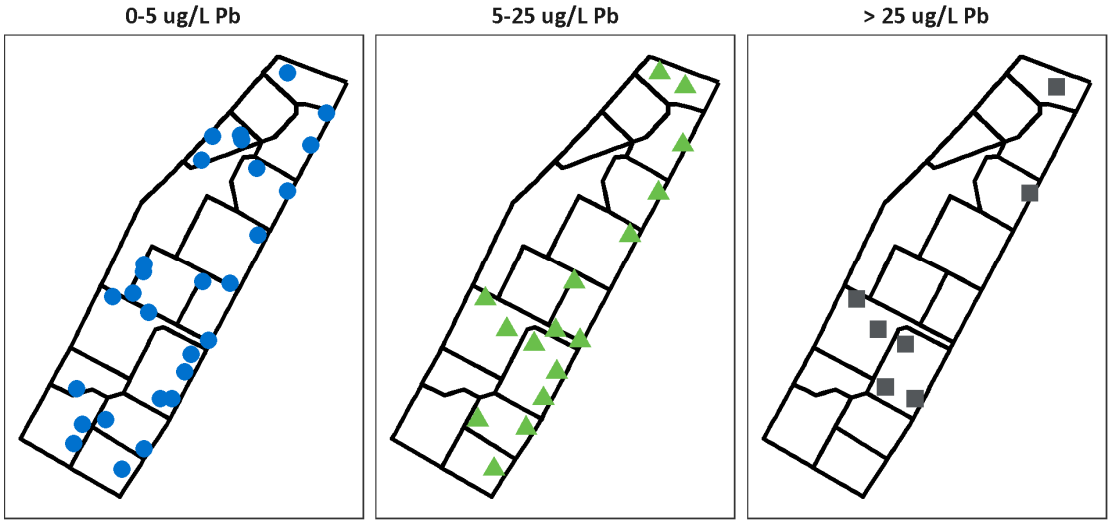
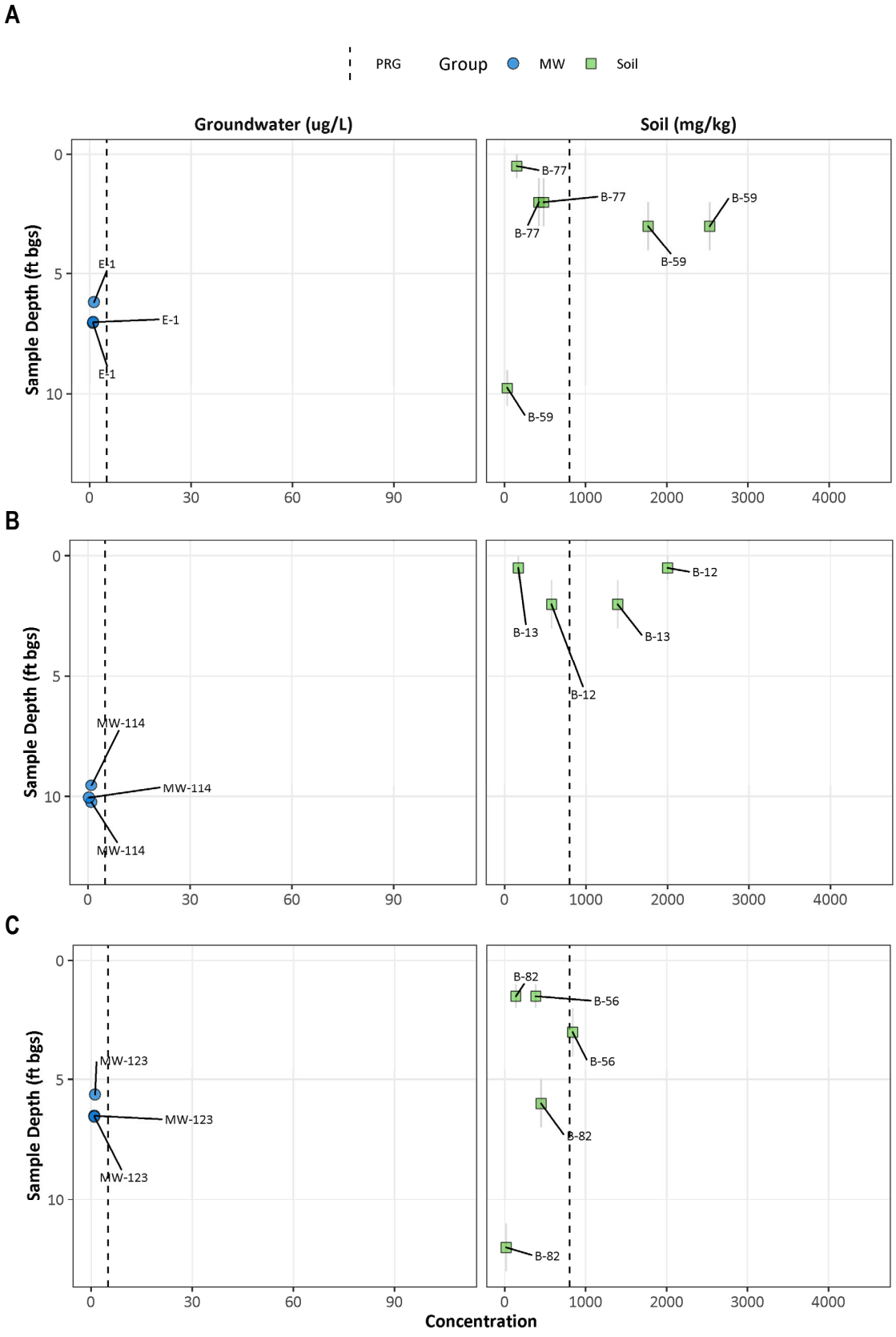


Figure 3: Monitoring Well Locations Grouped by Groundwater Lead Concentrations. These three maps show groundwater monitoring wells grouped by those that have had any lead measurements less than 5 µg/L, those that have had lead measurements between 5 and 25 µg/L, and those that have had any lead measurements over 25 µg/L, respectively. Low groundwater lead levels (<5 µg/L) are widespread at the Site. Lead concentrations are not consistently elevated at the Site; instead, in many wells, exceedances of the groundwater PRG have been transient. Moderate lead concentrations (5 to 25 µg/L) have been detected in wells throughout the Site during at least one sampling period, which suggests the presence of a consistent source of lead, such as would be found in historic fill. The highest concentrations have been found in limited locations across the entire Site and typically during just one sampling period. Only Well MW-107 has had measured lead concentrations higher than 25 µg/L in more than one sampling period.


A
PRG
Group
MW
Soil
Groundwater (ug/L)
Soil (mg/kg)
Sample Depth (ft bgs)
E-1
E-1
E-1
B-77
B-77
B-77
B-59
B-59
B-59
B
MW-114
MW-114
MW-114
B-13
B-13
B-12
B-12
C
MW-123
MW-123
MW-123
B-82
B-56
B-56
B-82
B-82
Concentration

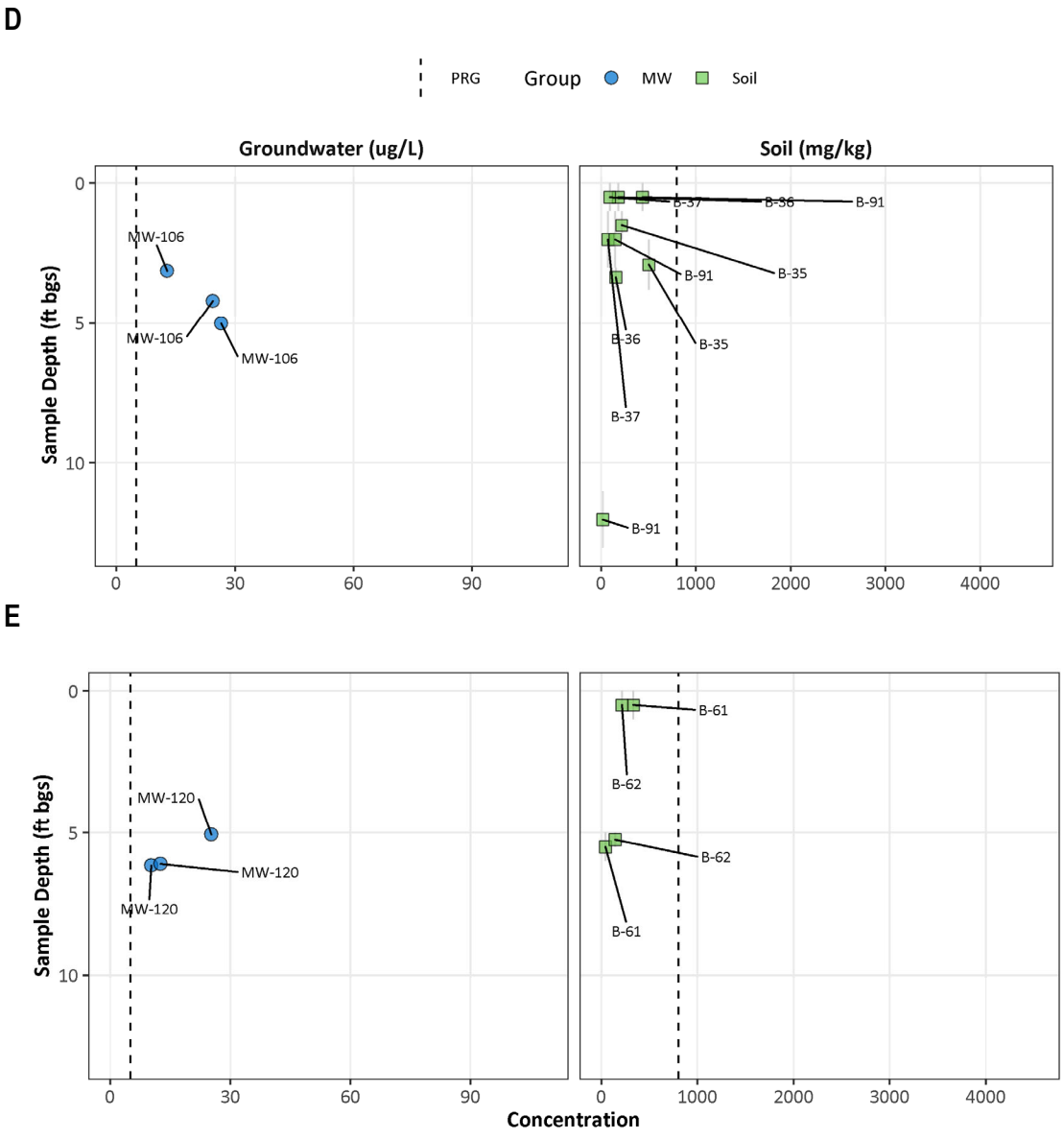


Figure 4: Depth Profiles of Groundwater and Soil/Fill Lead Concentrations Near Five Monitoring Wells. Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. The groundwater data shown are from shallow monitoring wells. Groundwater depths are the reported depths to the water table, and most wells were screened over a 10-ft interval. The soil/fill data are from the boring locations from the Remedial Investigation (RI), and sample start and end depths are shown as error bars on the sample depth data points. Duplicate samples are shown in both the groundwater and soil/fill graphs. Panels A, B, and C show wells (E-1, MW-114, and MW-123, respectively) adjacent to locations where lead levels exceeding the soil/fill PRG (800 mg/kg) have been detected in which low concentrations of lead (<5 µg/L) have been detected in groundwater. Panels D and E show wells (MW-106 and MW-120, respectively) adjacent to locations where lead levels have been detected at or below the soil PRG in which elevated groundwater lead concentrations have been detected.

Tidal Review: Fill Unit

Riverside Industrial Park Site
29 Riverside Avenue
City of Newark, New Jersey
Figure **5**

Legend

- Monitoring Well: Fill Unit
- Bulkhead
- Approximate Extent of Inferred Tidal Influence on Shallow (Fill) Groundwater
- Building Outline
- Fence

0 40 80 160 Feet

N

WOODARD &CURRAN

Project #: 0013620
Map Created: September 2020

Figure Exported: 9/8/2020 By: baigler Using: \\woodardcurran.net\shared\Projects\0013620 PPG Industries - Riverside - Newark NJ\wip\GIS\Project Files\MXD\2020 Hydraulic\Shallow_Tidal.mxd

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: Site Features and Sample Locations surveyed by Denns W. Sklar, Inc.; Aerial Photo: ESRI World Imagery**

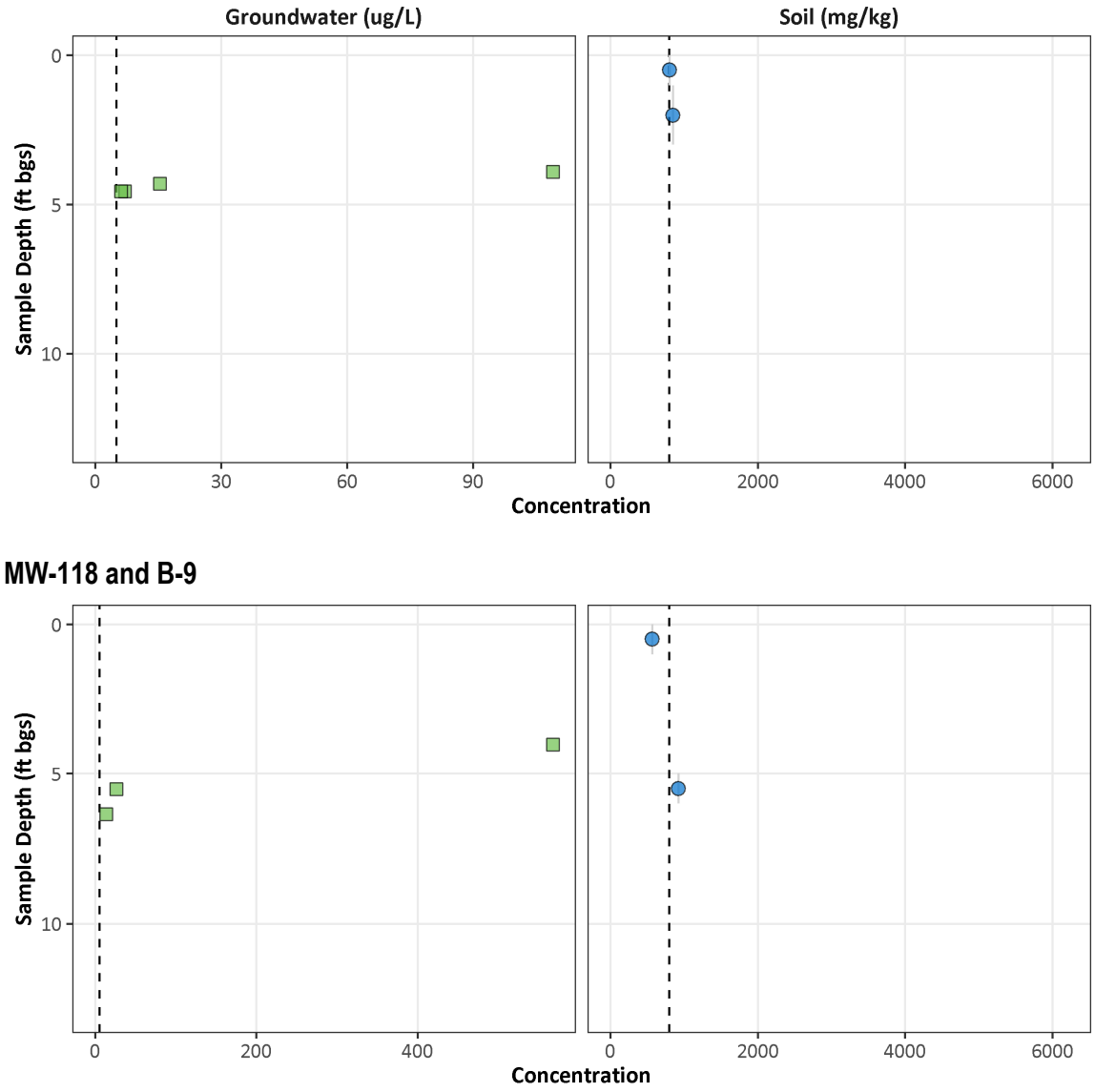
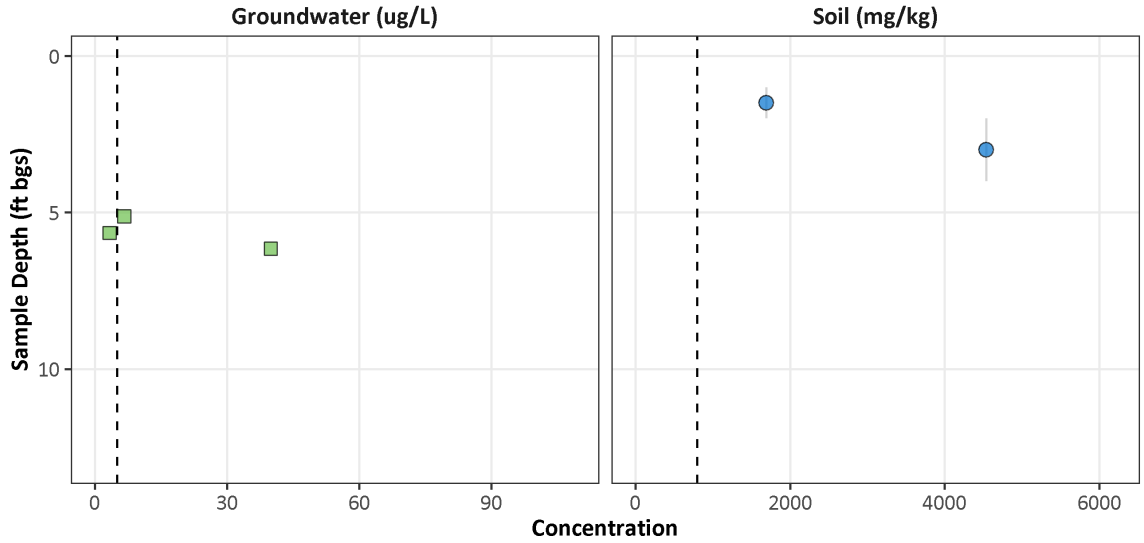
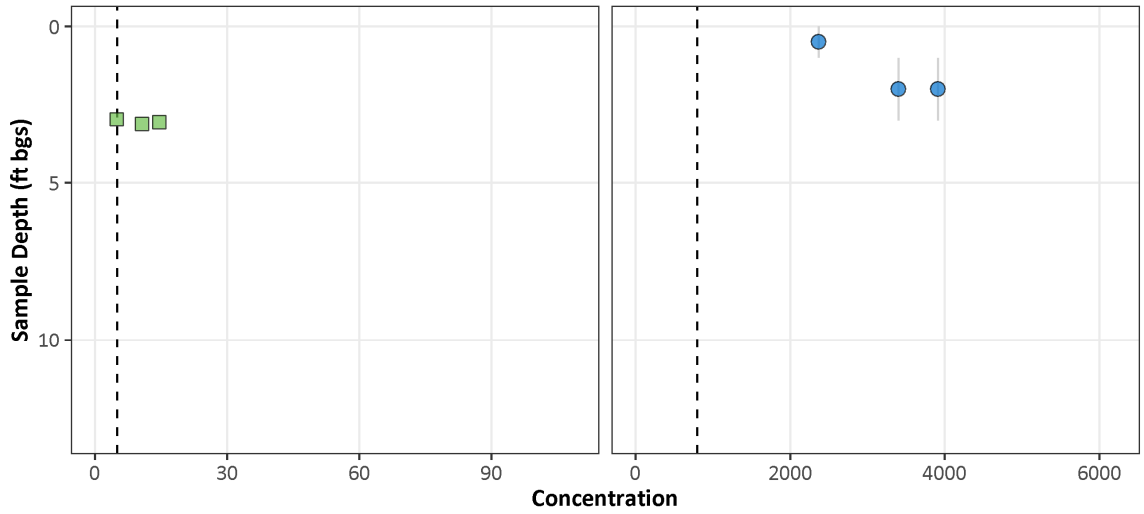


Figure 6. Depth Profiles of Groundwater and Soil/Fill Lead Concentrations Near the Two Monitoring Wells with the Highest Groundwater Concentrations. Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. MW-108 is located within 2 feet of B-29. MW-118 is located with 4 feet of B-9. Groundwater depths are the reported depths to the water table, and most wells were screened over a 10-ft interval. The soil/fill data are from the boring locations from the Remedial Investigation (RI), and sample start and end depths are shown as error bars on the sample depth data points. Duplicate samples are shown in both the groundwater and soil/fill graphs.

MW-110 and B-32



MW-111 and B-87



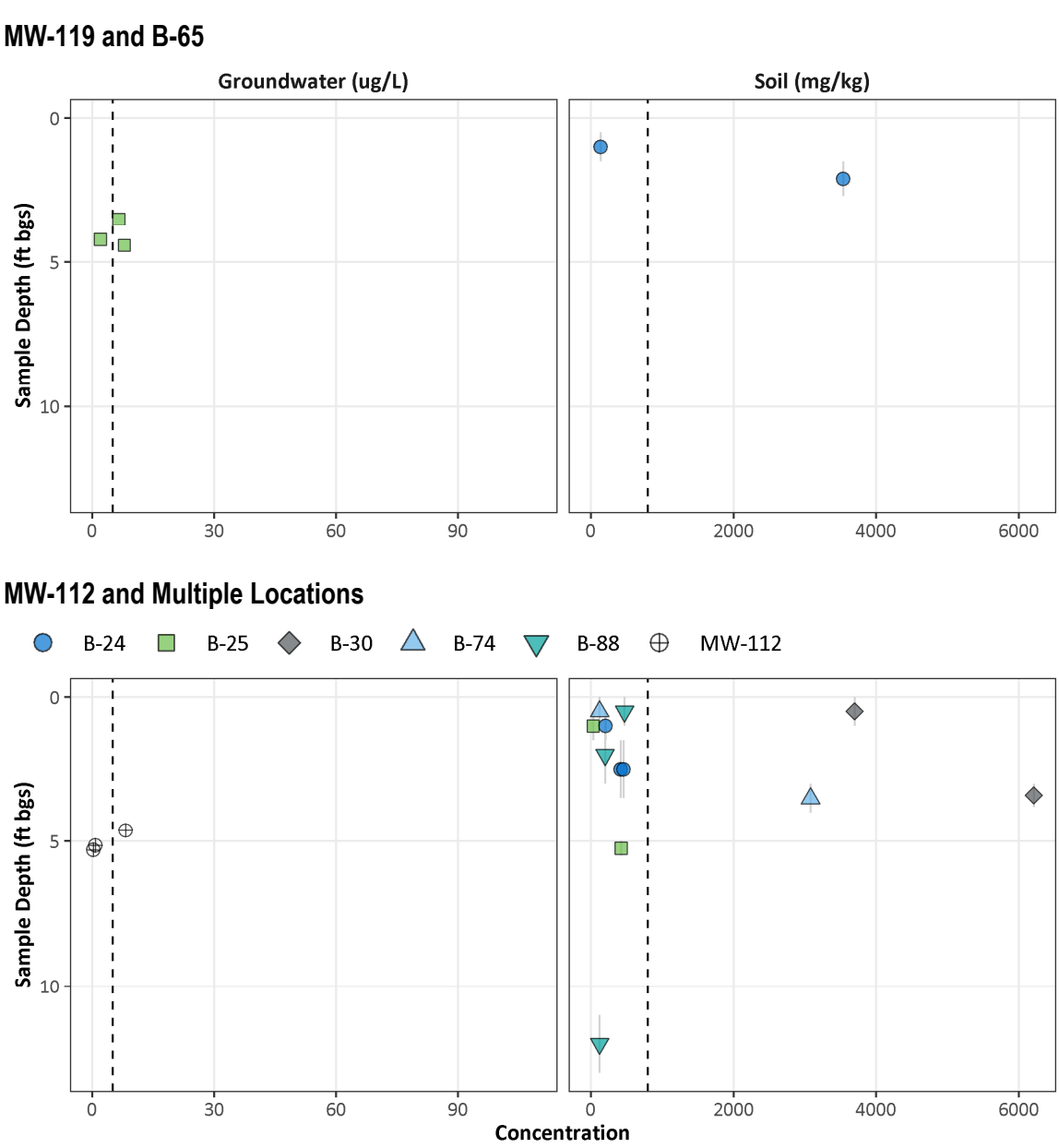


Figure 7. Depth Profiles of Groundwater and Soil/Fill Lead Concentrations Near to Some of the Highest Soil/Fill Concentrations. Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. MW-110 is located approximately 8 feet of B-32, MW-111 is located within 8 feet of B-87 and MW-119 is located with 3 feet of B-65. Multiple soil bores are located 40 to 60 feet from MW-112. Groundwater depths are the reported depths to the water table, and most wells were screened over a 10-ft interval. The soil/fill data are from the boring locations from the Remedial Investigation (RI), and sample start and end depths are shown as error bars on the sample depth data points. Duplicate samples are shown in both the groundwater and soil/fill graphs.

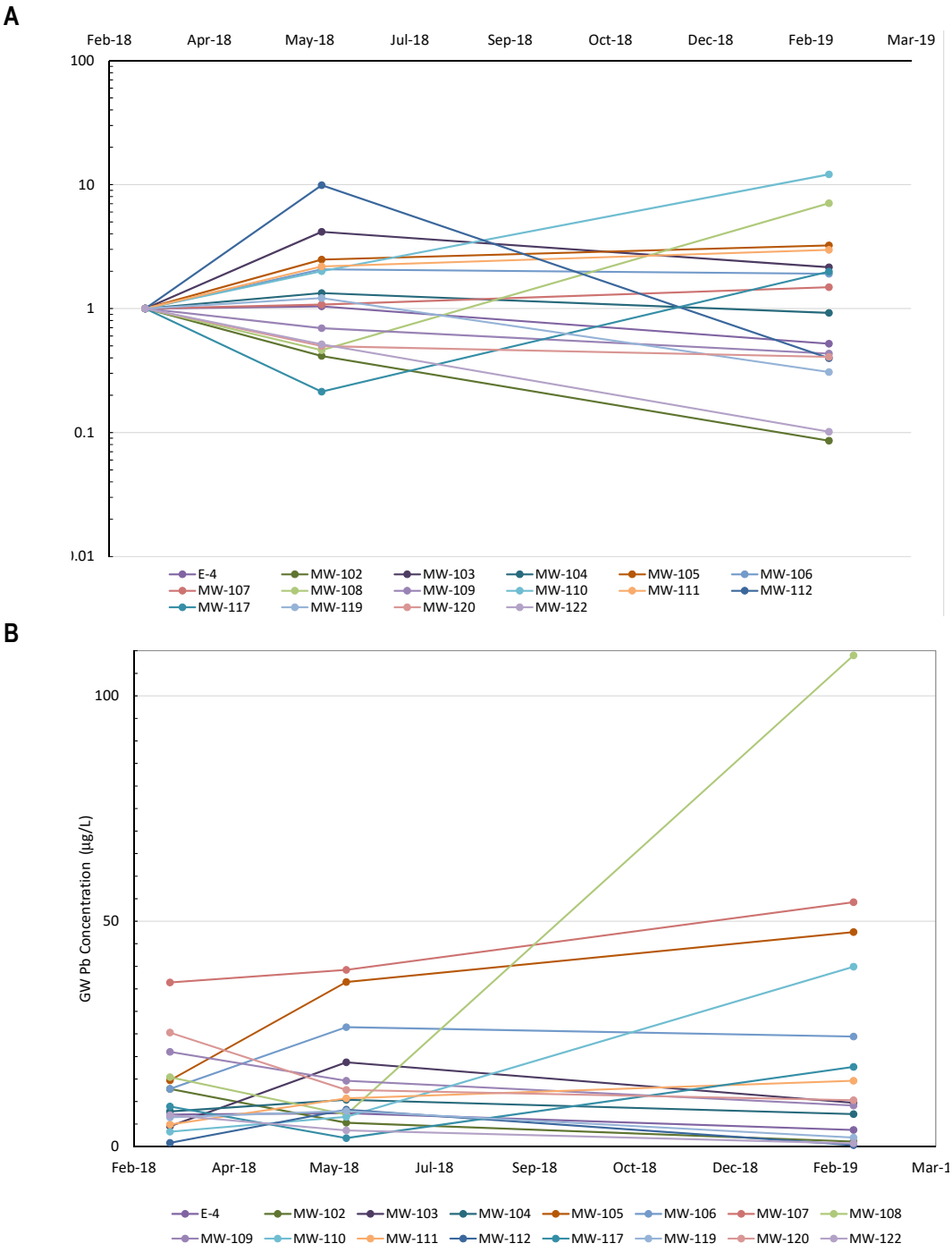


Figure 8: Relative Lead Concentrations in 16 Monitoring Wells with Any Measurement Above 5 µg/L. (A) The groundwater lead concentrations are scaled to the measurement taken during the first sampling event (in March 2018) to show both the direction and magnitude of the concentration changes over time; the value of 1 represents no change in concentration, while 10 represents a 10-fold increase in concentration and 0.1 a 10-fold decrease. (B) The same 16 wells are shown, with measured groundwater lead concentrations over time. This variability suggests that the groundwater lead concentrations are not being governed by soil/fill lead concentrations below the water table alone (contrary to USEPA's "top-down" CSM), and instead reflect the fact that the lead mobility is sensitive to changes in groundwater geochemistry.

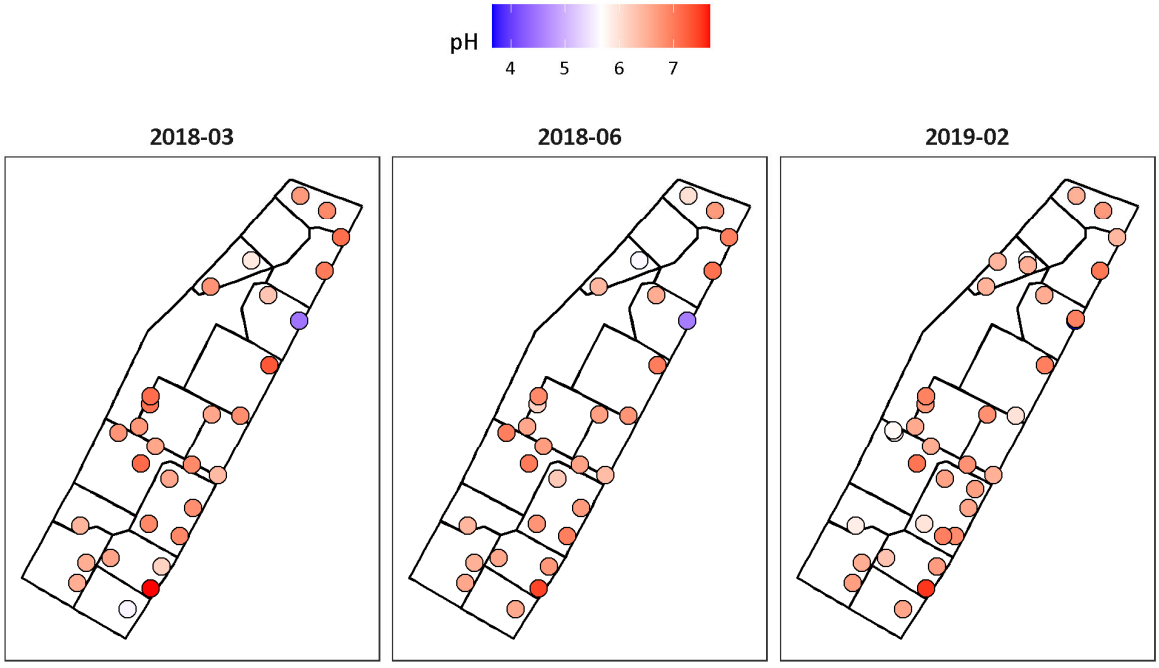
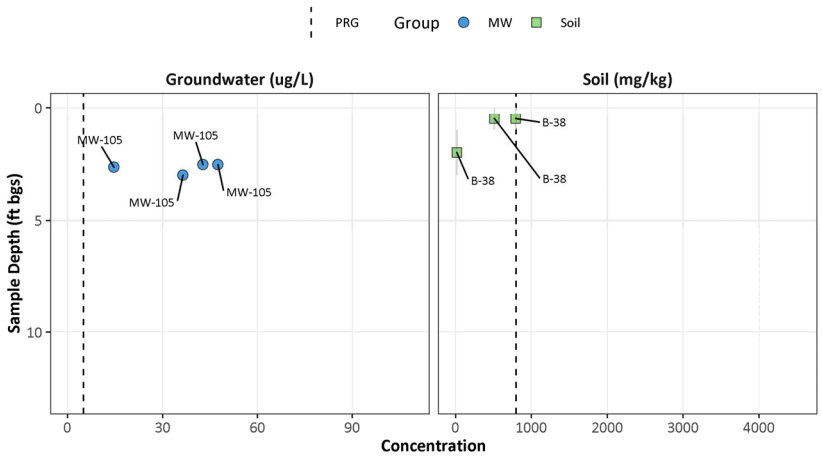


Figure 9: Field pH Measured in Each Monitoring Well During the Three Sampling Events. The groundwater at the Site has a near-neutral pH, with a pH between 6 and 7.5 measured in most wells during the various sampling events. pH values below 6 have occasionally been measured. Measured pH values have varied across the Site, with significantly lower measurements observed in many wells during the February 2019 sampling event.

A



B

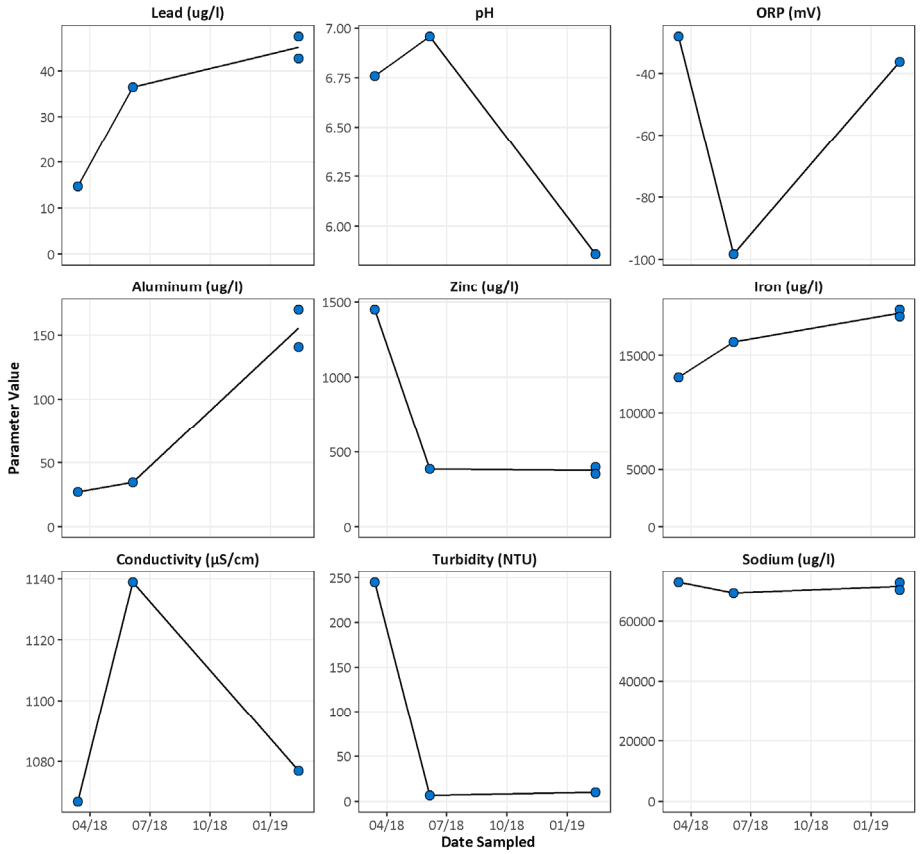
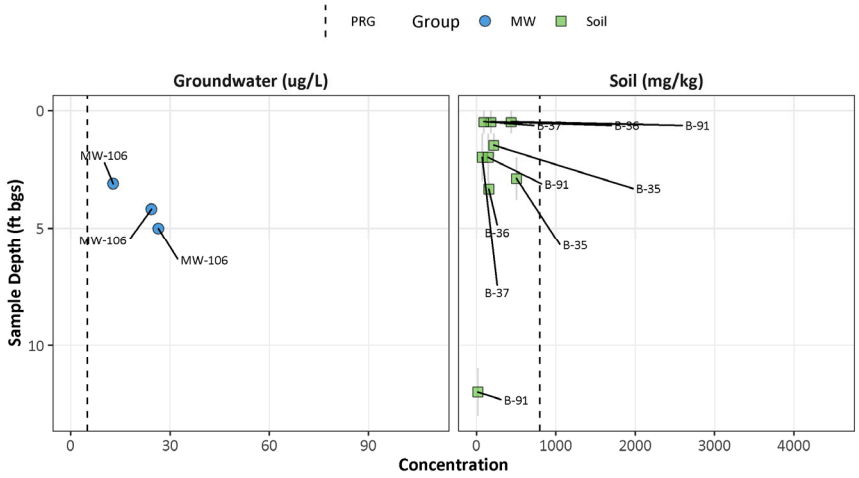


Figure 10: Groundwater and Soil/Fill Lead Concentration Depth Profiles (A) and Groundwater Concentrations Over Time (B) for MW-105. Panel A: Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. Groundwater lead concentrations at MW-105 have consistently been higher than the groundwater PRG, even though adjacent soil/fill concentrations have been at or lower than the soil/fill PRG. The groundwater lead concentrations reflect those of aluminum (a naturally occurring constituent), and the highest lead concentrations correspond with a drop in pH from nearly 7 to below 6 in this well between

sampling events. Other groundwater parameters have varied significantly in this well over time (*e.g.*, conductivity, though not sodium, and ORP).

A



B

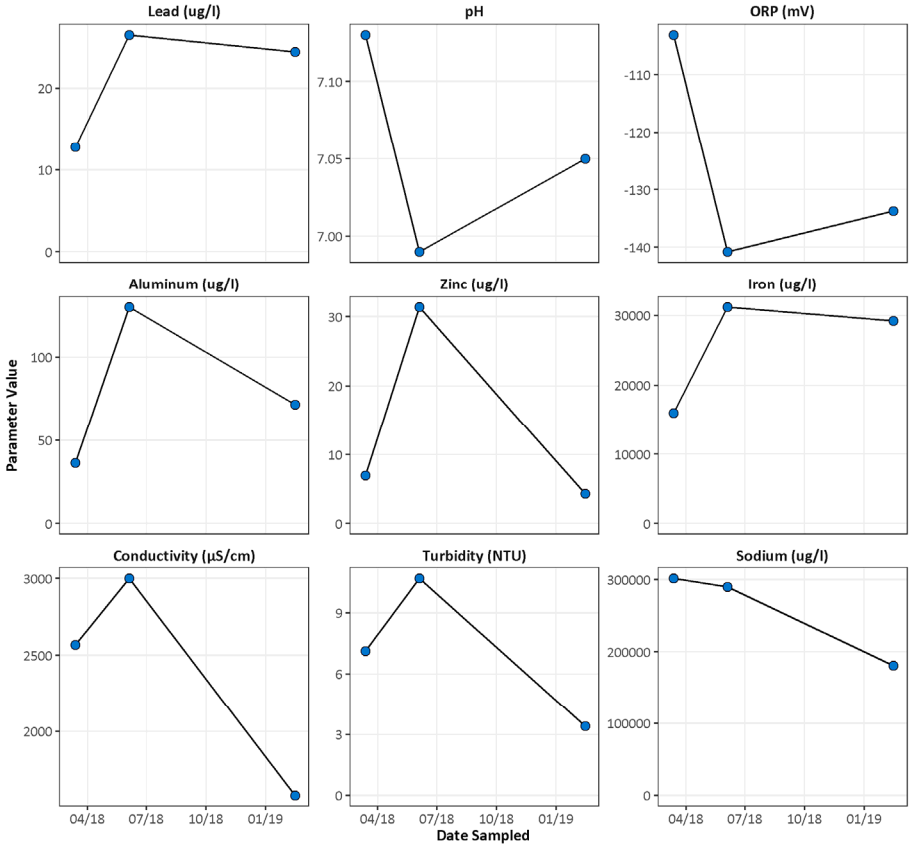
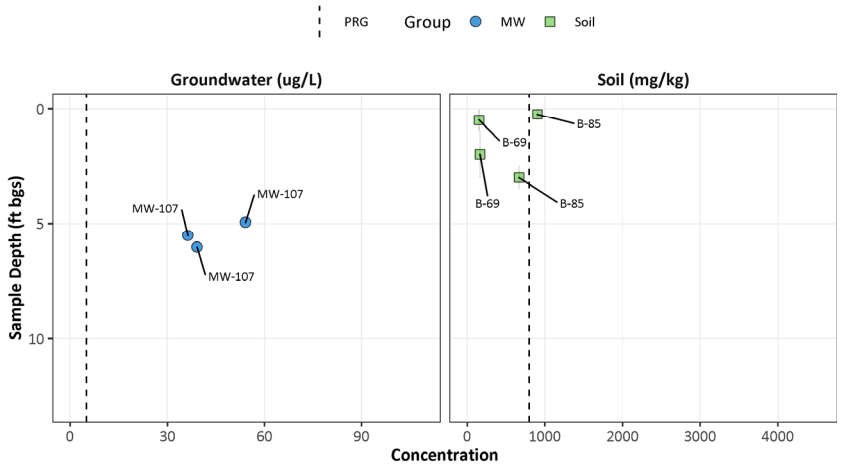


Figure 11: Groundwater and Soil/Fill Lead Concentration Depth Profiles (A) and Groundwater Concentrations Over Time (B) for MW-106. Panel A: Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. Groundwater lead concentrations at MW-106 have consistently been higher than the groundwater PRG, even though adjacent soil/fill concentrations have been much lower than the soil/fill PRG. The groundwater lead concentrations reflect those of aluminum (a naturally occurring constituent), and the highest lead concentrations correspond with a small drop in pH in this well between sampling events. Other

groundwater parameters have varied significantly in this well over time (*e.g.*, ORP, conductivity, and to some extent, sodium).

A



B

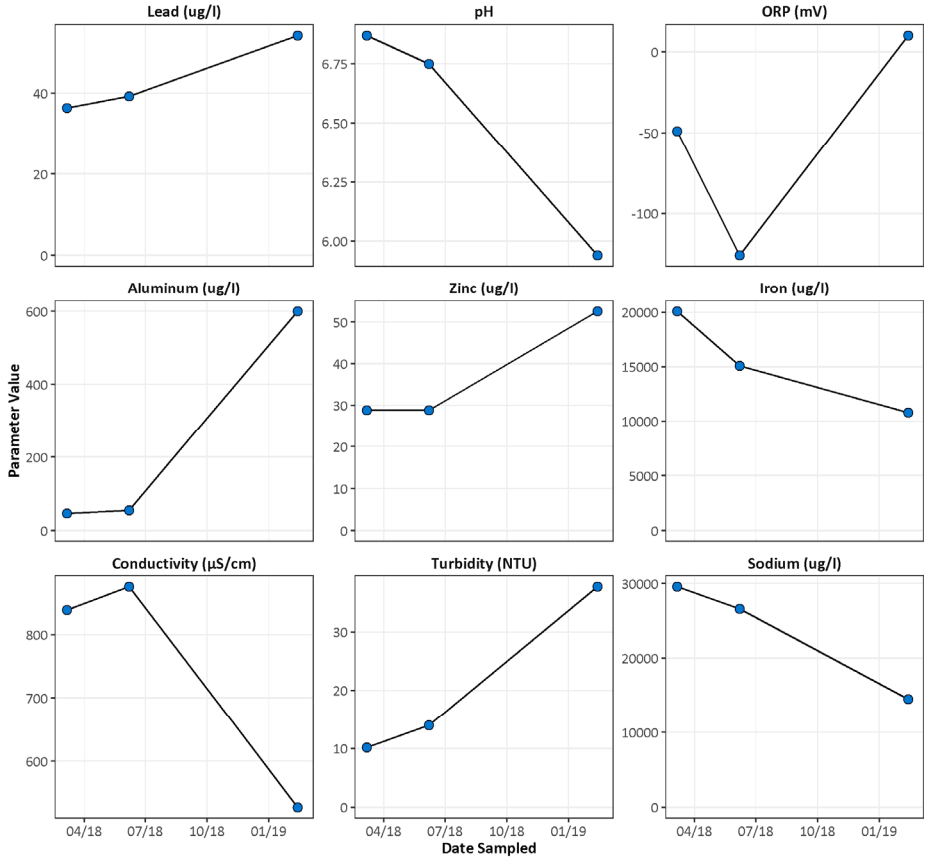
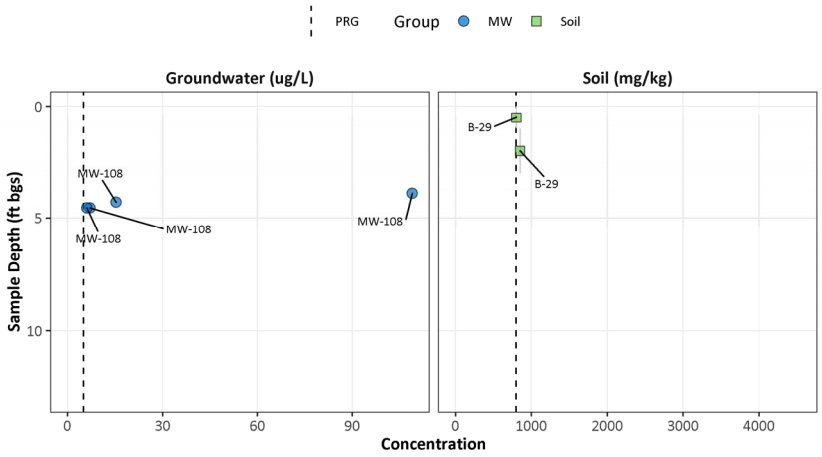


Figure 12: Groundwater and Soil/Fill Lead Concentration Depth Profiles (A) and Groundwater Concentrations Over Time (B) for MW-107. Panel A: Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. Groundwater lead concentrations at MW-107 have been consistently higher than the groundwater PRG, even though adjacent soil/fill concentrations have been at or lower than the soil/fill PRG. The groundwater lead concentrations reflect those of aluminum and zinc (naturally occurring constituents or constituents in historic fill), and the highest lead concentration corresponds with a significant decrease in

pH and increase in turbidity in this well between sampling events. Other groundwater parameters have varied significantly in this well over time (*e.g.*, conductivity, sodium, and ORP).

A



B

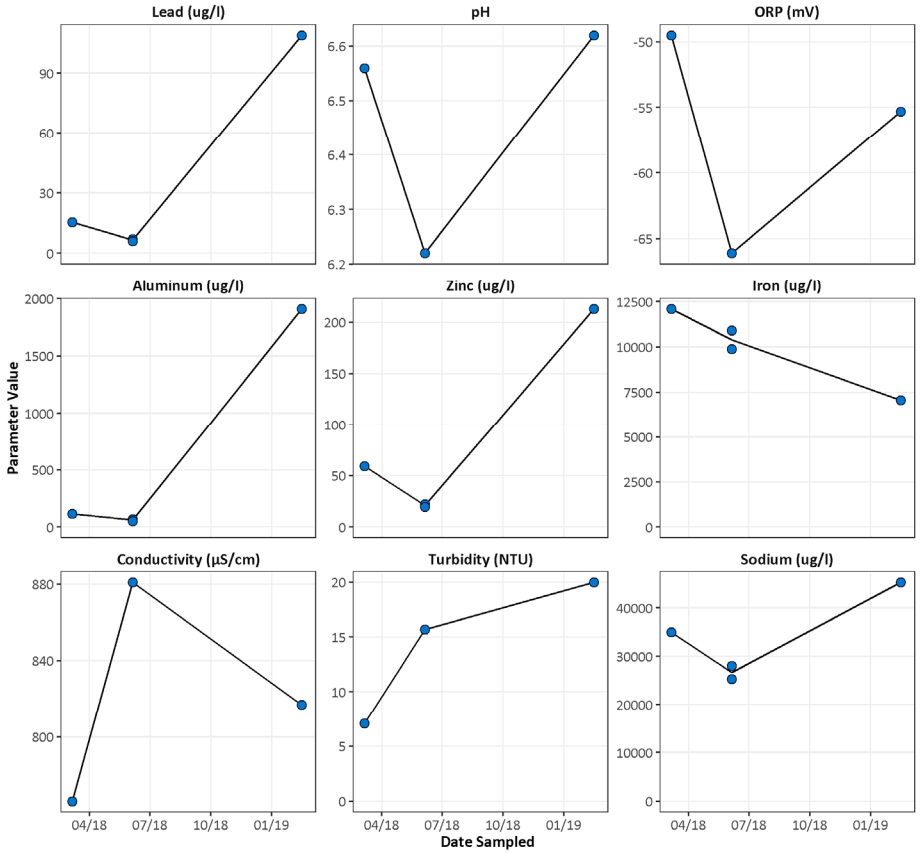


Figure 13: Groundwater and Soil/Fill Lead Concentration Depth Profiles (A) and Groundwater Concentrations Over Time (B) for MW-108. Panel A: Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. Groundwater lead concentrations at MW-108 have been consistently at or higher than the groundwater PRG, even though the adjacent soil/fill concentrations have been at the soil/fill PRG. The groundwater lead concentrations reflect those of aluminum and zinc (naturally occurring constituents or constituents in historic fill). However, the significant increase in the groundwater aluminum level from the

second to third sampling events may indicate the presence of small particles in the sampled water. Other groundwater parameters have varied less in this well over time (*e.g.*, pH, ORP, conductivity, and sodium).

A

B

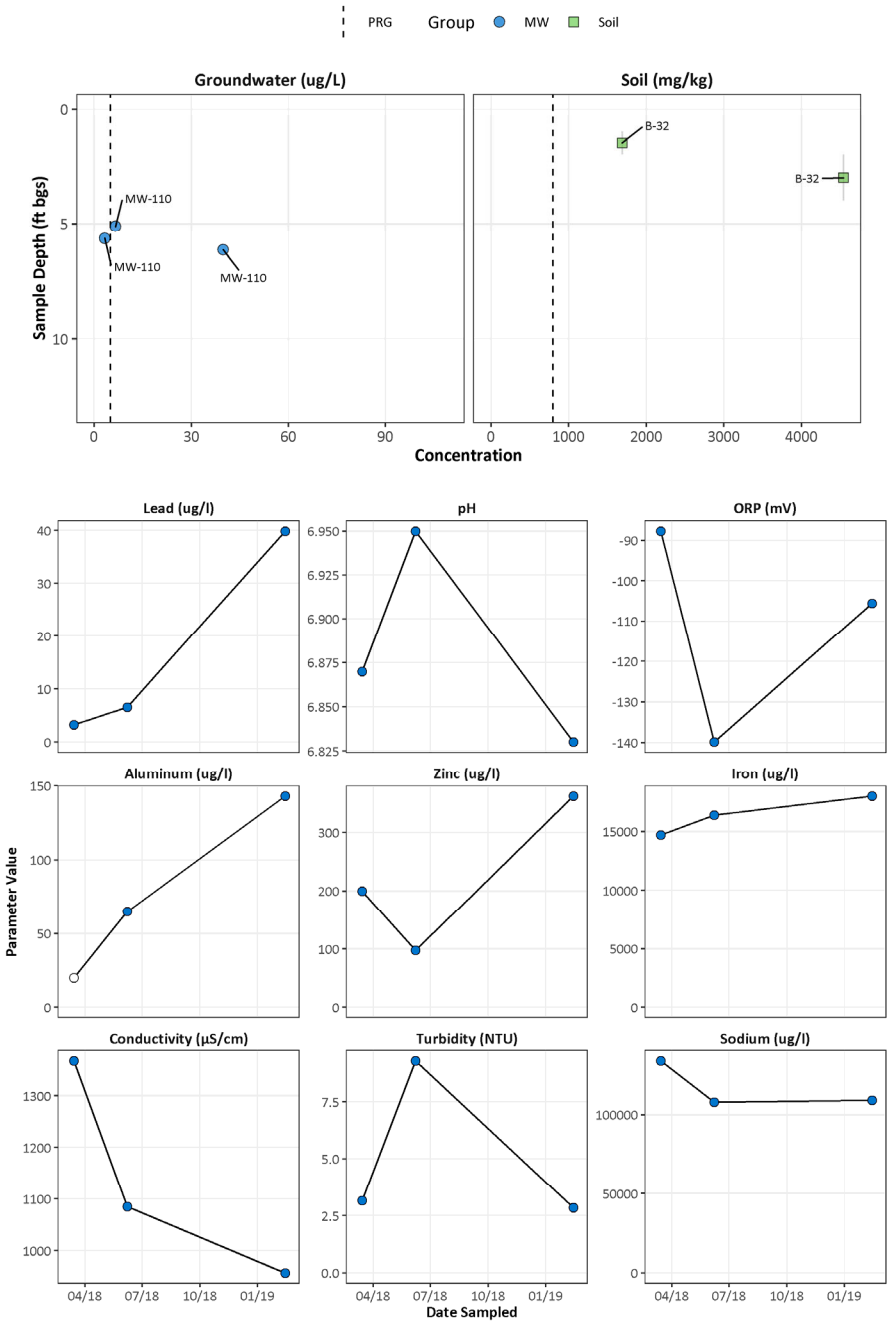


Figure 14: Groundwater and Soil/Fill Lead Concentration Depth Profiles (A) and Groundwater Concentrations Over Time (B) for MW-110. Panel A: Soil PRG for lead = 800 mg/kg; Groundwater PRG for lead = 5 µg/L. Panel B: A white marker indicated a not-detected value (the constituent's detection limit is plotted instead). Two measurements of groundwater lead concentrations in this well have been at or lower than the groundwater PRG, even though the adjacent soil/fill concentrations have been significantly higher than the soil/fill PRG (the other groundwater sample had an elevated lead level of 40 µg/L). The

groundwater lead concentrations reflect those of aluminum and zinc (naturally occurring constituents or constituents in historic fill). Other groundwater parameters have varied less over time (*e.g.*, pH, conductivity, and sodium).

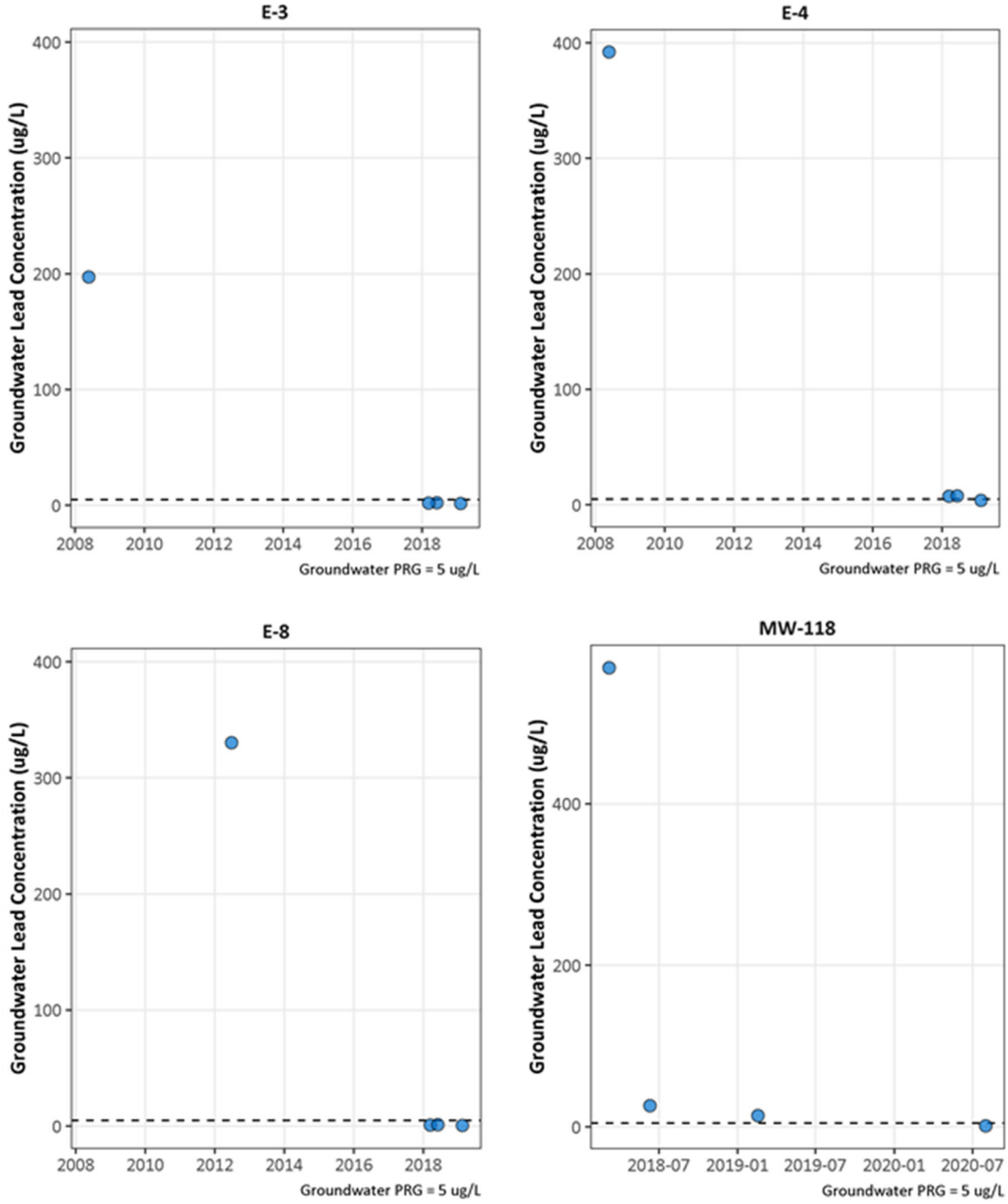


Figure 15: Groundwater Concentrations Over Time in Four Monitoring Wells. Groundwater concentrations over time are shown for E-3, E-4, E-8 and MW-118.

Figure **16A**

Lead Results
For Each Sampling Event
Compared to 5 ug/L

Riverside Industrial Park Superfund Site
29 Riverside Avenue
City of Newark, New Jersey

Legend

RIFS Groundwater Sampling Results (ug/L)

- Detection Below 5 ug/l (yellow)
- Detection Exceeds 5 ug/l (blue)
- Result Not Detected (green)

Buildings (Survey)

Notes:

1. See RIR results tables for qualifier definitions.
2. Shoreline extents are approximate and are subject to interpretation
3. Reference: April 2020 RIR, Figure 4-40.

N

0 75 150 Feet

1 inch = 150 feet

Project #: 0013620

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

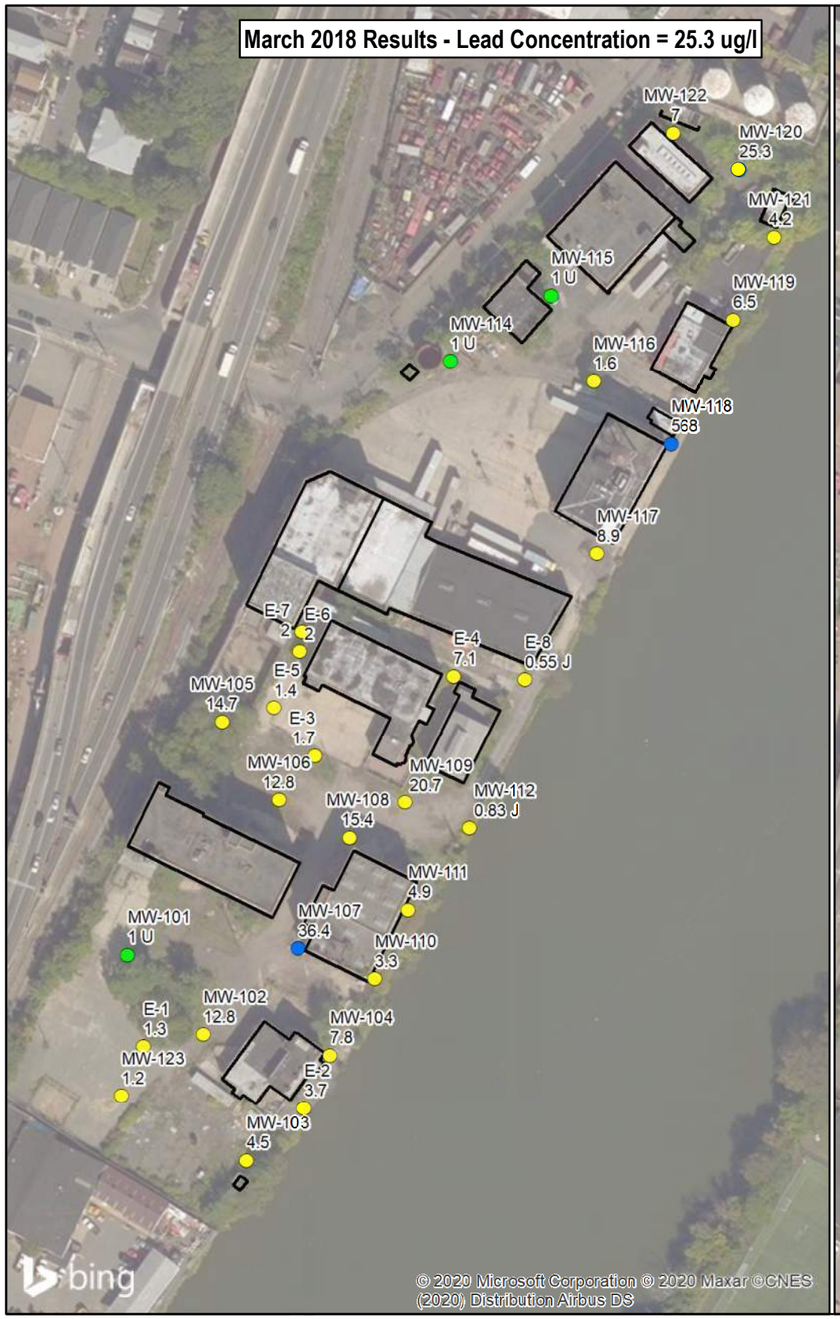


Figure 16B

Lead Results
For Each Sampling Event
Compared to 25.3 ug/L

Riverside Industrial Park Superfund Site
29 Riverside Avenue
City of Newark, New Jersey

Legend

RIFS Groundwater Sampling Results (ug/L)

- Detection Below 25.3 ug/l (yellow)
- Detection Exceeds 25.3 ug/l (blue)
- Result Not Detected

Buildings (Survey)

Notes:

1. See RIR results tables for qualifier definitions.
2. Shoreline extents are approximate and are subject to interpretation
3. Reference: April 2020 RIR, Figure 4-40.

N

0 75 150 Feet

1 inch = 150 feet

Project #: 0013620

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

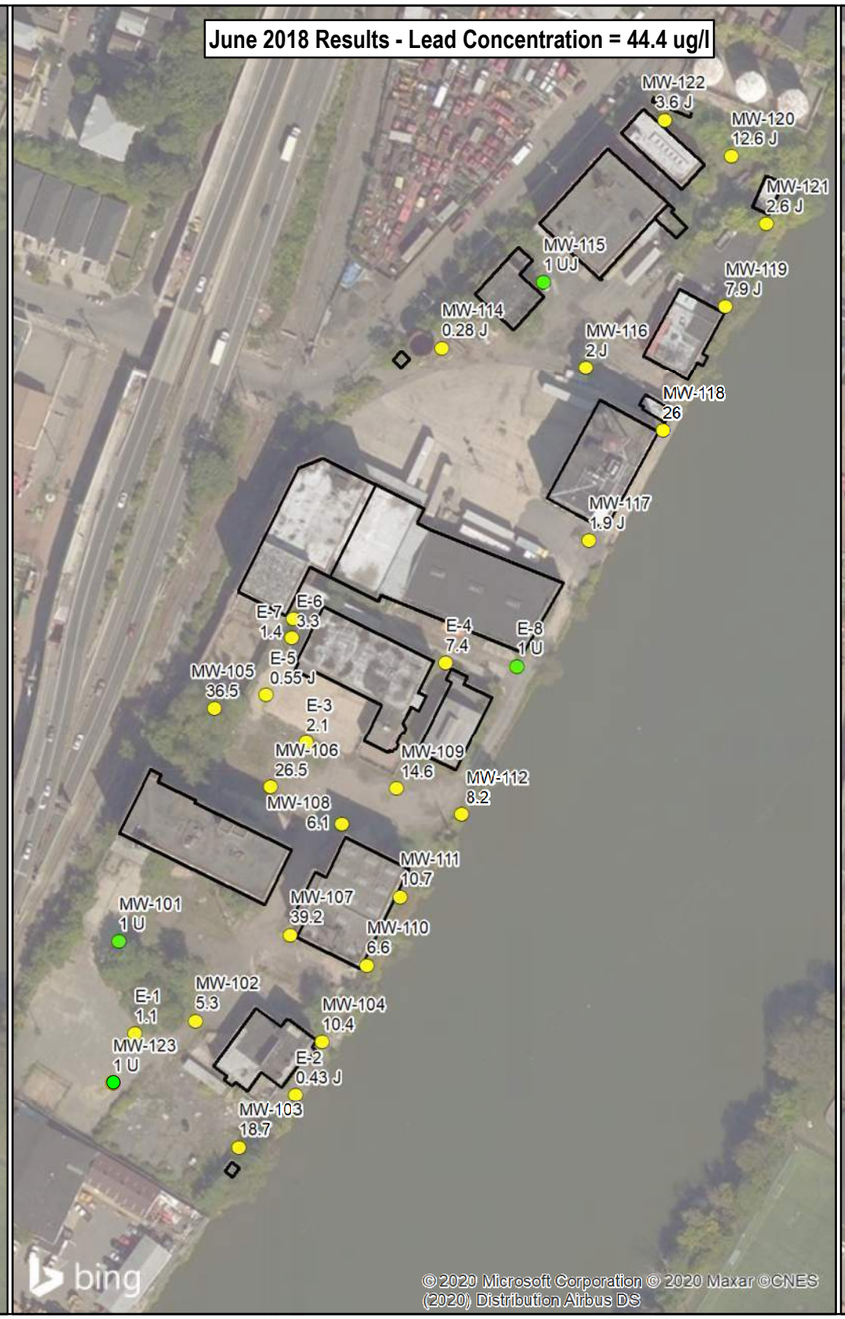


Figure 16C

Lead Results
For Each Sampling Event
Compared to 44.4 ug/L

Riverside Industrial Park Superfund Site
29 Riverside Avenue
City of Newark, New Jersey

Legend

RIFS Groundwater Sampling Results (ug/L)

- Detection Below 44.4 ug/l (yellow)
- Detection Exceeds 44.4 ug/l (blue)
- Result Not Detected

Buildings (Survey)

Notes:

1. See RIR results tables for qualifier definitions.
2. Shoreline extents are approximate and are subject to interpretation
3. Reference: April 2020 RIR, Figure 4-40.

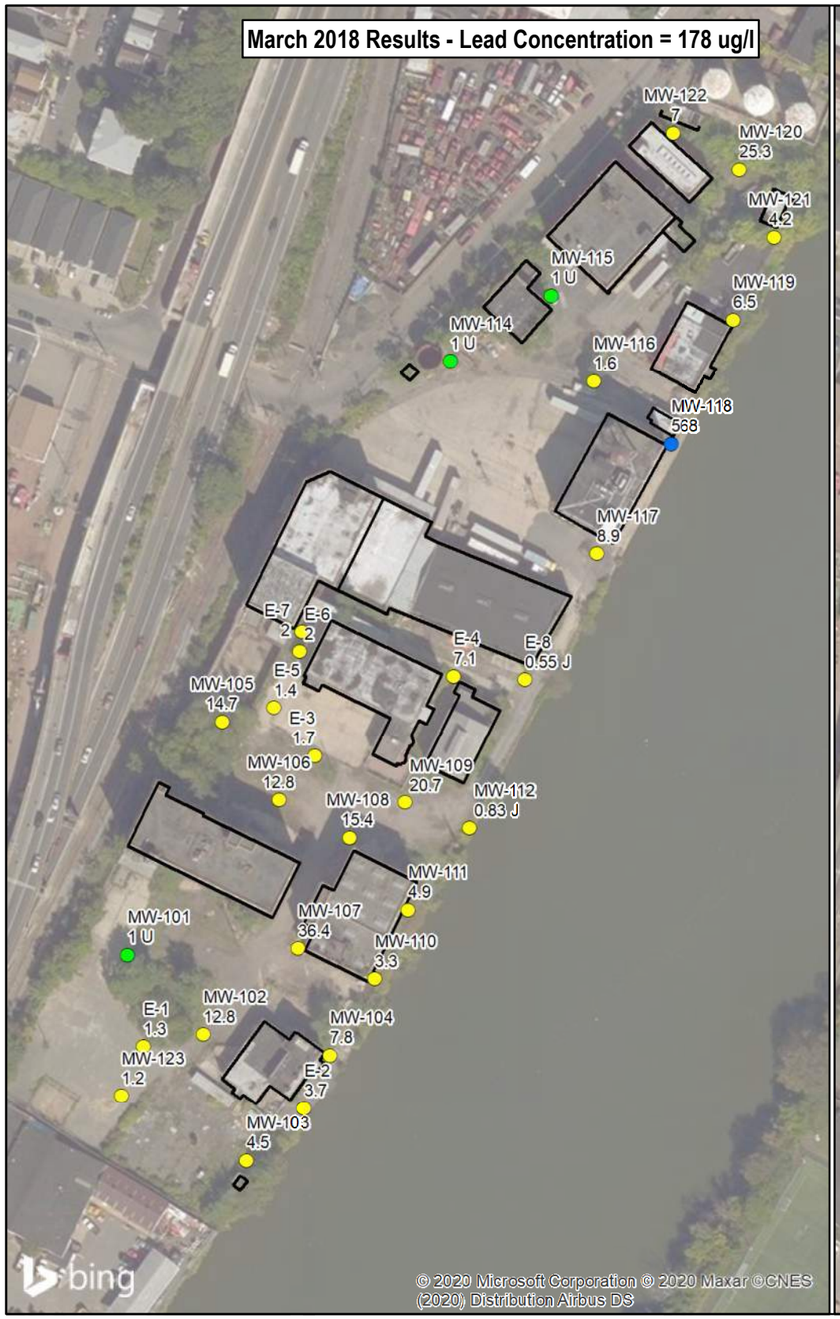
N

0 75 150 Feet

1 inch = 150 feet

Project #: 0013620

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.



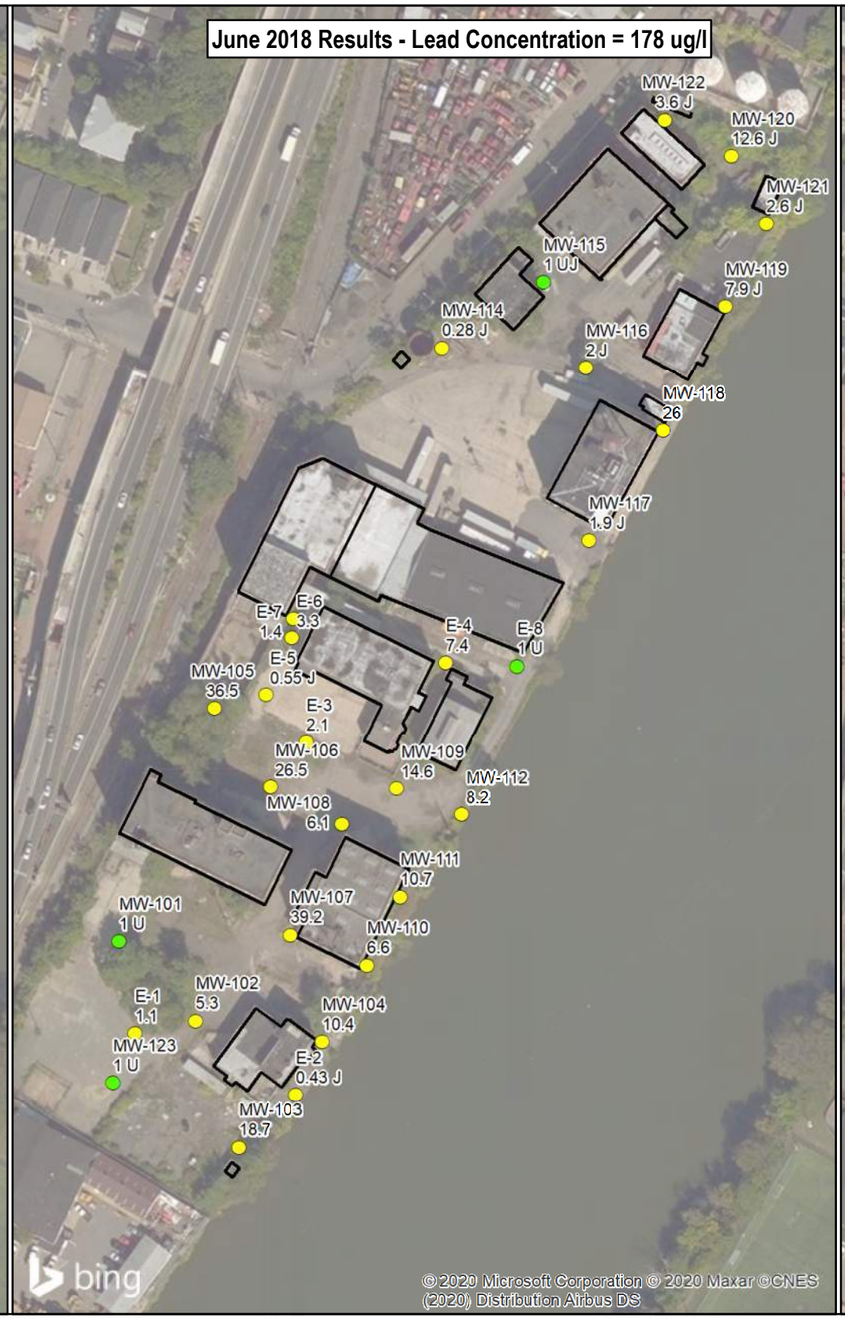


Figure 16D

Lead Results
For Each Sampling Event
Compared to 178 ug/L

Riverside Industrial Park Superfund Site
29 Riverside Avenue
City of Newark, New Jersey

Legend

RIFS Groundwater Sampling Results (ug/L)

- Detection Below 178 ug/l
- Detection Exceeds 178 ug/l
- Result Not Detected

Buildings (Survey)

Notes:

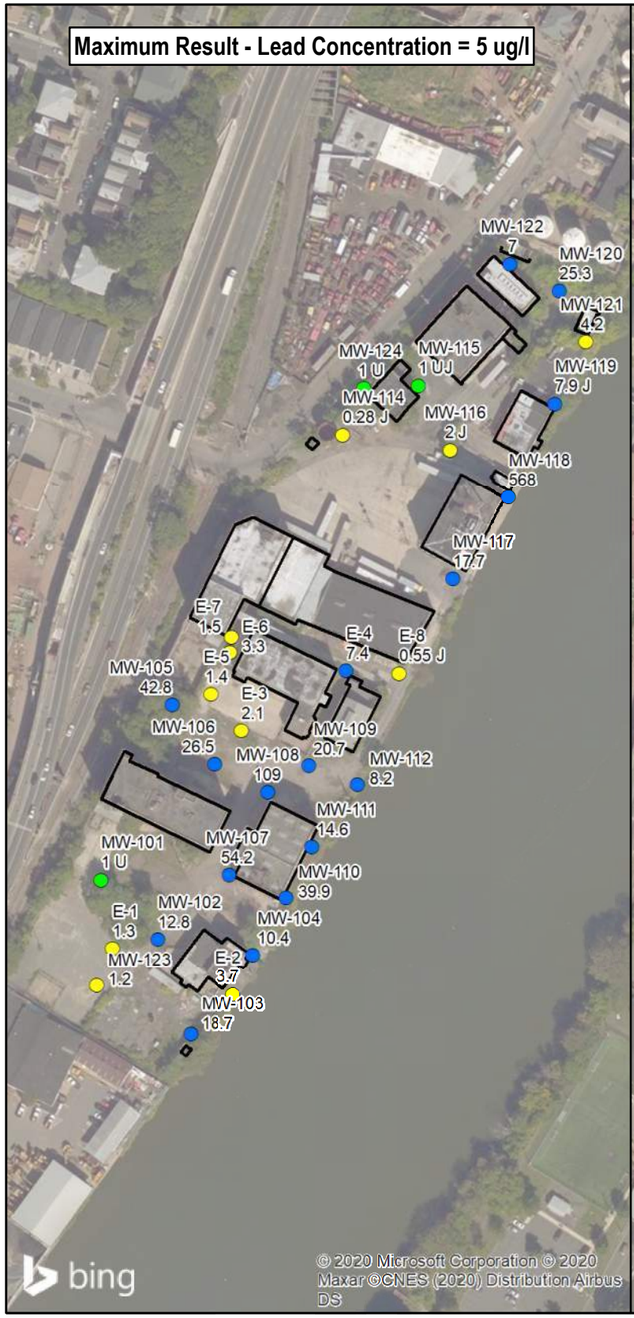
1. See RIR results tables for qualifier definitions.
2. Shoreline extents are approximate and are subject to interpretation
3. Reference: April 2020 RIR, Figure 4-40.

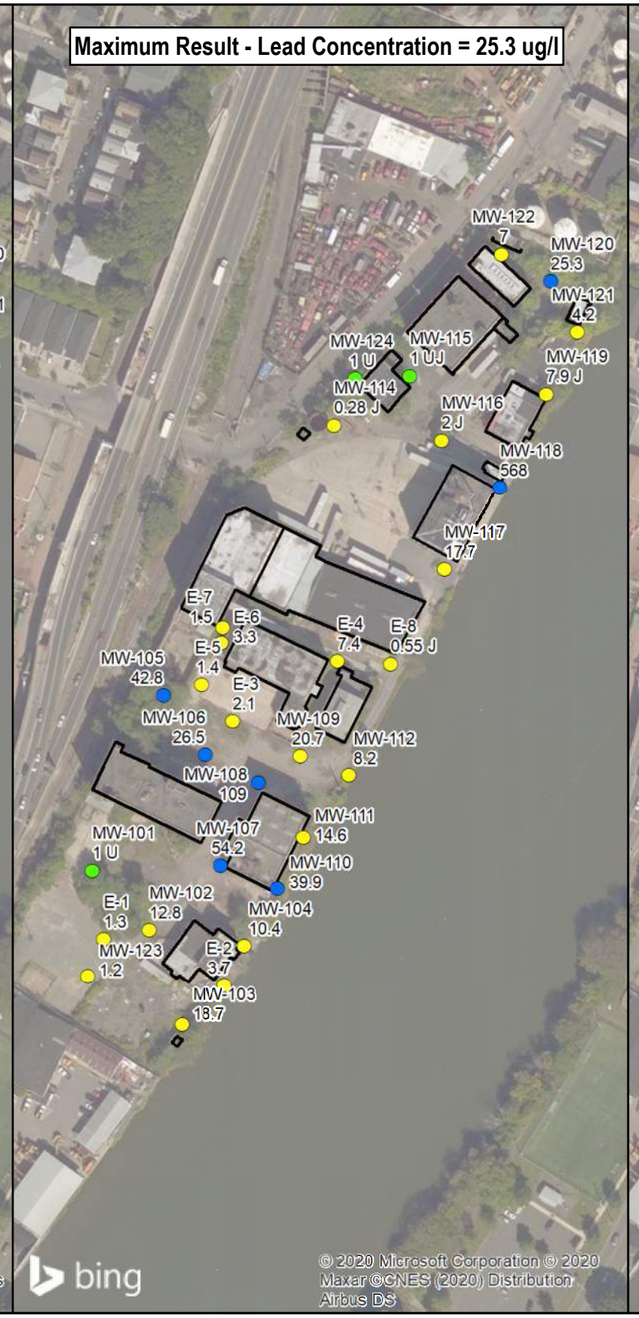
N

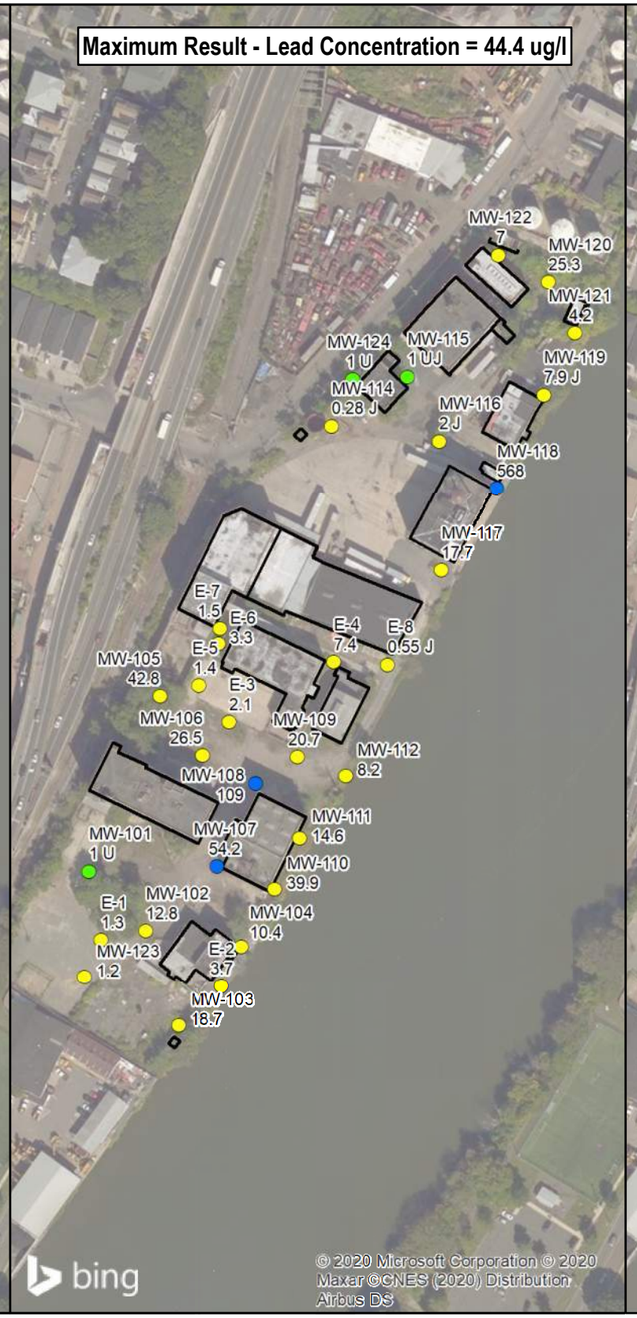
0 75 150 Feet

1 inch = 150 feet

Project #: 0013620







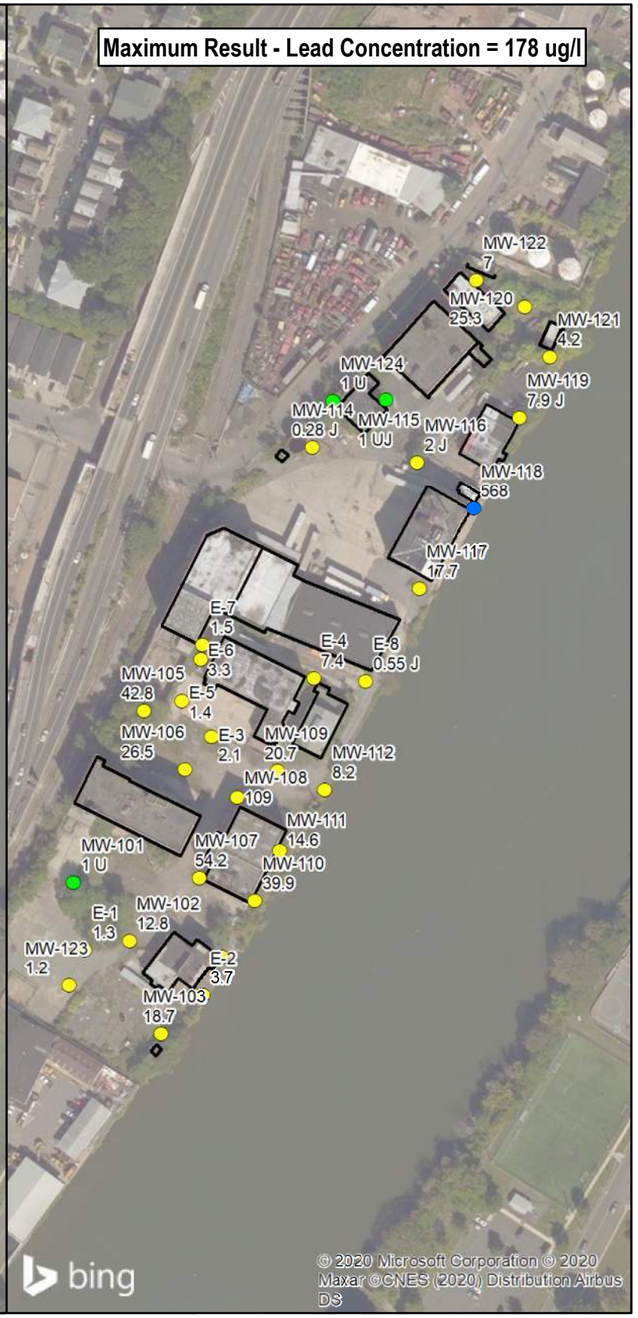


Figure 16E

Maximum Lead Results
At a Well During RI Compared to
5, 25.3, 44.4, and 178 ug/L

Riverside Industrial Park Superfund Site
29 Riverside Avenue
City of Newark, New Jersey

Legend

RIFS Groundwater Sampling Results (ug/L)

- Detection Below Lead Concentration (yellow)
- Detection Exceeds Lead Concentration (blue)
- Result Not Detected (green)

Buildings (Survey)

Notes:

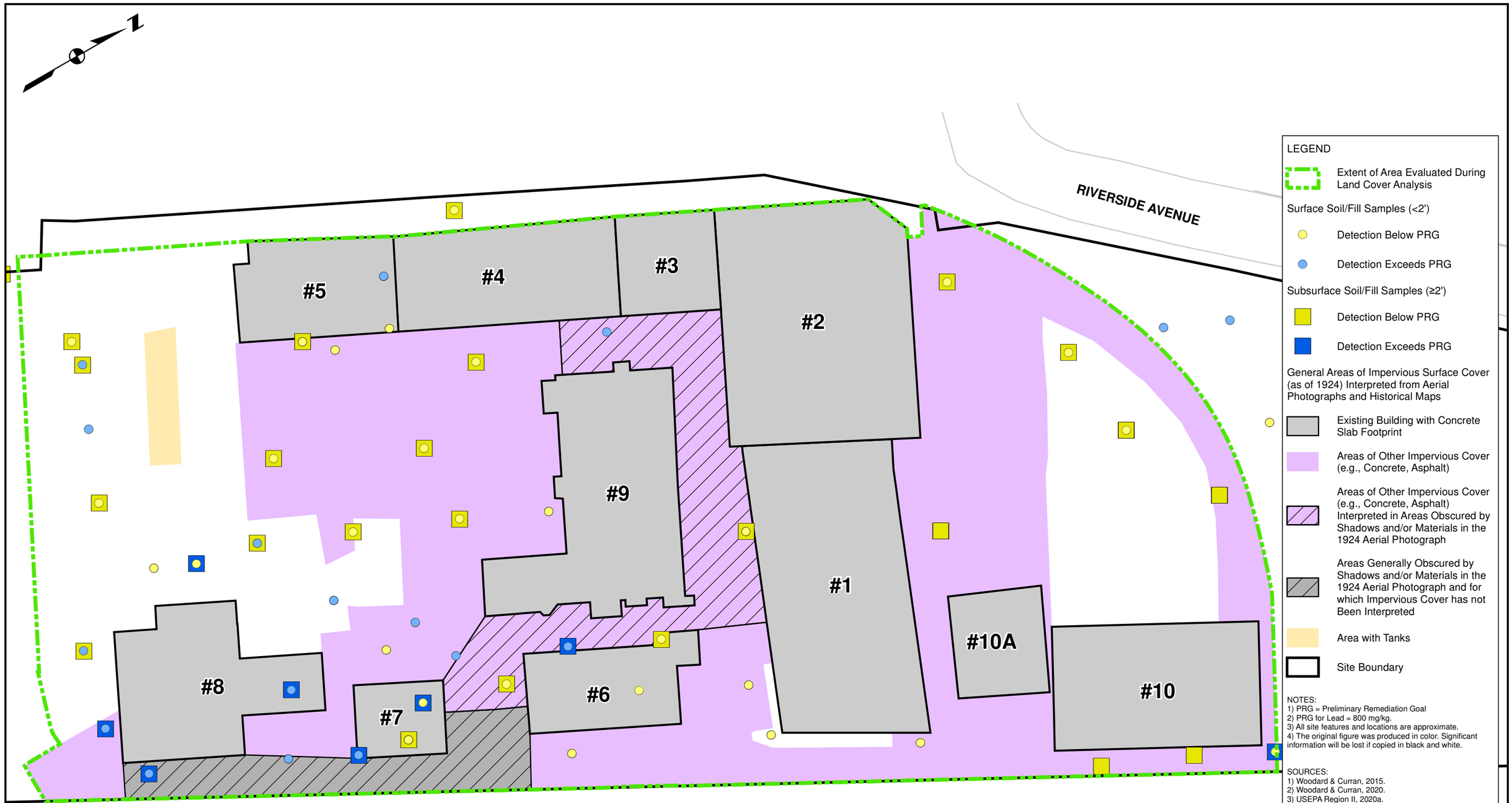
1. See RIR results tables for qualifier definitions.
2. Shoreline extents are approximate and are subject to interpretation
3. Reference: April 2020 RIR, Figure 4-40.
4. Results include sample events; March 2018, June 2018, and February 2018

N

0 75 150 Feet

1 inch = 200 feet

Project #: 0013620



LEGEND

Extent of Area Evaluated During Land Cover Analysis

Surface Soil/Fill Samples (<2')

Detection Below PRG

Detection Exceeds PRG

Subsurface Soil/Fill Samples (≥2')

Detection Below PRG

Detection Exceeds PRG

General Areas of Impervious Surface Cover (as of 1924) Interpreted from Aerial Photographs and Historical Maps

Existing Building with Concrete Slab Footprint

Areas of Other Impervious Cover (e.g., Concrete, Asphalt)

Areas of Other Impervious Cover (e.g., Concrete, Asphalt) Interpreted in Areas Obscured by Shadows and/or Materials in the 1924 Aerial Photograph

Areas Generally Obscured by Shadows and/or Materials in the 1924 Aerial Photograph and for which Impervious Cover has not Been Interpreted

Area with Tanks

Site Boundary

NOTES:
1) PRG = Preliminary Remediation Goal
2) PRG for Lead = 800 mg/kg.
3) All site features and locations are approximate.
4) The original figure was produced in color. Significant information will be lost if copied in black and white.

SOURCES:
1) Woodard & Curran, 2015.
2) Woodard & Curran, 2020.
3) USEPA Region II, 2020a.
4) See Appendix I Table E.1.

0 25 50
Feet

Figure **17**

Extent of Impervious Cover Existing as of 1924

Riverside Industrial Park Superfund Site
29 Riverside Avenue
City of Newark, New Jersey

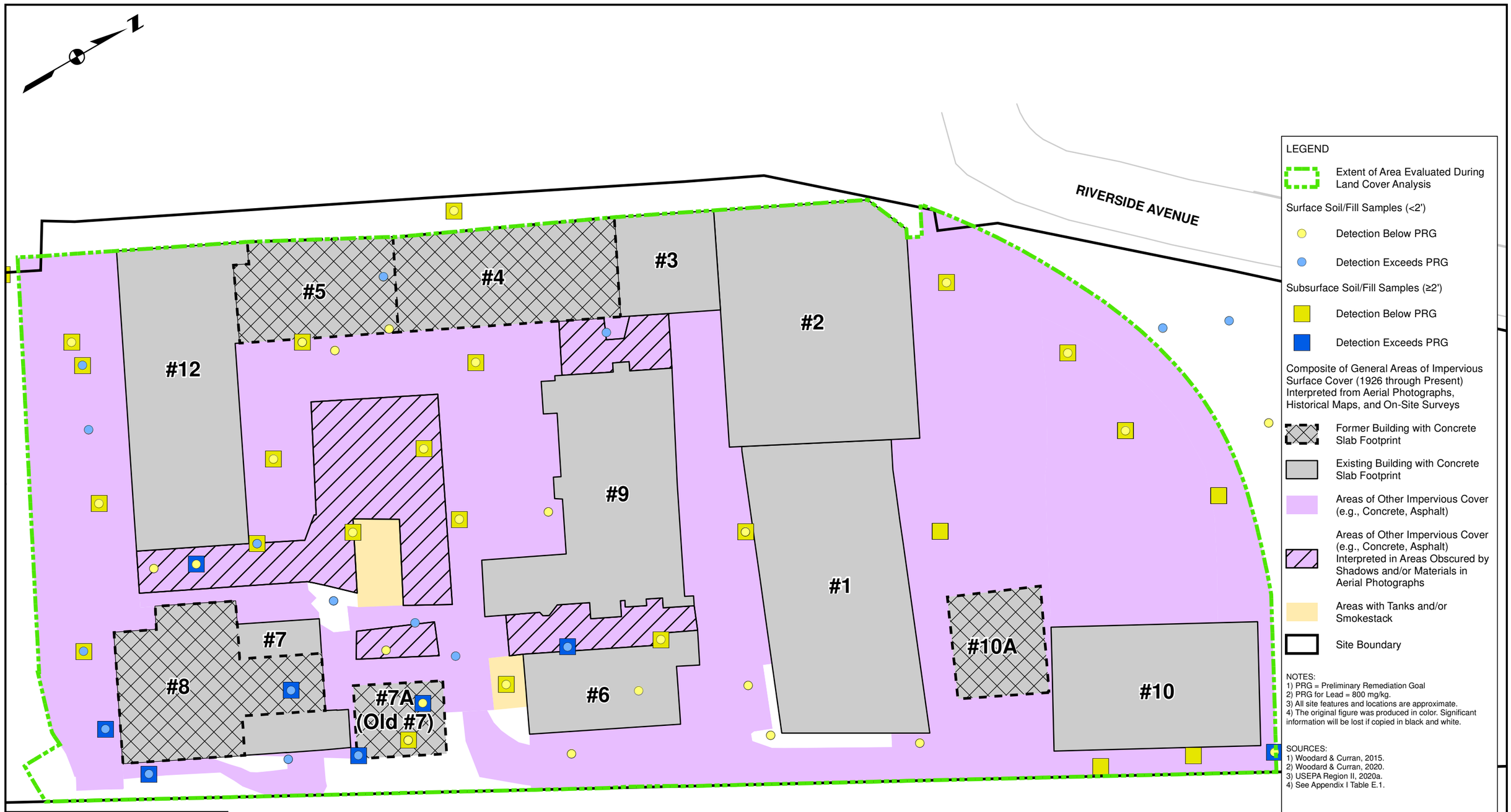
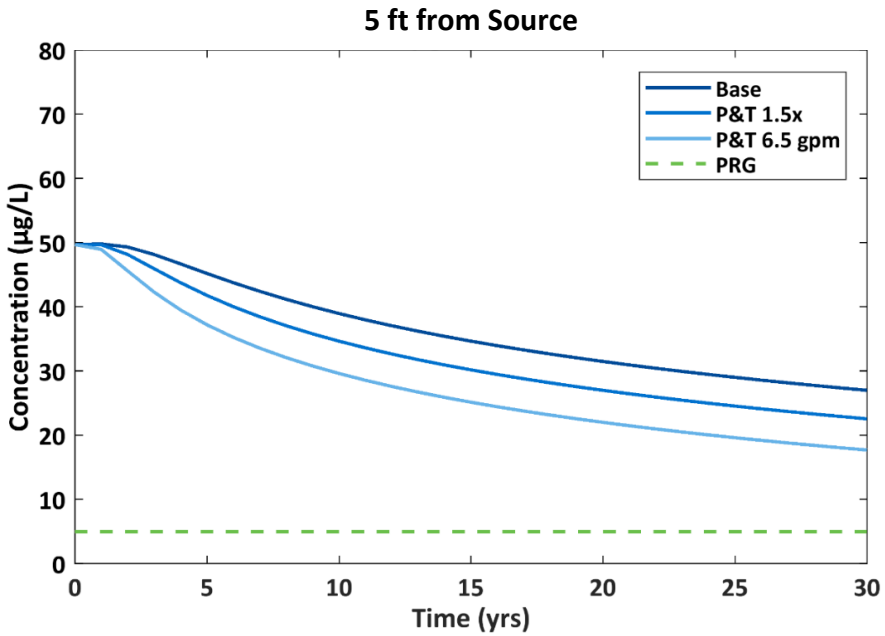


Figure **18**

Composite of Extent of Impervious Cover Existing from 1926 Through 1971 with Notations to Present

Riverside Industrial Park Superfund Site
29 Riverside Avenue
City of Newark, New Jersey

A



B

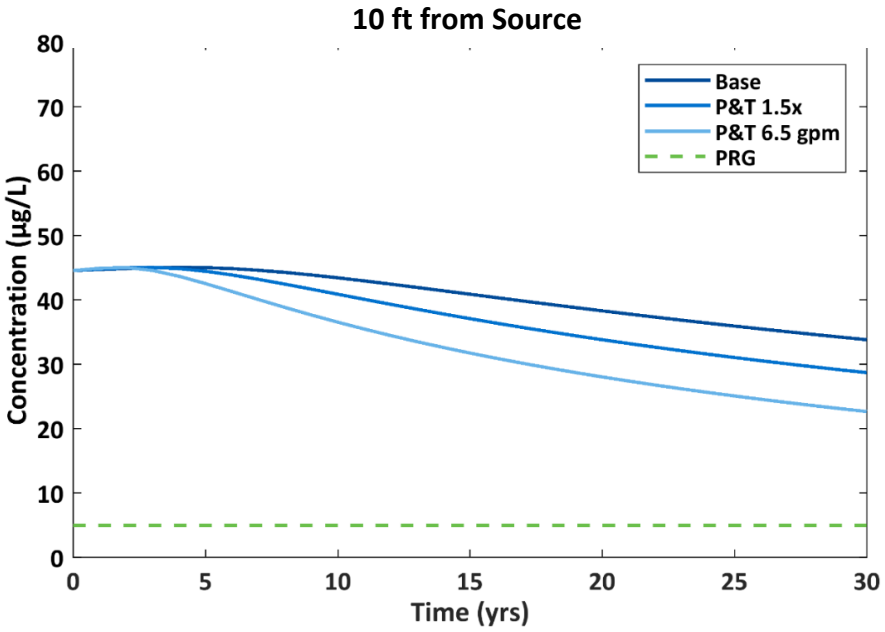
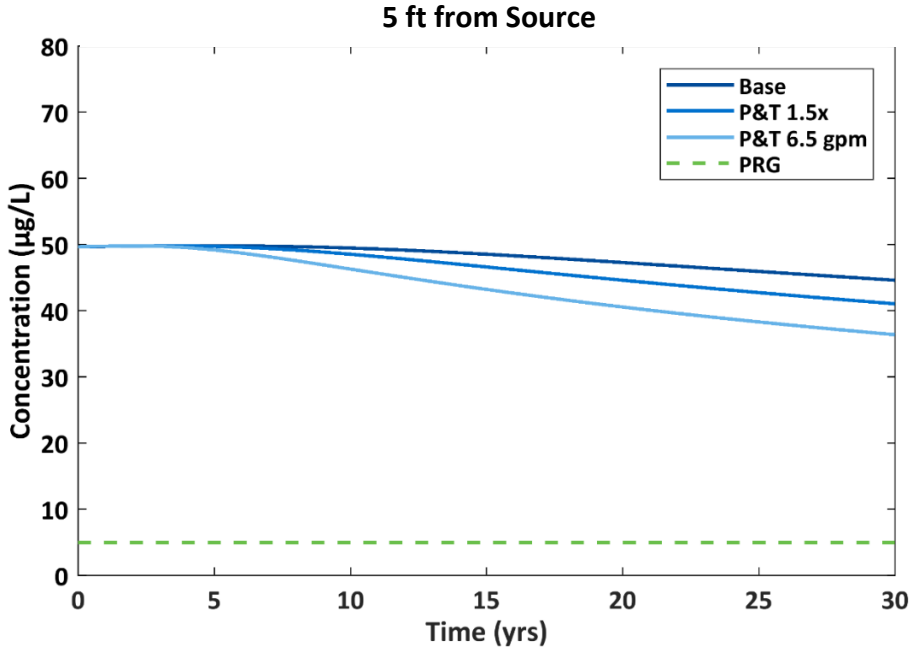


Figure 19: Calculated Groundwater Lead Concentrations After 30 Years Using a K_d of 900 L/kg. A 1D model was used to evaluate the change in groundwater lead concentrations due to the operation of a pump and treat (P&T) well located 50 ft from the "source" area, using a soil-water partition coefficient (K_d) of 900 L/kg. Groundwater lead concentrations were calculated for two locations downgradient from the "source" area using three groundwater flow rates – the no pumping scenario ("base") and two possible P&T pumping rates (6.5 gpm pumping with more than double the natural velocity and a lower pumping rate with 1.5 times the natural velocity). Groundwater flowing into the areas undergoing remediation (Inflow) was

assumed to have a lead concentration (C) of 5 µg/L, based on the maximum allowable concentration for New Jersey Class IIA groundwater.

A



B

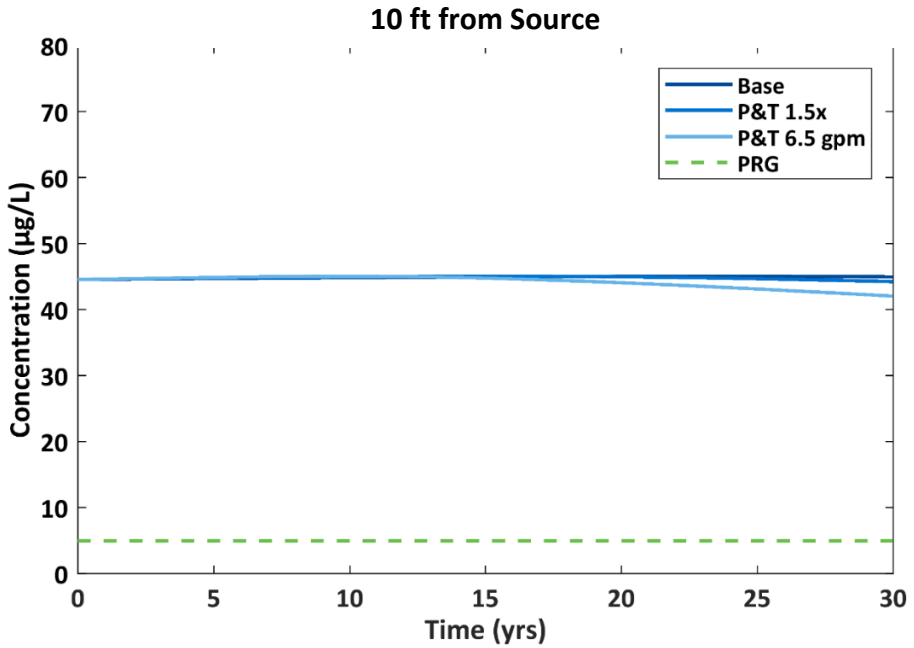


Figure 20: Calculated Groundwater Lead Concentrations After 30 Years Using a K_d of 5,000 L/kg. A 1D model was used to evaluate the change in groundwater lead concentrations due to the operation of a pump and treat (P&T) well located 50 ft from the "source" area using a soil-water partition coefficient (K_d of 5,000 L/kg. Groundwater lead concentrations were calculated for two locations downgradient from the "source" area using three groundwater flow rates – the no pumping scenario ("base") and two possible P&T pumping rates (6.5 gpm pumping with more than double the natural velocity and a lower pumping rate with 1.5 times the natural velocity). Groundwater flowing into the areas undergoing remediation (Inflow) was

assumed to have a lead concentration (C) of 5 µg/L, based on the maximum allowable concentration for New Jersey Class IIA groundwater.

APPENDIX A: NJDEP Historic Fill Table 4-2 – Summary of Target Contaminant Concentrations in Typical Historic Fill Material

Historic Fill Table - N.J.A.C. 7:26E-4.6

TABLE 4-2

Summary of Target Contaminant Concentrations in Typical Historic Fill Material

Contaminant (ppm)	Maximum	Average
Benzo(a)anthracene	160	1.37
Benzo(a)pyrene	120	1.89
Benzo(b)fluoranthene	110	1.91
Benzo(k)fluoranthene	93	1.79
Indeno(1,2,3-cd)pyrene	67	1.41
Dibenz(a,h)anthracene	25	1.24
Arsenic	1098	13.15
Beryllium	80	1.23
Cadmium	510	11.15
Lead	10700	574
Zinc	10900	575

Note: Table 4-2 was deleted from from proposed Technical Rules

APPENDIX B: August 2020 Sampling Data

Appendix B
Summary of August 2020 Lot 57 Groundwater Sampling Results

Parameter	Monitoring Well:	MW-116	MW-118
	Sample Date:	8/31/2020	8/31/2020
pH (Standard Units)[a]		6.58[g]	6.30
Specific Conductivity (µs/cm)[b]		5,829	4,617
Temperature (°C)[c]		21.00	24.13
Dissolved Oxygen (mg/L)[d]		0.16	0.10
Redox (mV)[e]		-137.9	-294.9
Turbidity (NTU)[f]		0.66	2.28
Total Lead (ug/L)		1.0U[h]	1.0U
Dissolved Lead (ug/L)		1.0U	1.3
Total Organic Carbon (ug/L)		6.8	23.4J[k]
Dissolved Organic Carbon (ug/L)		7.1	84.8J
Bicarbonate Alkalinity as CaCO3 (mg/L)		437	316
Carbonate Alkalinity as CaCO3 (mg/L)		5U	5U
Alkalinity (mg/L)		437	316
Hydroxide Alkalinity (mg/L)		5U	5U
Chloride (mg/L)		1,630	1,230
Fluoride (mg/L)		0.08U	4.94J+[l]
Sulfate (mg/L)		1.17	31

Notes:

a) pH is standard units.

b) "µS/cm" is microSiemens per centimeter.

c) "°C" is degrees Celsius.

d) "mg/L" is milligrams per liter; ug/L is micrograms per liter.

e) "mV" is millivolts.

f) "NTU" is Nephelometric Turbidity Units.

g) Field parameter data were monitored and recorded by Montrose Environmental. Data recorded was at stabilization prior to sampling.

h) "U" - not detected.

i) "UJ" - not detected but reporting limit is uncertain.

j) "R" - rejected.

k) "J" - analyte detected but reported concentration is considered estimated.

l) "J+" - result is estimated and may be biased high.

APPENDIX C: Lot 57 LSRP Report

September 29, 2020

Jimmy Placa, Jr., Vice President
Davion, Inc.
2 Progress Road
North Brunswick, NJ 08902

RE: Groundwater Sampling and River Wall Pipe Inspection – Davion Newark Facility
Riverside Industrial Park, 29-75 Riverside Avenue, Newark, NJ 07104
NJDEP Case #20-04-09-0923-04
Montrose AGC Project #2020-4047

Dear Mr. Placa:

Advanced GeoServices Corp. a Montrose Environmental Group company (Montrose AGC), is pleased to provide Davion, Inc.'s (Davion) Riverside Industrial Park facility this summary of recent investigation activities related to the groundwater sampling and the river wall pipe inspection. The Riverside Industrial Park has been named a National Priority List (NPL) (superfund) site by the United States Environmental Protection Agency (USEPA). PPG, Industries (PPG) has assumed the role of lead potential responsible party (PRP) for conducting a Site Investigation/Feasibility Study at the Superfund Site. They have engaged Woodard & Curran as their environmental consultant.

BACKGROUND

Davion's Riverside Industrial Park facility is located on the west bank of the Passaic River in Newark, Essex County, New Jersey. The investigation activities are specific to NJDEP Case #20-04-09-0923-04 pertaining to acetone and ethyl acetate reported in the groundwater on the Davion's Building #10, located on Lot 57.

Montrose AGC previously provided a letter to Davion dated June 16, 2020 addressing the remedial investigations performed by Woodard & Curran. This letter is being submitted in regards to the collection of groundwater samples from monitoring wells MW-116, MW-118, and MW-204 on August 31, 2020 for analysis of volatile organics and the inspection of the river wall pipe.

GROUNDWATER SAMPLE COLLECTION

Groundwater sampling consisted of Low-Flow Purging and Sampling on two shallow monitoring wells (MW-116 and MW-118) and one deep well (MW-204). **Figure 1** shows the monitoring well locations. In addition, Montrose personnel recorded depth to water, flow rate, and water quality indicator parameters (WQIPs) including the following: temperature, specific conductivity, dissolved oxygen, pH, oxidation-reduction potential (ORP), and turbidity. For a more detailed summary please refer to **Table 1** attached. The WQIPs were monitored during the purging of the wells to ensure groundwater quality conditions stabilized prior to sample collection. The field parameters indicate that the wells are tidally influenced for both the shallow and deep wells, the pH is neutral range (6.3 to 7.3 units), the groundwater is in an anaerobic (depleted oxygen below

1 milligram per liter (mg/l)) and reducing (negative ORP) state, and exhibits low turbidity. High turbidity can lead to higher reported concentrations, as contaminants can adhere to the suspended particles.

Samples from wells MW-116 and MW-118 were collected while the tide was going out. The groundwater sample collected from MW-204 occurred at low-tide. All samples were placed immediately on ice and then relinquished under chain of custody to Alpha Analytical, Inc. (Alpha, NJDEP Certification # MA935). A field equipment blank and a trip blank accompanied the groundwater samples. The samples were analyzed for target compound list (TCL) volatile organic compounds including ethyl acetate and a library search of up to fifteen tentatively identified compounds (TICs). Ethyl acetate was added as it is a targeted compound of concern on the site, versus the compound potentially being identified as TIC. By adding ethyl acetate as a targeted compound, the laboratory can analyze the compound against a calibrated standard for an accurate concentration. TICs are not analyzed against a standard and therefore, they are always reported as estimated values. These estimated values can be reported with large differing ranges.

Joshua Marfin, a representative from Woodard & Curran representing EPA and NJDEP, was onsite and collected split samples from all three monitoring wells and took matrix spike and matrix spike duplicate (MS/MSD) samples from well MW-118. Mr. Marfin collected samples for the following parameters: total metals including mercury, dissolved metals including mercury, alkalinity, anions, TOC, DOC, and TDS. Mr. Marfin submitted these samples directly to other laboratories.

GROUNDWATER SAMPLING RESULTS

For a summary of the analytes, please refer to the laboratory testing reports in **Attachment A**. The results of this sampling event are summarized in **Tables 2 and 3** (Attached), **Figure 1** and below:

- A sample from each well was collected for analysis of acetone and 1-ethyl acetate.
- The groundwater samples collected and analyzed from monitoring wells MW-116 and MW-204 were reported as non-detect for the volatile organic compounds at their respective reporting limits.
- The groundwater sample collected and analyzed from monitoring well MW-118 was reported as 1,600 micrograms per liter (µg/L) for acetone and 91 µg/L for ethyl acetate. The New Jersey Department of Environmental Protection's (NJDEP) Groundwater Quality Standard (GWQS) for a Class IIA aquifer is 6,000 µg/L for acetone. Ethyl acetate does not have a specific NJDEP GWQS.
- NJDEP's GWQS for TICs is 100 µg/L for an individual compound and 500 µg/L for total TICs up to fifteen compounds. The TICs reported for all groundwater samples were below these standards. Table 3 summarizes the TICs reported.
- Isopropyl alcohol was reported as a TIC in the field blank sample. Isopropyl alcohol was used during the decontamination process for the sampling pump. The reporting of isopropyl alcohol in the field blank does not affect the groundwater sampling results or conclusions.

DATA QUALITY ASSESSMENT

The samples were analyzed by Alpha for TCL volatile compounds plus ethyl acetate. The analysis was consistent with the NJDEP's Data of Known Quality Protocols (DKQP) and met the performance criteria and quality control samples specified for USEPA method SW-846 8260. An independent review of the laboratory quality control consisted of the holding times, method blanks, surrogate recoveries, laboratory control samples and laboratory control sample duplicates (LCS/LCSD) and sample dilutions. All quality control results were within acceptable criteria. Sample MW-118 was analyzed at a dilution to achieve an acetone concentration within the calibration range; therefore, all sample detection limits were elevated. A review of the laboratory quality control has determined that the analytical data reported meets the DKQP and the data is acceptable as reported.

INSPECTION OF THE RIVER WALL PIPE

An eight-inch (8") diameter steel pipe, which drains from beneath the Davion facility into the Passaic River, was inspected at low tide using a PearPoint P340+ 1-inch inspection camera. As tide went out, all water that had entered the pipe during high tide drained from the pipe. There was some off-white, discolored fluid observed leaving from the pipe area during this time, but it could not be confirmed that it was coming from the pipe. This discharge was temporary, lasting less than 5 minutes. As low tide arrived and the banks became exposed, a make-shift, temporary platform was constructed. A Montrose representative used an extension ladder to access the platform from the bulkhead and advanced the camera up the pipe. The camera reel and video screen were staged on top of the bulkhead with the Montrose support team in order to protect the equipment. Several passes were made using the camera into and back out of the pipe, each being recorded on video. Unfortunately, heavy build-up of sediment within the pipe repeatedly covered the camera lens, blocking the view of the camera. It should be noted that no flow was ever observed exiting the pipe. Due to the deteriorated nature of the pipe, it is possible that flow may have exited the pipe before the opening at the bulkhead. Other notable findings were as follows;

- The first 1 to 2 feet of the bottom of the pipe had deteriorated and was missing.
- The pipe had obstructions at approximately 40-feet and at approximately 60-feet. However, Montrose AGC was able to advance the 1-inch camera beyond these obstructions to a total distance of 82.9 feet.
- Some water appears to lay in sections of pipe (from 16' to 35' and also from 62' to 70').

Following the completion of the pipe camera inspection, off-white fluid was once again observed coming from the area around the pipe and under the bulkhead for a short period of time (~5 minutes). At that time, some soap suds were observed approximately 10 feet up the pipe. It is suspected that the off-white fluid is related to the soap production at the Davion facility and the pipe is losing the fluid before it can discharge at the bulkhead. Since liquid discharge never flowed out from the river wall pipe, a grab sample could not be collected.

Montrose AGC and Davion personnel visually inspected the soap production area on the ground floor on August 31 and September 1, 2020. There are several above ground storage soap processing tanks within the diked areas. Visual inspection of the dike areas showed some deterioration of the floor that will require some maintenance. Each dike area contains a sump, where accumulated liquid is pumped to a waste disposal tank. The wastewater in the disposal tank is treated for foam removal and pH adjustment before being pumped to the public sewer system. During the inspections on both days, the waste disposal pump was manually activated at low tide. White fluid did not appear from around the River Wall Pipe and bulkhead area. Therefore, based upon these observations the discharge of the processed waste from the waste disposal tank is not the source of the white liquid observed flowing from around the River Wall Pipe area.

A copy of the video can be submitted under separate cover upon request.

SUMMARY

NJDEP Case #20-04-09-0923-04 was opened to address dissolved acetone and ethyl acetate in the groundwater. Acetone and ethyl acetate were used to manufacture nail polish removal at the property. This process has recently been discontinued, and the above ground storage tanks emptied, cleaned and dismantled.

Montrose AGC advanced a 1-inch camera to a total distance of 82.9 feet up an eight-inch (8”) diameter steel pipe, which drains from beneath the Davion facility into the Passaic River. Montrose AGC observed two obstructions in the pipe, as well as significant deterioration. No fluid was observed exiting the pipe, but some off-white fluid and soap suds were observed exiting the bulkhead around the pipe on two separate short term periods.

Davion is in the process of resealing any cracks within the concrete floor of the soap production dike areas.

Results of the August 31, 2020 groundwater sampling event demonstrates that there are no volatile organic compounds above the NJDEP GWQS for a Class IIa aquifer in the three monitoring wells located on Lot 57. Groundwater field measurements confirmed that the wells are tidally influenced as the depth to water in the monitoring wells continued to drop as the tide receded in the Passaic River. The shallow and deep aquifers are under anaerobic conditions (oxygen depleted), neutral pH (6.3 to 7.3 units), and a reductive state (negative ORP).

NJDEP requires two consecutive groundwater sampling events at least 90 days apart to account for seasonal changes with all compounds of concern being below the GWQS to close the environmental groundwater case. The confirmation groundwater sampling event will be scheduled for December 2020.

Should you have any questions regarding this summary report, please contact me at your earliest convenience.

Sincerely,

MONTROSE AGC

Frederick J. Shoyer, LSRP
Senior Project Consultant

Attachments
Tables 1-3
Figure 1
Attachment A- Alpha Analytical Laboratory Report

cc: Ken Bird, Woodard Curran, PM- Riverside (KBird@woodardcurran.com)
Josh Smeraldi, EPA, Riverside Project Manager (Smeraldi.josh@epa.gov)
Jay Nickerson, NJDEP, RIPSF Case Manager (Jay.Nickerson@dep.nj.gov)
Thomas Spiesman, Esq. Porzio, Bromberg & Newman, P.C. (tspiesman@pbnlaw.com)

TABLES

TABLE 1 - SUMMARY OF GROUNDWATER FIELD PARAMETERS
DAVION, INC.
RIVERSIDE INDUSTRIAL PARK
29-75 RIVERSIDE AVENUE, NEWARK, NJ
BUILDING # 10
NJDEP SRWMP PI # 845668
NJDEP CASE # 20-04-09-0923-0449029

		Before Purge								After Purge							
Well	Date	Temp. (°Celsius)	Cond. (µs/cm)	D. O. (mg/l)	pH (S.U.)	ORP mV	Turbidity NTU	DTW (feet btoc)	Flow Rate (ml/min)	Temp. (°Celsius)	Cond. (µs/cm)	D. O. (mg/l)	pH (S.U.)	ORP mV	Turbidity NTU	DTW (feet btoc)	Flow Rate (ml/min)
MW-116	**8/31/2020**	22.27	2.193	1.25	6.53	-84.8	7.36	6.36	180	21.74	5.731	0.17	6.58	-134.3	0.71	6.35	300
	8/31/2020	22.00	3.614	1.39	6.52	-111.1	4.06	6.35	180	21.68	5.780	0.16	6.57	-134.5	0.68	6.36	300
	8/31/2020	21.83	4.564	0.56	6.55	-120.2	3.00	6.35	180	21.65	5.829	0.16	6.58	-137.9	0.66	6.36	300
	8/31/2020	21.82	4.992	0.37	6.56	-100.4	2.92	6.35	180								
	8/31/2020	21.80	5.302	0.22	6.57	-113.9	2.95	6.35	300								
	8/31/2020	21.77	5.527	0.17	6.58	-128.7	1.59	6.35	300								
MW-118	**8/31/2020**	23.27	1.752	1.42	7.21	-117.2	144	4.38	280	20.15	1.660	0.14	7.32	-188.2	11.9	4.41	280
	8/31/2020	22.74	1.669	0.33	8.07	-182.2	620AU	4.38	280	20.04	1.656	0.13	7.32	-191.6	11.7	4.41	280
	8/31/2020	22.40	1.673	0.14	7.91	-188.5	143	4.38	280	19.96	1.652	0.13	7.33	-195.4	9.43	4.41	280
	8/31/2020	21.74	1.693	0.19	7.50	-162.7	153	4.38	280								
	8/31/2020	21.10	1.693	0.18	7.39	-158.8	105.5	4.38	280								
	8/31/2020	20.50	1.684	0.17	7.35	-165.5	39.4	4.40	280								
	8/31/2020	20.48	1.679	0.14	7.35	-168.9	32.5	4.40	280								
	8/31/2020	20.34	1.672	0.13	7.30	-162.4	22.6	4.41	280								
	8/31/2020	20.29	1.670	0.13	7.31	-156.9	19.9	4.41	280								
	8/31/2020	20.17	1.662	0.14	7.33	-185.9	13.5	4.41	280								
MW-204	**8/31/2020**	24.13	4.215	0.37	6.38	-257.4	6.73	5.93	400	23.98	4.665	0.09	6.32	-296.5	2.48	6.75	180
	8/31/2020	23.81	4.368	0.16	6.34	-270.4	4.54	6.77	400	24.12	4.609	0.10	6.31	-289.4	2.34	6.76	180
	8/31/2020	23.68	4.475	0.13	6.32	-292.8	4.37	6.77	180	24.13	4.617	0.10	6.30	-294.9	2.28	6.76	180
	8/31/2020	23.86	4.608	0.11	6.33	-291.9	3.07	6.77	180								
	8/31/2020	23.94	4.675	0.10	6.33	-294.3	2.58	6.77	180								

Notes:

NS	= Not Sampled	µs/cm	= Microsiemens/centimeter	AU	= Attenuation Unit
NA	= Not Analyzed	D.O.	= Dissolved Oxygen		
mg/l	= Milligrams per liter	Cond.	= Specific Conductivity		
S.U.	= Standard Unit	mV	= Millivolt		
NTU	=Nephelometric Turbidity Unit	btoc	= Below top of casing		
ml/min	=milliliters per minute	OR	= Over Range		

TABLE 2 - GROUNDWATER RESULTS - AUGUST 2020 - VOLATILE ORGANICS
DAVION, INC.
RIVERSIDE INDUSTRIAL PARK
29-75 RIVERSIDE AVENUE, NEWARK, NJ
BUILDING # 10
NJDEP SRWMP PI # 845668
NJDEP CASE # 20-04-09-0923-04

Sample ID:	NJDEP	MW-116			MW-118			MW-204			FIELD BLANK			TRIP BLANK		
Lab ID:	GWQS for	L2035834-01			L2035834-04			L2035834-02			L2035834-03			L2035834-05		
Date Sampled:	Class IIA	8/31/2020			8/31/2020			8/31/2020			8/31/2020			8/31/2020		
Groundwater Depth:	Aquifers	6.31			2.82			4.38								
	(µg/L)	Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL
Volatile Organics (µg/L)																
1,1,1-Trichloroethane	30	ND		0.16	ND		1.6	ND		0.16	ND		0.16	ND		0.16
1,1,2,2-Tetrachloroethane	1	ND		0.17	ND		1.7	ND		0.17	ND		0.17	ND		0.17
1,1,2-Trichloroethane	3	ND		0.14	ND		1.4	ND		0.14	ND		0.14	ND		0.14
1,1-Dichloroethane	50	ND		0.21	ND		2.1	ND		0.21	ND		0.21	ND		0.21
1,1-Dichloroethene	1	ND		0.17	ND		1.7	ND		0.17	ND		0.17	ND		0.17
1,2,3-Trichlorobenzene	NS	ND		0.23	ND		2.3	ND		0.23	ND		0.23	ND		0.23
1,2,4-Trichlorobenzene	9	ND		0.22	ND		2.2	ND		0.22	ND		0.22	ND		0.22
1,2-Dibromo-3-chloropropane	0.02	ND		0.35	ND		3.5	ND		0.35	ND		0.35	ND		0.35
1,2-Dibromoethane	0.03	ND		0.19	ND		1.9	ND		0.19	ND		0.19	ND		0.19
1,2-Dichlorobenzene	600	ND		0.18	ND		1.8	ND		0.18	ND		0.18	ND		0.18
1,2-Dichloroethane	2	ND		0.13	ND		1.3	ND		0.13	ND		0.13	ND		0.13
1,2-Dichloropropane	1	ND		0.14	ND		1.4	ND		0.14	ND		0.14	ND		0.14
1,3-Dichlorobenzene	600	ND		0.19	ND		1.9	ND		0.19	ND		0.19	ND		0.19
1,3-Dichloropropene, Total	1	ND		0.14	ND		1.4	ND		0.14	ND		0.14	ND		0.14
1,4-Dichlorobenzene	75	ND		0.19	ND		1.9	ND		0.19	ND		0.19	ND		0.19
1,4-Dioxane	0.4	ND		61	ND		610	ND		61	ND		61	ND		61
2-Butanone	300	ND		1.9	ND		19	ND		1.9	ND		1.9	ND		1.9
2-Hexanone	300	ND		0.52	ND		5.2	ND		0.52	ND		0.52	ND		0.52
4-Methyl-2-pentanone	NS	ND		0.42	ND		4.2	ND		0.42	ND		0.42	ND		0.42
Acetone	6,000	ND		1.5	1600		15	ND		1.5	ND		1.5	ND		1.5
Benzene	1	ND		0.16	ND		1.6	ND		0.16	ND		0.16	ND		0.16
Bromochloromethane	NS	ND		0.15	ND		1.5	ND		0.15	ND		0.15	ND		0.15
Bromodichloromethane	1	ND		0.19	ND		1.9	ND		0.19	ND		0.19	ND		0.19
Bromoform	4	ND		0.25	ND		2.5	ND		0.25	ND		0.25	ND		0.25
Bromomethane	10	ND		0.26	ND		2.6	ND		0.26	ND		0.26	ND		0.26
Carbon disulfide	700	ND		0.3	ND		3	ND		0.3	ND		0.3	ND		0.3
Carbon tetrachloride	1	ND		0.13	ND		1.3	ND		0.13	ND		0.13	ND		0.13
Chlorobenzene	50	ND		0.18	ND		1.8	ND		0.18	ND		0.18	ND		0.18
Chloroethane	5	ND		0.13	ND		1.3	ND		0.13	ND		0.13	ND		0.13
Chloroform	70	ND		0.22	ND		2.2	ND		0.22	ND		0.22	ND		0.22
Chloromethane	NS	ND		0.2	ND		2	ND		0.2	ND		0.2	ND		0.2
cis-1,2-Dichloroethene	70	ND		0.19	ND		1.9	ND		0.19	ND		0.19	ND		0.19
cis-1,3-Dichloropropene	NS	ND		0.14	ND		1.4	ND		0.14	ND		0.14	ND		0.14
Cyclohexane	NS	ND		0.27	ND		2.7	ND		0.27	ND		0.27	ND		0.27
Dibromochloromethane	1	ND		0.15	ND		1.5	ND		0.15	ND		0.15	ND		0.15
Dichlorodifluoromethane	1,000	ND		0.24	ND		2.4	ND		0.24	ND		0.24	ND		0.24
Ethyl Acetate	NS	ND		0.72	91	J	7.2	ND		0.72	ND		0.72	ND		0.72
Ethylbenzene	700	ND		0.17	ND		1.7	ND		0.17	ND		0.17	ND		0.17
Freon-113	20,000	ND		0.15	ND		1.5	ND		0.15	ND		0.15	ND		0.15
Isopropylbenzene	700	ND		0.19	ND		1.9	ND		0.19	ND		0.19	ND		0.19
Methyl Acetate	7,000	ND		0.23	ND		2.3	ND		0.23	ND		0.23	ND		0.23
Methyl cyclohexane	NS	ND		0.4	ND		4	ND		0.4	ND		0.4	ND		0.4
Methyl tert butyl ether	70	ND		0.17	ND		1.7	1.3		0.17	ND		0.17	ND		0.17
Methylene chloride	3	ND		0.68	ND		6.8	ND		0.68	ND		0.68	ND		0.68
o-Xylene	NS	ND		0.39	ND		3.9	ND		0.39	ND		0.39	ND		0.39
p/m-Xylene	NS	ND		0.33	3.9	J	3.3	ND		0.33	ND		0.33	ND		0.33
Styrene	100	ND		0.36	ND		3.6	ND		0.36	ND		0.36	ND		0.36
Tetrachloroethene	1	ND		0.18	ND		1.8	ND		0.18	ND		0.18	ND		0.18
Toluene	600	ND		0.2	33		2	ND		0.2	ND		0.2	ND		0.2
trans-1,2-Dichloroethene	100	ND		0.16	ND		1.6	ND		0.16	ND		0.16	ND		0.16
trans-1,3-Dichloropropene	NS	ND		0.16	ND		1.6	ND		0.16	ND		0.16	ND		0.16
Trichloroethene	1	ND		0.18	ND		1.8	ND		0.18	ND		0.18	ND		0.18
Trichlorofluoromethane	2,000	ND		0.16	ND		1.6	ND		0.16	ND		0.16	ND		0.16
Vinyl chloride	1	ND		0.07	ND		0.71	ND		0.07	ND		0.07	ND		0.07
Xylenes, Total	1,000	ND		0.33	3.9	J	3.3	ND		0.33	ND		0.33	ND		0.33
VOC TIC Conc. (# TICs)	100/500 total	1.11	J		71.5	J	0	3.46	J		72.6	J		-	-	-

µg/L = All concentrations reported in micrograms per liter
bgs = Below ground surface
Q = Qualifier
TICs = Tentatively Identified Compounds
NS = No standard available
ND = Analyzed for but not detected at the MDL
N = Presumptive evidence of a compound from the use of GC/MS library search.

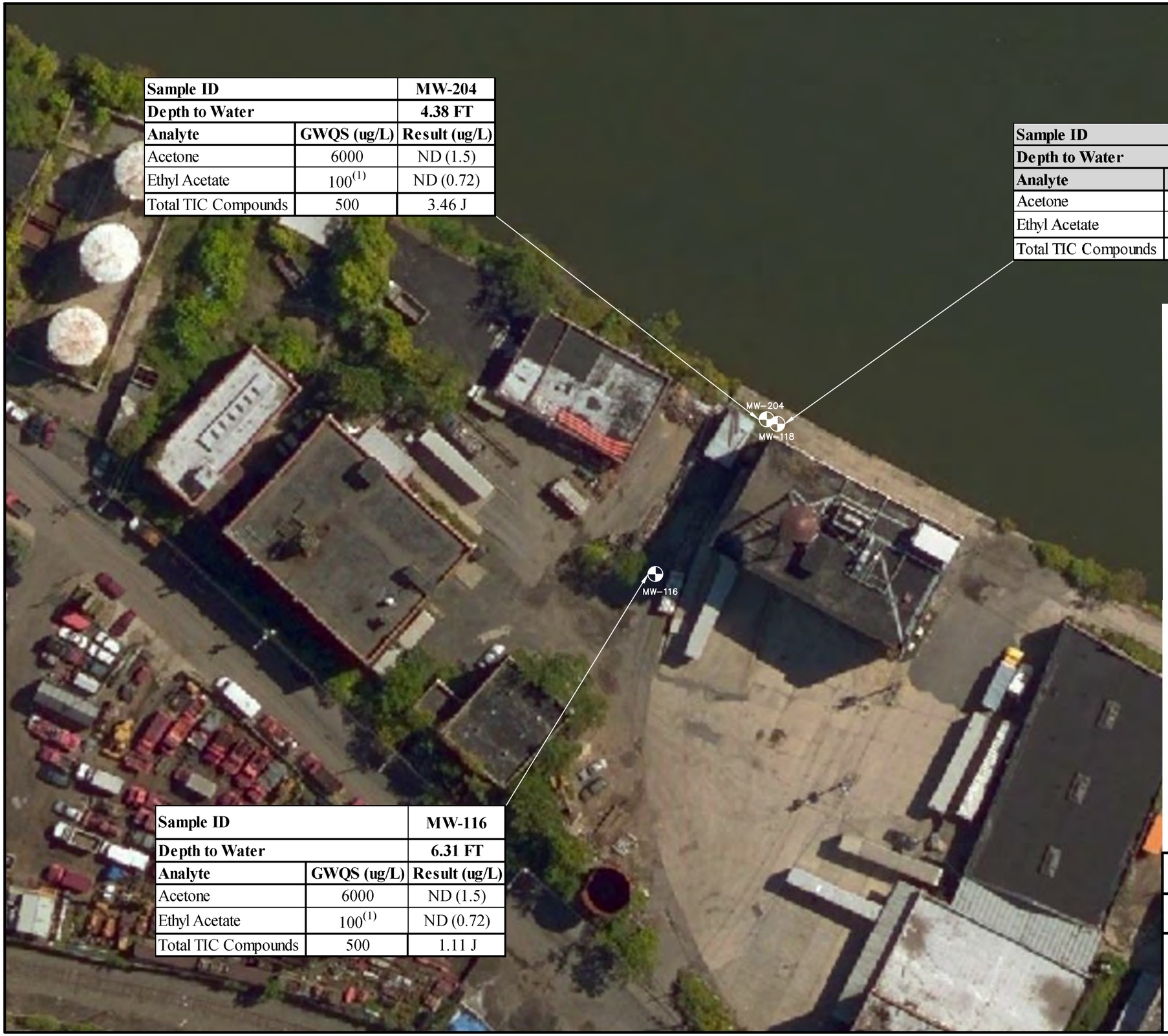
Exceeds Groundwater Quality Class IIA Criteria (GWQS)
0.35 Method Detection Limit exceeds a standard but compound not detected
* = Concentration meets a standard once rounding is applied
J = Concentration detected at a value below the RL and above the MDL

TABLE 3 - GROUNDWATER - AUGUST 2020 - VOLATILE ORGANICS TICs
DAVION, INC.
RIVERSIDE INDUSTRIAL PARK
29-75 RIVERSIDE AVENUE, NEWARK, NJ
BUILDING # 10
NJDEP SRWMP PI # 845668
NJDEP CASE # 20-04-09-0923-04

Sample ID:	NJDEP GWQS for Class IIA Aquifers (µg/L)	MW-116		MW-118		MW-204		FIELD BLANK		TRIP BLANK	
Lab ID:		L2035834-01		L2035834-04		L2035834-02		L2035834-03		L2035834-05	
Date Sampled:		8/31/2020		8/31/2020		8/31/2020		8/31/2020		8/31/2020	
Groundwater Depth:		6.31		2.82		4.38					
		Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
VOLATILE ORGANICS BY 8260C (µg/L)											
Unknown Benzene	100	-	-	10.6	J	-	-	-	-	-	-
Unknown	100	1.11	J	-	-	1.92	J	-	-	-	-
iso-Propyl Alcohol	100	-	-	-	-	-	-	72.6	NJ	-	-
Unknown	100	-	-	11.7	J	-	-	-	-	-	-
Unknown	100	-	-	16.7	J	-	-	-	-	-	-
Unknown Aromatic	100	-	-	-	-	1.54	J	-	-	-	-
Unknown	100	-	-	32.5	J	-	-	-	-	-	-
Total TIC Compounds	100	1.11	J	71.5	J	3.46	J	72.6	J	-	-

µg/L = All concentrations reported in micrograms per liter
J = Indicates an estimated concentration
Exceeds NJ-GWQS
Q = Qualifier
TICs = Tentatively Identified Compounds
NS = No standard available
D = The compound was reported from the Diluted analysis
N = Presumptive evidence of a compound from the use of GC/MS library search.
ND = Analyzed for but Not Detected at the MDL
* = Concentration meets a standard once rounding is applied

FIGURE



Sample ID		MW-204
Depth to Water		4.38 FT
Analyte	GWQS (ug/L)	Result (ug/L)
Acetone	6000	ND (1.5)
Ethyl Acetate	100(1)	ND (0.72)
Total TIC Compounds	500	3.46 J

Sample ID		MW-118
Depth to Water		2.82 FT
Analyte	GWQS (ug/L)	Result (ug/L)
Acetone	6000	1600
Ethyl Acetate	100(1)	91 J
Total TIC Compounds	500	71.5 J

Sample ID		MW-116
Depth to Water		6.31 FT
Analyte	GWQS (ug/L)	Result (ug/L)
Acetone	6000	ND (1.5)
Ethyl Acetate	100(1)	ND (0.72)
Total TIC Compounds	500	1.11 J

GRAPHIC SCALE

0 25 50 100

(IN FEET)
1 INCH = 50 FT

LEGEND

⊕	MONITORING WELL
→	GROUNDWATER FLOW DIRECTION
— 18.5 —	GROUNDWATER CONTOUR
NA	NOT ANALYZED
DTW	DEPTH TO WATER
NJDEP	NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
GWQS	GROUNDWATER QUALITY STANDARDS
ND (0.5)	NOT DETECTED AT (RL OR MDL)
RL	REPORTING LIMIT
MDL	METHOD DETECTION LIMIT
VOC	VOLATILE ORGANIC COMPOUND
SVOC	SEMI-VOLATILE ORGANIC COMPOUND
BTOC	BELOW TOP OF CASING
19.18'	GROUNDWATER TABLE ELEVATION
J	ESTIMATED VALUE. THE TARGET ANALYTE CONCENTRATION IS BELOW THE QUANTITATION LIMIT (RL), BUT ABOVE THE METHOD DETECTION LIMIT.
*(1)	NO STANDARD DEFAULT TO TENTATIVELY IDENTIFIED COMPOUND STANDARD OF 100 µG/L

DAVION, INC. RIVERSIDE INDUSTRIAL PARK

29-75 RIVERSIDE AVE, NEWARK, NJ 07104 (BLOCK 614, LOT 57)
NJDEP CASE # 20-04-09-0923-04, SRWMP PI # 845668.

GROUNDWATER RESULTS SEPTEMBER 2020

ADVANCED GeoServices™
Engineering for the Environment. Planning for People.
1055 ANDREW DRIVE, SUITE A
WEST CHESTER, PENNSYLVANIA 19380
Tel: 610.840.9100 Fax: 610.840.9199 Web: www.advancedgeoservices.com

Scale:	1"=50'
Drawn By:	KJF
Checked By:	RJS
Project Mgr.:	RJS
Originated By:	KJF
Project No.:	2020-4047
Drawing Date:	9-18-2020
Sheet No.:	1 OF 1
Revision Number:	

FIGURE 1

ATTACHMENT A

ALPHA ANALYTICAL LABORATORY REPORT

ALPHA ANALYTICAL

World Class Chemistry

www.alphalab.com

Lab Number: L2035834

Client: Advanced GeoServices Corporatior

ATTN: Rick Shoyer

Project Name: DAVION

Project Number: 2020-4047-400

ANALYTICAL DATA PACKAGE FOR THE
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON NEW JERSEY 08625

Agency/Division:	**Bureau/Office:**
Project No: 2020-4047-400	**Contract No:**
Laboratory: Alpha Analytical	**Laboratory Location:** Westborough, Ma.
	Laboratory Phone Number: (508) 898-9220
SDG No: L2035834	**NJDEP Certification #:** MA935
Date of First Sample Receipt: 08/31/2020	**Date of Last Sample Receipt:** 08/31/2020

Agency Sample Number	Laboratory Sample Number	Sample Location	Date/Time of Collection
MW-116	L2035834-01	DAVION	08/31/2020 09:45
MW-204	L2035834-02	DAVION	08/31/2020 11:45
FIELD BLANK	L2035834-03	DAVION	08/31/2020 12:40
MW-118	L2035834-04	DAVION	08/31/2020 13:05
TRIP BLANK	L2035834-05	DAVION	08/31/2020 00:00

I certify that this data package is in compliance with the terms and conditions of this contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on disk or electronically has been authorized by the laboratory director or his/her designee, as verified by the following signature.

Technical Director/Representative (Typed)	Tiffani Morrissey	09/04/20
Technical Director/Representative (Signature)	Tiffani Morrissey	

Table of Contents

Chain of Custody

NEW JERSEY CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page 1 of 1

Date Rec'd in Lab: 08/31/20

ALPHA Job #: L2035834

Client Information

Client: MONTROSE-AGC CORP.
Address: 1878 E. MARLTON PIKE
CHERRY HILL, NJ
Phone: 1-856-905-2218
Fax:
Email: RSNYDER@MONTROSE-ENV.COM

Project Information

Project Name: DANION
Project Location: NEWARK, NJ 29 RIVERSIDE AVE.
Project # 2020-4047-4001
(Use Project name as Project #) ☐
Project Manager: RICK SNYDER
ALPHAQuote #:

Turn-Around Time

Standard ☒ Due Date:
Rush (only if pre approved) ☐ # of Days:

These samples have been previously analyzed by Alpha ☐

Deliverables

☒ NJ Full / Reduced
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Regulatory Requirement

☐ SRS Residential/Non Residential
☐ SRS Impact to Groundwater
☒ NJ Ground Water Quality Standards
☐ NJ IGW SPLP Leachate Criteria
☐ Other

Billing Information

☒ Same as Client Info
PO #

Site Information

Is this site impacted by Petroleum? Yes ☐
Petroleum Product:

For EPH, selection is REQUIRED:
☐ Category 1
☐ Category 2

For VOC, selection is REQUIRED:
☐ 1,4-Dioxane
☐ 8011

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	NJDEP-8260 + 15	1-ETHYL ACETATE	Total Bottle	Sample Specific Comments
35834-01	MW-116	8-31-20	0945	GW	RC	X	X		
-02	MW-204	8-31-20	1145	GW	RC	X	X		
-03	FIELD BLANK	8-31-20	1240	AQ	RC	X	X		
-04	MW-118	8-31-20	1305	GW	RC	X	X		
-05	TRIP BLANK	8-31-20		AQ	AC	X	X		

Container Type: V
Preservative: B

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
	8-31-20/1450		
	8/31/20/1630		8/31/20 1655
	8/31/20 2200	William Mellner	8/31/20 2200

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONSTITUTIONS. (See reverse side.)

Form No: 01-14 HC (rev. 30-Sept-2013)

ALPHA ANALYTICAL LABORATORIES, INC.
LOGIN CHAIN OF CUSTODY REPORT
Sep 04 2020, 05:06 pm

Login Number: L2035834
Account: AGSC Advanced GeoServices CorporationProject: 2020-4047-400
Received: 31AUG20 Due Date: 08SEP20

Sample #	Client ID	Mat	PR	Collected
L2035834-01	MW-116		1 S0	31AUG20 09:45

8260: NJ std including Ethylacetate.Reporting list built NJ-RED Package Due Date: 09/08/20

NJ-8260,NJ-RED,NJDEP

L2035834-02	MW-204		1 S0	31AUG20 11:45

8260: NJ std including Ethylacetate.Reporting list built Package Due Date: 09/08/20

NJ-8260

L2035834-03	FIELD BLANK		1 S0	31AUG20 12:40

8260: NJ std including Ethylacetate.Reporting list built Package Due Date: 09/08/20

NJ-8260

L2035834-04	MW-118		1 S0	31AUG20 13:05

8260: NJ std including Ethylacetate.Reporting list built Package Due Date: 09/08/20

NJ-8260

L2035834-05	TRIP BLANK		1 S0	31AUG20 00:00

8260: NJ std including Ethylacetate.Reporting list built Package Due Date: 09/08/20

NJ-8260

Logged By: Tom Tanico

ALPHA ANALYTICAL LABORATORIES
Container Tracking Report

Container ID	Type	Status	Transaction Date	From Response	From Location	From Operator	To Response	To Location	To Operator
L2035834-01A	Vial-B	INTACT	03-SEP-20	CUSTODY	GC/MS	Amanda Kennedy	VOA-DEAD-CUSTODY-371	VOA-DEAD-CUSTODY-371	Amanda Kennedy
L2035834-01A	Vial-B	INTACT	03-SEP-20	CUSTODY	V56-18 CUSTODY	Piotr Duczmalewski	GC/MS	GC/MS	Piotr Duczmalewski
L2035834-01A	Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V56-18 CUSTODY	V56-18 CUSTODY	Phillip Renaud
L2035834-01A	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-01B	Vial-B	INTACT	01-SEP-20	CUSTODY	CUSTODY	Robert Pino	VOA-DEAD-CUSTODY-313	VOA-DEAD-CUSTODY-313	Robert Pino
L2035834-01B	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-01C	Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V65-07 CUSTODY	V65-07 CUSTODY	Phillip Renaud
L2035834-01C	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-02A	Vial-B	INTACT	03-SEP-20	CUSTODY	GC/MS	Amanda Kennedy	VOA-DEAD-CUSTODY-371	VOA-DEAD-CUSTODY-371	Amanda Kennedy
L2035834-02A	Vial-B	INTACT	03-SEP-20	CUSTODY	V56-18 CUSTODY	Piotr Duczmalewski	GC/MS	GC/MS	Piotr Duczmalewski
L2035834-02A	Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V56-18 CUSTODY	V56-18 CUSTODY	Phillip Renaud
L2035834-02A	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-02B	Vial-B	INTACT	01-SEP-20	CUSTODY	CUSTODY	Robert Pino	VOA-DEAD-CUSTODY-313	VOA-DEAD-CUSTODY-313	Robert Pino
L2035834-02B	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-02C	Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V65-07 CUSTODY	V65-07 CUSTODY	Phillip Renaud
L2035834-02C	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-03A	Vial-B	INTACT	03-SEP-20	CUSTODY	GC/MS	Amanda Kennedy	VOA-DEAD-CUSTODY-371	VOA-DEAD-CUSTODY-371	Amanda Kennedy
L2035834-03A	Vial-B	INTACT	03-SEP-20	CUSTODY	V56-18 CUSTODY	Piotr Duczmalewski	GC/MS	GC/MS	Piotr Duczmalewski
L2035834-03A	Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V56-18 CUSTODY	V56-18 CUSTODY	Phillip Renaud
L2035834-03A	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-03B	Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V65-07 CUSTODY	V65-07 CUSTODY	Phillip Renaud
L2035834-03B	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-03C	Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V65-07 CUSTODY	V65-07 CUSTODY	Phillip Renaud
L2035834-03C	Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-04A	Vial-B	INTACT	03-SEP-20	CUSTODY	GC/MS	Amanda Kennedy	VOA-DEAD-CUSTODY-371	VOA-DEAD-CUSTODY-371	Amanda Kennedy

Container ID Type	Status	Transaction Date	From Response	Location	To Operator	Response	Location	Operator
L2035834-04A Vial-B	INTACT	03-SEP-20	CUSTODY	V56-18 CUSTODY	Piotr Duczmalewski	GC/MS	GC/MS	Piotr Duczmalewski
L2035834-04A Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V56-18 CUSTODY	V56-18 CUSTODY	Phillip Renaud
L2035834-04A Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-04B Vial-B	INTACT	01-SEP-20	CUSTODY	CUSTODY	Robert Pino	VOA-DEAD-CUSTODY-313	VOA-DEAD-CUSTODY-313	Robert Pino
L2035834-04B Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-04C Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V65-07 CUSTODY	V65-07 CUSTODY	Phillip Renaud
L2035834-04C Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-05A Vial-B	INTACT	03-SEP-20	CUSTODY	GC/MS	Amanda Kennedy	VOA-DEAD-CUSTODY-371	VOA-DEAD-CUSTODY-371	Amanda Kennedy
L2035834-05A Vial-B	INTACT	03-SEP-20	CUSTODY	V56-18 CUSTODY	Piotr Duczmalewski	GC/MS	GC/MS	Piotr Duczmalewski
L2035834-05A Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V56-18 CUSTODY	V56-18 CUSTODY	Phillip Renaud
L2035834-05A Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng
L2035834-05B Vial-B	INTACT	01-SEP-20		CUSTODY	Phillip Renaud	V65-07 CUSTODY	V65-07 CUSTODY	Phillip Renaud
L2035834-05B Vial-B	INTACT	01-SEP-20	LOGIN	LOGIN	Uriel Amparbeng	CUSTODY	CUSTODY	Uriel Amparbeng

Methodology Review

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Laboratory Chronicle

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2035834-01A	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-01B	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-01C	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-02A	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-02B	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-02C	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-03A	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-03B	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-03C	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-04A	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-04B	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-04C	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-05A	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)
L2035834-05B	Vial HCl preserved	A	NA		2.7	Y	Absent		NJ-8260(14)

*Values in parentheses indicate holding time in days

NJ DEP
Data of Known Quality Protocols
Conformance/Non-Conformance
Summary Questionnaire

NJ DEP Data of Known Quality Protocols
Conformance/Non-Conformance
Summary Questionnaire

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the NJDEP Data of Known Quality performance standards?	YES
1a	Were the method specified handling, preservation, and holding time requirements met?	YES
1b	EPH Method: Was the EPH Method conducted without significant modifications (see Section 11.3 of respective DKQ methods)?	N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	YES
3	Were all samples received at an appropriate temperature (4 ± 2° C)?	YES
4	Were all QA/QC performance criteria specified in the NJDEP DKQP standards achieved?	YES
5a	Were reporting limits specified or referenced on the chain-of-custody or communicated to the laboratory prior to sample receipt?	YES
5b	Were these reporting limits met?	NO
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the DKQP documents and/or site-specific QAPP?	YES
7	Are project-specific matrix spikes and/or laboratory duplicates included in this data set?	NO

Note: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1a or #1b is "No", the data package does not meet the requirements for "Data of Known Quality".

Conformance/Non-Conformance Summary

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

DKQP Related Narratives

Volatile Organics

In reference to question 5b:

L2035834-01 through -05: One or more of the target analytes did not achieve the requested regulatory limits.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Tiffani Morrissey Report Date: 09/04/20

Title: Technical Director/Representative

Glossary

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: DU Report with 'J' Qualifiers

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

Report Format: DU Report with 'J' Qualifiers

Data Qualifiers

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Organics

GC/MS 8260
Analysis

Sample Results Summary

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-01	**Date Collected**	: 08/31/20 09:45
Client ID	: MW-116	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 12:34
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A16	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	0.35	U
123-91-1	1,4-Dioxane	ND	250	61.	U
106-93-4	1,2-Dibromoethane	ND	2.0	0.19	U
75-09-2	Methylene chloride	ND	2.5	0.68	U
75-34-3	1,1-Dichloroethane	ND	0.75	0.21	U
67-66-3	Chloroform	ND	0.75	0.22	U
56-23-5	Carbon tetrachloride	ND	0.50	0.13	U
78-87-5	1,2-Dichloropropane	ND	1.0	0.14	U
124-48-1	Dibromochloromethane	ND	0.50	0.15	U
79-00-5	1,1,2-Trichloroethane	ND	0.75	0.14	U
127-18-4	Tetrachloroethene	ND	0.50	0.18	U
108-90-7	Chlorobenzene	ND	0.50	0.18	U
75-69-4	Trichlorofluoromethane	ND	2.5	0.16	U
107-06-2	1,2-Dichloroethane	ND	0.50	0.13	U
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.16	U
75-27-4	Bromodichloromethane	ND	0.50	0.19	U
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	U
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	U
542-75-6	1,3-Dichloropropene, Total	ND	0.50	0.14	U
75-25-2	Bromoform	ND	2.0	0.25	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.17	U
71-43-2	Benzene	ND	0.50	0.16	U
108-88-3	Toluene	ND	0.75	0.20	U
100-41-4	Ethylbenzene	ND	0.50	0.17	U
74-87-3	Chloromethane	ND	2.5	0.20	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-01	**Date Collected**	: 08/31/20 09:45
Client ID	: MW-116	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 12:34
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A16	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
74-83-9	Bromomethane	ND	1.0	0.26	U
75-01-4	Vinyl chloride	ND	0.20	0.07	U
75-00-3	Chloroethane	ND	1.0	0.13	U
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	U
156-60-5	trans-1,2-Dichloroethene	ND	0.75	0.16	U
79-01-6	Trichloroethene	ND	0.50	0.18	U
95-50-1	1,2-Dichlorobenzene	ND	2.5	0.18	U
541-73-1	1,3-Dichlorobenzene	ND	2.5	0.19	U
106-46-7	1,4-Dichlorobenzene	ND	2.5	0.19	U
1634-04-4	Methyl tert butyl ether	ND	1.0	0.17	U
179601-23-1	p/m-Xylene	ND	1.0	0.33	U
95-47-6	o-Xylene	ND	1.0	0.39	U
1330-20-7	Xylenes, Total	ND	1.0	0.33	U
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.19	U
100-42-5	Styrene	ND	1.0	0.36	U
75-71-8	Dichlorodifluoromethane	ND	5.0	0.24	U
67-64-1	Acetone	ND	5.0	1.5	U
75-15-0	Carbon disulfide	ND	5.0	0.30	U
78-93-3	2-Butanone	ND	5.0	1.9	U
108-10-1	4-Methyl-2-pentanone	ND	5.0	0.42	U
591-78-6	2-Hexanone	ND	5.0	0.52	U
74-97-5	Bromochloromethane	ND	2.5	0.15	U
98-82-8	Isopropylbenzene	ND	0.50	0.19	U
87-61-6	1,2,3-Trichlorobenzene	ND	2.5	0.23	U
120-82-1	1,2,4-Trichlorobenzene	ND	2.5	0.22	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-01	**Date Collected**	: 08/31/20 09:45
Client ID	: MW-116	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 12:34
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A16	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
79-20-9	Methyl Acetate	ND	2.0	0.23	U
141-78-6	Ethyl Acetate	ND	10	0.72	U
110-82-7	Cyclohexane	ND	10	0.27	U
108-87-2	Methyl cyclohexane	ND	10	0.40	U
76-13-1	Freon-113	ND	2.5	0.15	U

Tentatively Identified Compounds
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-01	**Date Collected**	: 08/31/20 09:45
Client ID	: MW-116	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 12:34
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A16	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	:
Level	:	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

Number TICS found: 2 **Concentration Units: ug/L**

CAS Number	Compound Name	RT	EST. CONC.	Qualifier
	Unknown	1.04	1.11	J
	Total TIC Compounds		1.11J	J

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-02	**Date Collected**	: 08/31/20 11:45
Client ID	: MW-204	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 12:56
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A17	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	0.35	U
123-91-1	1,4-Dioxane	ND	250	61.	U
106-93-4	1,2-Dibromoethane	ND	2.0	0.19	U
75-09-2	Methylene chloride	ND	2.5	0.68	U
75-34-3	1,1-Dichloroethane	ND	0.75	0.21	U
67-66-3	Chloroform	ND	0.75	0.22	U
56-23-5	Carbon tetrachloride	ND	0.50	0.13	U
78-87-5	1,2-Dichloropropane	ND	1.0	0.14	U
124-48-1	Dibromochloromethane	ND	0.50	0.15	U
79-00-5	1,1,2-Trichloroethane	ND	0.75	0.14	U
127-18-4	Tetrachloroethene	ND	0.50	0.18	U
108-90-7	Chlorobenzene	ND	0.50	0.18	U
75-69-4	Trichlorofluoromethane	ND	2.5	0.16	U
107-06-2	1,2-Dichloroethane	ND	0.50	0.13	U
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.16	U
75-27-4	Bromodichloromethane	ND	0.50	0.19	U
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	U
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	U
542-75-6	1,3-Dichloropropene, Total	ND	0.50	0.14	U
75-25-2	Bromoform	ND	2.0	0.25	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.17	U
71-43-2	Benzene	ND	0.50	0.16	U
108-88-3	Toluene	ND	0.75	0.20	U
100-41-4	Ethylbenzene	ND	0.50	0.17	U
74-87-3	Chloromethane	ND	2.5	0.20	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-02	**Date Collected**	: 08/31/20 11:45
Client ID	: MW-204	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 12:56
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A17	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
74-83-9	Bromomethane	ND	1.0	0.26	U
75-01-4	Vinyl chloride	ND	0.20	0.07	U
75-00-3	Chloroethane	ND	1.0	0.13	U
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	U
156-60-5	trans-1,2-Dichloroethene	ND	0.75	0.16	U
79-01-6	Trichloroethene	ND	0.50	0.18	U
95-50-1	1,2-Dichlorobenzene	ND	2.5	0.18	U
541-73-1	1,3-Dichlorobenzene	ND	2.5	0.19	U
106-46-7	1,4-Dichlorobenzene	ND	2.5	0.19	U
1634-04-4	Methyl tert butyl ether	1.3	1.0	0.17	
179601-23-1	p/m-Xylene	ND	1.0	0.33	U
95-47-6	o-Xylene	ND	1.0	0.39	U
1330-20-7	Xylenes, Total	ND	1.0	0.33	U
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.19	U
100-42-5	Styrene	ND	1.0	0.36	U
75-71-8	Dichlorodifluoromethane	ND	5.0	0.24	U
67-64-1	Acetone	ND	5.0	1.5	U
75-15-0	Carbon disulfide	ND	5.0	0.30	U
78-93-3	2-Butanone	ND	5.0	1.9	U
108-10-1	4-Methyl-2-pentanone	ND	5.0	0.42	U
591-78-6	2-Hexanone	ND	5.0	0.52	U
74-97-5	Bromochloromethane	ND	2.5	0.15	U
98-82-8	Isopropylbenzene	ND	0.50	0.19	U
87-61-6	1,2,3-Trichlorobenzene	ND	2.5	0.23	U
120-82-1	1,2,4-Trichlorobenzene	ND	2.5	0.22	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-02	**Date Collected**	: 08/31/20 11:45
Client ID	: MW-204	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 12:56
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A17	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
79-20-9	Methyl Acetate	ND	2.0	0.23	U
141-78-6	Ethyl Acetate	ND	10	0.72	U
110-82-7	Cyclohexane	ND	10	0.27	U
108-87-2	Methyl cyclohexane	ND	10	0.40	U
76-13-1	Freon-113	ND	2.5	0.15	U

Tentatively Identified Compounds
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-02	**Date Collected**	: 08/31/20 11:45
Client ID	: MW-204	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 12:56
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A17	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	:
Level	:	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

Number TICS found: 3 **Concentration Units: ug/L**

CAS Number	Compound Name	RT	EST. CONC.	Qualifier
	Unknown	3.05	1.92	J
	Unknown Aromatic	9.88	1.54	J
	Total TIC Compounds		3.46J	J

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-03	**Date Collected**	: 08/31/20 12:40
Client ID	: FIELD BLANK	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 13:17
Sample Matrix	: Field Blank	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A18	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	0.35	U
123-91-1	1,4-Dioxane	ND	250	61.	U
106-93-4	1,2-Dibromoethane	ND	2.0	0.19	U
75-09-2	Methylene chloride	ND	2.5	0.68	U
75-34-3	1,1-Dichloroethane	ND	0.75	0.21	U
67-66-3	Chloroform	ND	0.75	0.22	U
56-23-5	Carbon tetrachloride	ND	0.50	0.13	U
78-87-5	1,2-Dichloropropane	ND	1.0	0.14	U
124-48-1	Dibromochloromethane	ND	0.50	0.15	U
79-00-5	1,1,2-Trichloroethane	ND	0.75	0.14	U
127-18-4	Tetrachloroethene	ND	0.50	0.18	U
108-90-7	Chlorobenzene	ND	0.50	0.18	U
75-69-4	Trichlorofluoromethane	ND	2.5	0.16	U
107-06-2	1,2-Dichloroethane	ND	0.50	0.13	U
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.16	U
75-27-4	Bromodichloromethane	ND	0.50	0.19	U
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	U
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	U
542-75-6	1,3-Dichloropropene, Total	ND	0.50	0.14	U
75-25-2	Bromoform	ND	2.0	0.25	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.17	U
71-43-2	Benzene	ND	0.50	0.16	U
108-88-3	Toluene	ND	0.75	0.20	U
100-41-4	Ethylbenzene	ND	0.50	0.17	U
74-87-3	Chloromethane	ND	2.5	0.20	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-03	**Date Collected**	: 08/31/20 12:40
Client ID	: FIELD BLANK	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 13:17
Sample Matrix	: Field Blank	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A18	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
74-83-9	Bromomethane	ND	1.0	0.26	U
75-01-4	Vinyl chloride	ND	0.20	0.07	U
75-00-3	Chloroethane	ND	1.0	0.13	U
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	U
156-60-5	trans-1,2-Dichloroethene	ND	0.75	0.16	U
79-01-6	Trichloroethene	ND	0.50	0.18	U
95-50-1	1,2-Dichlorobenzene	ND	2.5	0.18	U
541-73-1	1,3-Dichlorobenzene	ND	2.5	0.19	U
106-46-7	1,4-Dichlorobenzene	ND	2.5	0.19	U
1634-04-4	Methyl tert butyl ether	ND	1.0	0.17	U
179601-23-1	p/m-Xylene	ND	1.0	0.33	U
95-47-6	o-Xylene	ND	1.0	0.39	U
1330-20-7	Xylenes, Total	ND	1.0	0.33	U
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.19	U
100-42-5	Styrene	ND	1.0	0.36	U
75-71-8	Dichlorodifluoromethane	ND	5.0	0.24	U
67-64-1	Acetone	ND	5.0	1.5	U
75-15-0	Carbon disulfide	ND	5.0	0.30	U
78-93-3	2-Butanone	ND	5.0	1.9	U
108-10-1	4-Methyl-2-pentanone	ND	5.0	0.42	U
591-78-6	2-Hexanone	ND	5.0	0.52	U
74-97-5	Bromochloromethane	ND	2.5	0.15	U
98-82-8	Isopropylbenzene	ND	0.50	0.19	U
87-61-6	1,2,3-Trichlorobenzene	ND	2.5	0.23	U
120-82-1	1,2,4-Trichlorobenzene	ND	2.5	0.22	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-03	**Date Collected**	: 08/31/20 12:40
Client ID	: FIELD BLANK	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 13:17
Sample Matrix	: Field Blank	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A18	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
79-20-9	Methyl Acetate	ND	2.0	0.23	U
141-78-6	Ethyl Acetate	ND	10	0.72	U
110-82-7	Cyclohexane	ND	10	0.27	U
108-87-2	Methyl cyclohexane	ND	10	0.40	U
76-13-1	Freon-113	ND	2.5	0.15	U

Tentatively Identified Compounds
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-03	**Date Collected**	: 08/31/20 12:40
Client ID	: FIELD BLANK	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 13:17
Sample Matrix	: Field Blank	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A18	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	:
Level	:	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

Number TICS found: 2 **Concentration Units: ug/L**

CAS Number	Compound Name	RT	EST. CONC.	Qualifier
000067-63-0	Isopropyl Alcohol	2.34	72.6	NJ
	Total TIC Compounds		72.6J	J

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-04D	**Date Collected**	: 08/31/20 13:05
Client ID	: MW-118	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 14:00
Sample Matrix	: WATER	**Dilution Factor**	: 10
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A20	**Instrument ID**	: ELAINE
Sample Amount	: 1 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
96-12-8	1,2-Dibromo-3-chloropropane	ND	25	3.5	U
123-91-1	1,4-Dioxane	ND	2500	610	U
106-93-4	1,2-Dibromoethane	ND	20	1.9	U
75-09-2	Methylene chloride	ND	25	6.8	U
75-34-3	1,1-Dichloroethane	ND	7.5	2.1	U
67-66-3	Chloroform	ND	7.5	2.2	U
56-23-5	Carbon tetrachloride	ND	5.0	1.3	U
78-87-5	1,2-Dichloropropane	ND	10	1.4	U
124-48-1	Dibromochloromethane	ND	5.0	1.5	U
79-00-5	1,1,2-Trichloroethane	ND	7.5	1.4	U
127-18-4	Tetrachloroethene	ND	5.0	1.8	U
108-90-7	Chlorobenzene	ND	5.0	1.8	U
75-69-4	Trichlorofluoromethane	ND	25	1.6	U
107-06-2	1,2-Dichloroethane	ND	5.0	1.3	U
71-55-6	1,1,1-Trichloroethane	ND	5.0	1.6	U
75-27-4	Bromodichloromethane	ND	5.0	1.9	U
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	1.6	U
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	1.4	U
542-75-6	1,3-Dichloropropene, Total	ND	5.0	1.4	U
75-25-2	Bromoform	ND	20	2.5	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	1.7	U
71-43-2	Benzene	ND	5.0	1.6	U
108-88-3	Toluene	33	7.5	2.0	
100-41-4	Ethylbenzene	ND	5.0	1.7	U
74-87-3	Chloromethane	ND	25	2.0	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-04D	**Date Collected**	: 08/31/20 13:05
Client ID	: MW-118	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 14:00
Sample Matrix	: WATER	**Dilution Factor**	: 10
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A20	**Instrument ID**	: ELAINE
Sample Amount	: 1 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
74-83-9	Bromomethane	ND	10	2.6	U
75-01-4	Vinyl chloride	ND	2.0	0.71	U
75-00-3	Chloroethane	ND	10	1.3	U
75-35-4	1,1-Dichloroethene	ND	5.0	1.7	U
156-60-5	trans-1,2-Dichloroethene	ND	7.5	1.6	U
79-01-6	Trichloroethene	ND	5.0	1.8	U
95-50-1	1,2-Dichlorobenzene	ND	25	1.8	U
541-73-1	1,3-Dichlorobenzene	ND	25	1.9	U
106-46-7	1,4-Dichlorobenzene	ND	25	1.9	U
1634-04-4	Methyl tert butyl ether	ND	10	1.7	U
179601-23-1	p/m-Xylene	3.9	10	3.3	J
95-47-6	o-Xylene	ND	10	3.9	U
1330-20-7	Xylenes, Total	3.9	10	3.3	J
156-59-2	cis-1,2-Dichloroethene	ND	5.0	1.9	U
100-42-5	Styrene	ND	10	3.6	U
75-71-8	Dichlorodifluoromethane	ND	50	2.4	U
67-64-1	Acetone	1600	50	15.	
75-15-0	Carbon disulfide	ND	50	3.0	U
78-93-3	2-Butanone	ND	50	19.	U
108-10-1	4-Methyl-2-pentanone	ND	50	4.2	U
591-78-6	2-Hexanone	ND	50	5.2	U
74-97-5	Bromochloromethane	ND	25	1.5	U
98-82-8	Isopropylbenzene	ND	5.0	1.9	U
87-61-6	1,2,3-Trichlorobenzene	ND	25	2.3	U
120-82-1	1,2,4-Trichlorobenzene	ND	25	2.2	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-04D	**Date Collected**	: 08/31/20 13:05
Client ID	: MW-118	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 14:00
Sample Matrix	: WATER	**Dilution Factor**	: 10
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A20	**Instrument ID**	: ELAINE
Sample Amount	: 1 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
79-20-9	Methyl Acetate	ND	20	2.3	U
141-78-6	Ethyl Acetate	91	100	7.2	J
110-82-7	Cyclohexane	ND	100	2.7	U
108-87-2	Methyl cyclohexane	ND	100	4.0	U
76-13-1	Freon-113	ND	25	1.5	U

Tentatively Identified Compounds
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-04D	**Date Collected**	: 08/31/20 13:05
Client ID	: MW-118	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 14:00
Sample Matrix	: WATER	**Dilution Factor**	: 10
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A20	**Instrument ID**	: ELAINE
Sample Amount	: 1 ml	**GC Column**	:
Level	:	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

Number TICS found: 5 **Concentration Units: ug/L**

CAS Number	Compound Name	RT	EST. CONC.	Qualifier
	Unknown	1.11	32.5	J
	Unknown	2.34	11.7	J
	Unknown	5.66	16.7	J
	Unknown Benzene	9.91	10.6	J
	Total TIC Compounds		71.5J	J

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-05	**Date Collected**	: 08/31/20 00:00
Client ID	: TRIP BLANK	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 13:39
Sample Matrix	: Trip Blank (aqueous)	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A19	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	0.35	U
123-91-1	1,4-Dioxane	ND	250	61.	U
106-93-4	1,2-Dibromoethane	ND	2.0	0.19	U
75-09-2	Methylene chloride	ND	2.5	0.68	U
75-34-3	1,1-Dichloroethane	ND	0.75	0.21	U
67-66-3	Chloroform	ND	0.75	0.22	U
56-23-5	Carbon tetrachloride	ND	0.50	0.13	U
78-87-5	1,2-Dichloropropane	ND	1.0	0.14	U
124-48-1	Dibromochloromethane	ND	0.50	0.15	U
79-00-5	1,1,2-Trichloroethane	ND	0.75	0.14	U
127-18-4	Tetrachloroethene	ND	0.50	0.18	U
108-90-7	Chlorobenzene	ND	0.50	0.18	U
75-69-4	Trichlorofluoromethane	ND	2.5	0.16	U
107-06-2	1,2-Dichloroethane	ND	0.50	0.13	U
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.16	U
75-27-4	Bromodichloromethane	ND	0.50	0.19	U
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	U
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	U
542-75-6	1,3-Dichloropropene, Total	ND	0.50	0.14	U
75-25-2	Bromoform	ND	2.0	0.25	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.17	U
71-43-2	Benzene	ND	0.50	0.16	U
108-88-3	Toluene	ND	0.75	0.20	U
100-41-4	Ethylbenzene	ND	0.50	0.17	U
74-87-3	Chloromethane	ND	2.5	0.20	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-05	**Date Collected**	: 08/31/20 00:00
Client ID	: TRIP BLANK	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 13:39
Sample Matrix	: Trip Blank (aqueous)	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A19	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
74-83-9	Bromomethane	ND	1.0	0.26	U
75-01-4	Vinyl chloride	ND	0.20	0.07	U
75-00-3	Chloroethane	ND	1.0	0.13	U
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	U
156-60-5	trans-1,2-Dichloroethene	ND	0.75	0.16	U
79-01-6	Trichloroethene	ND	0.50	0.18	U
95-50-1	1,2-Dichlorobenzene	ND	2.5	0.18	U
541-73-1	1,3-Dichlorobenzene	ND	2.5	0.19	U
106-46-7	1,4-Dichlorobenzene	ND	2.5	0.19	U
1634-04-4	Methyl tert butyl ether	ND	1.0	0.17	U
179601-23-1	p/m-Xylene	ND	1.0	0.33	U
95-47-6	o-Xylene	ND	1.0	0.39	U
1330-20-7	Xylenes, Total	ND	1.0	0.33	U
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.19	U
100-42-5	Styrene	ND	1.0	0.36	U
75-71-8	Dichlorodifluoromethane	ND	5.0	0.24	U
67-64-1	Acetone	ND	5.0	1.5	U
75-15-0	Carbon disulfide	ND	5.0	0.30	U
78-93-3	2-Butanone	ND	5.0	1.9	U
108-10-1	4-Methyl-2-pentanone	ND	5.0	0.42	U
591-78-6	2-Hexanone	ND	5.0	0.52	U
74-97-5	Bromochloromethane	ND	2.5	0.15	U
98-82-8	Isopropylbenzene	ND	0.50	0.19	U
87-61-6	1,2,3-Trichlorobenzene	ND	2.5	0.23	U
120-82-1	1,2,4-Trichlorobenzene	ND	2.5	0.22	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-05	**Date Collected**	: 08/31/20 00:00
Client ID	: TRIP BLANK	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 13:39
Sample Matrix	: Trip Blank (aqueous)	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A19	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
79-20-9	Methyl Acetate	ND	2.0	0.23	U
141-78-6	Ethyl Acetate	ND	10	0.72	U
110-82-7	Cyclohexane	ND	10	0.27	U
108-87-2	Methyl cyclohexane	ND	10	0.40	U
76-13-1	Freon-113	ND	2.5	0.15	U

Tentatively Identified Compounds
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: L2035834-05	**Date Collected**	: 08/31/20 00:00
Client ID	: TRIP BLANK	**Date Received**	: 08/31/20
Sample Location	: NEWARK, NJ 29 RIVERSIDE AVE.	**Date Analyzed**	: 09/03/20 13:39
Sample Matrix	: Trip Blank (aqueous)	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: AJK
Lab File ID	: VE200903A19	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	:
Level	:	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

Number TICS found: 0 **Concentration Units: ug/L**

CAS Number	Compound Name	RT	EST. CONC.	Qualifier
	NO TENTATIVELY IDENTIFIED COMPOUNDS			

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: WG1406395-5	**Date Collected**	: NA
Client ID	: WG1406395-5BLANK	**Date Received**	: NA
Sample Location	:	**Date Analyzed**	: 09/03/20 08:36
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: PD
Lab File ID	: VE200903A05	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	0.35	U
123-91-1	1,4-Dioxane	ND	250	61.	U
106-93-4	1,2-Dibromoethane	ND	2.0	0.19	U
75-09-2	Methylene chloride	ND	2.5	0.68	U
75-34-3	1,1-Dichloroethane	ND	0.75	0.21	U
67-66-3	Chloroform	ND	0.75	0.22	U
56-23-5	Carbon tetrachloride	ND	0.50	0.13	U
78-87-5	1,2-Dichloropropane	ND	1.0	0.14	U
124-48-1	Dibromochloromethane	ND	0.50	0.15	U
79-00-5	1,1,2-Trichloroethane	ND	0.75	0.14	U
127-18-4	Tetrachloroethene	ND	0.50	0.18	U
108-90-7	Chlorobenzene	ND	0.50	0.18	U
75-69-4	Trichlorofluoromethane	ND	2.5	0.16	U
107-06-2	1,2-Dichloroethane	ND	0.50	0.13	U
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.16	U
75-27-4	Bromodichloromethane	ND	0.50	0.19	U
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	U
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	U
542-75-6	1,3-Dichloropropene, Total	ND	0.50	0.14	U
75-25-2	Bromoform	ND	2.0	0.25	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.17	U
71-43-2	Benzene	ND	0.50	0.16	U
108-88-3	Toluene	ND	0.75	0.20	U
100-41-4	Ethylbenzene	ND	0.50	0.17	U
74-87-3	Chloromethane	ND	2.5	0.20	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: WG1406395-5	**Date Collected**	: NA
Client ID	: WG1406395-5BLANK	**Date Received**	: NA
Sample Location	:	**Date Analyzed**	: 09/03/20 08:36
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: PD
Lab File ID	: VE200903A05	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
74-83-9	Bromomethane	ND	1.0	0.26	U
75-01-4	Vinyl chloride	ND	0.20	0.07	U
75-00-3	Chloroethane	ND	1.0	0.13	U
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	U
156-60-5	trans-1,2-Dichloroethene	ND	0.75	0.16	U
79-01-6	Trichloroethene	ND	0.50	0.18	U
95-50-1	1,2-Dichlorobenzene	ND	2.5	0.18	U
541-73-1	1,3-Dichlorobenzene	ND	2.5	0.19	U
106-46-7	1,4-Dichlorobenzene	ND	2.5	0.19	U
1634-04-4	Methyl tert butyl ether	ND	1.0	0.17	U
179601-23-1	p/m-Xylene	ND	1.0	0.33	U
95-47-6	o-Xylene	ND	1.0	0.39	U
1330-20-7	Xylenes, Total	ND	1.0	0.33	U
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.19	U
100-42-5	Styrene	ND	1.0	0.36	U
75-71-8	Dichlorodifluoromethane	ND	5.0	0.24	U
67-64-1	Acetone	ND	5.0	1.5	U
75-15-0	Carbon disulfide	ND	5.0	0.30	U
78-93-3	2-Butanone	ND	5.0	1.9	U
108-10-1	4-Methyl-2-pentanone	ND	5.0	0.42	U
591-78-6	2-Hexanone	ND	5.0	0.52	U
74-97-5	Bromochloromethane	ND	2.5	0.15	U
98-82-8	Isopropylbenzene	ND	0.50	0.19	U
87-61-6	1,2,3-Trichlorobenzene	ND	2.5	0.23	U
120-82-1	1,2,4-Trichlorobenzene	ND	2.5	0.22	U

Results Summary
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: WG1406395-5	**Date Collected**	: NA
Client ID	: WG1406395-5BLANK	**Date Received**	: NA
Sample Location	:	**Date Analyzed**	: 09/03/20 08:36
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: PD
Lab File ID	: VE200903A05	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	: RTX-502.2
Level	: LOW	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

		ug/L			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
79-20-9	Methyl Acetate	ND	2.0	0.23	U
141-78-6	Ethyl Acetate	ND	10	0.72	U
110-82-7	Cyclohexane	ND	10	0.27	U
108-87-2	Methyl cyclohexane	ND	10	0.40	U
76-13-1	Freon-113	ND	2.5	0.15	U

Tentatively Identified Compounds
Form 1
Volatile Organics by GC/MS

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab ID	: WG1406395-5	**Date Collected**	: NA
Client ID	: WG1406395-5BLANK	**Date Received**	: NA
Sample Location	:	**Date Analyzed**	: 09/03/20 08:36
Sample Matrix	: WATER	**Dilution Factor**	: 1
Analytical Method	: 1,8260D	**Analyst**	: PD
Lab File ID	: VE200903A05	**Instrument ID**	: ELAINE
Sample Amount	: 10 ml	**GC Column**	:
Level	:	**%Solids**	: N/A
Extract Volume (MeOH)	: N/A	**Injection Volume**	: N/A

Number TICS found: 0 **Concentration Units: ug/L**

CAS Number	Compound Name	RT	EST. CONC.	Qualifier
	NO TENTATIVELY IDENTIFIED COMPOUNDS			

Tuning Results Summary

Instrument Performance Check (Tune) Summary
Form 5
Volatiles
Bromofluorobenzene (BFB)

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Instrument ID	: ELAINE	**Analysis Date**	: 08/21/20 14:49
Tune Standard	: WG1401852-1	**Tune File ID**	: VE200821NBF1_tune

m/e	Ion Abundance Criteria	%Relative Abundance
50	15.0 - 40.0% of mass 95	21.7
75	30.0 - 60.0% of mass 95	49.2
95	Base Peak, 100% relative abundance	100
96	5.0 - 9.0% of mass 95	7.8
173	Less than 2.0% of mass 174	0 (0)1
174	Greater than 50.0 of mass 95	88.3
175	5.0 - 9.0% of mass 174	6.6 (7.5)1
176	95.0 - 101% of mass 174	85.8 (97.2)1
177	5.0 - 9.0% of mass 176	5.9 (6.9)2

1-Value is % of mass 174 2-Value is % of mass 176

This Check Applies to the following Samples, MS, MSD, Blanks, and Standards:

Client Sample ID	Lab Sample ID	File ID	Analysis Date/Time
STD0.19PPB	R1342206-1	VE200821N03	08/21/20 15:52
STD0.5PPB	R1342206-2	VE200821N05	08/21/20 16:35
STD2PPB	R1342206-3	VE200821N07	08/21/20 17:18
STD10PPB	R1342206-4	VE200821N09	08/21/20 18:00
STD30PPB	R1342206-5	VE200821N10	08/21/20 18:22
STD80PPB	R1342206-6	VE200821N11	08/21/20 18:44
STD120PPB	R1342206-8	VE200821N12	08/21/20 19:05
STD200PPB	R1342206-7	VE200821N13	08/21/20 19:27
ICV Quant Report	R1342206-9	VE200821N19	08/21/20 21:36

Instrument Performance Check (Tune) Summary
Form 5
Volatiles
Bromofluorobenzene (BFB)

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Instrument ID	: ELAINE	**Analysis Date**	: 09/03/20 06:48
Tune Standard	: WG1406395-1	**Tune File ID**	: VE200903ABF1_tune

m/e	Ion Abundance Criteria	%Relative Abundance
50	15.0 - 40.0% of mass 95	21.8
75	30.0 - 60.0% of mass 95	48.2
95	Base Peak, 100% relative abundance	100
96	5.0 - 9.0% of mass 95	7.2
173	Less than 2.0% of mass 174	0.3 (.4)1
174	Greater than 50.0 of mass 95	86.9
175	5.0 - 9.0% of mass 174	6.6 (7.6)1
176	95.0 - 101% of mass 174	84.5 (97.2)1
177	5.0 - 9.0% of mass 176	5.1 (6.1)2

1-Value is % of mass 174 2-Value is % of mass 176

This Check Applies to the following Samples, MS, MSD, Blanks, and Standards:

Client Sample ID	Lab Sample ID	File ID	Analysis Date/Time
WG1406395-2CCAL	WG1406395-2	VE200903A02	09/03/20 07:32
WG1406395-3LCS	WG1406395-3	VE200903A02	09/03/20 07:32
WG1406395-4LCSD	WG1406395-4	VE200903A03	09/03/20 07:53
WG1406395-5BLANK	WG1406395-5	VE200903A05	09/03/20 08:36
MW-116	L2035834-01	VE200903A16	09/03/20 12:34
MW-204	L2035834-02	VE200903A17	09/03/20 12:56
FIELD BLANK	L2035834-03	VE200903A18	09/03/20 13:17
TRIP BLANK	L2035834-05	VE200903A19	09/03/20 13:39
MW-118	L2035834-04D	VE200903A20	09/03/20 14:00

Blank Results Summary

Method Blank Summary
Form 4
Volatiles

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Lab Sample ID	: WG1406395-5	**Lab File ID**	: VE200903A05
Instrument ID	: ELAINE		
Matrix	: WATER	**Analysis Date**	: 09/03/20 08:36

Client Sample No.	Lab Sample ID	Analysis Date
WG1406395-3LCS	WG1406395-3	09/03/20 07:32
WG1406395-4LCSD	WG1406395-4	09/03/20 07:53
MW-116	L2035834-01	09/03/20 12:34
MW-204	L2035834-02	09/03/20 12:56
FIELD BLANK	L2035834-03	09/03/20 13:17
TRIP BLANK	L2035834-05	09/03/20 13:39
MW-118	L2035834-04D	09/03/20 14:00

Standards Data Summary

Initial Calibration Summary
Form 6
Volatiles

Client	**: Advanced GeoServices Corporation**	**Lab Number**	**: L2035834**
Project Name	**: DAVION**	**Project Number**	**: 2020-4047-400**
Instrument ID	**: ELAINE**	**Ical Ref**	**: ICAL17063**
Calibration dates	**: 08/21/20 15:52 08/21/20 19:27**		

Calibration Files
L11 =VE200821N03.D L1 =VE200821N05.D L2 =VE200821N07.D L3 =VE200821N09.D L4 =VE200821N10.D
L6 =VE200821N11.D L8 =VE200821N12.D L10 =VE200821N13.D

		Compound	L11	L1	L2	L3	L4	L6	L8	L10	Avg	%RSD
1)	I	Fluorobenzene	----------ISTD----------									
2)	TP	Dichlorodifluo		0.101	0.140	0.156	0.154	0.156	0.157	0.153	0.145	14.00
3)	TP	Chloromethane		0.213	0.249	0.218	0.227	0.212	0.230	0.228	0.225	5.70
4)	TC	Vinyl chloride	0.140	0.190	0.211	0.208	0.213	0.211	0.222	0.218	0.202	13.19
5)	TP	Bromomethane		0.069	0.083	0.079	0.083	0.087	0.104	0.110	0.088#	16.49
6)	TP	Chloroethane		0.108	0.125	0.122	0.122	0.105	0.111	0.106	0.114	7.72
7)	TP	Trichlorofluor		0.211	0.261	0.284	0.273	0.278	0.269	0.267	0.263	9.20
8)	TP	Ethyl ether		0.090	0.098	0.096	0.099	0.095	0.102	0.102	0.097	4.08
10)	TC	1,1-Dichloroet		0.139	0.161	0.156	0.165	0.165	0.176	0.175	0.163	7.62
11)	TP	Carbon disulfide		0.275	0.345	0.305	0.331	0.331	0.368	0.363	0.331	9.89
12)	TP	Freon-113		0.122	0.155	0.183	0.174	0.181	0.186	0.186	0.169	13.95
13)	TP	Iodomethane			0.032	0.061	0.107	0.139	0.173		*Q	0.9991
14)	TP	Acrolein		0.024	0.026	0.027	0.030	0.029	0.029	0.028	0.028#	6.93
15)	TP	Methylene chlo		0.241	0.225	0.182	0.187	0.177	0.189	0.187	0.198	12.37
17)	TP	Acetone			0.046	0.045	0.038	0.039	0.041	0.039	0.041#	7.73
18)	TP	trans-1,2-Dich		0.149	0.167	0.153	0.164	0.162	0.178	0.177	0.164	6.66
19)	TP	Methyl acetate			0.142	0.116	0.118	0.117	0.121	0.120	0.122	8.10
20)	TP	Methyl tert butyl ether		0.397	0.427	0.418	0.451	0.443	0.464	0.466	0.438	5.82
21)	TP	tert-Butyl alc		0.010	0.010	0.012	0.012	0.013	0.012	0.012	0.012#	10.08
22)	TP	Diisopropyl ether		0.673	0.728	0.746	0.790	0.775	0.817	0.801	0.762	6.53
23)	TP	1,1-Dichloroet		0.319	0.382	0.350	0.370	0.360	0.377	0.377	0.362	6.08
24)	TP	Halothane		0.124	0.152	0.145	0.149	0.149	0.158	0.156	0.148	7.54
25)	TP	Acrylonitrile		0.045	0.049	0.053	0.053	0.052	0.053	0.053	0.051	6.21
26)	TP	Ethyl tert-but		0.523	0.595	0.608	0.619	0.629	0.663	0.670	0.615	7.98
27)	TP	Vinyl acetate		0.386	0.386	0.415	0.454	0.465	0.486	0.485	0.440	9.94
28)	TP	cis-1,2-Dichlo		0.177	0.194	0.197	0.221	0.200	0.216	0.215	0.203	7.58
29)	TP	2,2-Dichloropr		0.201	0.245	0.236	0.270	0.262	0.276	0.274	0.252	10.70
30)	TP	Bromochloromet		0.072	0.096	0.092	0.096	0.092	0.095	0.090	0.091	9.14
31)	TP	Cyclohexane		0.255	0.320	0.362	0.385	0.399	0.411	0.412	0.363	15.88
32)	TC	Chloroform		0.299	0.339	0.313	0.323	0.318	0.343	0.339	0.325	5.10
33)	TP	Ethyl acetate		0.178	0.144	0.160	0.161	0.157	0.161	0.159	0.160	6.29
34)	TP	Carbon tetrachloride	0.151	0.180	0.247	0.238	0.258	0.260	0.275	0.273	0.235	19.27
35)	TP	Tetrahydrofuran			0.043	0.043	0.045	0.041	0.043	0.043	0.043#	2.92
36)	S	Dibromofluoromethane	0.237	0.242	0.248	0.245	0.244	0.246	0.254	0.246	0.245	2.00
37)	TP	1,1,1-Trichlor		0.238	0.283	0.281	0.300	0.299	0.316	0.312	0.290	9.08
39)	TP	2-Butanone		0.072	0.069	0.063	0.065	0.066	0.067	0.069	0.067#	4.61

Initial Calibration Summary
Form 6
Volatiles

Client	**: Advanced GeoServices Corporation**	**Lab Number**	**: L2035834**
Project Name	**: DAVION**	**Project Number**	**: 2020-4047-400**
Instrument ID	**: ELAINE**	**Ical Ref**	**: ICAL17063**
Calibration dates	**: 08/21/20 15:52 08/21/20 19:27**		

Calibration Files
L11 =VE200821N03.D L1 =VE200821N05.D L2 =VE200821N07.D L3 =VE200821N09.D L4 =VE200821N10.D
L6 =VE200821N11.D L8 =VE200821N12.D L10 =VE200821N13.D

	Compound	L11	L1	L2	L3	L4	L6	L8	L10	Avg	%RSD
40) TP	1,1-Dichloropr		0.194	0.239	0.239	0.260	0.261	0.275	0.276	0.249	11.47
41) TP	Benzene	0.656	0.704	0.796	0.752	0.790	0.767	0.818	0.801	0.760	7.26
42) TP	Tertiary-Amyl Methyl Ether		0.402	0.421	0.427	0.468	0.469	0.498	0.501	0.455	8.58
43) S	1,2-Dichloroethane-d4	0.283	0.288	0.278	0.282	0.284	0.278	0.276	0.280	0.281	1.42
44) TP	1,2-Dichloroet		0.230	0.272	0.249	0.249	0.242	0.250	0.251	0.249	5.13
47) TP	Methyl cyclohe		0.216	0.274	0.305	0.331	0.338	0.352	0.351	0.309	16.11
48) TP	Trichloroethene	0.183	0.166	0.195	0.185	0.193	0.191	0.204	0.200	0.189#	6.17
50) TP	Dibromomethane		0.070	0.095	0.097	0.098	0.096	0.099	0.100	0.093	11.42
51) TC	1,2-Dichloropr		0.174	0.215	0.203	0.207	0.205	0.217	0.216	0.205	7.24
53) TP	2-Chloroethyl		0.078	0.089	0.090	0.097	0.095	0.101	0.100	0.093	8.70
54) TP	Bromodichlorom		0.210	0.224	0.236	0.251	0.245	0.257	0.260	0.240	7.48
57) TP	1,4-Dioxane		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001#	5.32
58) TP	cis-1,3-Dichloropropene		0.246	0.274	0.279	0.300	0.306	0.323	0.324	0.293	9.67
59) I	Chlorobenzene-d5	----------ISTD----------									
60) S	Toluene-d8	1.279	1.284	1.280	1.298	1.264	1.275	1.283	1.287	1.281	0.76
61) TC	Toluene		0.531	0.661	0.622	0.650	0.642	0.660	0.666	0.633	7.50
62) TP	4-Methyl-2-pen		0.061	0.061	0.067	0.071	0.076	0.075	0.077	0.070#	9.71
63) TP	Tetrachloroethene		0.290	0.331	0.303	0.317	0.301	0.310	0.311	0.309	4.21
65) TP	trans-1,3-Dichloropropene		0.223	0.292	0.315	0.342	0.356	0.363	0.376	0.324	16.40
67) TP	Ethyl methacry		0.196	0.207	0.222	0.249	0.264	0.269	0.278	0.241	13.40
68) TP	1,1,2-Trichlor		0.128	0.167	0.164	0.162	0.160	0.163	0.168	0.159	8.67
69) TP	Chlorodibromom		0.194	0.206	0.220	0.229	0.233	0.236	0.244	0.223	8.00
70) TP	1,3-Dichloropr		0.295	0.356	0.351	0.349	0.342	0.346	0.353	0.342	6.11
71) TP	1,2-Dibromoethane		0.153	0.181	0.190	0.192	0.192	0.194	0.197	0.186	8.22
72) TP	2-Hexanone		0.123	0.115	0.130	0.134	0.139	0.139	0.141	0.132	7.38
73) TP	Chlorobenzene		0.683	0.709	0.690	0.709	0.695	0.711	0.706	0.700	1.57
74) TC	Ethylbenzene		1.002	1.180	1.166	1.233	1.195	1.213	1.166	1.165	6.52
75) TP	1,1,1,2-Tetrac		0.208	0.257	0.244	0.260	0.257	0.267	0.269	0.252	8.31
76) TP	p/m Xylene		0.376	0.462	0.471	0.496	0.480	0.487	0.473	0.463	8.69
77) TP	o Xylene		0.375	0.413	0.434	0.447	0.437	0.444	0.429	0.425	5.86
78) TP	Styrene		0.537	0.663	0.712	0.763	0.738	0.726	0.666	0.686	10.97
79) I	1,4-Dichlorobenzene-d4	----------ISTD----------									
80) TP	Bromoform		0.245	0.243	0.262	0.271	0.276	0.284	0.282	0.266	6.34
82) TP	Isopropylbenzene		1.742	2.235	2.263	2.384	2.268	2.323	2.159	2.197	9.66
83) S	4-Bromofluorobenzene	0.897	0.881	0.899	0.879	0.889	0.883	0.896	0.901	0.891	1.01
84) TP	Bromobenzene		0.493	0.574	0.559	0.576	0.562	0.573	0.573	0.559	5.32

Initial Calibration Summary
Form 6
Volatiles

Client	**: Advanced GeoServices Corporation**	**Lab Number**	**: L2035834**
Project Name	**: DAVION**	**Project Number**	**: 2020-4047-400**
Instrument ID	**: ELAINE**	**Ical Ref**	**: ICAL17063**
Calibration dates	**: 08/21/20 15:52 08/21/20 19:27**		

Calibration Files
L11 =VE200821N03.D L1 =VE200821N05.D L2 =VE200821N07.D L3 =VE200821N09.D L4 =VE200821N10.D
L6 =VE200821N11.D L8 =VE200821N12.D L10 =VE200821N13.D

	Compound	L11	L1	L2	L3	L4	L6	L8	L10	Avg	%RSD
85) TP	n-Propylbenzene		2.252	2.543	2.492	2.675	2.509	2.562	2.331	2.480	5.79
86) TP	1,4-Dichlorobu		0.623	0.726	0.693	0.710	0.681	0.689	0.685	0.687	4.67
87) TP	1,1,2,2-Tetrac		0.420	0.417	0.412	0.413	0.401	0.402	0.407	0.410	1.73
88) TP	4-Ethyltoluene		1.676	2.018	2.051	2.225	2.115	2.189	2.061	2.048	8.81
89) TP	2-Chlorotoluene		1.634	1.814	1.740	1.819	1.733	1.810	1.751	1.757	3.74
90) TP	1,3,5-Trimethy		1.521	1.836	1.835	1.979	1.877	1.943	1.846	1.834	8.11
91) TP	1,2,3-Trichlor		0.331	0.345	0.352	0.358	0.343	0.347	0.347	0.346	2.43
92) TP	trans-1,4-Dich		0.079	0.114	0.106	0.112	0.124	0.126	0.128	0.113	15.17
93) TP	4-Chlorotoluene		1.394	1.581	1.596	1.638	1.577	1.636	1.577	1.571	5.27
94) TP	tert-Butylbenzene		1.443	1.767	1.759	1.922	1.829	1.907	1.813	1.777	9.01
95) TP	Pentachloroethane		0.237	0.297	0.291	0.319	0.334	0.345	0.354	0.311	12.86
97) TP	1,2,4-Trimethy		1.320	1.795	1.818	1.938	1.864	1.931	1.855	1.789	11.94
98) TP	sec-Butylbenzene		1.732	2.164	2.138	2.352	2.186	2.267	2.112	2.136	9.18
99) TP	p-Isopropyltol		1.473	1.794	1.880	2.105	1.973	2.052	1.918	1.885	11.10
100) TP	1,3-Dichlorobe		0.968	1.064	1.062	1.096	1.043	1.083	1.072	1.055	3.99
101) TP	1,4-Dichlorobe		0.937	1.074	1.053	1.086	1.050	1.079	1.074	1.050	4.95
102) TP	p-Diethylbenzene		0.796	1.014	1.044	1.188	1.135	1.222	1.208	1.087	13.92
103) TP	n-Butylbenzene		1.310	1.579	1.575	1.795	1.676	1.792	1.726	1.636	10.37
104) TP	1,2-Dichlorobe		0.938	1.007	0.980	1.004	0.967	0.988	0.987	0.982	2.40
105) TP	1,2,4,5-Tetram		1.233	1.421	1.612	1.789	1.755	1.839	1.785	1.633	13.93
106) TP	1,2-Dibromo-3-		0.032	0.060	0.062	0.064	0.066	0.067	0.069	*L	0.9994
107) TP	1,3,5-Trichlor		0.604	0.717	0.706	0.757	0.723	0.759	0.771	0.720	7.83
108) TP	Hexachlorobuta		0.252	0.284	0.242	0.282	0.256	0.293	0.304	0.273	8.54
109) TP	1,2,4-Trichlor		0.580	0.577	0.621	0.663	0.675	0.698	0.718	0.647	8.63
110) TP	Naphthalene		0.956	0.922	1.111	1.224	1.261	1.303	1.311	1.155	14.03
111) TP	1,2,3-Trichlor		0.426	0.534	0.556	0.592	0.588	0.610	0.621	0.561	11.86

Calibration Verification Summary
Form 7
Volatiles

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834		
Project Name	: DAVION	**Project Number**	: 2020-4047-400		
Instrument ID	: ELAINE	**Calibration Date**	: 09/03/20 07:32		
Lab File ID	: VE200903A02	**Init. Calib. Date(s)**	: 08/21/20	08/21/20	
Sample No	: WG1406395-2	**Init. Calib. Times**	: 15:52	19:27	
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	98	0
Dichlorodifluoromethane	0.145	0.186	-	-28.3*	20	117	0
Chloromethane	0.225	0.235	-	-4.4	20	106	0
Vinyl chloride	0.202	0.21	-	-4	20	99	0
Bromomethane	0.088	0.088*	-	0	20	109	0
Chloroethane	0.114	0.122	-	-7	20	98	0
Trichlorofluoromethane	0.263	0.251	-	4.6	20	86	0
Ethyl ether	0.097	0.087	-	10.3	20	89	0
1,1-Dichloroethene	0.163	0.15	-	8	20	94	0
Carbon disulfide	0.331	0.286	-	13.6	20	92	0
Freon-113	0.169	0.155	-	8.3	20	83	0
Acrolein	0.028	0.022*	-	21.4*	20	80	0
Methylene chloride	0.198	0.174	-	12.1	20	94	0
Acetone	0.041	0.035*	-	14.6	20	78	0
trans-1,2-Dichloroethene	0.164	0.153	-	6.7	20	98	0
Methyl acetate	0.122	0.106	-	13.1	20	90	0
Methyl tert-butyl ether	0.438	0.385	-	12.1	20	90	0
tert-Butyl alcohol	0.01172	0.0092*	-	21.5*	20	75	0
Diisopropyl ether	0.762	0.721	-	5.4	20	95	0
1,1-Dichloroethane	0.362	0.353	-	2.5	20	99	0
Halothane	0.148	0.133	-	10.1	20	90	0
Acrylonitrile	0.051	0.044*	-	13.7	20	82	0
Ethyl tert-butyl ether	0.615	0.545	-	11.4	20	88	0
Vinyl acetate	0.44	0.373	-	15.2	20	88	0
cis-1,2-Dichloroethene	0.203	0.189	-	6.9	20	94	0
2,2-Dichloropropane	0.252	0.238	-	5.6	20	99	0
Bromochloromethane	0.091	0.087	-	4.4	20	92	0
Cyclohexane	0.363	0.322	-	11.3	20	87	0
Chloroform	0.325	0.308	-	5.2	20	97	0
Ethyl acetate	0.16	0.131	-	18.1	20	80	0
Carbon tetrachloride	0.235	0.216	-	8.1	20	89	0
Tetrahydrofuran	0.043	0.036*	-	16.3	20	81	0
Dibromofluoromethane	0.245	0.242	-	1.2	20	97	0
1,1,1-Trichloroethane	0.29	0.251	-	13.4	20	88	0
2-Butanone	0.067	0.06*	-	10.4	20	93	0
1,1-Dichloropropene	0.249	0.216	-	13.3	20	89	0
Benzene	0.76	0.722	-	5	20	94	0
tert-Amyl methyl ether	0.455	0.403	-	11.4	20	93	0
1,2-Dichloroethane-d4	0.281	0.277	-	1.4	20	96	0
1,2-Dichloroethane	0.249	0.235	-	5.6	20	93	0
Methyl cyclohexane	0.309	0.267	-	13.6	20	86	0
Trichloroethene	0.189	0.169*	-	10.6	20	90	0
Dibromomethane	0.093	0.084	-	9.7	20	85	0

*** Value outside of QC limits.**

Calibration Verification Summary
Form 7
Volatiles

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834		
Project Name	: DAVION	**Project Number**	: 2020-4047-400		
Instrument ID	: ELAINE	**Calibration Date**	: 09/03/20 07:32		
Lab File ID	: VE200903A02	**Init. Calib. Date(s)**	: 08/21/20	08/21/20	
Sample No	: WG1406395-2	**Init. Calib. Times**	: 15:52	19:27	
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.205	0.195	-	4.9	20	94	0
2-Chloroethyl vinyl ether	0.093	0.072	-	22.6*	20	79	0
Bromodichloromethane	0.24	0.219	-	8.7	20	91	0
1,4-Dioxane	0.00118	0.00092*	-	22*	20	73	0
cis-1,3-Dichloropropene	0.293	0.261	-	10.9	20	92	0
Chlorobenzene-d5	1	1	-	0	20	99	0
Toluene-d8	1.281	1.292	-	-0.9	20	99	0
Toluene	0.633	0.598	-	5.5	20	95	0
4-Methyl-2-pentanone	0.07	0.054*	-	22.9*	20	80	0
Tetrachloroethene	0.309	0.261	-	15.5	20	85	0
trans-1,3-Dichloropropene	0.324	0.289	-	10.8	20	91	0
Ethyl methacrylate	0.241	0.191	-	20.7*	20	85	0
1,1,2-Trichloroethane	0.159	0.145	-	8.8	20	88	0
Chlorodibromomethane	0.223	0.196	-	12.1	20	88	0
1,3-Dichloropropane	0.342	0.308	-	9.9	20	87	0
1,2-Dibromoethane	0.186	0.158	-	15.1	20	82	0
2-Hexanone	0.132	0.1	-	24.2*	20	76	0
Chlorobenzene	0.7	0.678	-	3.1	20	97	0
Ethylbenzene	1.165	1.086	-	6.8	20	92	0
1,1,1,2-Tetrachloroethane	0.252	0.235	-	6.7	20	95	0
p/m Xylene	0.463	0.439	-	5.2	20	92	0
o Xylene	0.425	0.406	-	4.5	20	93	0
Styrene	0.686	0.676	-	1.5	20	94	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	97	0
Bromoform	0.266	0.223	-	16.2	20	83	0
Isopropylbenzene	2.197	2.134	-	2.9	20	91	0
4-Bromofluorobenzene	0.891	0.92	-	-3.3	20	101	0
Bromobenzene	0.559	0.524	-	6.3	20	91	0
n-Propylbenzene	2.48	2.346	-	5.4	20	91	0
1,4-Dichlorobutane	0.687	0.626	-	8.9	20	88	0
1,1,2,2-Tetrachloroethane	0.41	0.354	-	13.7	20	83	0
4-Ethyltoluene	2.048	2	-	2.3	20	94	0
2-Chlorotoluene	1.757	1.661	-	5.5	20	92	0
1,3,5-Trimethylbenzene	1.834	1.752	-	4.5	20	92	0
1,2,3-Trichloropropane	0.346	0.309	-	10.7	20	85	0
trans-1,4-Dichloro-2-buten	0.113	0.094	-	16.8	20	87	0
4-Chlorotoluene	1.571	1.52	-	3.2	20	92	0
tert-Butylbenzene	1.777	1.48	-	16.7	20	81	0
1,2,4-Trimethylbenzene	1.789	1.718	-	4	20	92	0
sec-Butylbenzene	2.136	1.991	-	6.8	20	90	0
p-Isopropyltoluene	1.885	1.781	-	5.5	20	92	0
1,3-Dichlorobenzene	1.055	1.03	-	2.4	20	94	0
1,4-Dichlorobenzene	1.05	1.027	-	2.2	20	94	0

*** Value outside of QC limits.**

Calibration Verification Summary
Form 7
Volatiles

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834		
Project Name	: DAVION	**Project Number**	: 2020-4047-400		
Instrument ID	: ELAINE	**Calibration Date**	: 09/03/20 07:32		
Lab File ID	: VE200903A02	**Init. Calib. Date(s)**	: 08/21/20	08/21/20	
Sample No	: WG1406395-2	**Init. Calib. Times**	: 15:52	19:27	
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.087	0.995	-	8.5	20	92	0
n-Butylbenzene	1.636	1.483	-	9.4	20	91	0
1,2-Dichlorobenzene	0.982	0.95	-	3.3	20	94	0
1,2,4,5-Tetramethylbenzene	1.633	1.556	-	4.7	20	93	0
1,2-Dibromo-3-chloropropan	10	7.256	-	27.4*	20	73	0
1,3,5-Trichlorobenzene	0.72	0.698	-	3.1	20	96	0
Hexachlorobutadiene	0.273	0.228	-	16.5	20	91	0
1,2,4-Trichlorobenzene	0.647	0.615	-	4.9	20	96	0
Naphthalene	1.155	0.929	-	19.6	20	81	0
1,2,3-Trichlorobenzene	0.561	0.515	-	8.2	20	90	0

*** Value outside of QC limits.**

Surrogate Summary

Surrogate Recovery Summary
Form 2
Volatiles

Client: Advanced GeoServices Corporation
Project Name: DAVION

Lab Number: L2035834
Project Number: 2020-4047-400
Matrix: Trip Blank (Aqueous)/Water/Field Blank

CLIENT ID (LAB SAMPLE NO.)	SMC1 DCA	SMC2 TOL	SMC3 BFB	SMC4 DBFM	TOT OUT
MW-116 (L2035834-01)	105	96	98	103	0
MW-204 (L2035834-02)	103	100	94	106	0
FIELD BLANK (L2035834-03)	99	98	97	105	0
MW-118 (L2035834-04D)	101	99	97	102	0
TRIP BLANK (L2035834-05)	102	99	97	102	0
WG1406395-3LCS	99	101	103	99	0
WG1406395-4LCSD	99	99	96	101	0
WG1406395-5BLANK	101	97	99	100	0

QC LIMITS

(70-130) DCA = 1,2-DICHLOROETHANE-D4
(70-130) TOL = TOLUENE-D8
(70-130) BFB = 4-BROMOFLUOROBENZENE
(70-130) DBFM = DIBROMOFLUOROMETHANE

*** Values outside of QC limits**

FORM II NJ-8260

Batch QC Summary

Laboratory Control Sample Summary
Form 3
Volatiles

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Matrix	: WATER		
LCS Sample ID	: WG1406395-3	**Analysis Date** : 09/03/20 07:32	**File ID** : VE200903A02
LCSD Sample ID	: WG1406395-4	**Analysis Date** : 09/03/20 07:53	**File ID** : VE200903A03

	Laboratory Control Sample			Laboratory Control Duplicate					
Parameter	True (ug/l)	Found (ug/l)	%R	True (ug/l)	Found (ug/l)	%R	RPD	Recovery Limits	RPD Limit
1,2-Dibromo-3-chloropropane	10	7.2	72	10	7.6	76	5	40-160	20
1,4-Dioxane	500	390	78	500	410	82	5	40-160	20
1,2-Dibromoethane	10	8.5	85	10	8.8	88	3	70-130	20
Methylene chloride	10	8.8	88	10	8.8	88	0	70-130	20
1,1-Dichloroethane	10	9.7	97	10	9.4	94	3	70-130	20
Chloroform	10	9.5	95	10	9.0	90	5	70-130	20
Carbon tetrachloride	10	9.2	92	10	9.1	91	1	70-130	20
1,2-Dichloropropane	10	9.5	95	10	9.6	96	1	70-130	20
Dibromochloromethane	10	8.8	88	10	8.7	87	1	70-130	20
1,1,2-Trichloroethane	10	9.1	91	10	8.9	89	2	70-130	20
Tetrachloroethene	10	8.4	84	10	8.1	81	4	70-130	20
Chlorobenzene	10	9.7	97	10	9.5	95	2	70-130	20
Trichlorofluoromethane	10	9.5	95	10	9.1	91	4	40-160	20
1,2-Dichloroethane	10	9.4	94	10	9.3	93	1	70-130	20
1,1,1-Trichloroethane	10	8.7	87	10	8.5	85	2	70-130	20
Bromodichloromethane	10	9.1	91	10	9.0	90	1	70-130	20
trans-1,3-Dichloropropene	10	8.9	89	10	8.9	89	0	70-130	20
cis-1,3-Dichloropropene	10	8.9	89	10	8.9	89	0	70-130	20
Bromoform	10	8.4	84	10	8.4	84	0	40-160	20
1,1,2,2-Tetrachloroethane	10	8.6	86	10	8.6	86	0	40-160	20
Benzene	10	9.5	95	10	9.4	94	1	70-130	20
Toluene	10	9.4	94	10	9.3	93	1	70-130	20
Ethylbenzene	10	9.3	93	10	9.1	91	2	70-130	20
Chloromethane	10	10	100	10	10	100	0	40-160	20
Bromomethane	10	10	100	10	9.5	95	5	40-160	20
Vinyl chloride	10	10	100	10	10	100	0	70-130	20

Laboratory Control Sample Summary
Form 3
Volatiles

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Matrix	: WATER		
LCS Sample ID	: WG1406395-3	**Analysis Date** : 09/03/20 07:32	**File ID** : VE200903A02
LCSD Sample ID	: WG1406395-4	**Analysis Date** : 09/03/20 07:53	**File ID** : VE200903A03

	Laboratory Control Sample			Laboratory Control Duplicate					
Parameter	True (ug/l)	Found (ug/l)	%R	True (ug/l)	Found (ug/l)	%R	RPD	Recovery Limits	RPD Limit
Chloroethane	10	11	110	10	11	110	0	40-160	20
1,1-Dichloroethene	10	9.2	92	10	8.7	87	6	70-130	20
trans-1,2-Dichloroethene	10	9.3	93	10	9.2	92	1	70-130	20
Trichloroethene	10	8.9	89	10	8.8	88	1	70-130	20
1,2-Dichlorobenzene	10	9.7	97	10	9.2	92	5	70-130	20
1,3-Dichlorobenzene	10	9.8	98	10	9.4	94	4	70-130	20
1,4-Dichlorobenzene	10	9.8	98	10	9.5	95	3	70-130	20
Methyl tert butyl ether	10	8.8	88	10	8.5	85	3	70-130	20
p/m-Xylene	20	19	95	20	19	95	0	70-130	20
o-Xylene	20	19	95	20	19	95	0	70-130	20
cis-1,2-Dichloroethene	10	9.3	93	10	9.7	97	4	70-130	20
Styrene	20	20	100	20	19	95	5	40-160	20
Dichlorodifluoromethane	10	13	130	10	12	120	8	40-160	20
Acetone	10	8.6	86	10	8.8	88	2	40-160	20
Carbon disulfide	10	8.6	86	10	8.7	87	1	40-160	20
2-Butanone	10	8.9	89	10	9.2	92	3	40-160	20
4-Methyl-2-pentanone	10	7.8	78	10	8.1	81	4	40-160	20
2-Hexanone	10	7.6	76	10	8.2	82	8	40-160	20
Bromochloromethane	10	9.6	96	10	9.3	93	3	70-130	20
Isopropylbenzene	10	9.7	97	10	9.3	93	4	70-130	20
1,2,3-Trichlorobenzene	10	9.2	92	10	8.9	89	3	70-130	20
1,2,4-Trichlorobenzene	10	9.5	95	10	9.2	92	3	70-130	20
Methyl Acetate	10	8.6	86	10	8.0	80	7	70-130	20
Ethyl Acetate	10	8.2	82	10	8.4	84	2	70-130	20
Cyclohexane	10	8.8	88	10	8.7	87	1	70-130	20
Methyl cyclohexane	10	8.6	86	10	8.6	86	0	70-130	20

Laboratory Control Sample Summary
Form 3
Volatiles

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Matrix	: WATER		
LCS Sample ID	: WG1406395-3	**Analysis Date** : 09/03/20 07:32	**File ID** : VE200903A02
LCSD Sample ID	: WG1406395-4	**Analysis Date** : 09/03/20 07:53	**File ID** : VE200903A03

	Laboratory Control Sample			Laboratory Control Duplicate					
Parameter	True (ug/l)	Found (ug/l)	%R	True (ug/l)	Found (ug/l)	%R	RPD	Recovery Limits	RPD Limit
Freon-113	10	9.1	91	10	8.7	87	4	70-130	20

Internal Standard Summary

Internal Standard Area and RT Summary
Form 8a
Volatiles

Client	: Advanced GeoServices Corporation	**Lab Number**	: L2035834
Project Name	: DAVION	**Project Number**	: 2020-4047-400
Instrument ID	: ELAINE	**Analysis Date**	: 09/03/20 07:32
Sample No	: WG1406395-2	**Lab File ID**	: VE200903A02

	Fluorobenzene (IS)		Chlorobenzene-d5		1,4-Dichlorobenzene-D4	
	Area	RT	Area	RT	Area	RT
WG1406395-2	250172	5.49	189508	8.50	99145	9.99
Upper Limit	500344	5.99	379016	9.00	198290	10.49
Lower Limit	125086	4.99	94754	8.00	49573	9.49
Sample ID						
WG1406395-3 LCS	250172	5.49	189508	8.50	99145	9.99
WG1406395-4 LCSD	250931	5.49	189127	8.50	100791	9.99
WG1406395-5 BLANK	241209	5.49	181216	8.50	90131	9.99
MW-116	222963	5.49	172915	8.50	85250	9.99
MW-204	222633	5.49	167827	8.50	86737	9.99
FIELD BLANK	227645	5.49	170438	8.50	84957	9.99
TRIP BLANK	226195	5.49	168992	8.50	84508	9.99
MW-118	227500	5.49	168733	8.50	85904	9.99

Area Upper Limit = +100% of internal standard area
Area Lower Limit = - 50% of internal standard area

RT Upper Limit = +0.50 minutes of internal standard RT
RT Lower Limit = -0.50 minutes of internal standard RT

* Values outside of QC limits

Chromatograms

Sample Raw Data

Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A16.D
Acq On : 3 Sep 2020 12:34 pm
Operator : ELAINE:AJK
Sample : l2035834-01,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 16:54:23 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Fluorobenzene	5.490	96	222963	10.000 ug/L	0.00
Standard Area 1 = 250172			Recovery = 89.12%		
59) Chlorobenzene-d5	8.497	117	172915	10.000 ug/L	0.00
Standard Area 1 = 189508			Recovery = 91.24%		
79) 1,4-Dichlorobenzene-d4	9.988	152	85250	10.000 ug/L	0.00
Standard Area 1 = 99145			Recovery = 85.99%		
System Monitoring Compounds					
36) Dibromofluoromethane	4.502	113	56450	10.329 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 103.29%		
43) 1,2-Dichloroethane-d4	5.147	65	65754	10.486 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 104.86%		
60) Toluene-d8	7.195	98	213184	9.622 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 96.22%		
83) 4-Bromofluorobenzene	9.321	95	74124	9.763 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 97.63%		
Target Compounds					Qvalue
2) Dichlorodifluoromethane	0.000		0	N.D.	
3) Chloromethane	0.000		0	N.D. d	
4) Vinyl chloride	0.000		0	N.D.	
5) Bromomethane	1.397	94	84	N.D.	
6) Chloroethane	0.000		0	N.D. d	
7) Trichlorofluoromethane	0.000		0	N.D.	
10) 1,1-Dichloroethene	0.000		0	N.D.	
11) Carbon disulfide	1.870	76	946	0.128 ug/L #	76
12) Freon-113	0.000		0	N.D.	
15) Methylene chloride	0.000		0	N.D.	
17) Acetone	0.000		0	N.D. d	
18) trans-1,2-Dichloroethene	0.000		0	N.D.	
19) Methyl acetate	0.000		0	N.D. d	
20) Methyl tert-butyl ether	0.000		0	N.D.	
23) 1,1-Dichloroethane	0.000		0	N.D.	
28) cis-1,2-Dichloroethene	0.000		0	N.D.	
30) Bromochloromethane	0.000		0	N.D.	
31) Cyclohexane	4.040	56	26	N.D.	
32) Chloroform	0.000		0	N.D.	
33) Ethyl acetate	4.324	43	28	N.D.	

Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A16.D
Acq On : 3 Sep 2020 12:34 pm
Operator : ELAINE:AJK
Sample : l2035834-01,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 16:54:23 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
34) Carbon tetrachloride	0.000		0		N.D.	
37) 1,1,1-Trichloroethane	0.000		0		N.D.	
39) 2-Butanone	0.000		0		N.D.	
41) Benzene	4.961	78	57		N.D.	
44) 1,2-Dichloroethane	0.000		0		N.D.	
47) Methyl cyclohexane	5.634	83	282		N.D.	
48) Trichloroethene	5.634	95	81		N.D.	
51) 1,2-Dichloropropane	0.000		0		N.D.	
54) Bromodichloromethane	0.000		0		N.D.	
57) 1,4-Dioxane	0.000		0		N.D.	
58) cis-1,3-Dichloropropene	0.000		0		N.D.	
61) Toluene	7.251	92	180		N.D.	
62) 4-Methyl-2-pentanone	0.000		0		N.D.	
63) Tetrachloroethene	0.000		0		N.D.	
65) trans-1,3-Dichloropropene	0.000		0		N.D.	
68) 1,1,2-Trichloroethane	0.000		0		N.D.	
69) Chlorodibromomethane	0.000		0		N.D.	
71) 1,2-Dibromoethane	0.000		0		N.D.	
72) 2-Hexanone	0.000		0		N.D.	d
73) Chlorobenzene	0.000		0		N.D.	
74) Ethylbenzene	8.553	91	237		N.D.	
76) p/m Xylene	8.658	106	414		N.D.	
77) o Xylene	8.945	106	312		N.D.	
78) Styrene	0.000		0		N.D.	
80) Bromoform	0.000		0		N.D.	
82) Isopropylbenzene	9.154	105	410		N.D.	
87) 1,1,2,2-Tetrachloroethane	0.000		0		N.D.	
100) 1,3-Dichlorobenzene	9.997	146	90		N.D.	
101) 1,4-Dichlorobenzene	9.997	146	90		N.D.	
104) 1,2-Dichlorobenzene	0.000		0		N.D.	
106) 1,2-Dibromo-3-chloropr...	0.000		0		N.D.	
109) 1,2,4-Trichlorobenzene	11.065	180	55		N.D.	
111) 1,2,3-Trichlorobenzene	0.000		0		N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A16.D
Acq On : 3 Sep 2020 12:34 pm
Operator : ELAINE:AJK
Sample : l2035834-01,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 16:54:23 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

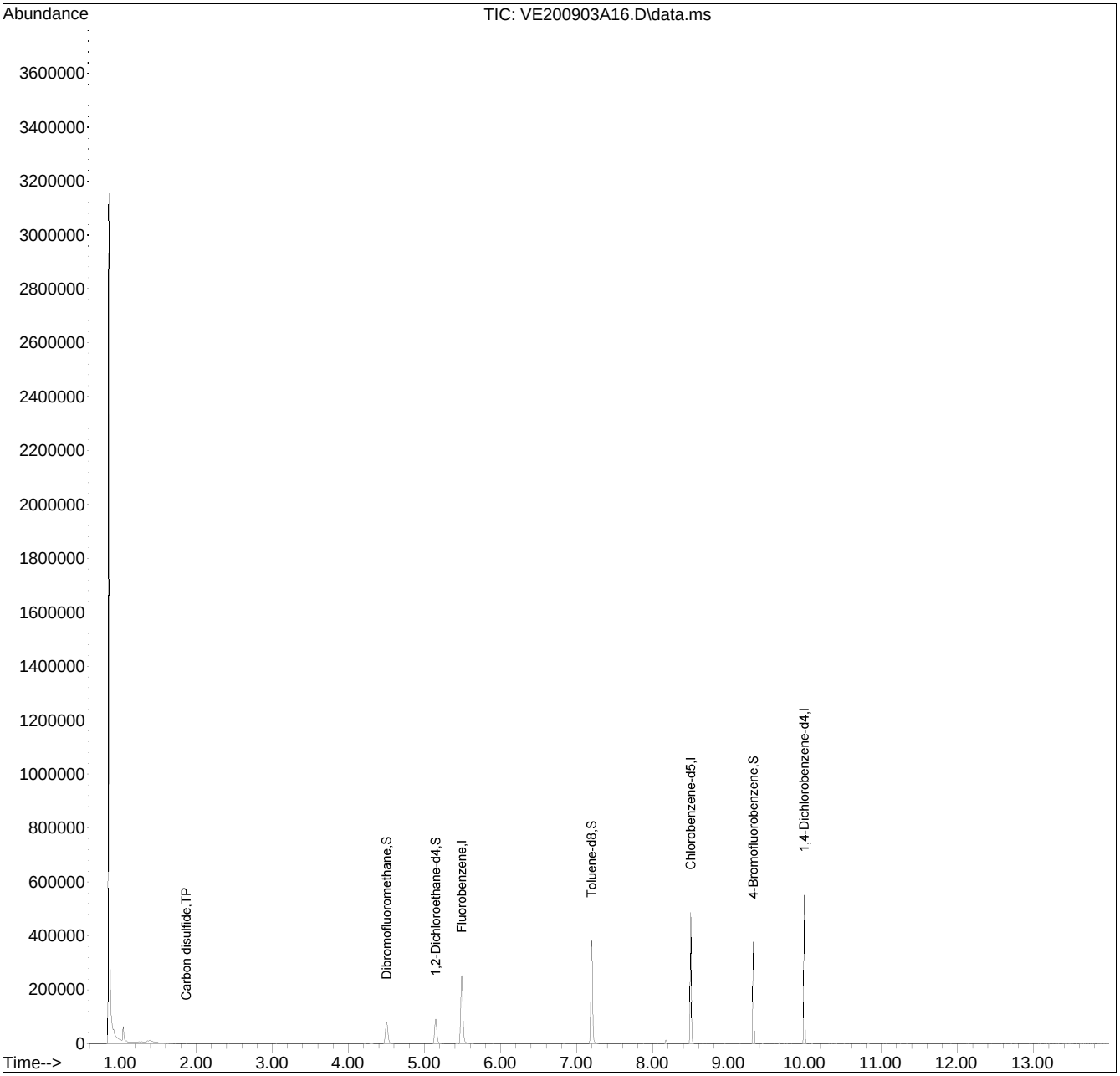
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

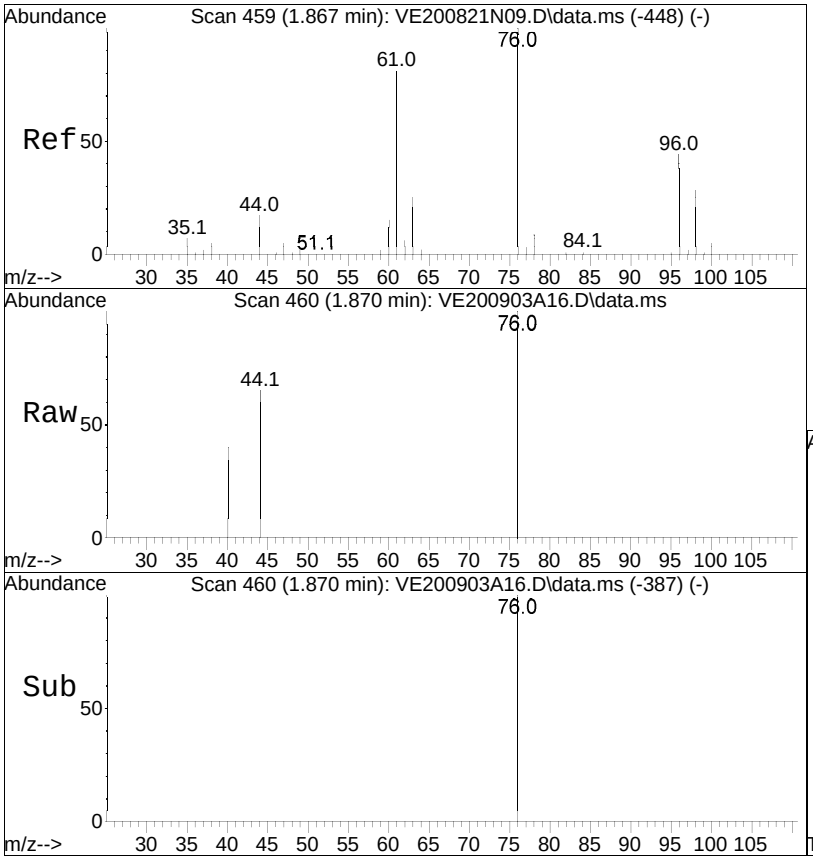
Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A16.D
Acq On : 3 Sep 2020 12:34 pm
Operator : ELAINE:AJK
Sample : l2035834-01,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 16:54:23 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist.D•

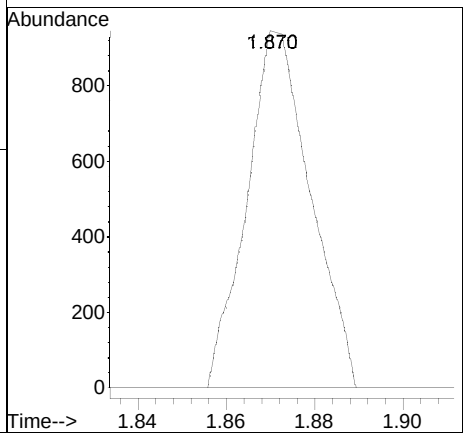




#11
Carbon disulfide
Concen: 0.13 ug/L
RT: 1.870 min Scan# 460
Delta R.T. 0.003 min
Lab File: VE200903A16.D
Acq: 3 Sep 2020 12:34 pm

Tgt Ion: 76 Resp: 946

Ion	Ratio	Lower	Upper
76	100		
78	0.0	5.7	11.7#



Manual Integration Report

Data Path	: I:\VOLATILES\Elaine\2020\2Q	Method	: Elaine_200821N_8260.m
Data File	: VE200903A16.D	Operator	: ELAINE:AJK
Date Inj'd	: 9/3/2020 12:34 pm	Instrument	: Elaine
Sample	: l2035834-01,31,10,10,,a	Quant Date	: 9/3/2020 4:37 pm

There are no manual integrations or false positives in this file.

LSC Area Percent Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A16.D
Acq On : 3 Sep 2020 12:34 pm
Operator : ELAINE:AJK
Sample : l2035834-01,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Integration Parameters: rteint.p
Integrator: RTE
Smoothing : ON Filtering: 5
Sampling : 1 Min Area: 3 % of largest Peak
Start Thrs: 0.2 Max Peaks: 100
Stop Thrs : 0 Peak Location: TOP

If leading or trailing edge < 100 prefer < Baseline drop else tangent >
Peak separation: 5

Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Title : VOLATILES BY GC/MS

Signal : TIC: VE200903A16.D\data.ms

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.044	156	163	174	rVB	53699	55151	9.14%	1.858%
2	4.502	1384	1406	1430	rBV2	78593	183053	30.33%	6.167%
3	5.147	1620	1638	1665	rBV2	91468	188001	31.14%	6.334%
4	5.490	1745	1761	1787	rBV	252480	494735	81.96%	16.669%
5	7.195	2360	2374	2401	rBV	382640	603633	100.00%	20.337%
6	8.172	2712	2725	2737	rBV2	13784	19087	3.16%	0.643%
7	8.497	2829	2842	2860	rBV	486003	533812	88.43%	17.985%
8	9.321	3128	3138	3155	rBV	378345	377296	62.50%	12.712%
9	9.988	3369	3378	3393	rBV	550973	513313	85.04%	17.294%

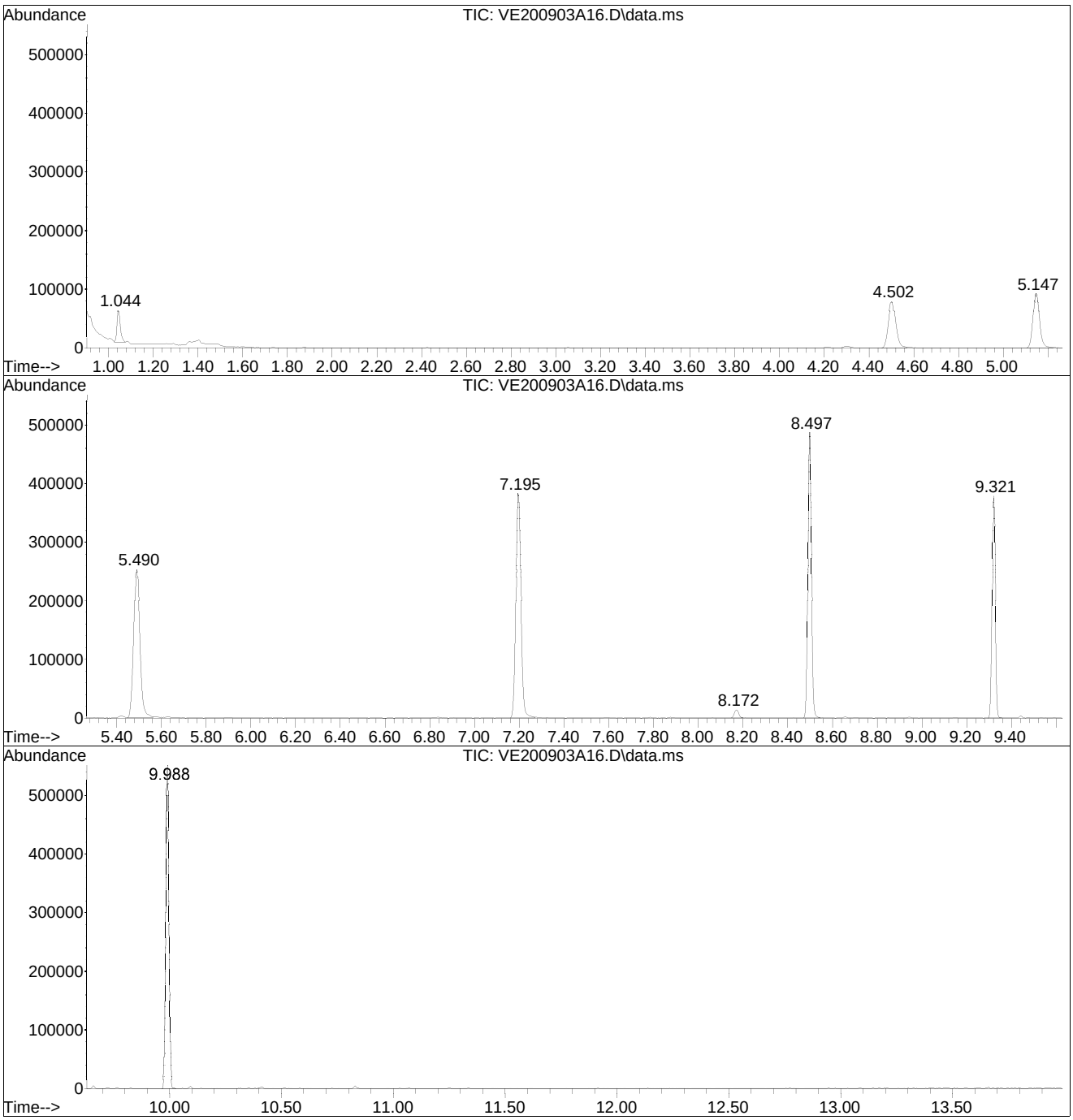
Sum of corrected areas: 2968081

LSC Report - Integrated Chromatogram

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A16.D
Acq On : 3 Sep 2020 12:34 pm
Operator : ELAINE:AJK
Sample : l2035834-01,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p



Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A16.D
Acq On : 3 Sep 2020 12:34 pm
Operator : ELAINE:AJK
Sample : l2035834-01,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

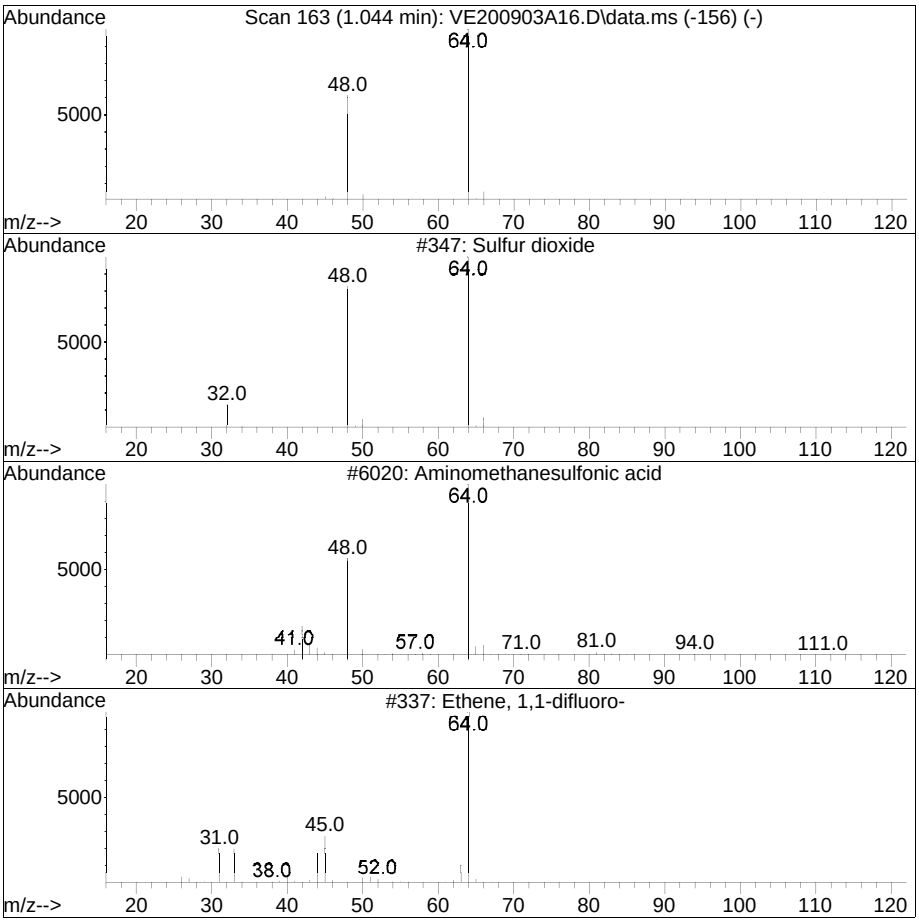
TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

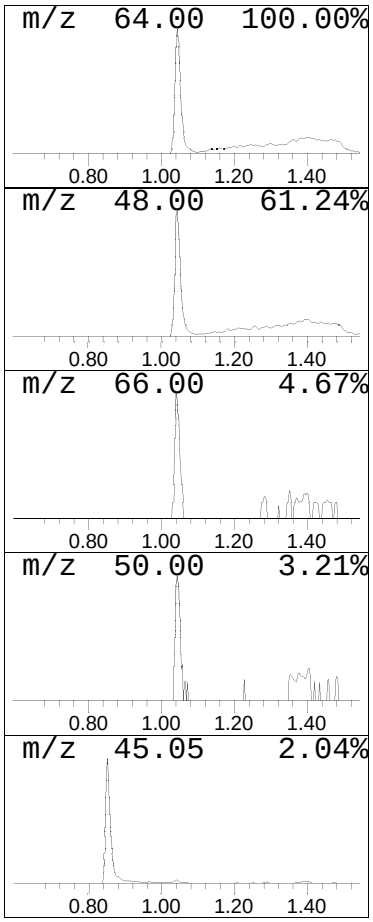
****

Peak Number 1 Unknown Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
1.044	1.11 ug/L	55151	Fluorobenzene	5.490

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Sulfur dioxide	64	O2S	007446-09-5	83
2	Aminomethanesulfonic acid	111	CH5NO3S	013881-91-9	64
3	Ethene, 1,1-difluoro-	64	C2H2F2	000075-38-7	4
4	Cysteic acid	169	C3H7NO5S	1000131-23-1	4
5	Ethyl Chloride	64	C2H5Cl	000075-00-3	3





Tentatively Identified Compound (LSC) summary

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A16.D
Acq On : 3 Sep 2020 12:34 pm
Operator : ELAINE:AJK
Sample : l2035834-01,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

					--Internal Standard---			
TIC Top Hit name	RT	EstConc	Units	Response	#	RT	Resp	Conc
Unknown	1.044	1.1	ug/L	55151	1	5.490	494735	10.0

Quantitation Report (LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 16:55:02 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Fluorobenzene	5.490	96	222633	10.000 ug/L	0.00
Standard Area 1 = 250172			Recovery = 88.99%		
59) Chlorobenzene-d5	8.497	117	167827	10.000 ug/L	0.00
Standard Area 1 = 189508			Recovery = 88.56%		
79) 1,4-Dichlorobenzene-d4	9.989	152	86737	10.000 ug/L	0.00
Standard Area 1 = 99145			Recovery = 87.48%		
System Monitoring Compounds					
36) Dibromofluoromethane	4.502	113	57836	10.598 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 105.98%		
43) 1,2-Dichloroethane-d4	5.147	65	64447	10.293 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 102.93%		
60) Toluene-d8	7.198	98	214598	9.980 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 99.80%		
83) 4-Bromofluorobenzene	9.321	95	72866	9.433 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 94.33%		
Target Compounds					Qvalue
2) Dichlorodifluoromethane	0.000		0	N.D.	
3) Chloromethane	0.000		0	N.D. d	
4) Vinyl chloride	0.000		0	N.D.	
5) Bromomethane	1.330	94	218	0.112 ug/L #	61
6) Chloroethane	0.000		0	N.D. d	
7) Trichlorofluoromethane	0.000		0	N.D.	
10) 1,1-Dichloroethene	0.000		0	N.D.	
11) Carbon disulfide	1.873	76	508	N.D.	
12) Freon-113	0.000		0	N.D.	
15) Methylene chloride	0.000		0	N.D.	
17) Acetone	2.429	43	845	0.921 ug/L #	64
18) trans-1,2-Dichloroethene	0.000		0	N.D.	
19) Methyl acetate	2.557	43	162	N.D.	
20) Methyl tert-butyl ether	2.627	73	12650	1.297 ug/L #	78
23) 1,1-Dichloroethane	0.000		0	N.D.	
28) cis-1,2-Dichloroethene	0.000		0	N.D.	
30) Bromochloromethane	0.000		0	N.D.	
31) Cyclohexane	0.000		0	N.D.	
32) Chloroform	0.000		0	N.D.	
33) Ethyl acetate	0.000		0	N.D.	

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 16:55:02 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
34) Carbon tetrachloride	0.000		0		N.D.	
37) 1,1,1-Trichloroethane	0.000		0		N.D.	
39) 2-Butanone	0.000		0		N.D.	
41) Benzene	0.000		0		N.D.	
44) 1,2-Dichloroethane	0.000		0		N.D.	
47) Methyl cyclohexane	0.000		0		N.D.	
48) Trichloroethene	5.568	95	26		N.D.	
51) 1,2-Dichloropropane	0.000		0		N.D.	
54) Bromodichloromethane	0.000		0		N.D.	
57) 1,4-Dioxane	0.000		0		N.D.	
58) cis-1,3-Dichloropropene	0.000		0		N.D.	
61) Toluene	7.245	92	116		N.D.	
62) 4-Methyl-2-pentanone	0.000		0		N.D.	
63) Tetrachloroethene	0.000		0		N.D.	
65) trans-1,3-Dichloropropene	0.000		0		N.D.	
68) 1,1,2-Trichloroethane	0.000		0		N.D.	
69) Chlorodibromomethane	0.000		0		N.D.	
71) 1,2-Dibromoethane	0.000		0		N.D.	
72) 2-Hexanone	0.000		0		N.D.	d
73) Chlorobenzene	8.508	112	91		N.D.	
74) Ethylbenzene	8.547	91	181		N.D.	
76) p/m Xylene	8.656	106	432		N.D.	
77) o Xylene	8.945	106	156		N.D.	
78) Styrene	0.000		0		N.D.	
80) Bromoform	0.000		0		N.D.	
82) Isopropylbenzene	0.000		0		N.D.	
87) 1,1,2,2-Tetrachloroethane	0.000		0		N.D.	
100) 1,3-Dichlorobenzene	9.944	146	26		N.D.	
101) 1,4-Dichlorobenzene	9.994	146	265		N.D.	
104) 1,2-Dichlorobenzene	0.000		0		N.D.	
106) 1,2-Dibromo-3-chloropr...	0.000		0		N.D.	
109) 1,2,4-Trichlorobenzene	0.000		0		N.D.	
111) 1,2,3-Trichlorobenzene	0.000		0		N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 16:55:02 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

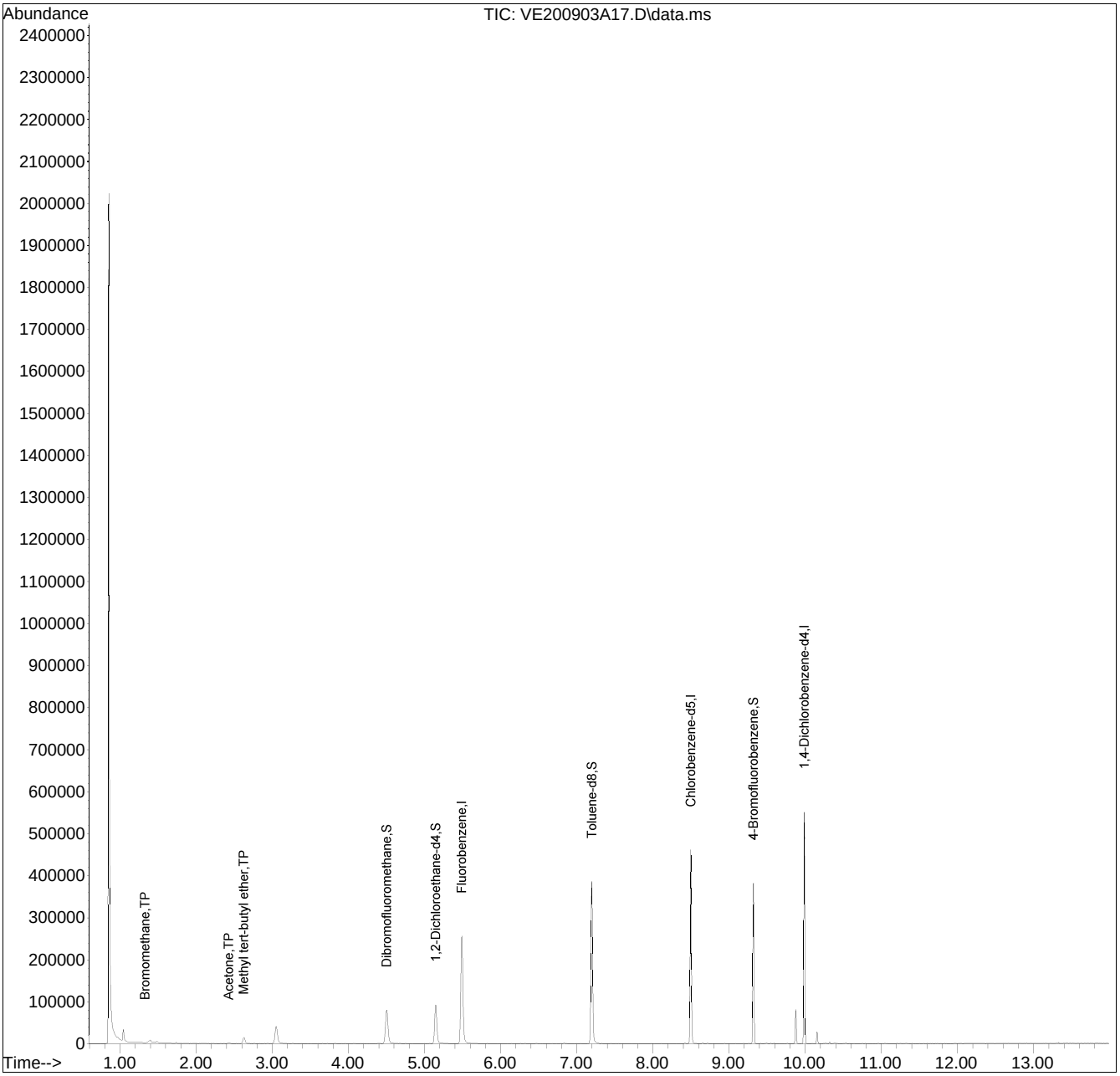
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

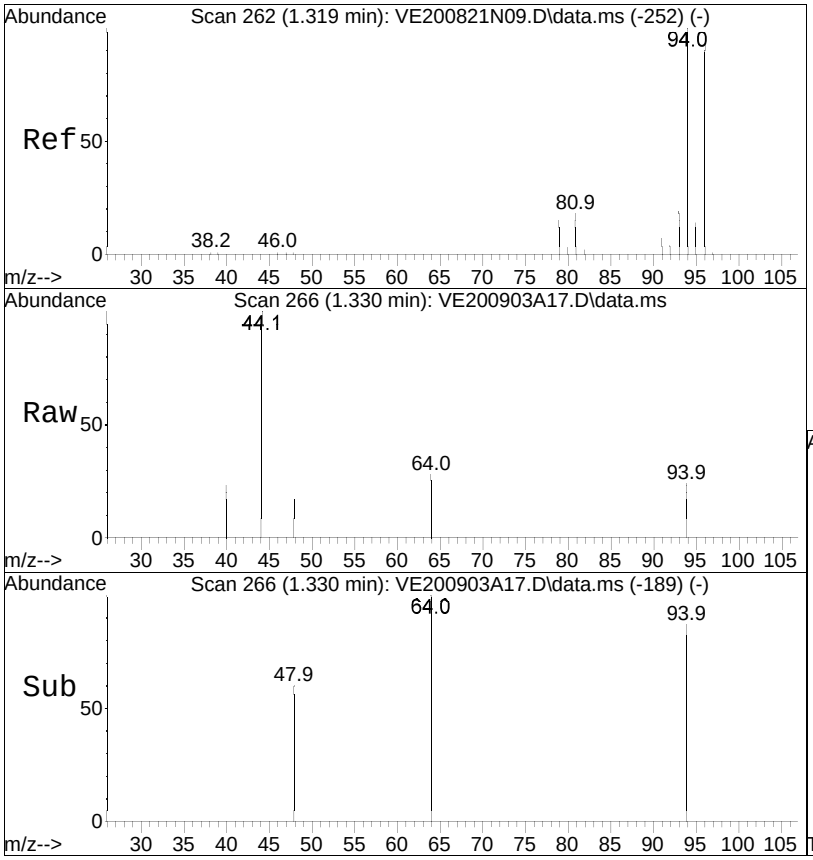
Quantitation Report (LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 16:55:02 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist.D•

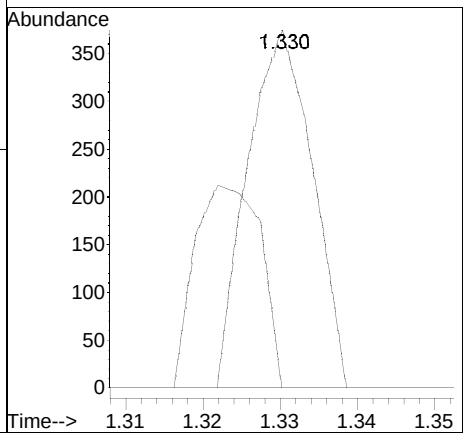


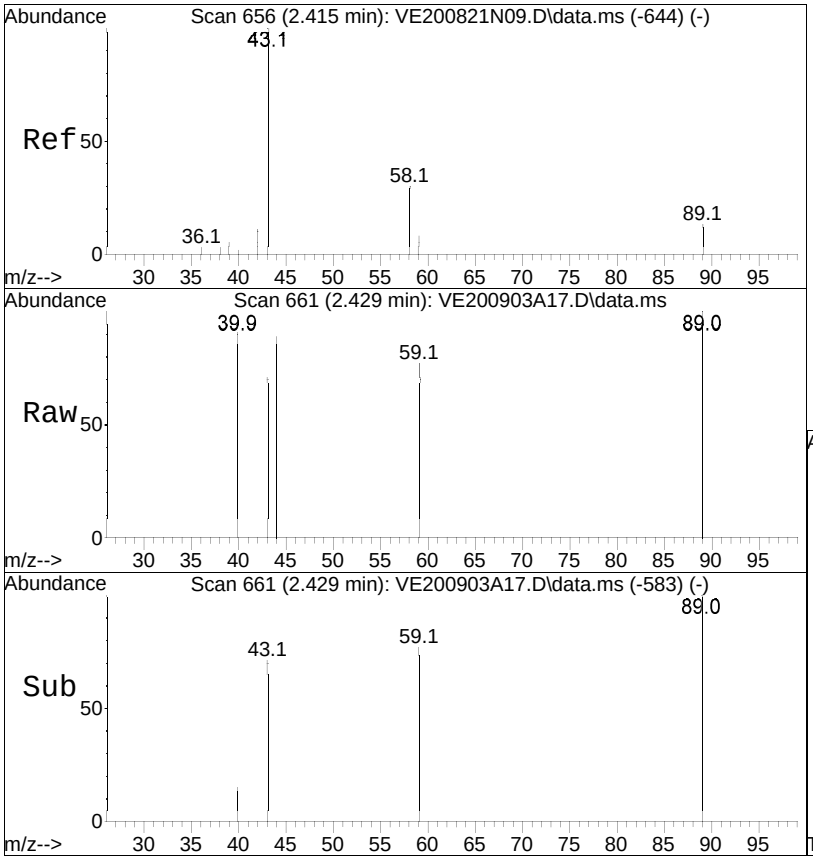


#5
Bromomethane
Concen: 0.11 ug/L
RT: 1.330 min Scan# 266
Delta R.T. 0.014 min
Lab File: VE200903A17.D
Acq: 3 Sep 2020 12:56 pm

Tgt Ion: 94 Resp: 218

Ion	Ratio	Lower	Upper
94	100		
96	57.3	75.6	115.6#

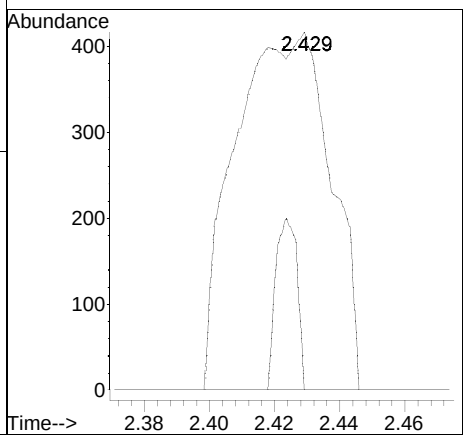


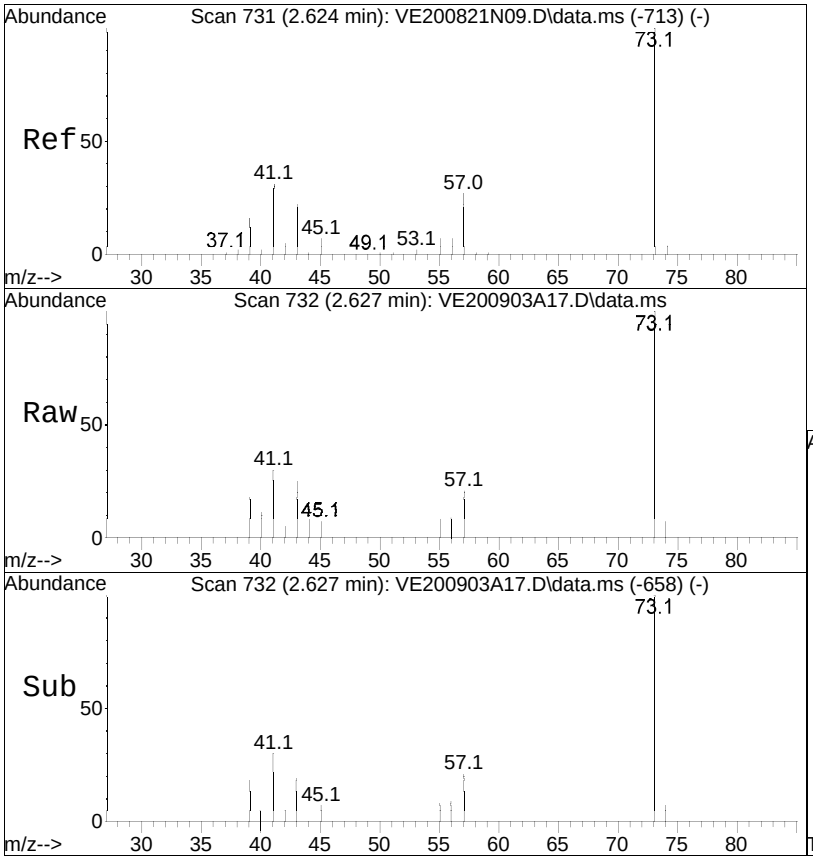


#17
Acetone
Concen: 0.92 ug/L
RT: 2.429 min Scan# 661
Delta R.T. 0.016 min
Lab File: VE200903A17.D
Acq: 3 Sep 2020 12:56 pm

Tgt Ion: 43 Resp: 845

Ion	Ratio	Lower	Upper
43	100		
58	10.8	24.2	36.4#

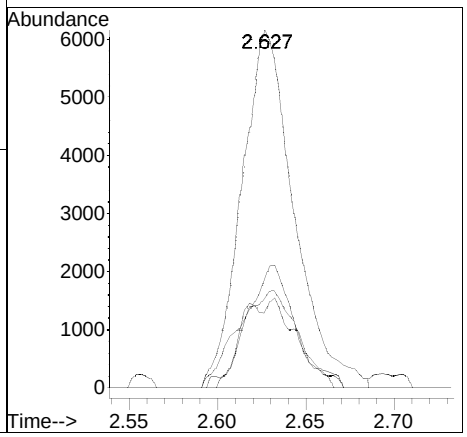




#20
Methyl tert-butyl ether
Concen: 1.30 ug/L
RT: 2.627 min Scan# 732
Delta R.T. 0.006 min
Lab File: VE200903A17.D
Acq: 3 Sep 2020 12:56 pm

Tgt Ion: 73 Resp: 12650

Ion	Ratio	Lower	Upper
73	100		
57	11.5	17.5	36.3#
43	29.0	15.3	31.9
41	34.9	15.3	31.7#



Manual Integration Report

Data Path	: I:\VOLATILES\Elaine\2020\2Q	Method	: Elaine_200821N_8260.m
Data File	: VE200903A17.D	Operator	: ELAINE:AJK
Date Inj'd	: 9/3/2020 12:56 pm	Instrument	: Elaine
Sample	: l2035834-02,31,10,10,,a	Quant Date	: 9/3/2020 4:37 pm

There are no manual integrations or false positives in this file.

LSC Area Percent Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Integration Parameters: rteint.p
Integrator: RTE
Smoothing : ON Filtering: 5
Sampling : 1 Min Area: 3 % of largest Peak
Start Thrs: 0.2 Max Peaks: 100
Stop Thrs : 0 Peak Location: TOP

If leading or trailing edge < 100 prefer < Baseline drop else tangent >
Peak separation: 5

Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Title : VOLATILES BY GC/MS

Signal : TIC: VE200903A17.D\data.ms

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.044	157	163	175	rVB	27894	30249	4.99%	0.957%
2	2.630	715	733	751	rBV2	14989	31033	5.12%	0.982%
3	3.052	868	885	909	rBV2	40774	96121	15.86%	3.043%
4	4.505	1385	1407	1433	rBV3	80170	186595	30.78%	5.906%
5	5.147	1622	1638	1660	rBV2	92386	186356	30.74%	5.899%
6	5.490	1739	1761	1788	rBV	255983	499736	82.44%	15.818%
7	7.198	2360	2375	2414	rVB	386306	606200	100.00%	19.188%
8	8.497	2831	2842	2863	rVB	460958	519745	85.74%	16.452%
9	9.321	3126	3138	3154	rVB	382599	376909	62.18%	11.930%
10	9.877	3323	3338	3348	rBV	81519	79814	13.17%	2.526%
11	9.989	3369	3378	3396	rVB	551068	519708	85.73%	16.451%
12	10.156	3430	3438	3454	rBV	27853	26756	4.41%	0.847%

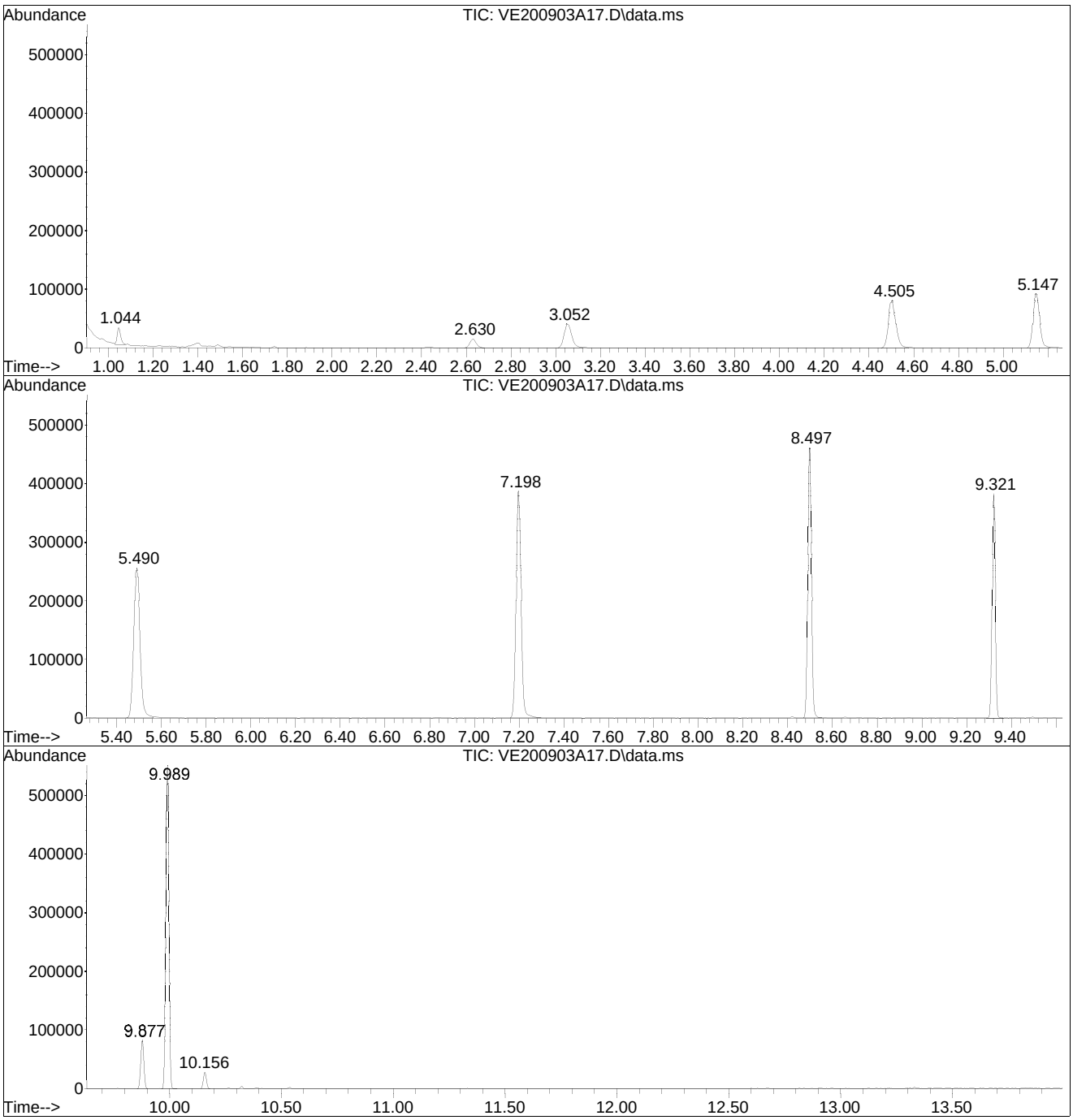
Sum of corrected areas: 3159222

LSC Report - Integrated Chromatogram

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p



Library Search Compound Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

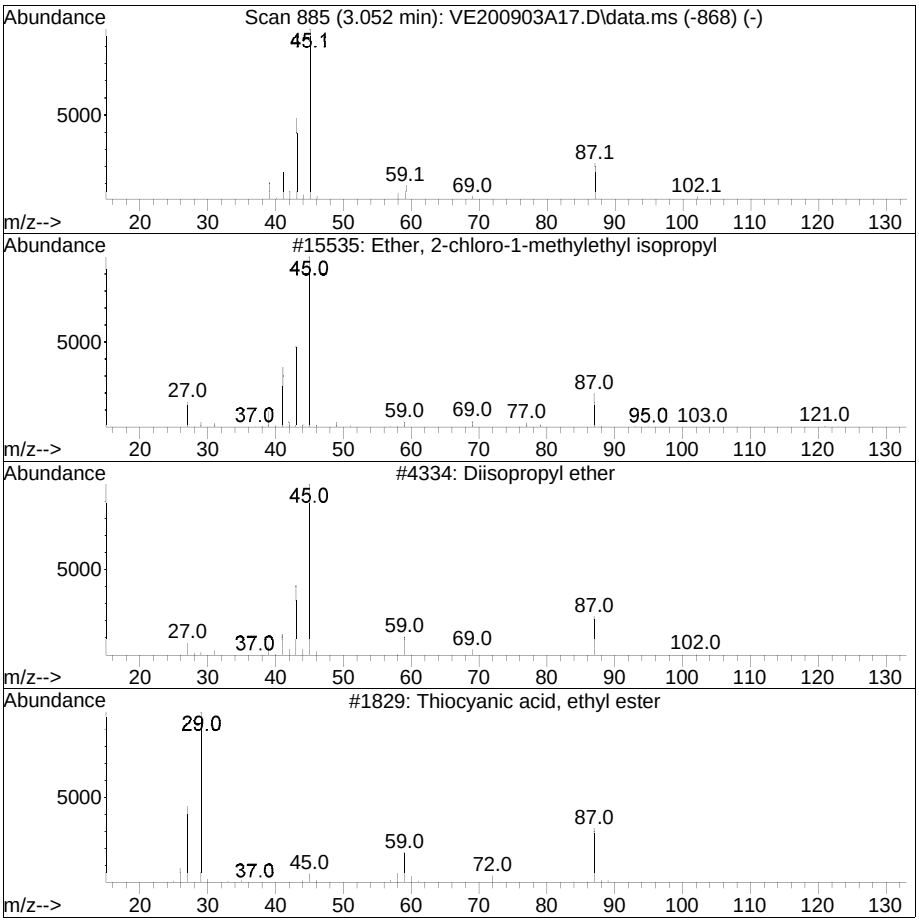
TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

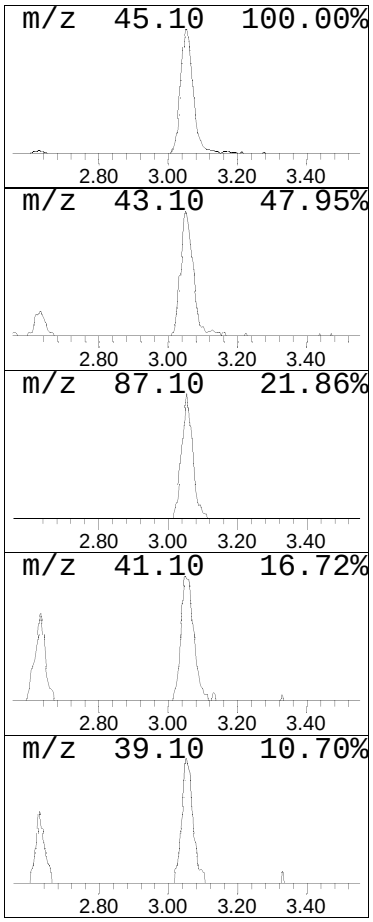
****

Peak Number 1 Unknown Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.052	1.92 ug/L	96121	Fluorobenzene	5.490

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Ether, 2-chloro-1-methylethyl is...	136	C6H13ClO	098277-76-0	83
2	Diisopropyl ether	102	C6H14O	000108-20-3	64
3	Thiocyanic acid, ethyl ester	87	C3H5NS	000542-90-5	9
4	Propanal, 3-methoxy-	88	C4H8O2	002806-84-0	9
5	2-Butanol, 3-methyl-, (S)-	88	C5H12O	001517-66-4	9





Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

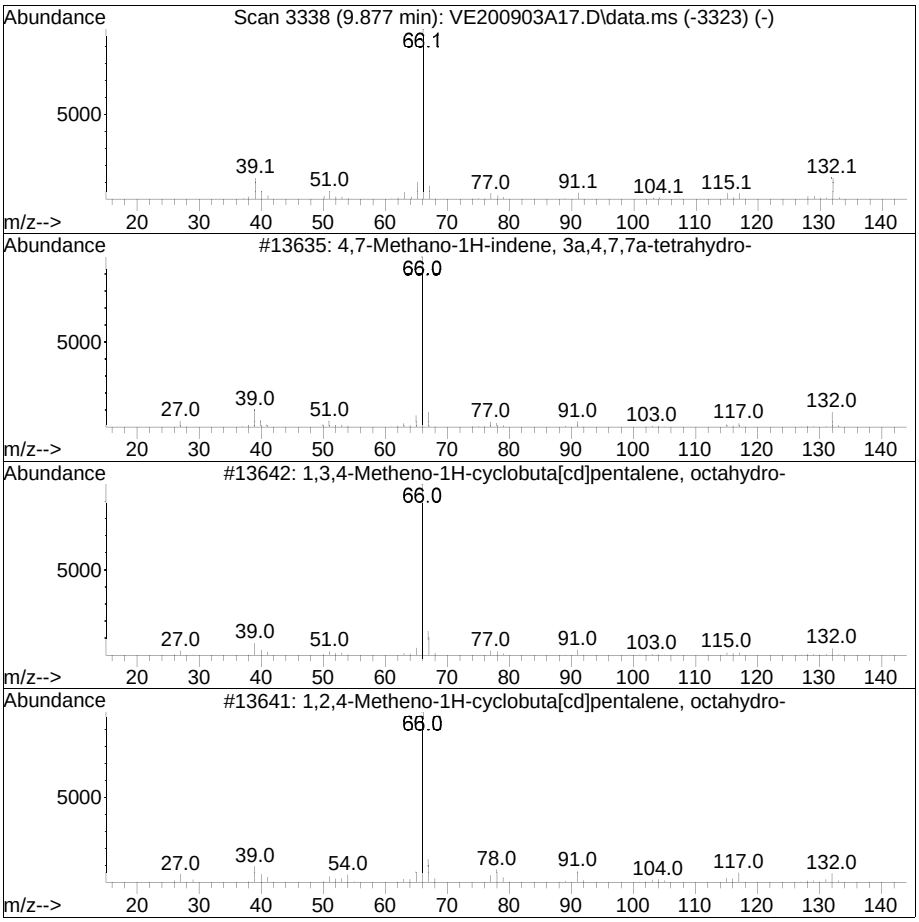
TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

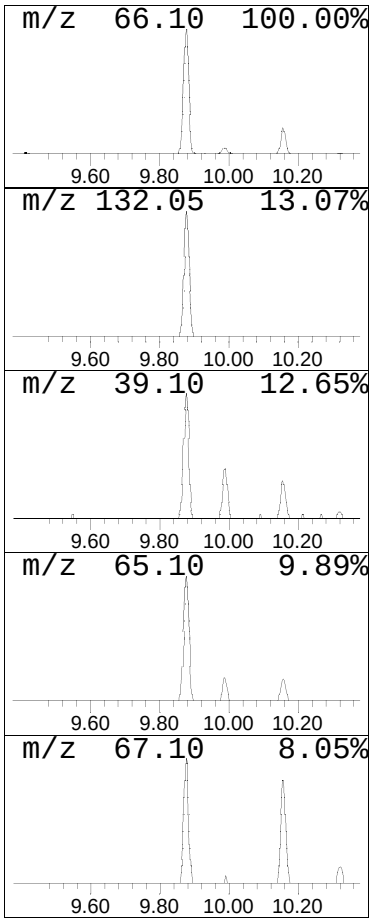
****

Peak Number 2 Unknown Aromatic Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.
9.877	1.54 ug/L	79814	1,4-Dichlorobenzene-d4	9.989

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	4,7-Methano-1H-indene, 3a,4,7,7a...	132	C10H12	000077-73-6	91
2	1,3,4-Metheno-1H-cyclobuta[cd]pe...	132	C10H12	006707-88-6	83
3	1,2,4-Metheno-1H-cyclobuta[cd]pe...	132	C10H12	006707-86-4	83
4	5-Norbornene-2,3-diacetonitrile	172	C11H12N2	101832-55-7	78
5	Bicyclo(2.2.1)hept-5-ene-2-carbo...	119	C8H9N	002888-90-6	78





Tentatively Identified Compound (LSC) summary

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A17.D
Acq On : 3 Sep 2020 12:56 pm
Operator : ELAINE:AJK
Sample : l2035834-02,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

					--Internal Standard---			
TIC Top Hit name	RT	EstConc	Units	Response	#	RT	Resp	Conc
Unknown	3.052	1.9	ug/L	96121	1	5.490	499736	10.0
Unknown Aromatic	9.877	1.5	ug/L	79814	3	9.989	519708	10.0

Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A18.D
Acq On : 3 Sep 2020 1:17 pm
Operator : ELAINE:AJK
Sample : l2035834-03,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:03:18 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Fluorobenzene	5.490	96	227645	10.000 ug/L	0.00
Standard Area 1 = 250172			Recovery = 91.00%		
59) Chlorobenzene-d5	8.497	117	170438	10.000 ug/L	0.00
Standard Area 1 = 189508			Recovery = 89.94%		
79) 1,4-Dichlorobenzene-d4	9.989	152	84957	10.000 ug/L	0.00
Standard Area 1 = 99145			Recovery = 85.69%		
System Monitoring Compounds					
36) Dibromofluoromethane	4.502	113	58632	10.507 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 105.07%		
43) 1,2-Dichloroethane-d4	5.147	65	63256	9.880 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 98.80%		
60) Toluene-d8	7.195	98	213790	9.790 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 97.90%		
83) 4-Bromofluorobenzene	9.321	95	73757	9.749 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 97.49%		
Target Compounds					Qvalue
2) Dichlorodifluoromethane	0.000		0	N.D.	
3) Chloromethane	1.063	50	116	N.D.	
4) Vinyl chloride	0.000		0	N.D.	
5) Bromomethane	0.000		0	N.D.	
6) Chloroethane	1.403	64	52	N.D.	
7) Trichlorofluoromethane	0.000		0	N.D.	
10) 1,1-Dichloroethene	0.000		0	N.D.	
11) Carbon disulfide	1.873	76	505	N.D.	
12) Freon-113	0.000		0	N.D.	
15) Methylene chloride	0.000		0	N.D.	
17) Acetone	0.000		0	N.D.	d
18) trans-1,2-Dichloroethene	0.000		0	N.D.	
19) Methyl acetate	0.000		0	N.D.	
20) Methyl tert-butyl ether	0.000		0	N.D.	
23) 1,1-Dichloroethane	0.000		0	N.D.	
28) cis-1,2-Dichloroethene	0.000		0	N.D.	
30) Bromochloromethane	0.000		0	N.D.	
31) Cyclohexane	0.000		0	N.D.	
32) Chloroform	0.000		0	N.D.	
33) Ethyl acetate	4.502	43	29	N.D.	

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A18.D
Acq On : 3 Sep 2020 1:17 pm
Operator : ELAINE:AJK
Sample : l2035834-03,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:03:18 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
34) Carbon tetrachloride	0.000		0	N.D.		
37) 1,1,1-Trichloroethane	0.000		0	N.D.		
39) 2-Butanone	4.711	43	54	N.D.		
41) Benzene	4.967	78	1093	N.D.		
44) 1,2-Dichloroethane	0.000		0	N.D.		
47) Methyl cyclohexane	0.000		0	N.D.		
48) Trichloroethene	5.565	95	182	N.D.		
51) 1,2-Dichloropropane	0.000		0	N.D.		
54) Bromodichloromethane	0.000		0	N.D.		
57) 1,4-Dioxane	0.000		0	N.D.		
58) cis-1,3-Dichloropropene	0.000		0	N.D.		
61) Toluene	7.251	92	1070	0.099	ug/L	86
62) 4-Methyl-2-pentanone	0.000		0	N.D.		
63) Tetrachloroethene	0.000		0	N.D.		
65) trans-1,3-Dichloropropene	0.000		0	N.D.		
68) 1,1,2-Trichloroethane	0.000		0	N.D.		
69) Chlorodibromomethane	0.000		0	N.D.		
71) 1,2-Dibromoethane	0.000		0	N.D.		
72) 2-Hexanone	8.492	43	113	N.D.		
73) Chlorobenzene	0.000		0	N.D.		
74) Ethylbenzene	8.547	91	244	N.D.		
76) p/m Xylene	8.653	106	199	N.D.		
77) o Xylene	8.942	106	168	N.D.		
78) Styrene	0.000		0	N.D.		
80) Bromoform	0.000		0	N.D.		
82) Isopropylbenzene	0.000		0	N.D.		
87) 1,1,2,2-Tetrachloroethane	0.000		0	N.D.		
100) 1,3-Dichlorobenzene	9.941	146	69	N.D.		
101) 1,4-Dichlorobenzene	9.997	146	109	N.D.		
104) 1,2-Dichlorobenzene	0.000		0	N.D.		
106) 1,2-Dibromo-3-chloropr...	0.000		0	N.D.		
109) 1,2,4-Trichlorobenzene	0.000		0	N.D.		
111) 1,2,3-Trichlorobenzene	0.000		0	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A18.D
Acq On : 3 Sep 2020 1:17 pm
Operator : ELAINE:AJK
Sample : l2035834-03,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:03:18 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

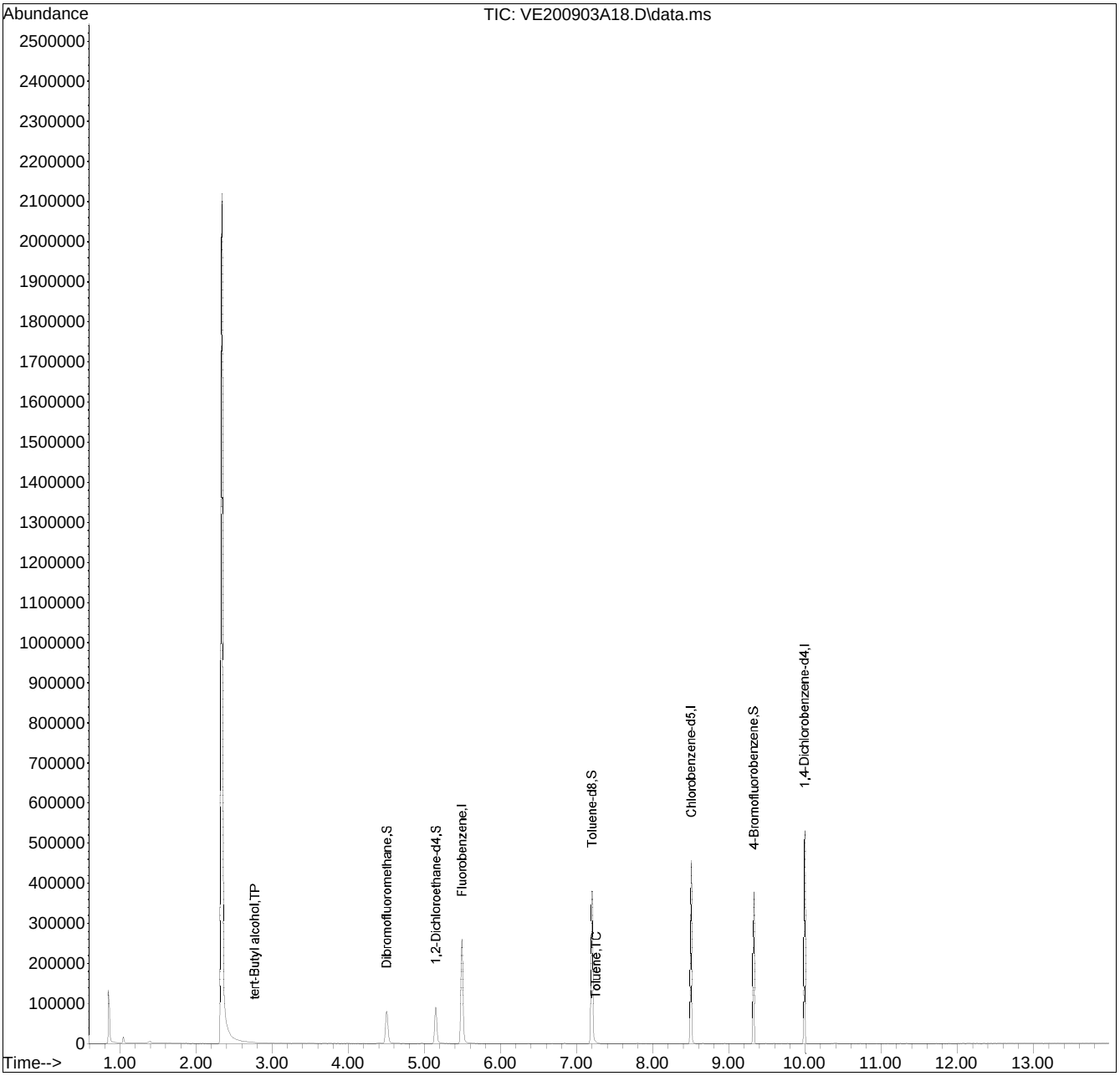
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

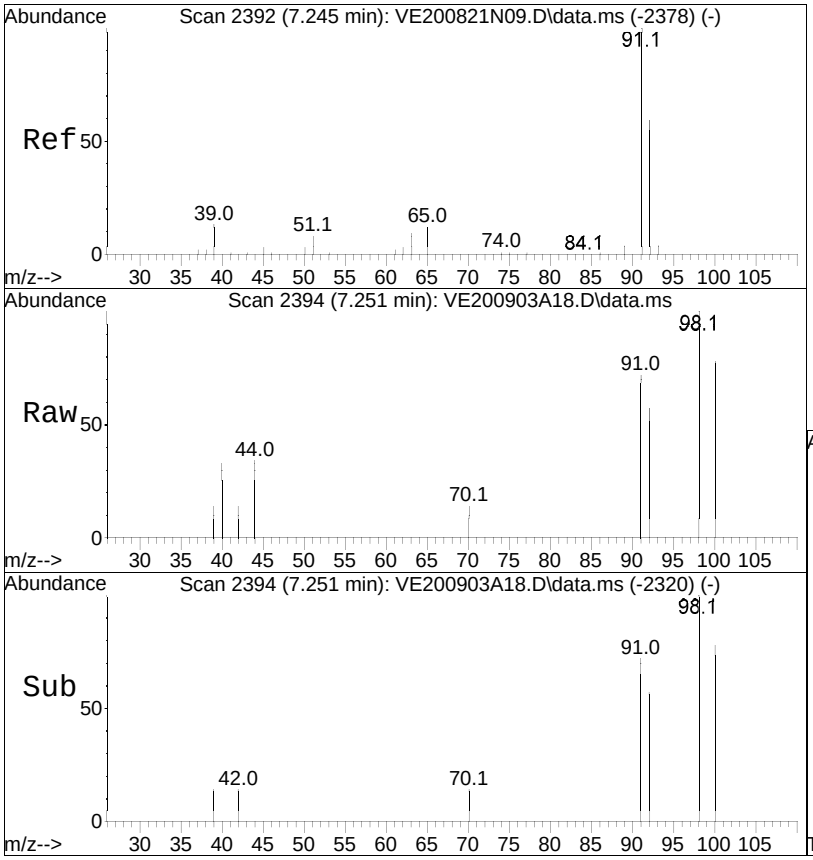
Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A18.D
Acq On : 3 Sep 2020 1:17 pm
Operator : ELAINE:AJK
Sample : l2035834-03,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:03:18 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist.D•

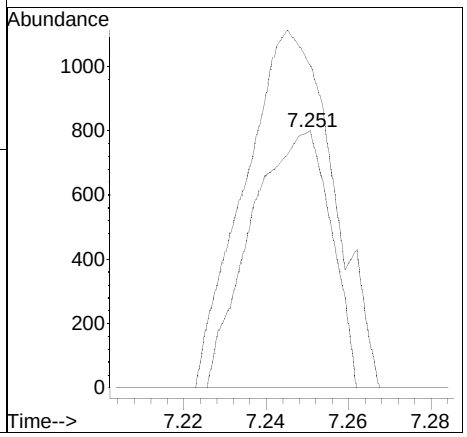




#61
Toluene
Concen: 0.10 ug/L
RT: 7.251 min Scan# 2394
Delta R.T. 0.006 min
Lab File: VE200903A18.D
Acq: 3 Sep 2020 1:17 pm

Tgt Ion: 92 Resp: 1070

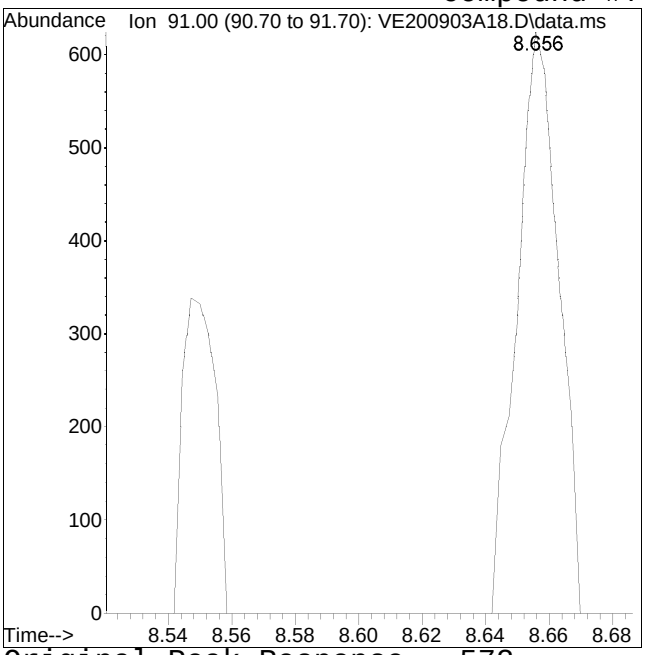
Ion	Ratio	Lower	Upper
92	100		
91	155.2	139.8	209.6

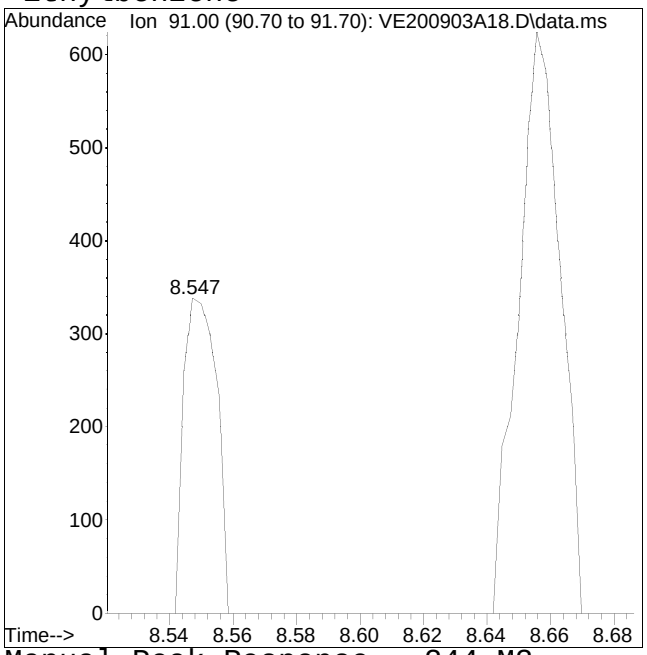


Manual Integration Report

Data Path : I:\VOLATILES\Elaine\2020\2QMethod : Elaine_200821N_8260.m
Data File : VE200903A18.D Operator : ELAINE:AJK
Date Inj'd : 9/3/2020 1:17 pm Instrument : Elaine
Sample : l2035834-03,31,10,10,,a Quant Date : 9/3/2020 4:37 pm

Compound #74: Ethylbenzene





Original Peak Response = 572 Manual Peak Response = 244 M3

M3 = Misidentification of the peak (i.e. 1,4-dichlorobenzene identified as 1,3-dichlorobenzene), or misidentification from 2 partially resolved peaks not being split.

LSC Area Percent Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A18.D
Acq On : 3 Sep 2020 1:17 pm
Operator : ELAINE:AJK
Sample : l2035834-03,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Integration Parameters: rteint.p
Integrator: RTE
Smoothing : ON Filtering: 5
Sampling : 1 Min Area: 3 % of largest Peak
Start Thrs: 0.2 Max Peaks: 100
Stop Thrs : 0 Peak Location: TOP

If leading or trailing edge < 100 prefer < Baseline drop else tangent >
Peak separation: 5

Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Title : VOLATILES BY GC/MS

Signal : TIC: VE200903A18.D\data.ms

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	2.337	605	628	684	rBV	2118819	3673689	100.00%	56.038%
2	4.502	1389	1406	1440	rBV2	79695	183185	4.99%	2.794%
3	5.147	1622	1638	1664	rBV	90359	187611	5.11%	2.862%
4	5.490	1742	1761	1796	rBV	258818	506208	13.78%	7.722%
5	7.195	2357	2374	2420	rBV	381915	606240	16.50%	9.247%
6	8.497	2829	2842	2860	rBV	456614	525497	14.30%	8.016%
7	9.321	3128	3138	3151	rVB	377572	374452	10.19%	5.712%
8	9.989	3364	3378	3390	rBV	530255	498851	13.58%	7.609%

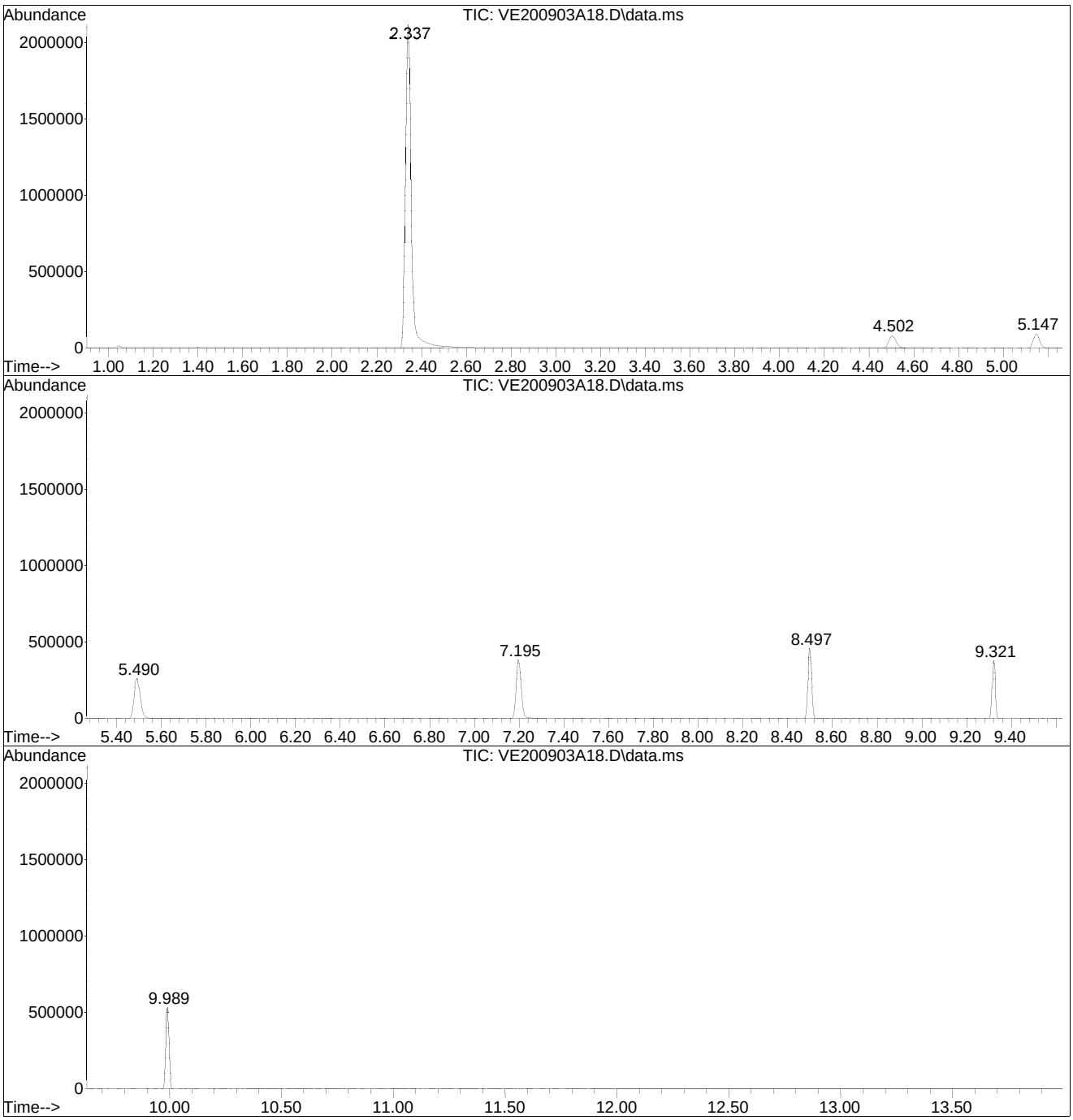
Sum of corrected areas: 6555733

LSC Report - Integrated Chromatogram

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A18.D
Acq On : 3 Sep 2020 1:17 pm
Operator : ELAINE:AJK
Sample : l2035834-03,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p



Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A18.D
Acq On : 3 Sep 2020 1:17 pm
Operator : ELAINE:AJK
Sample : l2035834-03,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

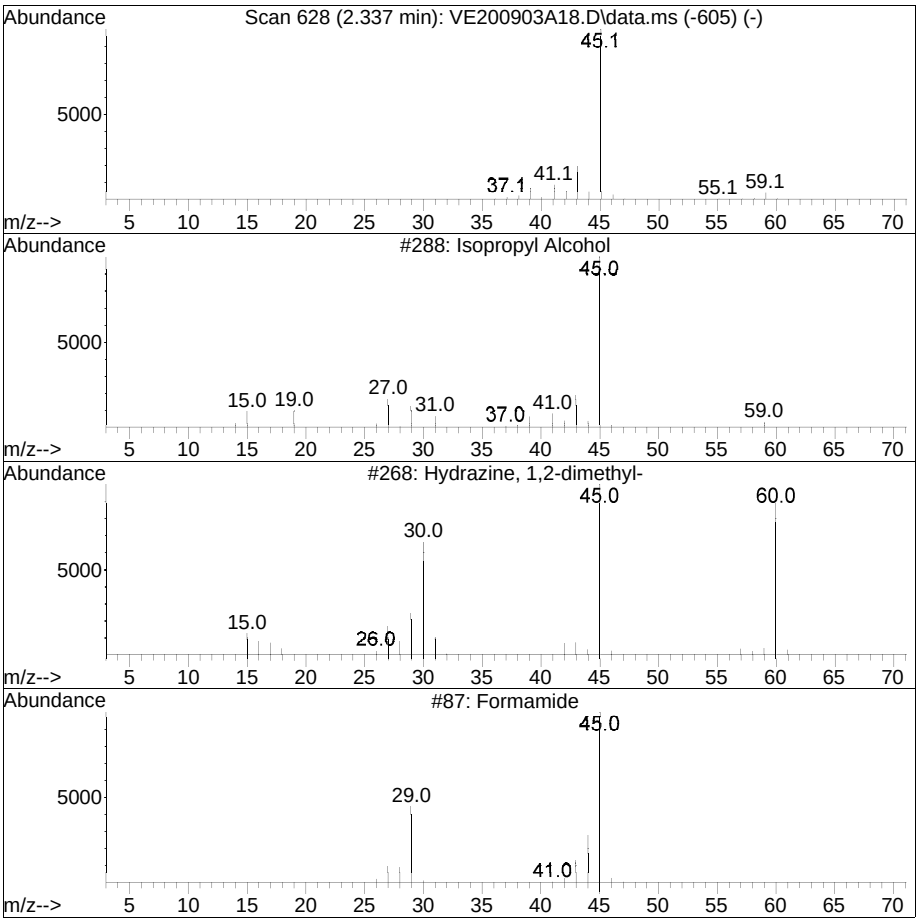
TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

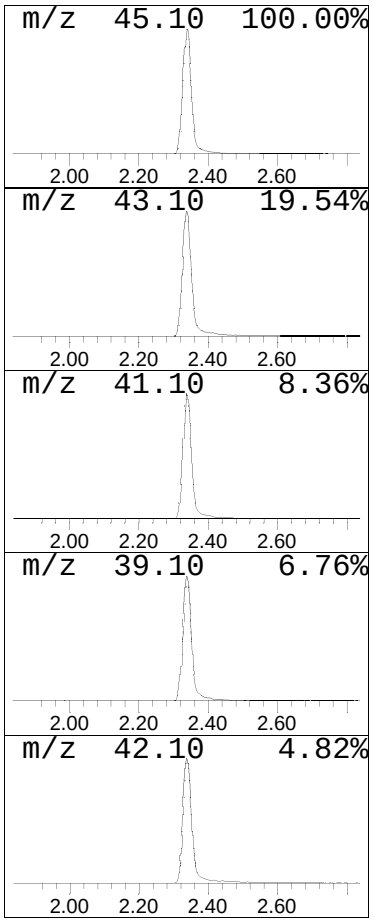
****

Peak Number 1 Isopropyl Alcohol Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
2.337	72.57 ug/L	3673690	Fluorobenzene	5.490

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Isopropyl Alcohol	60	C3H8O	000067-63-0	78
2	Hydrazine, 1,2-dimethyl-	60	C2H8N2	000540-73-8	9
3	Formamide	45	CH3NO	000075-12-7	7
4	Propanoic acid, 2-hydroxy-, meth...	104	C4H8O3	002155-30-8	4
5	4-Penten-2-ol	86	C5H10O	000625-31-0	4





Tentatively Identified Compound (LSC) summary

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A18.D
Acq On : 3 Sep 2020 1:17 pm
Operator : ELAINE:AJK
Sample : l2035834-03,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

					--Internal Standard---			
TIC Top Hit name	RT	EstConc	Units	Response	#	RT	Resp	Conc
Isopropyl Alcohol	2.337	72.6	ug/L	3673690	1	5.490	506208	10.0

Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A19.D
Acq On : 3 Sep 2020 1:39 pm
Operator : ELAINE:AJK
Sample : l2035834-05,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:03:36 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Fluorobenzene	5.489	96	226195	10.000 ug/L	0.00
Standard Area 1 = 250172			Recovery = 90.42%		
59) Chlorobenzene-d5	8.497	117	168992	10.000 ug/L	0.00
Standard Area 1 = 189508			Recovery = 89.17%		
79) 1,4-Dichlorobenzene-d4	9.988	152	84508	10.000 ug/L	0.00
Standard Area 1 = 99145			Recovery = 85.24%		
System Monitoring Compounds					
36) Dibromofluoromethane	4.505	113	56659	10.219 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 102.19%		
43) 1,2-Dichloroethane-d4	5.147	65	65198	10.249 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 102.49%		
60) Toluene-d8	7.195	98	214506	9.907 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 99.07%		
83) 4-Bromofluorobenzene	9.321	95	72808	9.674 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 96.74%		
Target Compounds					Qvalue
2) Dichlorodifluoromethane	0.000		0	N.D.	
3) Chloromethane	1.066	50	157	N.D.	
4) Vinyl chloride	0.000		0	N.D.	
5) Bromomethane	1.319	94	26	N.D.	
6) Chloroethane	0.000		0	N.D.	
7) Trichlorofluoromethane	0.000		0	N.D.	
10) 1,1-Dichloroethene	0.000		0	N.D.	
11) Carbon disulfide	1.873	76	316	N.D.	
12) Freon-113	0.000		0	N.D.	
15) Methylene chloride	0.000		0	N.D.	
17) Acetone	0.000		0	N.D.	d
18) trans-1,2-Dichloroethene	0.000		0	N.D.	
19) Methyl acetate	2.557	43	28	N.D.	
20) Methyl tert-butyl ether	0.000		0	N.D.	
23) 1,1-Dichloroethane	0.000		0	N.D.	
28) cis-1,2-Dichloroethene	0.000		0	N.D.	
30) Bromochloromethane	0.000		0	N.D.	
31) Cyclohexane	0.000		0	N.D.	
32) Chloroform	0.000		0	N.D.	
33) Ethyl acetate	0.000		0	N.D.	

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A19.D
Acq On : 3 Sep 2020 1:39 pm
Operator : ELAINE:AJK
Sample : l2035834-05,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:03:36 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
34) Carbon tetrachloride	0.000		0		N.D.	
37) 1,1,1-Trichloroethane	0.000		0		N.D.	
39) 2-Butanone	0.000		0		N.D.	
41) Benzene	4.964	78	52		N.D.	
44) 1,2-Dichloroethane	0.000		0		N.D.	
47) Methyl cyclohexane	0.000		0		N.D.	
48) Trichloroethene	5.559	95	109		N.D.	
51) 1,2-Dichloropropane	0.000		0		N.D.	
54) Bromodichloromethane	0.000		0		N.D.	
57) 1,4-Dioxane	0.000		0		N.D.	
58) cis-1,3-Dichloropropene	0.000		0		N.D.	
61) Toluene	7.239	92	434		N.D.	
62) 4-Methyl-2-pentanone	0.000		0		N.D.	
63) Tetrachloroethene	0.000		0		N.D.	
65) trans-1,3-Dichloropropene	0.000		0		N.D.	
68) 1,1,2-Trichloroethane	0.000		0		N.D.	
69) Chlorodibromomethane	0.000		0		N.D.	
71) 1,2-Dibromoethane	0.000		0		N.D.	
72) 2-Hexanone	8.497	43	55		N.D.	
73) Chlorobenzene	0.000		0		N.D.	
74) Ethylbenzene	8.550	91	172		N.D.	
76) p/m Xylene	0.000		0		N.D.	
77) o Xylene	0.000		0		N.D.	
78) Styrene	0.000		0		N.D.	
80) Bromoform	0.000		0		N.D.	
82) Isopropylbenzene	0.000		0		N.D.	
87) 1,1,2,2-Tetrachloroethane	0.000		0		N.D.	
100) 1,3-Dichlorobenzene	9.997	146	99		N.D.	
101) 1,4-Dichlorobenzene	9.997	146	99		N.D.	
104) 1,2-Dichlorobenzene	10.242	146	64		N.D.	
106) 1,2-Dibromo-3-chloropr...	0.000		0		N.D.	
109) 1,2,4-Trichlorobenzene	0.000		0		N.D.	
111) 1,2,3-Trichlorobenzene	0.000		0		N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A19.D
Acq On : 3 Sep 2020 1:39 pm
Operator : ELAINE:AJK
Sample : l2035834-05,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:03:36 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

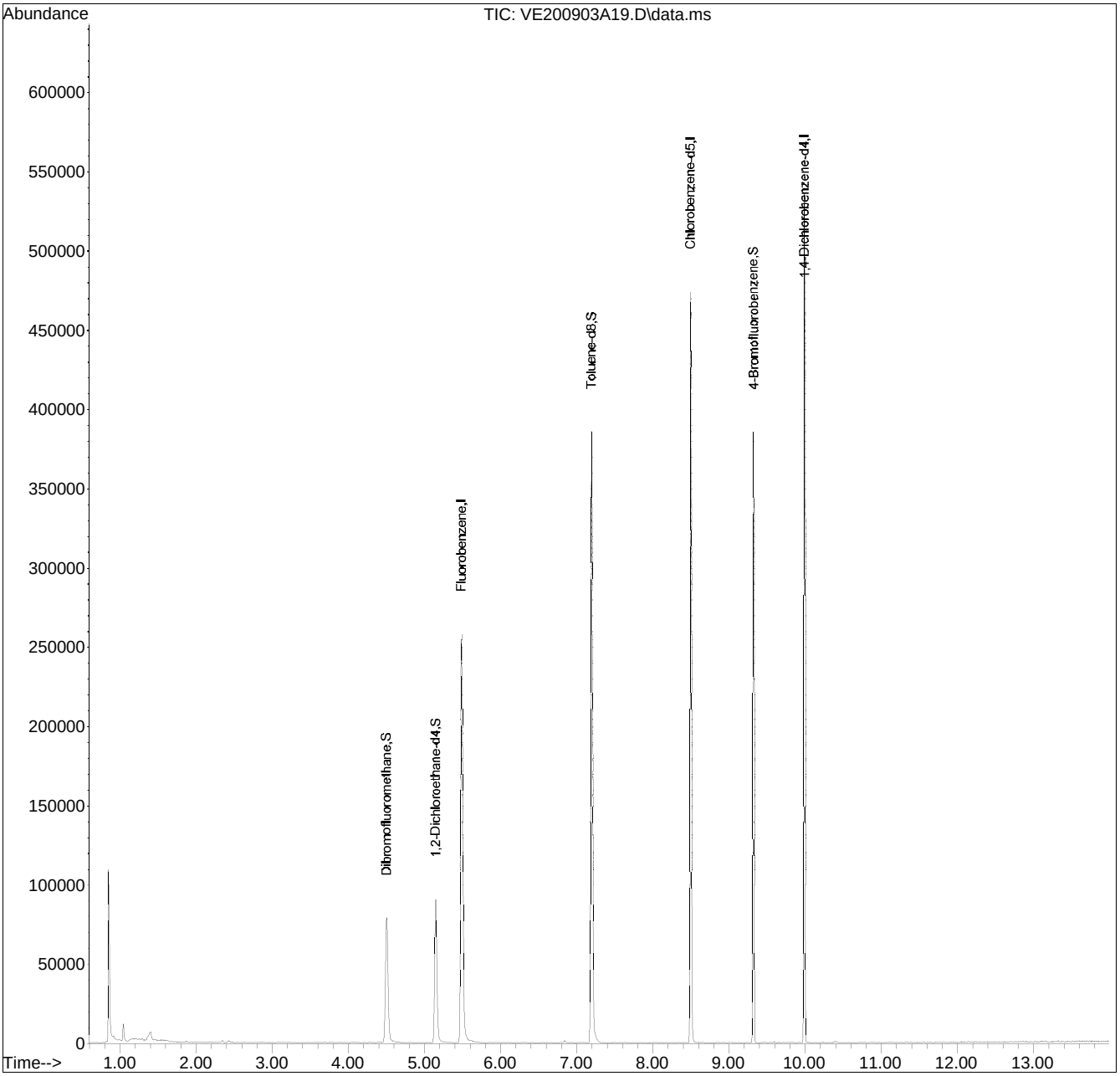
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A19.D
Acq On : 3 Sep 2020 1:39 pm
Operator : ELAINE:AJK
Sample : l2035834-05,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:03:36 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist.D•



Manual Integration Report

Data Path	: I:\VOLATILES\Elaine\2020\2Q	Method	: Elaine_200821N_8260.m
Data File	: VE200903A19.D	Operator	: ELAINE:AJK
Date Inj'd	: 9/3/2020 1:39 pm	Instrument	: Elaine
Sample	: l2035834-05,31,10,10,,a	Quant Date	: 9/3/2020 4:37 pm

There are no manual integrations or false positives in this file.

LSC Area Percent Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A19.D
Acq On : 3 Sep 2020 1:39 pm
Operator : ELAINE:AJK
Sample : l2035834-05,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Integration Parameters: rteint.p
Integrator: RTE
Smoothing : ON Filtering: 5
Sampling : 1 Min Area: 3 % of largest Peak
Start Thrs: 0.2 Max Peaks: 100
Stop Thrs : 0 Peak Location: TOP

If leading or trailing edge < 100 prefer < Baseline drop else tangent >
Peak separation: 5

Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Title : VOLATILES BY GC/MS

Signal : TIC: VE200903A19.D\data.ms

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	4.502	1388	1406	1434	rBV2	78471	182533	29.99%	6.301%
2	5.147	1621	1638	1665	rBV2	90007	188392	30.95%	6.503%
3	5.489	1741	1761	1791	rBV	257597	503464	82.72%	17.380%
4	7.195	2358	2374	2416	rBV	385548	608608	100.00%	21.010%
5	8.497	2831	2842	2863	rBV	473484	528330	86.81%	18.238%
6	9.321	3119	3138	3149	rVB	385186	377503	62.03%	13.032%
7	9.988	3367	3378	3393	rVB	535559	507973	83.46%	17.536%

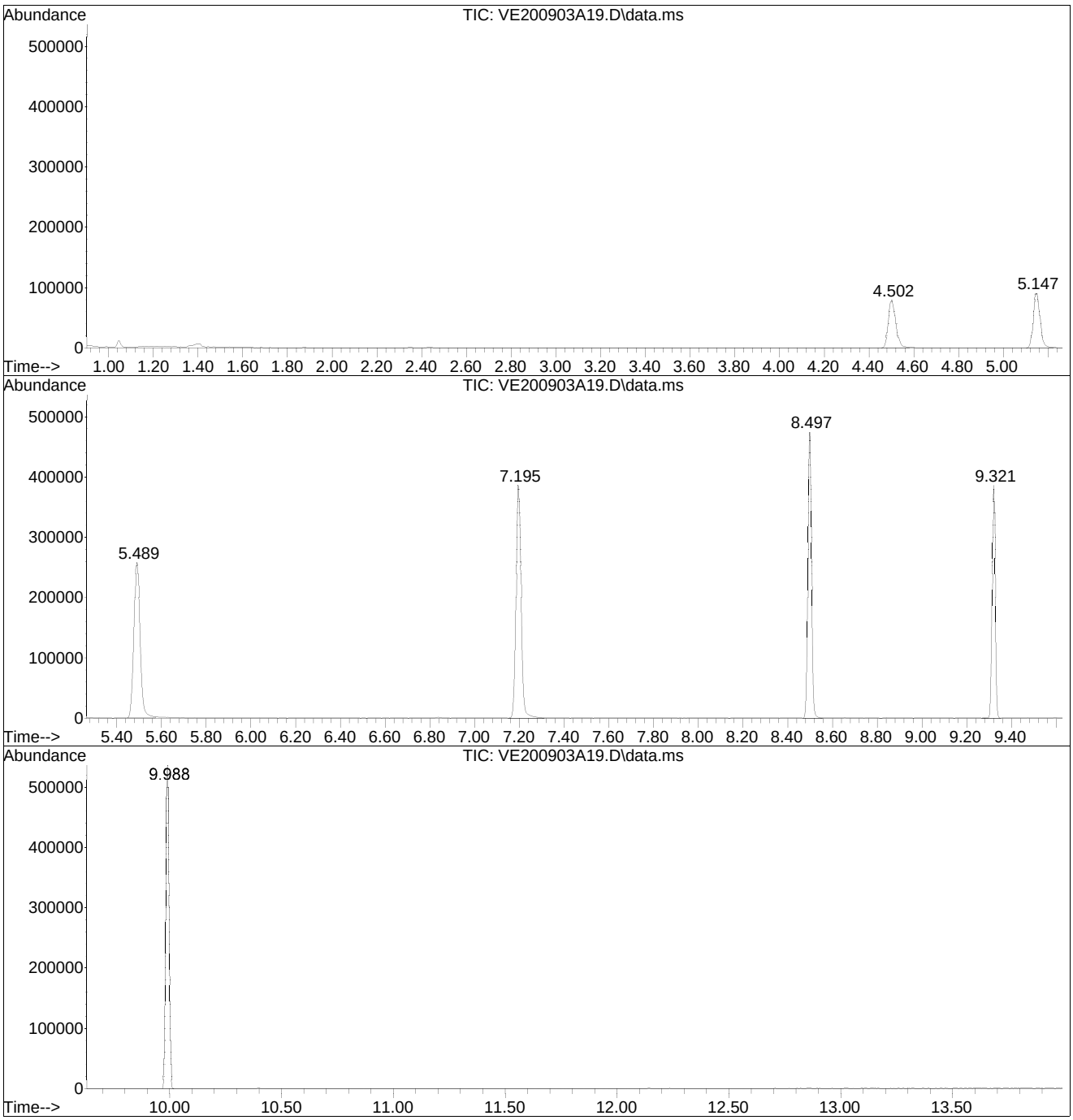
Sum of corrected areas: 2896803

LSC Report - Integrated Chromatogram

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A19.D
Acq On : 3 Sep 2020 1:39 pm
Operator : ELAINE:AJK
Sample : l2035834-05,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p



Library Search Compound Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A19.D
Acq On : 3 Sep 2020 1:39 pm
Operator : ELAINE:AJK
Sample : l2035834-05,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

No Library Search Compounds Detected
****

Tentatively Identified Compound (LSC) summary

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A19.D
Acq On : 3 Sep 2020 1:39 pm
Operator : ELAINE:AJK
Sample : l2035834-05,31,10,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

					--Internal Standard---			
TIC Top Hit name	RT	EstConc	Units	Response	#	RT	Resp	Conc

Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:04:24 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Fluorobenzene	5.490	96	227500	10.000 ug/L	0.00
Standard Area 1 = 250172			Recovery = 90.94%		
59) Chlorobenzene-d5	8.497	117	168733	10.000 ug/L	0.00
Standard Area 1 = 189508			Recovery = 89.04%		
79) 1,4-Dichlorobenzene-d4	9.989	152	85904	10.000 ug/L	0.00
Standard Area 1 = 99145			Recovery = 86.64%		
System Monitoring Compounds					
36) Dibromofluoromethane	4.502	113	57149	10.248 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 102.48%		
43) 1,2-Dichloroethane-d4	5.147	65	64781	10.125 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 101.25%		
60) Toluene-d8	7.195	98	214679	9.930 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 99.30%		
83) 4-Bromofluorobenzene	9.321	95	73950	9.666 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 96.66%		
Target Compounds					Qvalue
2) Dichlorodifluoromethane	0.000		0	N.D.	
3) Chloromethane	0.000		0	N.D. d	
4) Vinyl chloride	0.000		0	N.D.	
5) Bromomethane	1.327	94	113	N.D.	
6) Chloroethane	0.000		0	N.D.	
7) Trichlorofluoromethane	0.000		0	N.D.	
10) 1,1-Dichloroethene	0.000		0	N.D.	
11) Carbon disulfide	1.876	76	736	0.098 ug/L #	76
12) Freon-113	0.000		0	N.D.	
15) Methylene chloride	0.000		0	N.D.	
17) Acetone	2.413	43	149550	159.516 ug/L	95
18) trans-1,2-Dichloroethene	0.000		0	N.D.	
19) Methyl acetate	0.000		0	N.D. d	
20) Methyl tert-butyl ether	0.000		0	N.D.	
23) 1,1-Dichloroethane	0.000		0	N.D.	
28) cis-1,2-Dichloroethene	0.000		0	N.D.	
30) Bromochloromethane	0.000		0	N.D.	
31) Cyclohexane	0.000		0	N.D. d	
32) Chloroform	0.000		0	N.D.	
33) Ethyl acetate	4.508	43	33223	9.119 ug/L #	97

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:04:24 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
34) Carbon tetrachloride	0.000		0	N.D.		
37) 1,1,1-Trichloroethane	0.000		0	N.D.		
39) 2-Butanone	0.000		0	N.D. d		
41) Benzene	4.964	78	676	N.D.		
44) 1,2-Dichloroethane	0.000		0	N.D.		
47) Methyl cyclohexane	0.000		0	N.D.		
48) Trichloroethene	5.579	95	58	N.D.		
51) 1,2-Dichloropropane	0.000		0	N.D.		
54) Bromodichloromethane	0.000		0	N.D.		
57) 1,4-Dioxane	0.000		0	N.D.		
58) cis-1,3-Dichloropropene	0.000		0	N.D.		
61) Toluene	7.245	92	35320	3.305	ug/L	97
62) 4-Methyl-2-pentanone	0.000		0	N.D. d		
63) Tetrachloroethene	0.000		0	N.D.		
65) trans-1,3-Dichloropropene	0.000		0	N.D.		
68) 1,1,2-Trichloroethane	0.000		0	N.D.		
69) Chlorodibromomethane	0.000		0	N.D.		
71) 1,2-Dibromoethane	0.000		0	N.D.		
72) 2-Hexanone	0.000		0	N.D. d		
73) Chlorobenzene	0.000		0	N.D.		
74) Ethylbenzene	8.550	91	2525	0.128	ug/L	99
76) p/m Xylene	8.659	106	3084	0.394	ug/L	94
77) o Xylene	8.942	106	682	0.095	ug/L	98
78) Styrene	0.000		0	N.D.		
80) Bromoform	0.000		0	N.D.		
82) Isopropylbenzene	9.151	105	61	N.D.		
87) 1,1,2,2-Tetrachloroethane	0.000		0	N.D.		
100) 1,3-Dichlorobenzene	9.997	146	192	N.D.		
101) 1,4-Dichlorobenzene	9.997	146	192	N.D.		
104) 1,2-Dichlorobenzene	10.239	146	55	N.D.		
106) 1,2-Dibromo-3-chloropr...	0.000		0	N.D.		
109) 1,2,4-Trichlorobenzene	0.000		0	N.D.		
111) 1,2,3-Trichlorobenzene	0.000		0	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:04:24 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist

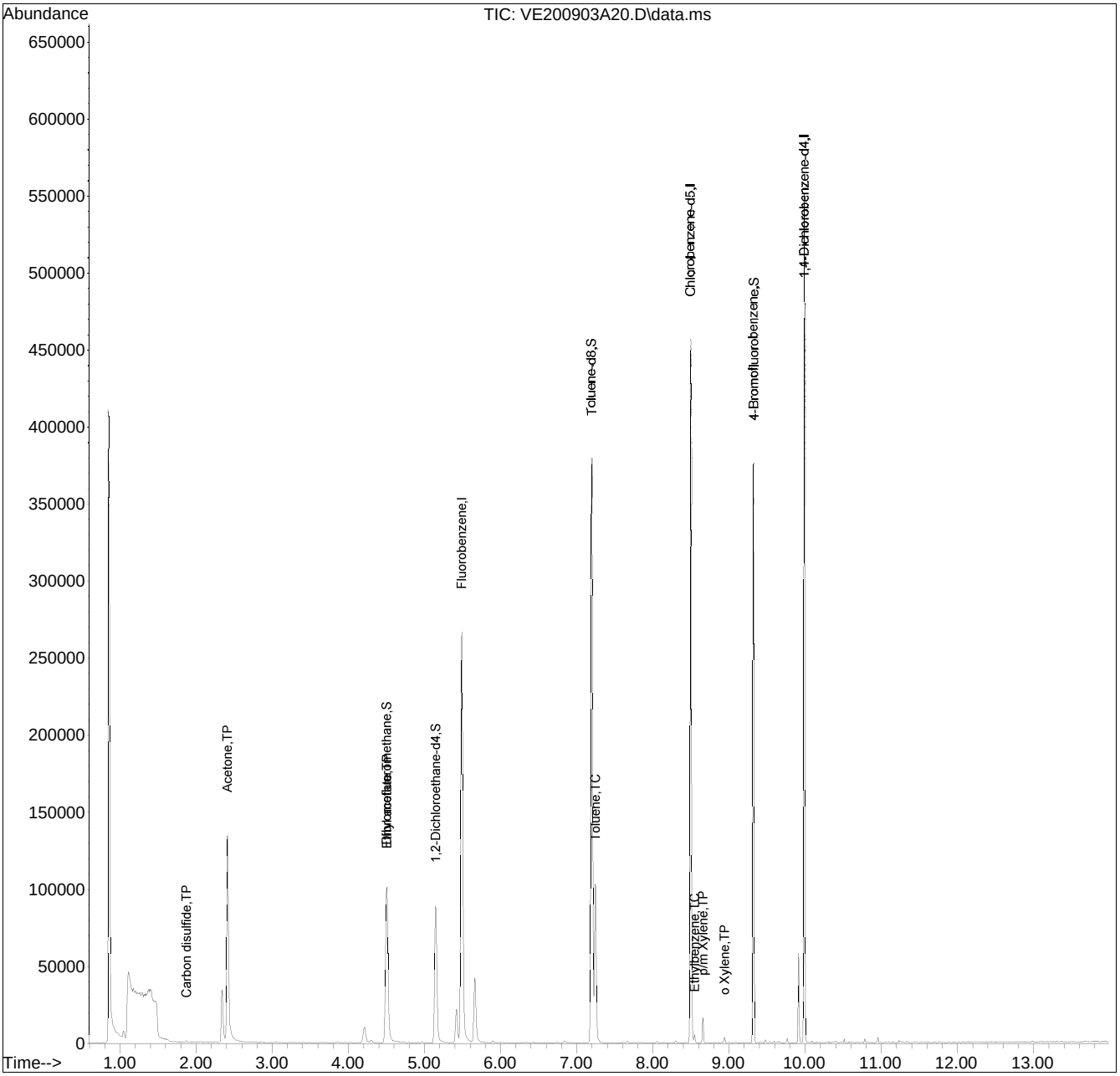
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

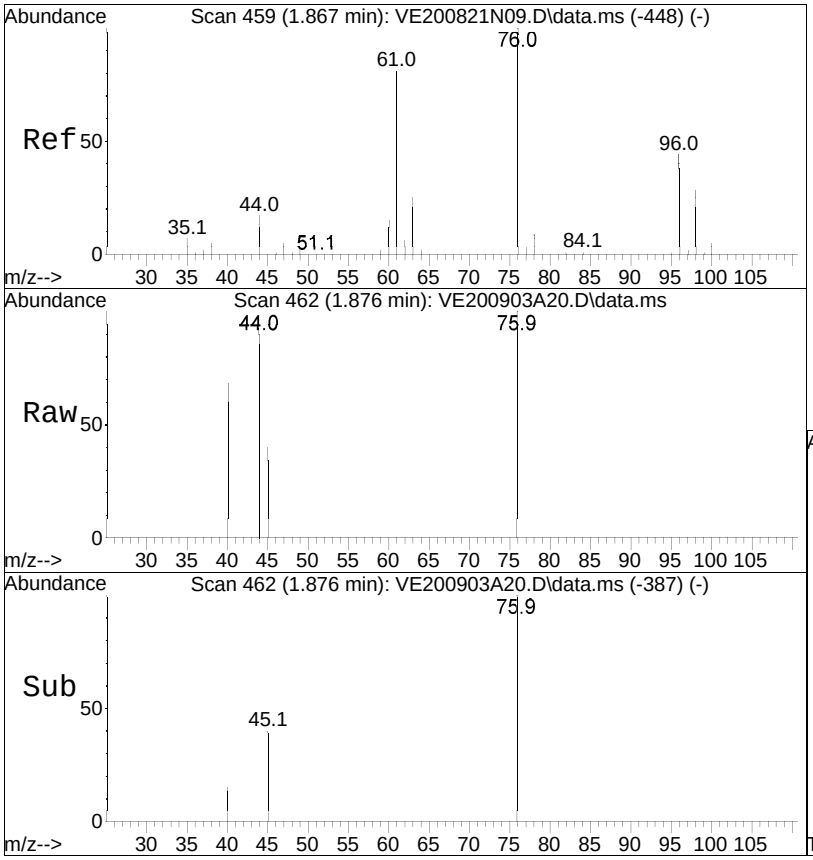
Quantitation Report (QT/LSC Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 17:04:24 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

Sub List : 8260-NJ+TBA+EA - NJTCL+TBA+Ethyl Acetate Sublist.D•

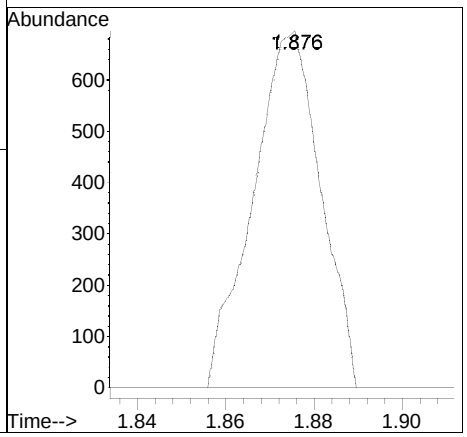


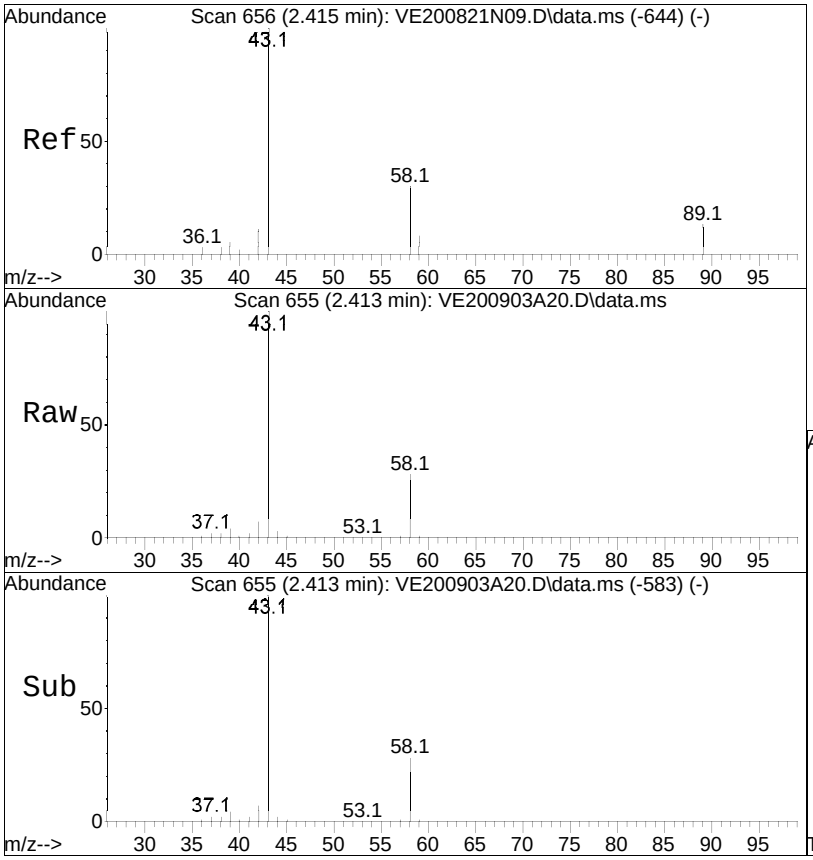


#11
Carbon disulfide
Concen: 0.10 ug/L
RT: 1.876 min Scan# 462
Delta R.T. 0.009 min
Lab File: VE200903A20.D
Acq: 3 Sep 2020 2:00 pm

Tgt Ion: 76 Resp: 736

Ion	Ratio	Lower	Upper
76	100		
78	0.0	5.7	11.7#

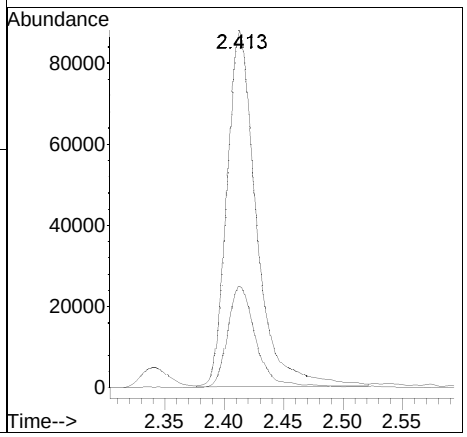


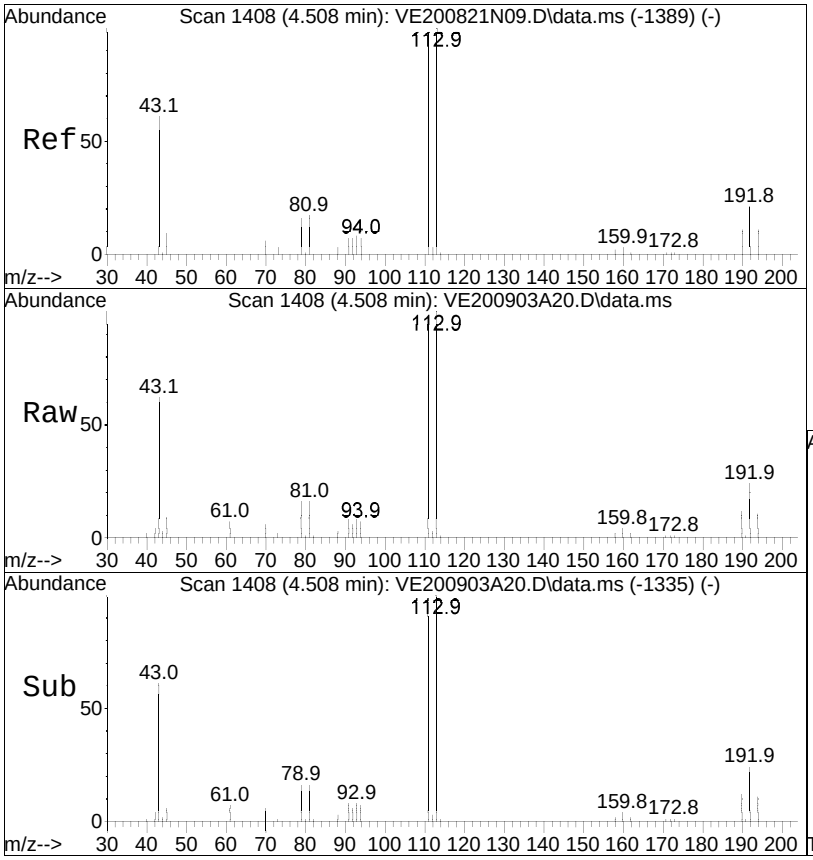


#17
Acetone
Concen: 159.52 ug/L
RT: 2.413 min Scan# 655
Delta R.T. -0.000 min
Lab File: VE200903A20.D
Acq: 3 Sep 2020 2:00 pm

Tgt Ion: 43 Resp: 149550

Ion	Ratio	Lower	Upper
43	100		
58	27.3	24.2	36.4

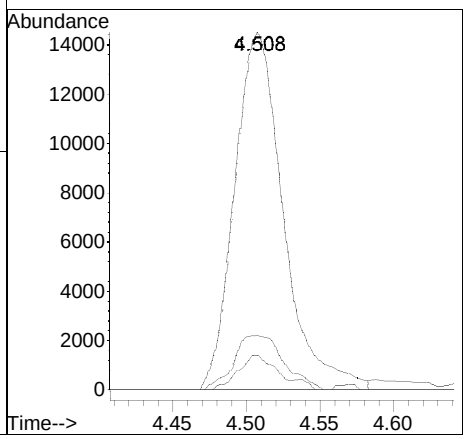


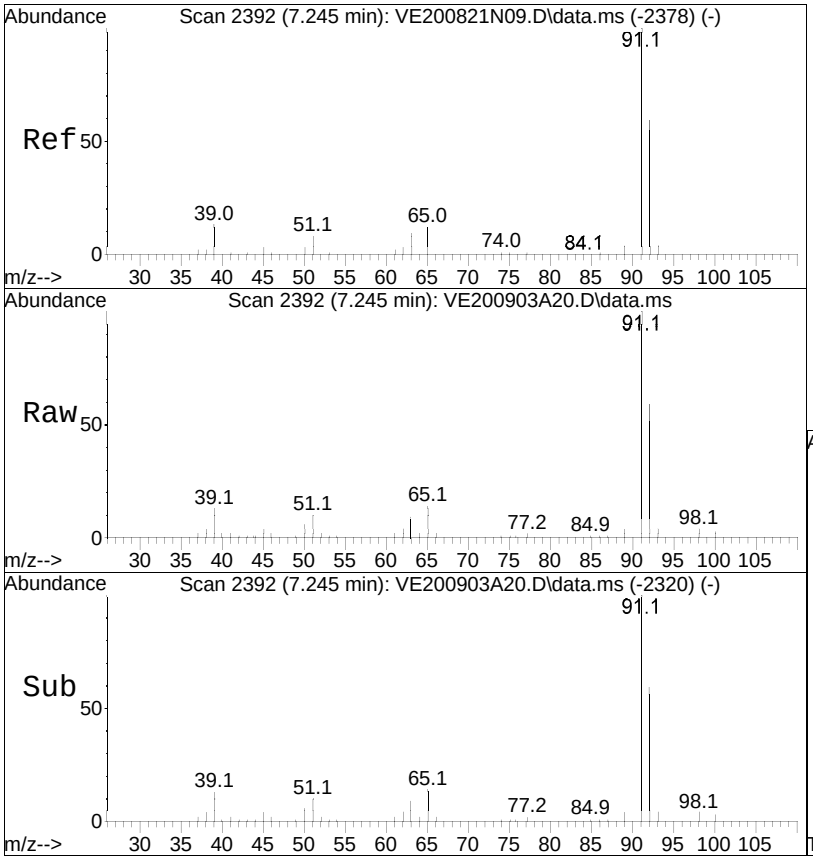


#33
Ethyl acetate
Concen: 9.12 ug/L
RT: 4.508 min Scan# 1408
Delta R.T. 0.003 min
Lab File: VE200903A20.D
Acq: 3 Sep 2020 2:00 pm

Tgt Ion: 43 Resp: 33223

Ion	Ratio	Lower	Upper
43	100		
45	15.7	12.2	18.2
70	7.4	4.1	6.1#

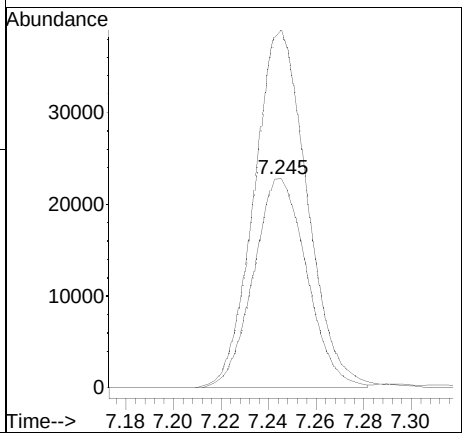


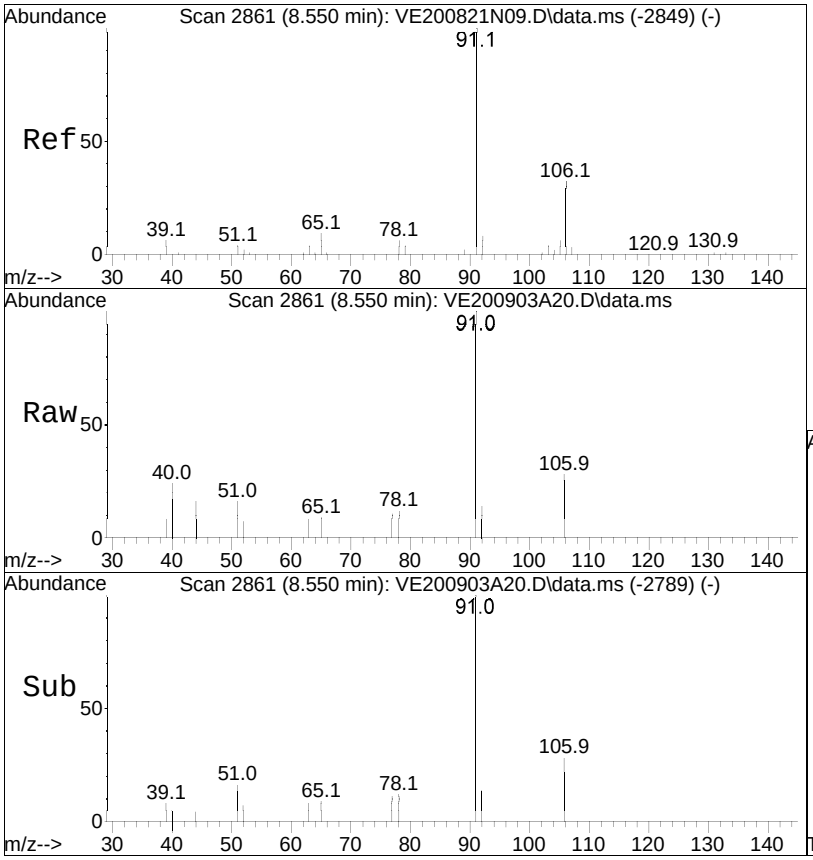


#61
Toluene
Concen: 3.31 ug/L
RT: 7.245 min Scan# 2392
Delta R.T. 0.000 min
Lab File: VE200903A20.D
Acq: 3 Sep 2020 2:00 pm

Tgt Ion: 92 Resp: 35320

Ion	Ratio	Lower	Upper
92	100		
91	169.9	139.8	209.6

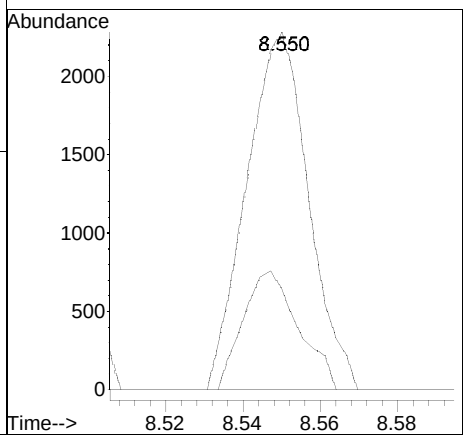


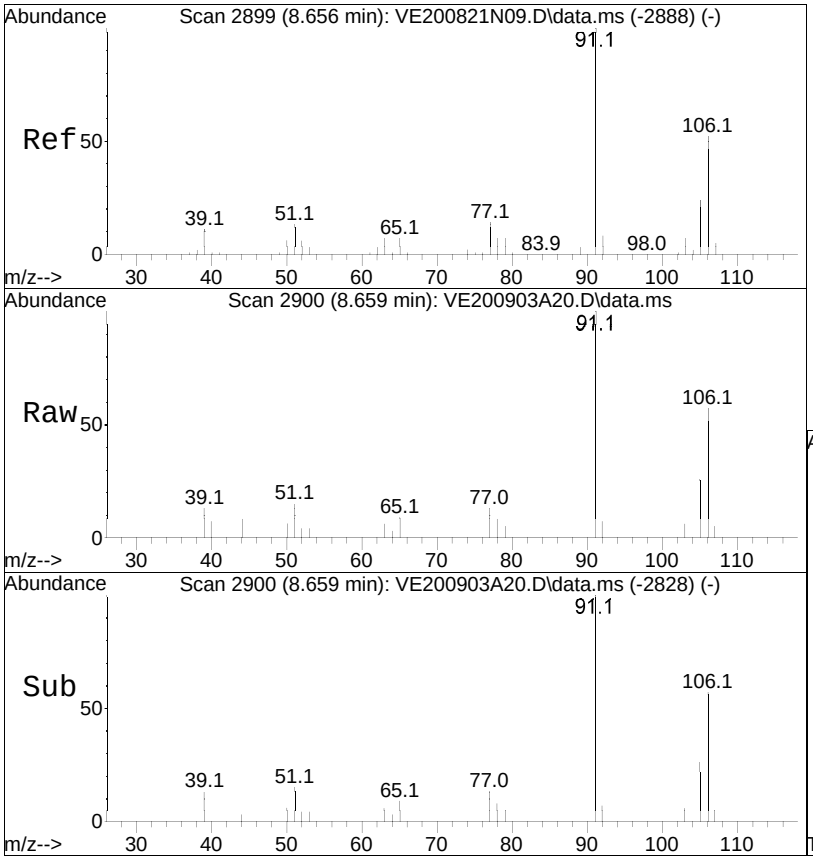


#74
Ethylbenzene
Concen: 0.13 ug/L
RT: 8.550 min Scan# 2861
Delta R.T. 0.000 min
Lab File: VE200903A20.D
Acq: 3 Sep 2020 2:00 pm

Tgt Ion: 91 Resp: 2525

Ion	Ratio	Lower	Upper
91	100		
106	29.9	24.3	36.5

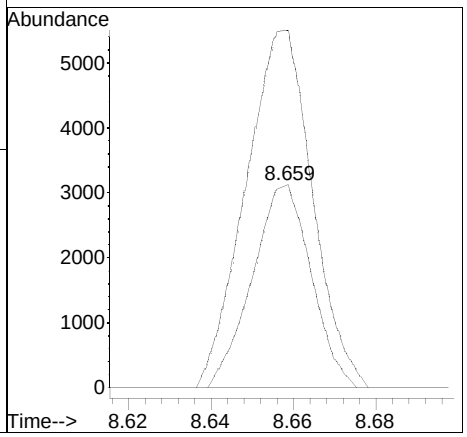


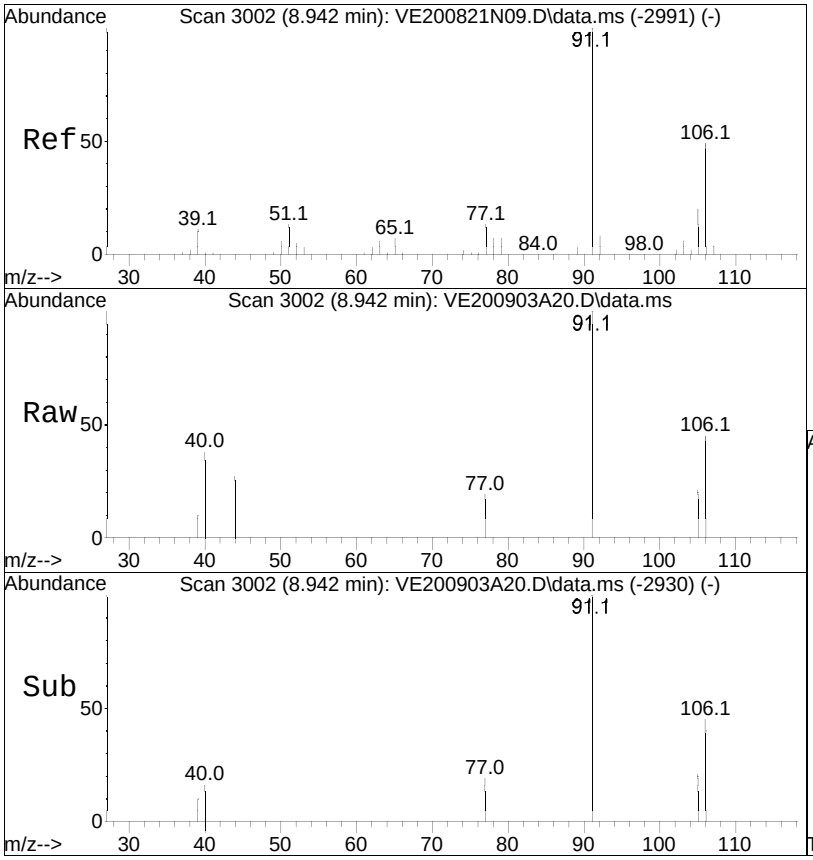


#76
p/m Xylene
Concen: 0.39 ug/L
RT: 8.659 min Scan# 2900
Delta R.T. -0.000 min
Lab File: VE200903A20.D
Acq: 3 Sep 2020 2:00 pm

Tgt Ion:106 Resp: 3084

Ion	Ratio	Lower	Upper
106	100		
91	199.4	166.4	249.6

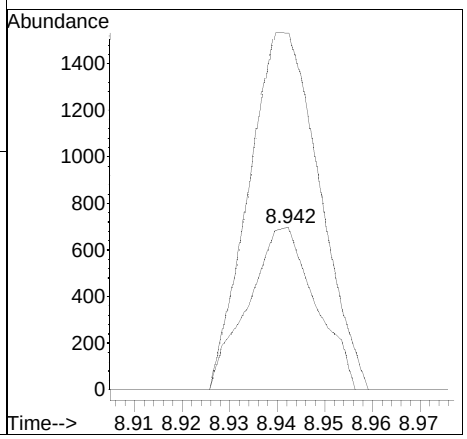




#77
o Xylene
Concen: 0.09 ug/L
RT: 8.942 min Scan# 3002
Delta R.T. 0.000 min
Lab File: VE200903A20.D
Acq: 3 Sep 2020 2:00 pm

Tgt Ion:106 Resp: 682

Ion	Ratio	Lower	Upper
106	100		
91	230.8	182.6	273.8



Manual Integration Report

Data Path	: I:\VOLATILES\Elaine\2020\2Q	Method	: Elaine_200821N_8260.m
Data File	: VE200903A20.D	Operator	: ELAINE:AJK
Date Inj'd	: 9/3/2020 2:00 pm	Instrument	: Elaine
Sample	: l2035834-04D,31,1,10,,a	Quant Date	: 9/3/2020 4:37 pm

There are no manual integrations or false positives in this file.

LSC Area Percent Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Integration Parameters: rteint.p
Integrator: RTE
Smoothing : ON Filtering: 5
Sampling : 1 Min Area: 3 % of largest Peak
Start Thrs: 0.2 Max Peaks: 100
Stop Thrs : 0 Peak Location: TOP

If leading or trailing edge < 100 prefer < Baseline drop else tangent >
Peak separation: 5

Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Title : VOLATILES BY GC/MS

Signal : TIC: VE200903A20.D\data.ms

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.110	173	187	206	rBV2	42918	163652	27.63%	4.368%
2	2.340	615	629	643	rBV	34223	58982	9.96%	1.574%
3	2.413	643	655	693	rVB	133461	229920	38.82%	6.137%
4	4.213	1285	1302	1315	rBV2	10172	24142	4.08%	0.644%
5	4.505	1386	1407	1434	rBV3	100803	235885	39.83%	6.296%
6	5.147	1621	1638	1666	rBV2	88750	189012	31.92%	5.045%
7	5.420	1721	1736	1747	rBV2	21751	41429	7.00%	1.106%
8	5.490	1747	1761	1792	rVB	264981	503449	85.01%	13.438%
9	5.662	1807	1823	1850	rVB2	41593	84125	14.21%	2.245%
10	7.195	2353	2374	2384	rBV	379329	592206	100.00%	15.807%
11	7.245	2385	2392	2418	rVB	102681	158613	26.78%	4.234%
12	8.497	2831	2842	2855	rBV	456415	522437	88.22%	13.945%
13	9.321	3127	3138	3151	rVB	376145	375710	63.44%	10.029%
14	9.913	3343	3351	3360	rBV	58082	54231	9.16%	1.448%
15	9.989	3367	3378	3395	rVB	550838	512597	86.56%	13.682%

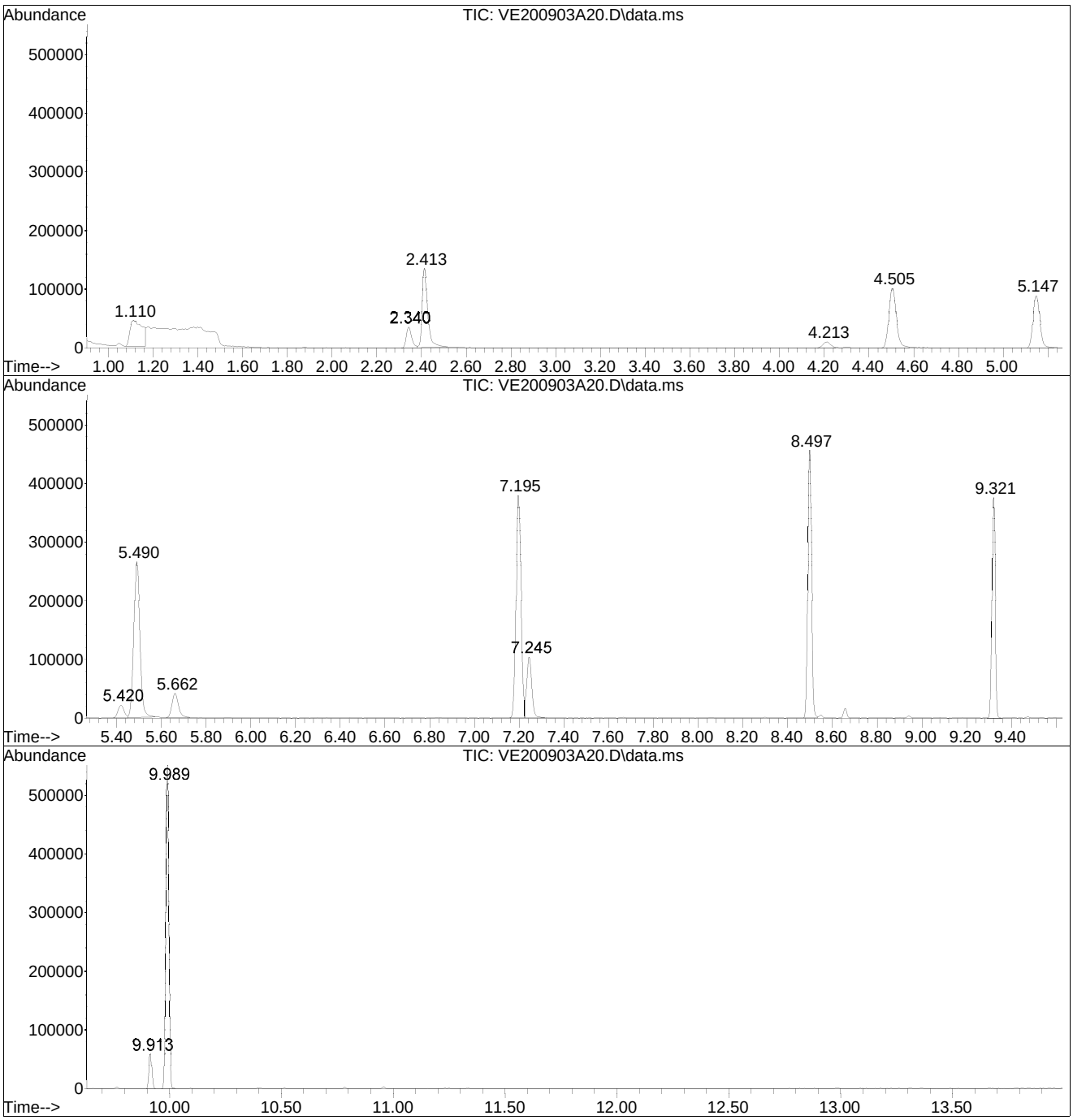
Sum of corrected areas: 3746390

LSC Report - Integrated Chromatogram

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p



Library Search Compound Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

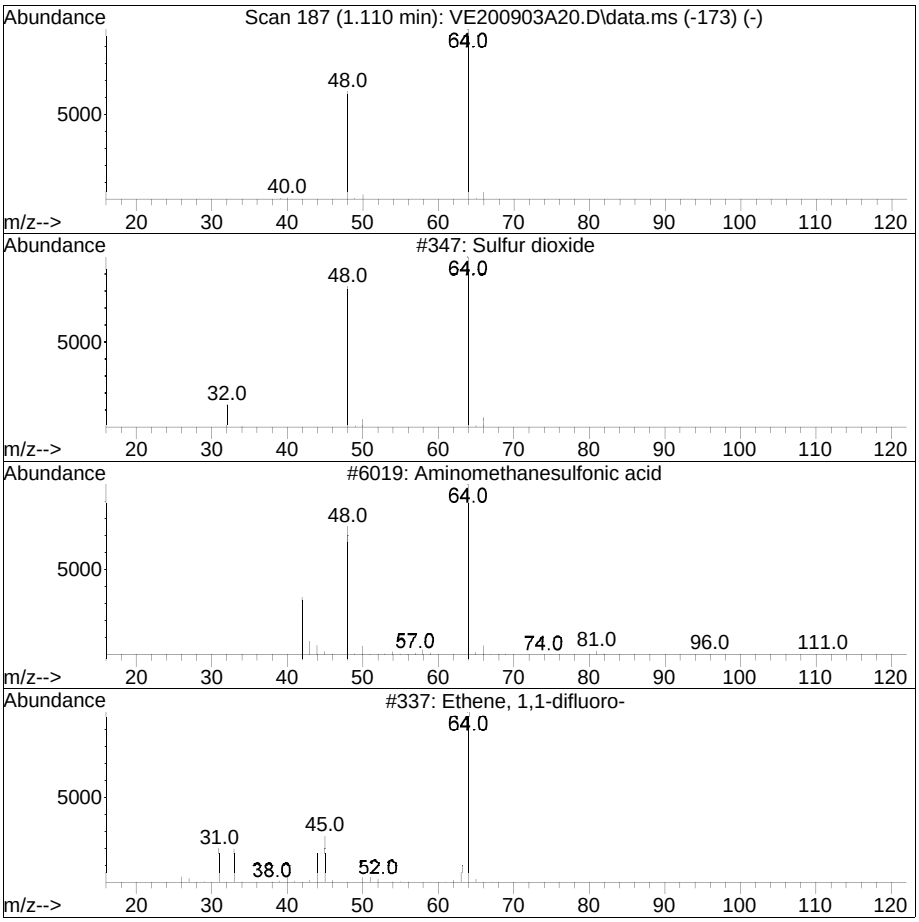
TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

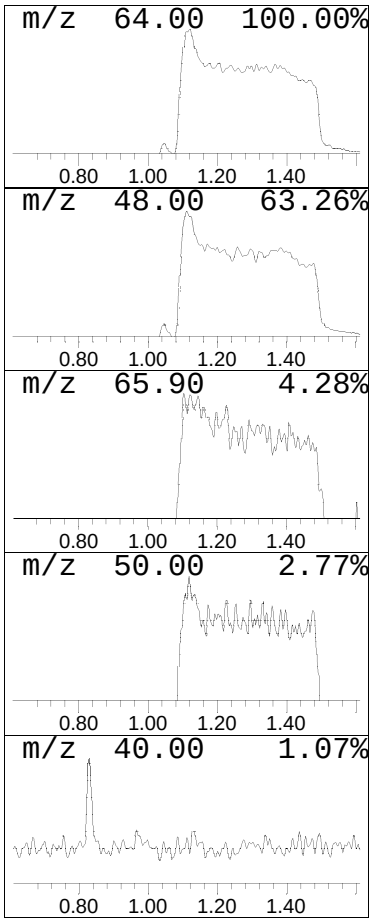
****

Peak Number 1 Unknown Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
1.110	3.25 ug/L	163652	Fluorobenzene	5.490

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Sulfur dioxide	64	O2S	007446-09-5	83
2	Aminomethanesulfonic acid	111	CH5NO3S	013881-91-9	64
3	Ethene, 1,1-difluoro-	64	C2H2F2	000075-38-7	4
4	Ethyl Chloride	64	C2H5Cl	000075-00-3	3
5	Ethene, 1,2-difluoro-	64	C2H2F2	001691-13-0	3





Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

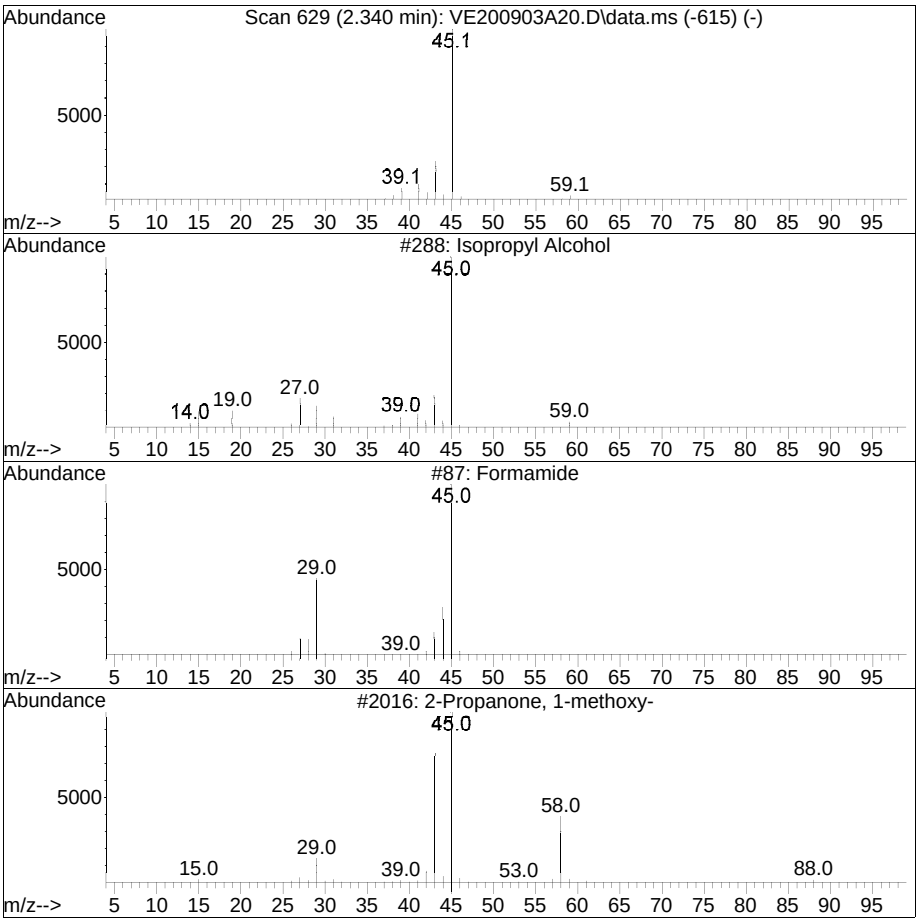
TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

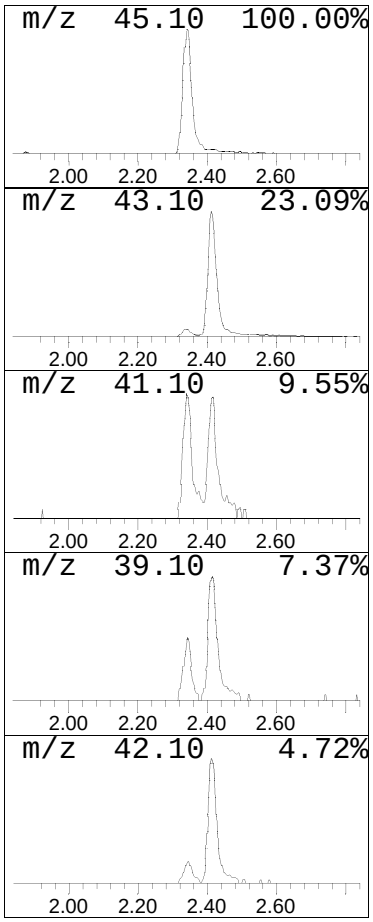
****

Peak Number 2 Unknown Concentration Rank 3

R.T.	EstConc	Area	Relative to ISTD	R.T.
2.340	1.17 ug/L	58982	Fluorobenzene	5.490

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Isopropyl Alcohol	60	C3H8O	000067-63-0	43
2	Formamide	45	CH3NO	000075-12-7	5
3	2-Propanone, 1-methoxy-	88	C4H8O2	005878-19-3	4
4	Oxirane, (methoxymethyl)-	88	C4H8O2	000930-37-0	4
5	Ethylamine	45	C2H7N	000075-04-7	3





Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

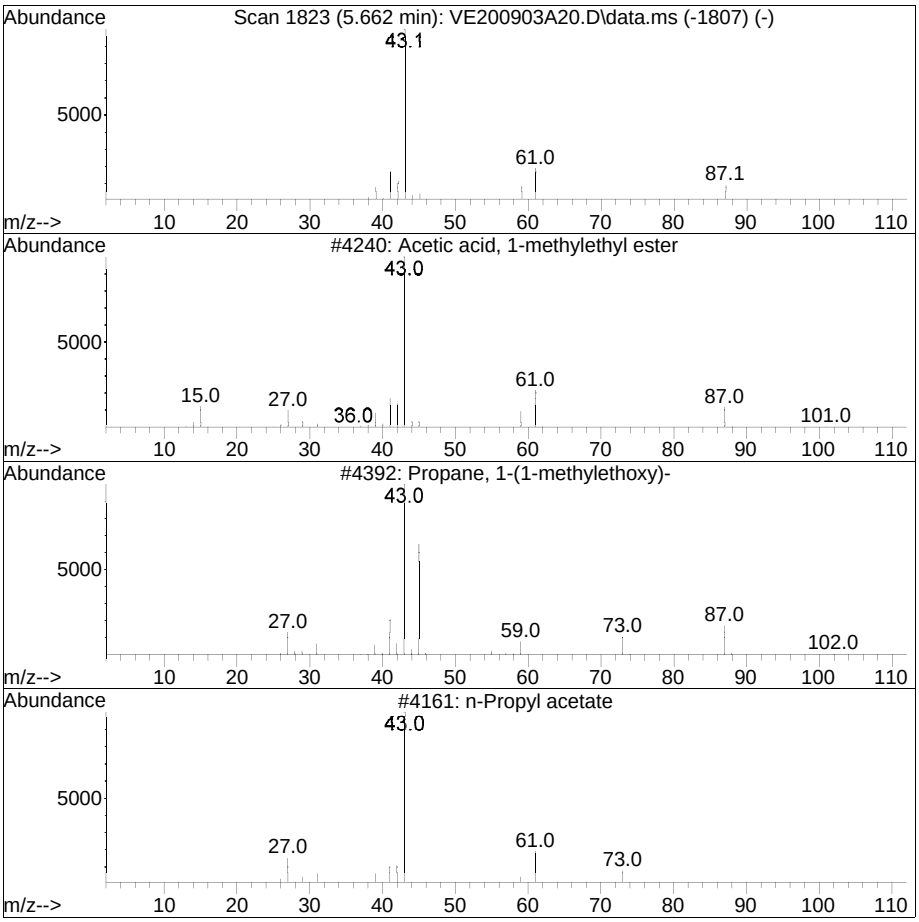
TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

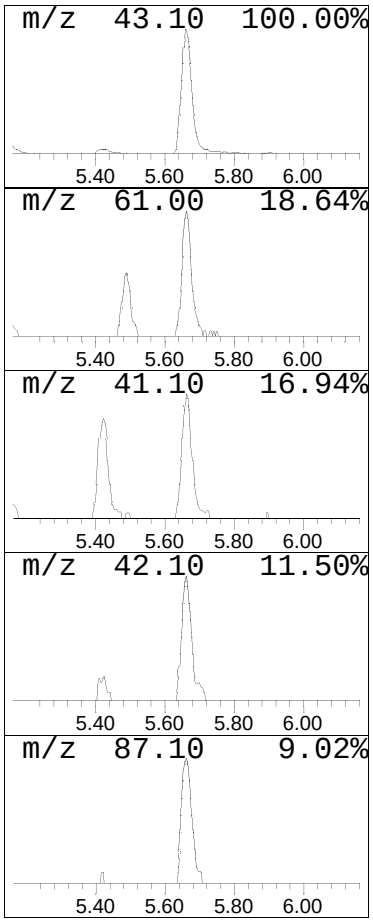
****

Peak Number 3 Unknown Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.
5.662	1.67 ug/L	84125	Fluorobenzene	5.490

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Acetic acid, 1-methylethyl ester	102	C5H10O2	000108-21-4	83
2	Propane, 1-(1-methylethoxy)-	102	C6H14O	000627-08-7	9
3	n-Propyl acetate	102	C5H10O2	000109-60-4	9
4	1-Butanamine, 3-methyl-	87	C5H13N	000107-85-7	5
5	3-Pyrrolidinol	87	C4H9NO	040499-83-0	4





Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

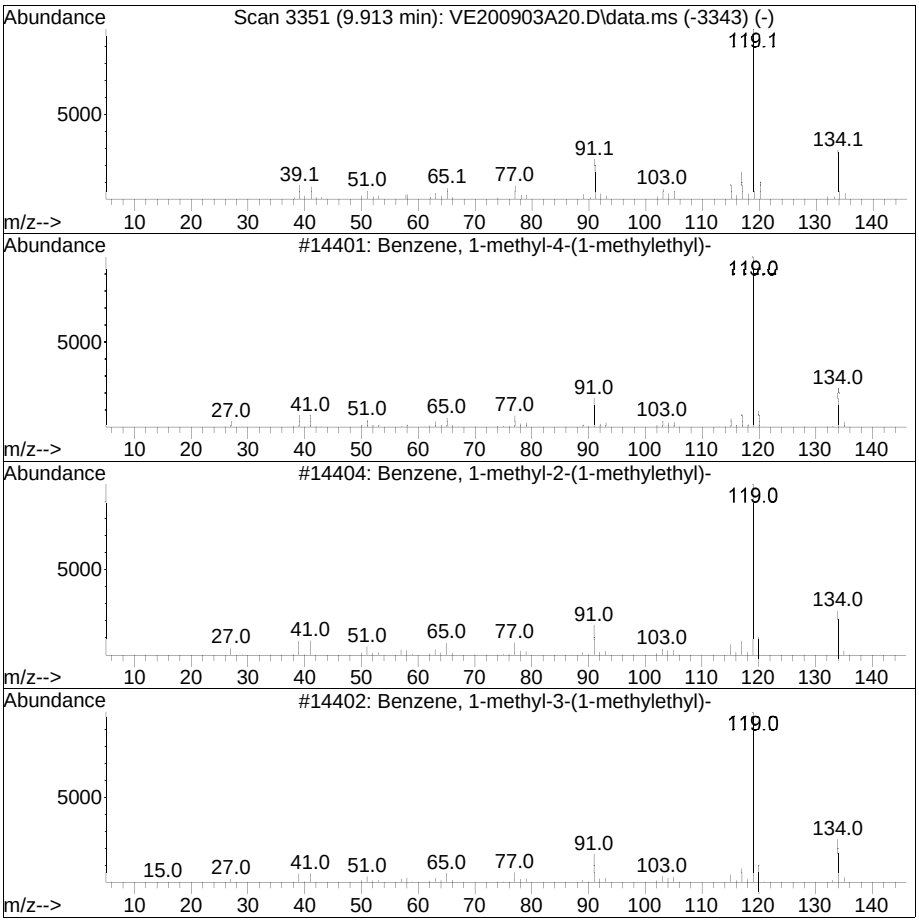
TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

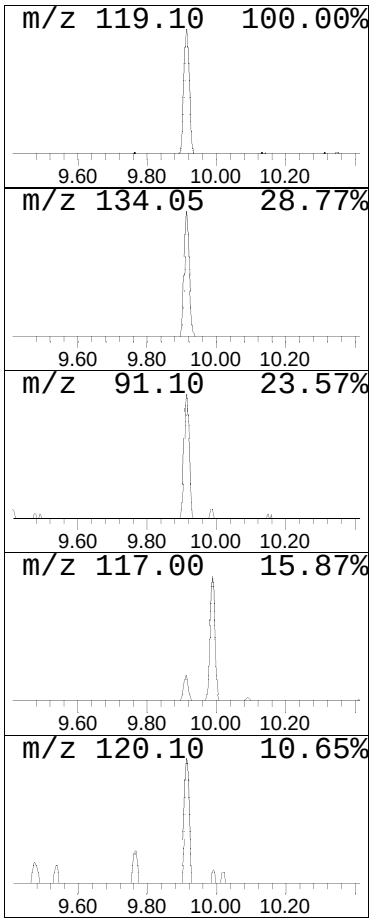
****

Peak Number 4 Unknown Benzene Concentration Rank 4

R.T.	EstConc	Area	Relative to ISTD	R.T.
9.913	1.06 ug/L	54231	1,4-Dichlorobenzene-d4	9.989

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Benzene, 1-methyl-4-(1-methyleth...	134	C10H14	000099-87-6	97
2	Benzene, 1-methyl-2-(1-methyleth...	134	C10H14	000527-84-4	97
3	Benzene, 1-methyl-3-(1-methyleth...	134	C10H14	000535-77-3	97
4	Benzene, 4-ethyl-1,2-dimethyl-	134	C10H14	000934-80-5	91
5	Benzene, 1-ethyl-2,4-dimethyl-	134	C10H14	000874-41-9	91





Tentatively Identified Compound (LSC) summary

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A20.D
Acq On : 3 Sep 2020 2:00 pm
Operator : ELAINE:AJK
Sample : l2035834-04D,31,1,10,,a
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

					--Internal Standard---			
TIC Top Hit name	RT	EstConc	Units	Response	#	RT	Resp	Conc
Unknown	1.110	3.3	ug/L	163652	1	5.490	503449	10.0
Unknown	2.340	1.2	ug/L	58982	1	5.490	503449	10.0
Unknown	5.662	1.7	ug/L	84125	1	5.490	503449	10.0
Unknown Benzene	9.913	1.1	ug/L	54231	3	9.989	512597	10.0

Method Blank
Raw Data

Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A05.D
Acq On : 3 Sep 2020 8:36 am
Operator : ELAINE:PD
Sample : WG1406395-5,31,10,10
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 09:04:00 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-Curve-Iodomethane - Megamix plus Diox-Iodomethane

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Fluorobenzene	5.490	96	241209	10.000 ug/L	0.00
Standard Area 1 = 250172			Recovery = 96.42%		
59) Chlorobenzene-d5	8.497	117	181216	10.000 ug/L	0.00
Standard Area 1 = 189508			Recovery = 95.62%		
79) 1,4-Dichlorobenzene-d4	9.989	152	90131	10.000 ug/L	0.00
Standard Area 1 = 99145			Recovery = 90.91%		
System Monitoring Compounds					
36) Dibromofluoromethane	4.502	113	59242	10.019 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 100.19%		
43) 1,2-Dichloroethane-d4	5.147	65	68260	10.063 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 100.63%		
60) Toluene-d8	7.195	98	224187	9.655 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 96.55%		
83) 4-Bromofluorobenzene	9.321	95	79370	9.888 ug/L	0.00
Spiked Amount 10.000	Range 70 - 130		Recovery = 98.88%		
Target Compounds					Qvalue
2) Dichlorodifluoromethane	0.000		0	N.D.	
3) Chloromethane	0.000		0	N.D. d	
4) Vinyl chloride	0.000		0	N.D.	
5) Bromomethane	1.327	94	273	0.129 ug/L #	50
6) Chloroethane	1.408	64	25	N.D.	
7) Trichlorofluoromethane	0.000		0	N.D.	
10) 1,1-Dichloroethene	0.000		0	N.D.	
11) Carbon disulfide	1.873	76	495	N.D.	
12) Freon-113	0.000		0	N.D.	
15) Methylene chloride	2.357	84	28	N.D.	
17) Acetone	0.000		0	N.D. d	
18) trans-1,2-Dichloroethene	0.000		0	N.D.	
19) Methyl acetate	2.560	43	102	N.D.	
20) Methyl tert-butyl ether	0.000		0	N.D.	
23) 1,1-Dichloroethane	0.000		0	N.D.	
28) cis-1,2-Dichloroethene	0.000		0	N.D.	
30) Bromochloromethane	0.000		0	N.D.	
31) Cyclohexane	0.000		0	N.D.	
32) Chloroform	4.246	83	26	N.D.	
33) Ethyl acetate	0.000		0	N.D.	

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A05.D
Acq On : 3 Sep 2020 8:36 am
Operator : ELAINE:PD
Sample : WG1406395-5,31,10,10
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 09:04:00 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-Curve-Iodomethane - Megamix plus Diox-Iodomethane

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
34) Carbon tetrachloride	0.000		0		N.D.	
37) 1,1,1-Trichloroethane	0.000		0		N.D.	
39) 2-Butanone	0.000		0		N.D.	
41) Benzene	0.000		0		N.D.	
44) 1,2-Dichloroethane	0.000		0		N.D.	
47) Methyl cyclohexane	0.000		0		N.D.	
48) Trichloroethene	5.662	95	65		N.D.	
51) 1,2-Dichloropropane	0.000		0		N.D.	
54) Bromodichloromethane	0.000		0		N.D.	
57) 1,4-Dioxane	0.000		0		N.D.	
58) cis-1,3-Dichloropropene	0.000		0		N.D.	
61) Toluene	7.242	92	25		N.D.	
62) 4-Methyl-2-pentanone	0.000		0		N.D.	
63) Tetrachloroethene	0.000		0		N.D.	
65) trans-1,3-Dichloropropene	0.000		0		N.D.	
68) 1,1,2-Trichloroethane	0.000		0		N.D.	
69) Chlorodibromomethane	0.000		0		N.D.	
71) 1,2-Dibromoethane	0.000		0		N.D.	
72) 2-Hexanone	0.000		0		N.D.	d
73) Chlorobenzene	8.511	112	143		N.D.	
74) Ethylbenzene	8.550	91	323		N.D.	
76) p/m Xylene	8.653	106	174		N.D.	
77) o Xylene	0.000		0		N.D.	
78) Styrene	8.981	104	261		N.D.	
80) Bromoform	0.000		0		N.D.	
82) Isopropylbenzene	9.154	105	170		N.D.	
87) 1,1,2,2-Tetrachloroethane	0.000		0		N.D.	
100) 1,3-Dichlorobenzene	9.944	146	271		N.D.	
101) 1,4-Dichlorobenzene	10.000	146	433		N.D.	
104) 1,2-Dichlorobenzene	10.239	146	210		N.D.	
106) 1,2-Dibromo-3-chloropr...	0.000		0		N.D.	
109) 1,2,4-Trichlorobenzene	11.068	180	262		N.D.	
111) 1,2,3-Trichlorobenzene	11.346	180	211		N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A05.D
Acq On : 3 Sep 2020 8:36 am
Operator : ELAINE:PD
Sample : WG1406395-5,31,10,10
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 09:04:00 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

CCAL FILE(s) : 1 - I:\VOLATILES\Elaine\2020\200903A\VE200903A02.D
Sub List : 8260-Curve-Iodomethane - Megamix plus Diox-Iodomethane

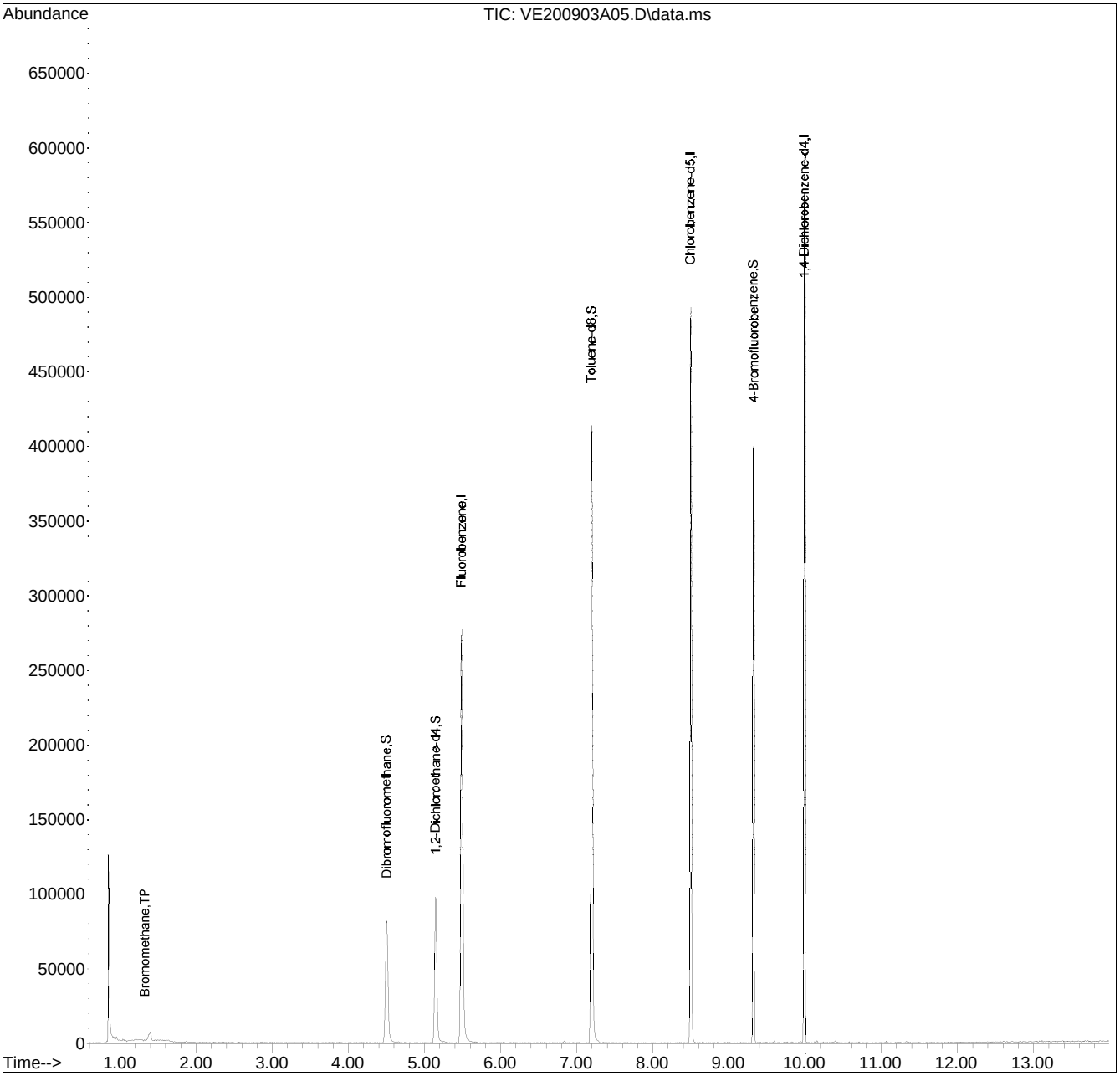
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

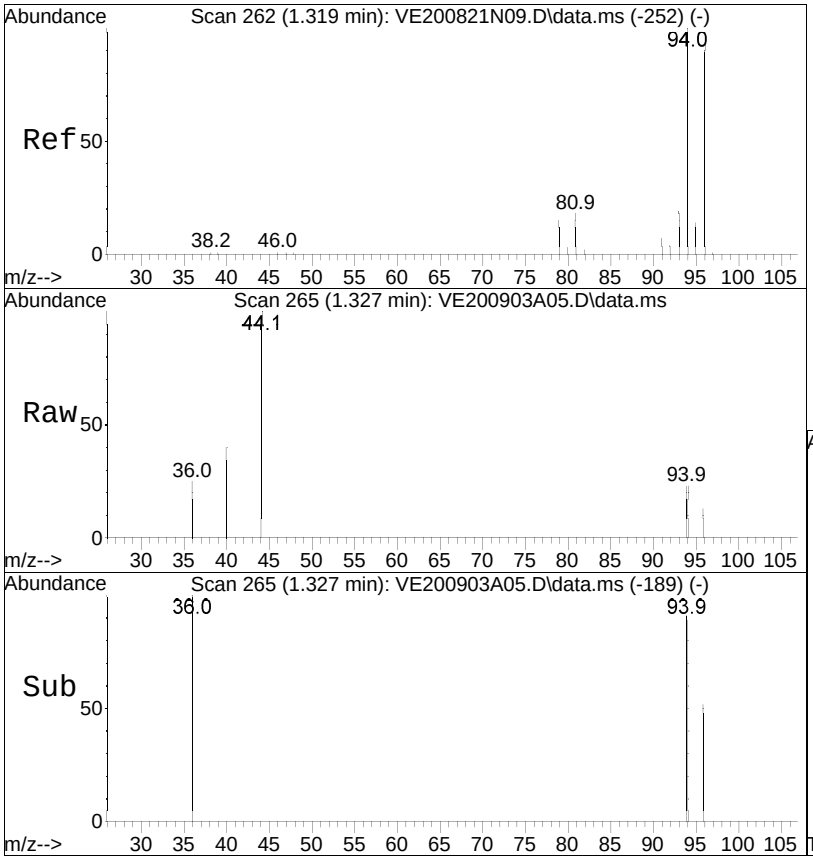
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A05.D
Acq On : 3 Sep 2020 8:36 am
Operator : ELAINE:PD
Sample : WG1406395-5,31,10,10
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 03 09:04:00 2020
Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS
QLast Update : Sat Aug 22 14:18:03 2020
Response via : Initial Calibration

Sub List : 8260-Curve-Iodomethane - Megamix plus Diox-Iodomethane

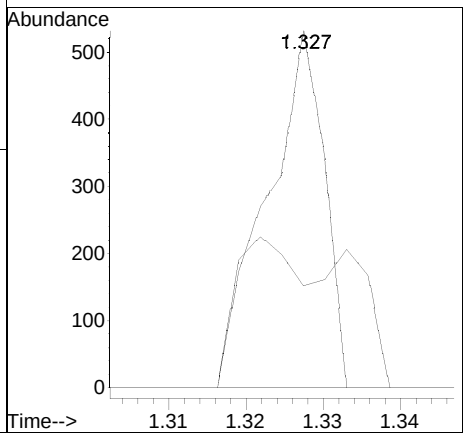




#5
Bromomethane
Concen: 0.13 ug/L
RT: 1.327 min Scan# 265
Delta R.T. 0.011 min
Lab File: VE200903A05.D
Acq: 3 Sep 2020 8:36 am

Tgt Ion: 94 Resp: 273

Ion	Ratio	Lower	Upper
94	100		
96	46.9	75.6	115.6#



Manual Integration Report

Data Path	: I:\VOLATILES\Elaine\2020\2Q	Method	: Elaine_200821N_8260.m
Data File	: VE200903A05.D	Operator	: ELAINE:PD
Date Inj'd	: 9/3/2020 8:36 am	Instrument	: Elaine
Sample	: WG1406395-5,31,10,10	Quant Date	: 9/3/2020 9:03 am

There are no manual integrations or false positives in this file.

LSC Area Percent Report

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A05.D
Acq On : 3 Sep 2020 8:36 am
Operator : ELAINE:PD
Sample : WG1406395-5,31,10,10
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Integration Parameters: rteint.p
Integrator: RTE
Smoothing : ON Filtering: 5
Sampling : 1 Min Area: 3 % of largest Peak
Start Thrs: 0.2 Max Peaks: 100
Stop Thrs : 0 Peak Location: TOP

If leading or trailing edge < 100 prefer < Baseline drop else tangent >
Peak separation: 5

Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Title : VOLATILES BY GC/MS

Signal : TIC: VE200903A05.D\data.ms

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	4.502	1384	1406	1446	rBV2	81294	192890	30.25%	6.315%
2	5.147	1622	1638	1665	rBV	97088	195137	30.60%	6.389%
3	5.490	1738	1761	1789	rBV	276807	534865	83.88%	17.511%
4	7.195	2360	2374	2412	rVB	413433	637638	100.00%	20.876%
5	8.497	2829	2842	2866	rVB	492596	555908	87.18%	18.200%
6	9.321	3128	3138	3152	rBV	400186	402848	63.18%	13.189%
7	9.989	3369	3378	3398	rBV	568719	535090	83.92%	17.519%

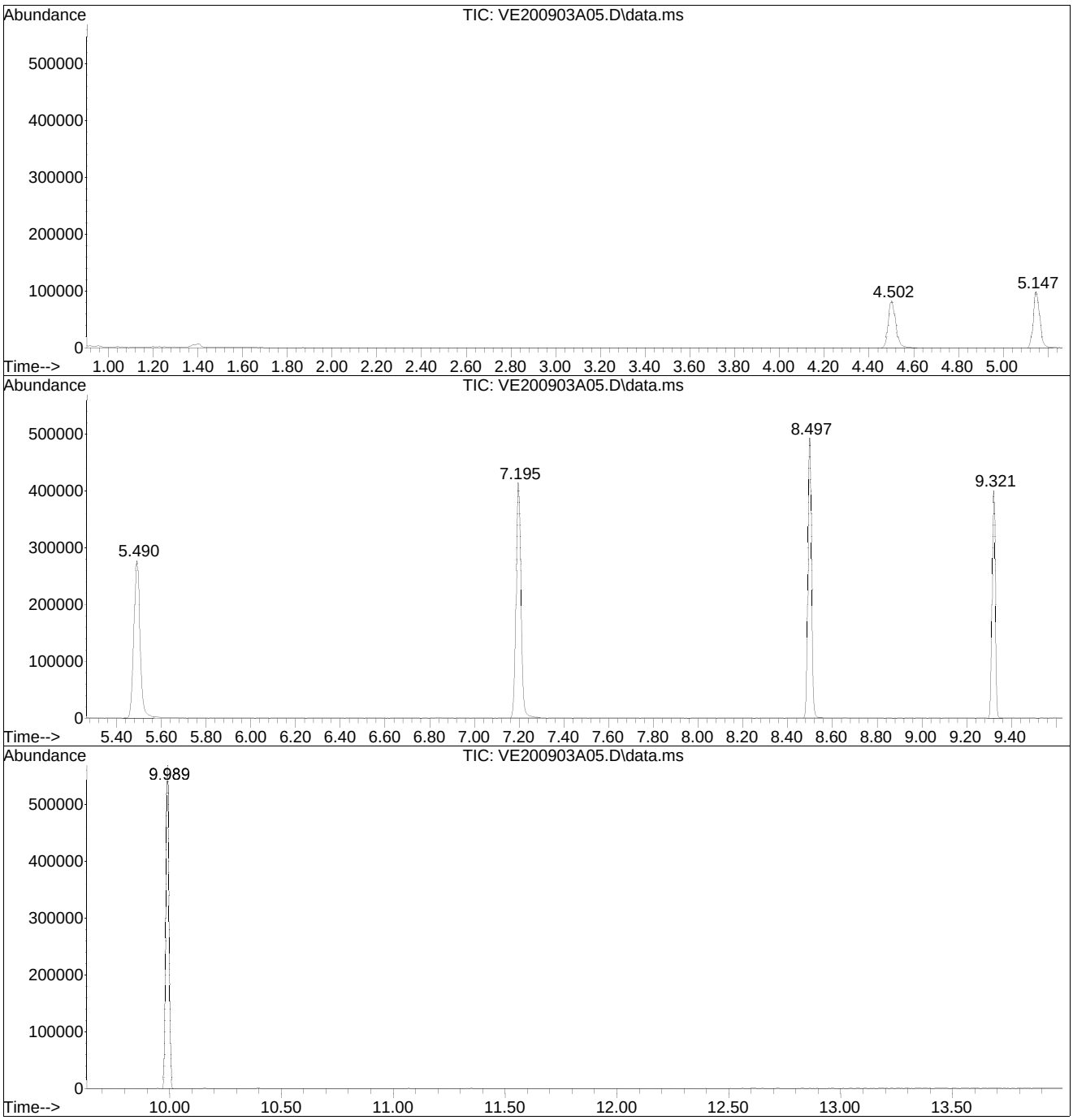
Sum of corrected areas: 3054376

LSC Report - Integrated Chromatogram

Data Path : I:\VOLATILES\Elaine\2020\200903A\
Data File : VE200903A05.D
Acq On : 3 Sep 2020 8:36 am
Operator : ELAINE:PD
Sample : WG1406395-5,31,10,10
Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p



Library Search Compound Report

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Data File : VE200903A05.D
Acq On : 3 Sep 2020 8:36 am
Operator : ELAINE:PD
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Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

No Library Search Compounds Detected
****

Tentatively Identified Compound (LSC) summary

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Misc : WG1406395,ICAL17063
ALS Vial : 1 Sample Multiplier: 1

Quant Method : I:\VOLATILES\Elaine\2020\200903A\Elaine_200821N_8260.m
Quant Title : VOLATILES BY GC/MS

TIC Library : I:\nist-db\NIST02.L
TIC Integration Parameters: rteint.p

					--Internal Standard---			
TIC Top Hit name	RT	EstConc	Units	Response	#	RT	Resp	Conc

APPENDIX D: K_d Supporting Analysis
Riverside Industrial Park Superfund Site

While many site-specific factors ultimately control contaminant mobility at a given site, USEPA, NJDEP, and USEPA Region 2 all use a simple, linear partitioning (or distribution) coefficient, known as the K_d, to estimate potential groundwater impacts from soil contamination for a range of contaminants, including lead (NJDEP, 2013; USEPA, 2020a). The K_d describes the equilibrium partitioning (or distribution) of a contaminant between groundwater and soil that comes in contact with groundwater. This value simplifies all the adsorption and desorption reactions that occur when soil and groundwater come into contact into the ratio of the soil concentration to the groundwater concentration. This approach assumes that the contaminant's affinity for adsorption and desorption is linear over all concentrations and is not modified by other factors (pH, ligands, the presence of other contaminants). Because USEPA uses its K_d values to develop Soil Screening Levels (SSLs) that are protective of groundwater (USEPA, 2020a), they are intended to be biased low, to assume that less adsorption to soil is occurring and more of a contaminant is present in groundwater. Both USEPA and NJDEP use USEPA's K_d of 900 L/kg to represent lead's mobility in typical soils in their approaches for calculating lead soil standards that are protective of groundwater, which is based on a review of soil leaching by Baes and Sharp (1983). This K_d indicates that for every 1 mg/L (1,000 µg/L) of lead in the groundwater, 900 mg/kg of that lead is adsorbed on the soil. If the "contaminated" groundwater is replaced with "clean" groundwater containing less lead, some lead will desorb from the soil, thus increasing the lead groundwater concentration. The lead will be continually desorbed from the soil into the groundwater as groundwater with lower lead concentrations flows over the soil; this proceeds until the soil's lead content is depleted.

USEPA derives its SSLs, which are protective of potential impacts that soil could have on groundwater that is used for drinking water (*i.e.*, accounting for the tendency of lead to migrate through soil into groundwater), using only the K_d, and, by not incorporating a DAF into its calculations, does not account for any dilution of a contaminant released from soil (*i.e.*, the desorbed concentration) before it impacts groundwater. USEPA notes that a site-specific value DAF may be calculated, and a DAF of 20 may be used specifically for source areas less than 0.5 acre in size (USEPA, 2020b). USEPA Region 2 has presented a similar analysis as USEPA (*i.e.*, with no DAF incorporated into the calculation of expected groundwater lead concentrations based on soil concentrations), but has suggested a lead K_d value of 5,000 L/kg (log 3.7) for this Site.[24]

NJDEP has developed a modified approach to establishing soil standards based on soil's potential impacts on groundwater (*i.e.*, the Impact-to-Groundwater Soil Remediation Standard [IGWSRS]). The agency's approach includes consideration of a DAF that describes the how the leachate concentration of a contaminant (*i.e.*, the concentration that desorbs from the soil) is modified (*i.e.*, diluted) as it enters the groundwater (NJDEP, 2013). We have adapted their approach to derive a Site-specific DAF and to then estimate a groundwater concentration at a given soil concentration. For metals, the equation NJDEP uses to calculate an IGWSRS is:

[24] The technical basis for USEPA Region 2's suggested lead K_d values has not been described by USEPA Region 2. USEPA Region 2's range of lead K_d values went up to 100,000 L/kg, which is exceptionally high and does not appear to be technically defensible or applicable to this Site.

$$IGWSRS = C_{gw}\left\{K_d + \frac{\theta_w}{\rho_b}\right\}DAF \qquad \text{(Eq. 1)}$$

where:

IGWSRS	=	Impact-to-Groundwater Soil Remediation Standard (mg/kg)
C_{gw}	=	Groundwater Quality Criterion (mg/L)
K_d	=	Soil-water partition coefficient (L/kg)
Θ_w	=	Water-filled soil porosity (L_{water}/L_{soil})
ρ_b	=	Dry soil bulk density (kg/L_{soil})
DAF	=	Dilution and attenuation factor

The DAF is based on aquifer properties and is calculated using the following equation:

$$DAF = 1 + \frac{Kid}{IL} \qquad \text{(Eq. 2)}$$

where:

K	=	Aquifer hydraulic conductivity (m/year)
i	=	Hydraulic gradient (unitless)
d	=	Mixing zone depth (m) calculated from the aquifer thickness (d_a) (m)
I	=	Infiltration rate (m/year)
L	=	Length of the area of concern parallel with groundwater flow (m)

NJDEP assumes a default DAF of 20 to be representative of the sites in New Jersey (NJDEP, 2013). However, the agency also allows for the calculation of site-specific DAFs, using four site-specific parameters and several NJDEP-prescribed values (Table 1.1). Using the best estimates for site-specific aquifer properties developed during the Remedial Investigation (RI) of the site, the DAF for the Riverside site is estimated to be only 5, due to the large area of the site that contains historic fill (L and d) and a lower hydraulic conductivity at the site than the default value.

Since there is no dilution with USEPA's (and USEPA Region 2's) approach, estimating groundwater concentrations at a given soil concentration just requires the K_d. Estimating the groundwater concentration at a given soil concentrations using a DAF requires the use of NJDEP's equation, which is shown as Equation 1. Using USEPA and USEPA Region 2's approach only requires a ratio since there is no dilution. The estimated groundwater concentrations at the soil/fill PRG of 800 mg/kg are given in Table 2.

Table D.1: Parameters Used to Calculate Site-specific DAF Using NJDEP's Approach

Parameter	Definition	Unit	NJDEP Default	Riverside	
				Best Estimate	Range
Site-Specific					
L	Length of area of concern parallel of groundwater flow	ft	100	300	–
d_a	Aquifer thickness	ft	11.5	6	4 to 8
K	Aquifer hydraulic conductivity	ft/year	51,865	19,710[a]	5,475 to 54,750
i	Hydraulic gradient	Unitless	0.003	0.009[b]	0.003 to 0.015
NJDEP-Prescribed Values					
Θ_w	Water-filled soil porosity	L_{water}/L_{soil}	0.23	NA	NA
ρ_b	Dry soil bulk density	kg/L_{soil}	1.5	NA	NA
Calculated Values					
DAF	Dilution and attenuation factor	Unitless	20	5	–

Notes:
– = Not Applicable; NA = Not Available.
Sources: NJDEP (2013); USEPA Region II (2020b). NJDEP's spreadsheet for estimating DAF accepts values in imperial units and converts to metric, so units are given in imperial units here.
(a) The geometric mean of K was chosen as the best estimate for the Site.
(b) The best estimate for the hydraulic gradient was based on the arithmetic average gradient from three well pairs.

APPENDIX E: Land Cover Evaluation Supporting Analysis
Riverside Industrial Park Superfund Site

A land cover analysis was conducted to evaluate the possibility that surface releases could contribute to surface soil/fill concentrations. This analysis revealed that the operational areas of the Site have been covered in impervious surfaces as early as 1924 and throughout its operational history to 1971 and into the current day (see Figures 17 and 18).

The analysis is based on the review of historical maps, visual interpretation and statistical analysis of aerial photographs and digital imagery acquired for the Site and its vicinity between 1924 and 2020 and on information collected during Site survey activities summarized in the RIR (Woodard & Curran, 2020). Land cover, including pervious ground cover (*e.g.*, grass, trees) and impervious material (*e.g.*, buildings, structures, pavement) can be determined from aerial photographs through visual analysis of standard cues useful in photographic interpretation (Schott, 2007). Table E.1 summarizes historical maps, aerial photographs and imagery, and other documents reviewed for this analysis. Table E.2 is a list of standard cues used in aerial photographic interpretation, including short descriptions of each.

Table E.1 Historical Maps, Aerial Photographs and Images, and Other Documents Used for Land Cover Analysis

Date of Historical Map, Photograph, or Document			Type of Document	Source
Year	Month	Day		
1892			Historical Map	Woodard & Curran (2015)
1901			Historical Map	Robinson and Tenney (1901)
1909			Sanborn Map	Woodard & Curran (2015)
1911			Historical Map	Lathrop *et al*. (1911)
1924			Aerial	Fairchild Aerial Camera Corp. (1924)
1926			Historical Map	Robinson (1926)
1931			Sanborn Map	Woodard & Curran (2015)
1933	-	-	Aerial	Woodard & Curran (2015)
1939	-	-	Aerial	Woodard & Curran (2015)
1940	April	28	Aerial	Terra Flight Aerial Imaging, Inc. (1940)
1940	April	28	Aerial	EDR (1940)
1941	-	-	Aerial	Woodard & Curran (2015)
1944	January	1	Aerial	EDR (1944)
1946	-	-	Aerial	Woodard & Curran (2015)
1950			Sanborn Map	Woodard & Curran (2015)
1951	April	7	Aerial	Terra Flight Aerial Imaging, Inc. (1951)
1951	April	27	Aerial	EDR (1951)
1953	December	5	Aerial	EDR (1953)
1953	June	3	Aerial	USGS (1953)
Prior to 1954[a]	-	-	Aerial	Anonymous (Undated)
1954	-	-	Aerial	Woodard & Curran (2015)
1954	February	18	Aerial	USGS (1954)
1960	May	5	Aerial	USGS (1960)
1961	April	23	Aerial	Terra Flight Aerial Imaging, Inc. (1961)
1961	April	23	Aerial	EDR (1961)
1966	-	-	Aerial	Woodard & Curran (2015)
1966	February	23	Aerial	USGS (1966)
1970	-	-	Aerial	Woodard & Curran (2015)
1970	February	24	Aerial	USGS (1970)

Date of Historical Map, Photograph, or Document			Type of Document	Source
Year	Month	Day		
1973			Sanborn Map	Woodard & Curran (2015)
1974	April	11	Aerial	Terra Flight Aerial Imaging, Inc. (1974)
1974	April	11	Aerial	EDR (1974)
1976	October	29	Aerial	Woodard & Curran (2015)
1976	October	29	Aerial	USGS (1976)
1984	January	1	Aerial	Woodard & Curran (2015)
1991	January	1	Aerial	Woodard & Curran (2015)
1995	March	29	Aerial	Woodard & Curran (2015)
2006			Aerial	Woodard & Curran (2015)
2008	-	-	Aerial	Woodard & Curran (2015)
2010	-	-	Aerial	Woodard & Curran (2015)
2014	September	15	Aerial	Nearmap, Ltd. (2014)
2015	April	15	Site Report	Woodard & Curran (2015)
2016	April	16	Aerial	Nearmap, Ltd. (2016)
2017	July	19	Aerial	Nearmap, Ltd. (2017a)
2017	October	27	Aerial	Nearmap, Ltd. (2017b)
2018	June	12	Aerial	Nearmap, Ltd. (2018)
2019	June	30	Aerial	Nearmap, Ltd. (2019a)
2019	March	28	Aerial	Nearmap, Ltd. (2019b)
2020	April	20	Site Report	Woodard & Curran (2020)
2020	July	20	Site Report	US EPA Region II (2020)
2020	October	1	Aerial	Nearmap, Ltd. (2020)

Note:
(a) Image source is unknown and undated. Photograph date is estimated based on land cover.

Table E.2 Summary of Cues Used in Photographic Interpretation

Cue	Description (Schott, 2007)
Shape	The geometric outline of an object.
Size	The area of an object or a single dimension such as length.
Tone	The brightness level in a monochrome image or a combination of varying brightness and color in a color image.
Texture	The structure of the variation in brightness within an object.
Pattern	Shapes with identifiable geometric or periodic attributes.
Shadow	Dark areas in a photograph as a result of the object's height and the angle of the sun during photograph acquisition.
Site	The geographic location of a target or the location of one feature relative to another.

In general, impervious surfaces can be identified in aerial photographs and imagery based on several criteria:

- Well-defined geometric outlines due to their design and engineering (*e.g.*, edges of buildings or structures, curbing, linearity of roadways);
- Signature tone in monochrome or natural color images (*e.g.*, lighter areas for concrete or gravel, darker areas for asphalt) that often match with like materials throughout a single image;
- Smooth textures due to the uniformity of the material;

- Obvious patterns (*e.g.*, edges of concrete slabs, painted parking spaces); and
- Good visibility (*e.g.*, unobscured by shadows and/or staged or stored materials).

The general areas of impervious surface identified through this land cover analysis are shown on Figures 17 and 18. These figures also show areas of uncertainty in the photographic interpretation due to the presence of shadows and/or materials storage in the photographic record (see Table E.1).

In addition to the visual interpretation methods outlined above, land cover was examined in select aerial photographs through a univariate statistical approach. This approach evaluates the distribution of pixel brightness values for a selected portion of the image and reports the frequency distribution. The statistics of an area of known cover, such as concrete at an entryway or asphalt on a roadway, can then be compared to areas of unknown cover to support determination of the land cover type. This comparison considers several factors including the mean, median, skewness, and distribution shape (see Figure E.1). This analysis is similar to those described by Jensen (2005) to evaluate the distribution of the image pixel values for areas of known and unknown land cover.

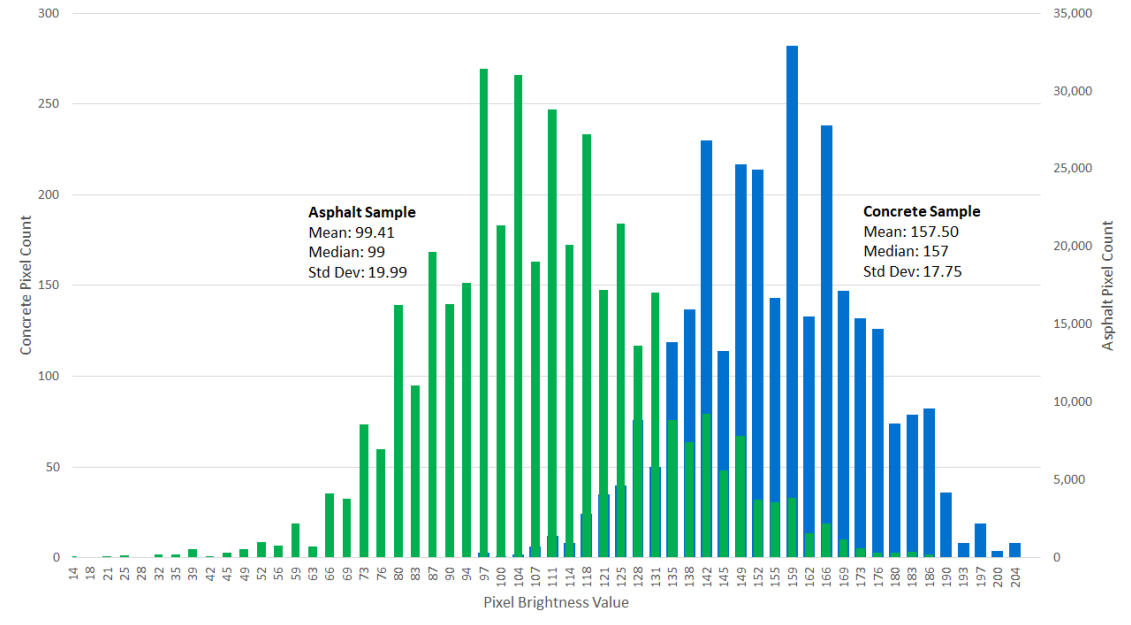

Figure E.1: Distribution of Pixel Brightness Values and Statistical Results for Asphalt and Concrete Area Identified in the April 23, 1961 Aerial Photograph (Terra Flight Aerial Imaging, Inc., 1961)

This statistical analysis was performed on single-band, high-resolution scans of relatively high-quality (*e.g.*, clear, unobscured) photographs from April 28, 1940 (Terra Flight Aerial Imaging, Inc., 1940), and April 23, 1961 (Terra Flight Aerial Imaging, Inc., 1961). Several areas determined to be impervious based on visual interpretation were further confirmed using this analysis.

In addition to reviewing the information above, and as a confirmation of the results of the land cover analysis, the boring logs provided in Appendix C of the RIR (Woodard & Curran, 2020) were reviewed to evaluate the properties of materials encountered during drilling exploration conducted in the operational areas. Table E.3 provides representative examples of borings that were advanced through asphalt and/or concrete. The

descriptions of the materials encountered in the shallow regions of the borings are consistent with the findings of the land cover analysis. Table E.3 also provides the range in lead concentrations for samples collected from these representative borings. Providing further evidence that, many of the samples with elevated lead concentrations are located beneath areas of impervious materials.

Table E.3 Examples of Soil/Fill Sampling Locations Located in Areas of Impervious Cover

Boring ID	Lot #	Lead Concentration in Surface (<2') Samples (mg/kg)	Lead Concentration in Subsurface (≥2') Samples (mg/kg)	Cover Type Designation Rationale
B-26	61	1,510	831	Boring log indicates concrete from 0 to 0.5 ft.
B-30	63	3,700	6,210	Located in within the concrete slab footprint of Building #7A (Old #7)
B-31	63	3,880	3,980	Boring log indicates concrete from 0 to 1 ft; Located within the concrete slab footprint of Building #7
B-32	63	1,690	4,540	Boring log indicates concrete from 0 to 1 ft.
B-33	63	911	1,210	Boring log indicates concrete from 0 to 0.5 ft.
B-74	64	123	3,080	Located in within the concrete slab footprint of Building #7A (Old #7)
B-75	64	76.3 to 8,690	No Sample	Boring log indicates concrete from 1.5 to 2 ft.
B-85	63	905	668	Boring log indicates concrete from 0.5 to 2.5 ft.
B-86	65	400 to 1,190	No Sample	Boring log indicates asphalt from 0 to 0.3 ft.

Impervious cover inhibits infiltration of water (*e.g.*, precipitation, stormwater) into soils and groundwater, minimizing possibility for downward migration of materials (*e.g.*, metal pigments) to subsurface soil/fill. A majority of soil/fill samples with exceedances of the lead PRG were collected under areas covered with impervious materials presently and in the past, contradicting USEPA's CSM.

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APPENDIX F: 1D Modeling Parameters
Riverside Industrial Park Superfund Site

We can model how adsorption may limit the transport of lead in the aquifer at the Site and estimate how much time may be necessary for a P&T system to achieve the groundwater PRG for lead. To conduct this analysis, we used a 1D advection, dispersion, and retardation transport model to estimate lead concentrations in the aquifer at the Site, using a K_d value to calculate lead retardation that favors desorption and multiple assumptions designed to derive a best-case estimate of lead extraction using the P&T system, including an underestimate of the amount of lead available in the soil/fill at the Site and a pumping rate that may not be achievable in reality. The governing equation is:

$$R\frac{\partial C}{\partial t} = D\frac{\partial^2 C}{\partial x^2} - v\frac{\partial C}{\partial x} \qquad \text{(Eq. 3)}$$

where:

R	=	Retardation factor, which approximates how much adsorption slows the transport of lead relative to groundwater flow (and is related to the lead K_d by Equation 4, below)
D	=	Hydraulic dispersion coefficient
C	=	Lead concentration in the dissolved phase
t	=	Time
x	=	Distance along the groundwater flow path
v	=	Groundwater advection velocity

$$R = 1 + \rho K_d/\theta \qquad \text{(Eq. 4)}$$

where:

ρ	=	Aquifer bulk density (1.5 grams per cubic meter [g/cm^3])
K_d	=	Soil-water partition coefficient (900 L/kg)
θ	=	Aquifer porosity (0.23)
R	=	Retardation factor (5,870)

All of the values used in Equation 4 are based on NJDEP's default parameters, including the use of the USEPA-recommended K_d for lead of 900 L/kg. USEPA's default lead K_d is a low-end estimate of lead partitioning and is meant to overestimate the desorption of lead from soil to groundwater. Therefore, the R value can also provide an estimate of the rate at which lead can be depleted from soil and a high-end estimate for the potential effectiveness of a P&T remedy. The R for lead is calculated to be 5,870 using NJDEP's default parameters, meaning that the lead in groundwater will move 5,870 times slower than groundwater alone. USEPA Region 2 has suggested that using a lead K_d of 5,000 L/kg (log 3.7) may be appropriate for this Site; using a K_d of 5,000 L/kg in the equation, the R would be 32,610.[25]

[25] The technical basis for USEPA Region 2's suggested lead K_d values has not been described by USEPA Region 2. USEPA Region 2 has also suggested a lead K_d value of 100,000 L/kg, which is exceptionally high and does not appear to be technically defensible or applicable to this Site.

We calculated the groundwater lead concentration at a given distance along the groundwater flow path (x) at a specified time (t) using a 1D numerical grid with grid spacing of 0.5 m and small enough time-steps that the model remained stable. The input parameters include:

- Inflowing groundwater lead concentration (C_i);
- Retardation factor (R);
- Initial groundwater lead concentration or concentration range (C_0);
- Groundwater advection velocity (v); and
- Hydraulic dispersion coefficient (D).

We evaluated the model using the following assumptions:

- The lead concentration in the inflowing groundwater (C_i) was assumed to be 5 µg/L.
- The initial lead "source" was assumed to result in a groundwater concentration of 55 µg/L at a location 50 ft from the P&T extraction well (*i.e.*, the "source" area). Initial groundwater lead concentrations were assumed to decrease linearly towards the P&T well.
- The groundwater advection velocity was estimated from measurements of hydraulic conductivity (K) and gradient (i) at the Site using the following formula:

$$v = Ki/\theta \qquad \text{(Eq. 5)}$$

  where the geometric mean of K was measured to be 54 ft/day (16.5 m/day; 19,710 ft/year) and the arithmetic mean of hydraulic gradients from three well pairs was estimated to be 0.009. Using NJDEP's default porosity (θ), the natural advection velocity was calculated to be 2.1 ft/day (0.6 m/day).

- The P&T well was estimated to extract 6.5 gpm based on the scenario presented in the attached Pumping Rates Assessment (Appendix G). The feasibility of this assumed pumping rate was not evaluated, nor was its potential ability to produce USEPA Region 2's desired "hydraulic control" at the Site. The horizontal velocity at the source was estimated to be 5.0 ft/day (1.5 m/day), thus representing an approximate doubling of the natural groundwater flow velocity (2.1 ft/day). We also modeled a scenario in which the P&T system's pumping rate was at 1.5 times the natural velocity (approximately 2.5 gpm).
- Longitudinal dispersivity (α_L) was estimated to be one-tenth of the groundwater flowpath length, based on the observations that 10 m is representative of sandy aquifers across spatial scales of ~100 m (Gelhar *et al.*, 1992). Hydraulic dispersion (D) was estimated to be the advection velocity multiplied by the dispersivity.

The parameters used to model the initial groundwater conditions are provided in Table 2.1.

Table F.1: 1D Modeling Parameters for Initial Groundwater Conditions

Parameter	Definition	Value	Unit	Source
θ	Porosity	0.23	Unitless	NJDEP default
ρ	Bulk density	1.5	g/cm^3	NJDEP default
K_d	Soil-water partition coefficient	900	L/kg	USEPA default
i	Hydraulic gradient	0.009	Unitless	Site-specific, arithmetic estimate from three well pairs
K	Hydraulic conductivity	54	ft/day	Site-specific, geometric mean of conductivities in shallow wells
d	Aquifer thickness	6	ft	Site-specific, best estimate
v	Natural advection velocity	2.1	ft/day	Site-specific, calculated from site-specific parameters
α_L	Longitudinal dispersivity	3.0	m	Professional judgment (based on Gelhar *et al.*, 1992)
C_{in}	Inflowing groundwater lead concentration	5	µg/L	Site-specific assumption
C_0	Initial groundwater lead concentration at source	55	µg/L	Site-specific assumption

Notes:
NJDEP = New Jersey Department of Environmental Protection; USEPA = United States Environmental Protection Agency.
USEPA and NJDEP default values were used for porosity, bulk density, and K_d because site-specific values were not available.

The groundwater lead concentration was estimated at two observation points, located 5 ft (1.5 m) and 10 ft (3 m) downgradient of the start of the "source" area, respectively, over time using two K_d vales (shown in Tables 4 to 8 and on Figures 12 and 14).

One significant limitation of this modeling approach is that it inadequately estimates the amount of lead available in the subsurface, because the soil concentration is calculated from the groundwater concentration and does not account for dilution from infiltration. Thus, the starting soil lead concentrations are significantly lower than those that have been measured at the Site. In addition, the lead concentration of inflowing "clean" water is estimated to be 5 µg/L, whereas background groundwater lead concentrations in the area of the Site are expected to be higher due to the presence of historic fill throughout the area. Thus, the modeled decreases in groundwater concentrations are overestimated.

APPENDIX G: Pumping Rates Assessment
Riverside Industrial Park Superfund Site

The purpose of this assessment is to present an approach for evaluating a feasible pumping rate for the proposed pump and treat groundwater remedy at the Riverside Industrial Park Superfund Site (Site) using Site-specific parameters and information from the literature. The following assumptions are applied to this evaluation:

- The pumping well extracts water only from the shallow, unconfined hydrogeologic unit.
- The analysis of pumping rate and drawdown represents a single-well system.
- The drawdown and pumping rate calculations represent a homogeneous and isotropic aquifer of uniform saturated thickness (i.e., the Theis solution). Although the Site is not expected to adhere to these characteristics, the models used in this evaluation require a simplified groundwater system. As described below, a storage value approximating an unconfined aquifer was used as an input, rather than the much lower storage coefficient of a confined system that generally is assumed in the Theis solution.
- Drawdown from pumping the single-well system reaches a steady state within three days of pumping at a constant rate; in other words, within three days, the cone of depression induced by pumping has reached a recharge boundary and no longer is increasing the depression of the surrounding water table. This duration is based on professional judgement and is expected to vary based on Site factors such as seasonality, soil heterogeneity, and tidal fluctuations.

The inputs to the calculation include:

- Hydraulic Conductivity (K): A value of 54 feet per day (ft/day) was selected based on the geometric mean of K values obtained from slug testing in shallow wells at the Site.
- Aquifer Thickness (b): A value of six feet was selected based on an approximate average saturated thickness of the shallow soils.
- Hydraulic Gradient (i): A value of 0.009 ft/ft was selected based on the average hydraulic gradient from three upgradient/downgradient monitoring well pairs at the Site. Although the Site is tidally influenced, the Serfes approach, which averages water levels during two full tidal cycles, was incorporated into the gradient calculations to avoid biasing toward a particular point in the tidal cycle.
- Storage (unitless): A value of 0.23 was selected to approximate the effective porosity or specific yield of the shallow soils. The selected value is the default porosity (water content) used in New Jersey Department of Environmental Protection (2013).
- Radial Distance (ft): A value of two feet was selected. The drawdown within the simulated aquifer varies with distance from pumping, and it was assumed for this scenario that a point about two feet from the center of the pumping well would represent the hydraulic response of native soils that were undisturbed by drilling and construction associated with installing the pumping well and associated subsurface infrastructure.

- Extraction Rate (gallons per minute [gpm]): Although the pumping rate is treated as the output in this evaluation, the Theis worksheet used for performing the calculations generates drawdown or the change in head (water potential) as output based on the input pumping rate.

Calculations were performed using the Theis solution in a workbook provided by the Utah Division of Water Rights (2010). For the purposes of this evaluation, the pumping rate was adjusted until a drawdown of about 2.5 feet was reached but not exceeded. The rationale for the 2.5-foot threshold assumes that the top of the pumping well screen, which contains the pump, is about 4.5 feet below the water table, and accounting for a two-foot safety factor above the top of screen to avoid the pump and screen being exposed to air, the drawdown is limited to 2.5 feet. With the assumptions and inputs presented above, a pumping rate of roughly 6.5 gpm will result in about 2.4 feet of drawdown for the simplified aquifer.

The evaluation presented in this Appendix is intended as a decision-support tool and utilizes either Site data or information obtained from the literature to present a simplified approach to assessing groundwater withdrawal scenarios. Site factors that are not presented herein but that are expected to influence design efforts include: seasonal variation in hydraulic gradients and saturated thickness of the shallow soils; the influence of tidal cycles and distance from the shoreline on the groundwater/surface water exchange; inherent heterogeneity of shallow soils; construction details of the pumping wells; potential hydraulic connection between the shallow soils and underlying units; the additive drawdown effects of multiple wells pumping simultaneously; and adjustments to the pumping schedule based on tidal cycle, among other considerations.

Table G.1: Hydraulic Inputs: Shallow Unit

	Symbol	Value	Units
Hydraulic Conductivity	K	54	ft/day
Aquifer Thickness	b	6	ft
Hydraulic Gradient	i	0.009	ft/ft
Storage	S	0.23	--
Radial Distance	r	2	ft
Extraction Rate	*Q*	*6.5*	*gpm*

Table G.2: Hydraulic Outputs: Shallow Unit

	Symbol	Value	Units
Drawdown at three days	$S_{t=3}$	2.4	ft

References:

New Jersey Department of Environmental Protection (NJDEP). 2013. Guidance Document: Development of Impact to Ground Water Soil Remediation Standards Using the Soil-Water Partition Equation, v. 2. Trenton, New Jersey. November.

Utah Division of Water Rights. 2010. Theis Equation Calculation for Aquifer Testing and Well Drawdown. https://waterrights.utah.gov/wellinfo/theis/theis_input.asp. Accessed August 2020.

APPENDIX H: Imperial Oil ROD Excerpts

RECORD OF DECISION AMENDMENT

Imperial Oil Co., Inc./Champion Chemicals Superfund Site

Operable Unit 2

Marlboro Township, Monmouth County, New Jersey

U.S. Environmental Protection Agency
Region 2
September 2020

615707

SITE NAME, LOCATION AND BRIEF DESCRIPTION

The Imperial Oil Co., Inc./Champion Chemicals Superfund Site (Site), United States Environmental Protection Agency (EPA) ID# NJD980654099, is located on Orchard Road, Block 122, Lot 29, in Morganville, NJ which is a lightly developed area of Marlboro Township, Monmouth County, New Jersey. The Site encompasses approximately 15-acres and the former industrial active portion of the property was about 4.2 acres (Figure 1).

SCOPE AND ROLE OF THE ACTION

As with many Superfund sites, the contamination at the Site is complex. In order to manage the cleanup of the Site more effectively, EPA has organized the work into three operable units (OUs) for long-term cleanup. In addition, EPA and the New Jersey Department of Environmental Protection (NJDEP) have conducted a number of removal actions at the Site.

On September 27, 1990 EPA issued the Record of Decision (ROD) for OU1. The OU1 ROD addressed soil and sediment in areas located adjacent to and downgradient of the former Imperial Oil property, and within Birch Swamp Brook and its floodplain, as well as contaminated soil located on six residential properties near the former facility. All OU1 cleanup activities were completed by 2018.

On September 30, 1992 EPA issued the OU2 ROD, which addresses the Site's contaminated groundwater, and which selected the construction of a groundwater extraction and treatment system as the remedy. All OU2 actions were deferred until completion of the OU3 remedy. In 1998, in order to prevent potential exposure to the impacted groundwater, the NJDEP established an institutional control in the form of a Classification Exemption Area/Well Restriction Area (CEA/WRA).

On September 30, 1999 EPA issued the OU3 ROD for removal of the Site's contaminated soil, which was the source of the groundwater contamination.

In addition, EPA and NJDEP have completed several removal actions to address conditions that presented a serious risk to public health and the environment. For example, in November 1991, EPA removed a waste filter clay mound contaminated with polychlorinated biphenyls (PCBs), arsenic, lead, and total petroleum hydrocarbons (TPHs) down to ground level. The excavated material (approximately 660 cubic yards) was disposed of at an approved Resource Conservation and Recovery Act (RCRA) landfill. Waste filter clay material remaining below grade was covered with a protective liner to limit the migration of this contaminated material. Also in 1991, EPA installed extraction wells to remove a floating layer of contamination that laid on the groundwater beneath the waste filter clay disposal area. In 1996, NJDEP assumed responsibility for the removal of the floating product. Between 1996 and 2009, approximately 25,000 gallons of floating product were recovered from the Site.

In April 1993, EPA began the removal of several buried drums, which contained waste oil and sludge. The purpose of the action was to minimize the possibility of further migration of contaminated materials already in the ground.

The major components of the remedy selected in the OU2 ROD included the following:

- Installation of extraction wells to extract the contaminated groundwater;
- Treatment of extracted groundwater via precipitation of inorganic contaminants and carbon adsorption of organic contaminants;
- Discharge of the treated groundwater to Birch Swamp Brook;
- Continuation of the floating product removal action that was initially undertaken by EPA; and
- Appropriate environmental monitoring to ensure the effectiveness of the remedy.

OU2 Activities

Implementation of all the elements of the OU2 ROD was deferred while the contaminated soil, which was the source of the groundwater contamination, was removed as part of the OU3 remedy.

OU3 ROD

The OU3 ROD was issued on September 30, 1999. The OU3 RAOs are:

- Restoring the soil to levels which would allow for future residential/recreational use without restrictions;
- Preventing human exposure to the on-site contaminated soils and waste filter clay material;
- Preventing ecological exposure to contaminated surface soils; and
- Eliminating continuing sources of contamination from on-site areas to ground water, Birch Swamp Brook, the Fire Pond, and associated wetlands.

The major components of the remedy selected in the OU3 ROD include the following:

- Excavation of contaminated soils and disposal of these soils at appropriate off-site facilities;
- Transportation of those soils which pose the principal threat to Resource Conservation and Recovery Act/Toxic Substances Control Act (RCRA/TSCA) hazardous waste disposal facilities;

the remedial goals. The number of metal COCs exceeding remedial goals has decreased, and currently only two metals, arsenic and beryllium, continue to exceed the remedial goals. These results suggest that the source removal activities were effective in discontinuing contaminant contributions to groundwater.

EPA conducted a Focused RI (FRI) and Focused Feasibility Study (FFS) for OU2 to evaluate how the concentration of contaminants in the groundwater had changed since the OU3 remedy was completed in 2011. The FRI/FFS report, which was completed in May 2020, documents that as discussed above, of the fourteen COCs identified in the OU2 ROD, only four contaminants (TCE, benzene, beryllium and arsenic) remained above their respective remedial goals (Table 1). In additional, the levels of these four COCs were substantially lower than their levels before the OU3 remedy was completed. These significant reductions in groundwater contamination levels took place without active groundwater remediation. Table 1 shows the maximum concentration levels for the four remaining COCs in 1992, before the OU3 remediation, and their maximum levels in 2018.

Evidence for Natural Attenuation

Natural attenuation is defined as the reliance on natural physical, biological or chemical in-situ processes to reduce the mass, toxicity, mobility, volume, or concentration of chemicals in groundwater. These processes include biodegradation, dispersion, dilution, sorption, volatilization, stabilization, transformation and destruction. During a Monitored Natural Attenuation (MNA) remedy, these natural processes are monitored through regular sampling of degradation products, and other parameters such as pH, reduction-oxidation potential and dissolved oxygen, to show that attenuation is progressing.

Since the deliberate breaching of the OU3 barrier wall (Figure 2), sampling has shown that contamination levels in the groundwater are declining due to natural attenuation processes, including biodegradation, dechlorination, dilution and dispersion. The specific natural attenuation processes for the four remaining COCs are described below.

Arsenic:
Arsenic is a metal and does not decompose. When it is in a soluble form, arsenic is mobile and moves with the groundwater. When the arsenic is in an insoluble form, it precipitates out of solution and adheres to the materials in the aquifer.

The solubility of arsenic depends on the geochemical conditions in the area. Specifically, it depends on the pH of and the oxidation-reduction potential (measured as Eh in millivolts (mV)) of the local groundwater. At the lower values of Eh, arsenic exists in a soluble form (As^{+3}), which is dissolved in and moves with the groundwater. At higher Eh values (about 200 mV and above), arsenic exists in a relatively insoluble form (As^{+5}), comes out of solution and adheres to iron hydroxide in the soil.

The area hydraulically upgradient of the source area was not contaminated by industrial activities. In this area, the groundwater currently contains less than 6 ug/L arsenic, has pH values

between 4 and 6, and has Eh values greater than +200 mV. Under these conditions, arsenic exists primarily as the insoluble As^{+5}.

Since the source area barrier wall was breached, groundwater has been able to migrate from the upgradient area through the source area. During this same period, the average groundwater Eh increased from +183 mV to +250 mV, becoming more oxidizing. Simply put, breaching the retaining wall has reintroduced geochemical conditions conducive to converting the soluble form of arsenic into the insoluble form.

For example, the highest concentration for arsenic was 1,000 µg/L at well PZ-09 during the second sampling event on July 2012. The concentrations at PZ-09 have steadily decreased over time, falling an order of magnitude by May 2019 to 150 µg/L (the cleanup goal is 3 µg/L). Similarly, the well with the second highest arsenic concentration (PZ- 12) decreased from 130 µg/L in July 2012 to 1 µg/L in May 2019. (Figure 2 shows both wells are along the northern boundary inside the former source area).

However, as noted above, arsenic can exist as either As^{+3} to As^{+5} depending on the specific Eh value at each sampling location. The observed variation of Eh values results in a range of arsenic values found in the source area wells. Over time, as the more oxidized upgradient groundwater continues to enter the source area and spread out, locations with soluble As^{+3} will continue to oxidize to insoluble As^{+5}. The As^{+5} will continue to adsorb to iron oxyhydroxides in the soil and the levels of arsenic in the groundwater will continue to fall.

Because wells just outside and downgradient of the source area barrier wall are receiving groundwater from the former source area, from May 2016 to May 2019 there was an increase in the average arsenic concentrations in downgradient wells. There has also been a corresponding drop in the average Eh of downgradient groundwater from +349 mV to +196 mV. Closer to the former source area, there is evidence of groundwater mixing. In 2019, the average concentration of arsenic in the groundwater leaving the northwest corner of the source area has dropped from 29 µg/L in 2016 to 5 µg/L. This is a good indication that the transition of As^{+3} to insoluble As^{+5} is underway. Over time, as the groundwater exiting the former source area continues to become more oxidized and moves off-site, As^{+3} will continue to convert to the less soluble As^{+5} and adsorb to the aquifer soils.

While sorption, specifically adsorption to iron hydroxides in aquifer soils, is the predominant MNA mechanism, dilution and dispersion also play a minor role in the reduction of arsenic concentrations.

Beryllium:
Beryllium is also a metal and does not decompose. Beryllium concentrations have been trending downward over the past five years from a high of 50 µg/L in April 2014 to at or below 10 µg/L in May 2019 (the remedial goal is 1.0 µg/L). Low levels of beryllium remain dissolved in groundwater when the pH is greater than 4.5. In May 2019, the average pH of upgradient groundwater entering the Site was 4.9. Under these conditions (pH greater than 4.5 entering the Site and low overall concentrations in the groundwater), dilution and dispersion by upgradient and downgradient groundwater are expected to be the primary mechanisms for attenuation.

Benzene:
Benzene concentrations have been trending downward over the past 7 years, from a concentration of 13.0 µg/L to at or below 5.1 µg/L (the remedial goal is 1.0 µg/L). In general, benzene decomposes relatively quickly through aerobic biodegradation. This was the likely mechanism when the benzene concentrations were higher and may still be occurring. However, at the current low benzene concentrations, dilution and dispersion are the primary attenuation mechanisms.

TCE:
TCE concentrations have been trending downward over the past four years from a high of 8.9 µg/L in May 2015 to at or below 3.1 µg/L in May 2019 (the remedial goal is 1.0 µg/L). In the past, when higher levels of TCE were present, this compound underwent reductive dechlorination. The primary breakdown product of TCE under reductive dechlorination is cis-1,2 dichloroethene (cis-1,2 DCE). Cis-1,2 DCE was not a Site contaminant, therefore its presence shows that reductive dechlorination occurred.

In May 2019, cis-1,2 DCE was detected in multiple Site wells with a maximum concentration of 24 µg/L, which is below the current New Jersey Groundwater Quality Standard (NJGWQS) and the federal Maximum Contaminant Level (MCL), both of which are 70 µg/L, which is the remedial goal for cis-1,2 DCE. The complete reductive dechlorination pathway may produce vinyl chloride, but this process does not appear to be occurring, as vinyl chloride was not detected above 1 µg/L in May 2019. Regardless, at the current low concentrations, dilution and dispersion are the primary attenuation mechanisms for TCE.

This shows that natural attenuation is occurring and the specific mechanisms have been identified. Logarithmic decay analyses of the groundwater data estimate that the four COCs will achieve the ROD cleanup goals within 15 years through MNA.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The FRI and FFS reports and the Proposed Plan for the remedy amendment were released to the public for comment on July 28, 2020. These documents were made available to the public in the Administrative Record file on the EPA Region 2 website at https://www.epa.gov/superfund/imperial-oil. The notice of availability for these documents was published in the Asbury Park Press on July 28, 2020. A public comment period was held from July 28, 2020 through August 28, 2020.

EPA also maintains a local repository at the Township Municipal Building, which is located at 1979 Township Drive, Marlboro Twp., NJ 07746. The phone number is: 732-536-0200.

In addition, on August 11, 2020, EPA conducted a virtual (on-line) public meeting to discuss the findings of the FRI/FFS and to present EPA's Proposed Plan to local officials and the community. At this meeting, EPA representatives explained the proposed ROD Amendment. There were a few questions or comments from the audience and additional comments were received during the public comment period.

EPA's response to comments received during the public comment period, as well as the transcript of the EPA's presentation at the public meeting, can be found in the Responsiveness Summary, in Appendix III.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Land Uses:

Although the Site is primarily surrounded by residential properties, it is zoned for industrial use and is expected to remain so into the future. The former industrial portion of the Site has been remediated and restored, as have the impacted residential properties.

The Site is bordered by undeveloped property to the north. To the west is the Henry Hudson Trail, a paved bike path administered by Monmouth County Parks, which occupies a former Central Railroad right-of-way. Further to the west is a right-of-way for Jersey Central Power and Light high-power electric transmission lines. To the east are light commercial properties. In 2018, the property to the south was developed into a commercial self-storage warehouse facility.

Ground and Surface Water Uses:

The groundwater aquifer underlying the Site is classified as a Class IIA groundwater aquifer (potable water source) by the State of New Jersey. In 1998, NJDEP established a Classification Exception Area/Well Restriction Area for the Site as Institutional Controls (ICs) that restrict the use of groundwater over an area that includes the area beneath and downgradient of the Site. Therefore, the water cannot currently be used as a source of drinking water.

Flow in the aquifer in the vicinity of the Site is to the north. There the surface water discharges to Birch Swamp Brook, which in turn flows into Lake Lefferts. Lake Lefferts is located approximately one mile north of the Site and currently used as a swimming and recreational area.

BASIS FOR REMEDY MODIFICATION

This is an amendment to the OU2 ROD that addressed groundwater contamination. The sources of groundwater contamination were removed as part of the remedial action selected in the OU3 ROD issued on September 30, 1999 (former Site industrial area contaminated soil). Data have been collected from monitoring wells twice a year since the removal of the contaminated soil was completed in late 2011. These data show that ten of the fourteen COCs identified in the 1992 ROD are now present at levels that are below their cleanup goals. There are four remaining COCs - TCE, benzene, beryllium and arsenic – at concentration levels that remain above their cleanup goals. In addition, the cleanup goal for arsenic has been modified since the original OU2 ROD was issued; the OU2 ROD identified the state MCL as the remedial goal for arsenic, whereas in this ROD Amendment EPA has selected the lower NJGWQS for arsenic, promulgated after the OU2 ROD, as the remedial goal for that contaminant (see Table 2). As explained above under "Evidence for Natural Attenuation," the 2020 FRI/FFS data trends show that, due to natural attenuation processes, levels of the four COCs have been declining since

2011. The levels are currently low and will continue to decline. Therefore, MNA is effective and the extraction and treatment system chosen in the 1992 OU2 ROD is no longer necessary.

SUMMARY OF SITE RISKS

As part of the original OU2 RI/FS issued in 1992, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land and groundwater uses. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD Amendment summarizes the results of the baseline risk assessment for the Site and the updated streamlined risk evaluation.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario:

- *Hazard Identification* – uses the analytical data collected to identify the contaminants of potential concern at the site for each medium, with consideration of a number of factors explained below;
- *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed;
- *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and
- *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the National Contingency Plan (NCP) as an excess lifetime cancer risk greater than $1 \times 10^{-6} – 1 \times 10^{-4}$, an excess of lifetime cancer risk greater than 1×10^{-6} (i.e., point of departure) combined with site-specific circumstances, or a Hazard Index greater than 1; contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, the chemicals of potential concern (COPCs) in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence and bioaccumulation. The original risk assessment for OU2 and this updated risk evaluation both focused on groundwater at the Site that may pose significant risk to human health. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of VOCs, metals, SVOCs, and PCBs in groundwater at concentrations of potential concern. Four of the original

APPENDIX I: Sherwin Williams Gibbsboro Site Excerpts

RECORD OF DECISION

Sherwin-Williams/Hilliards Creek Superfund Site

Operable Unit 2

Gibbsboro, New Jersey

U.S. Environmental Protection Agency
Region II
August 2020

598791

DECLARATION STATEMENT

SITE NAME AND LOCATION

Sherwin-Williams/Hilliards Creek Superfund Site (NJD980417976),
Borough of Gibbsboro, Camden County, New Jersey.
Operable Unit 2 – Soil, Sediment and Light Non-Aqueous Phase Liquid

STATEMENT OF BASIS AND PURPOSE

This Record of Decision ("ROD") presents the selected remedy to address contaminated soil, sediment and light non-aqueous phase liquid ("LNAPL") at portions of the Sherwin-Williams/Hilliards Creek Superfund Site ("Site"), located in the Borough of Gibbsboro, Camden County, New Jersey. The Site is comprised of the former manufacturing plant ("FMP") area, Hilliards Creek, portions of Silver Lake (Gibbsboro, New Jersey), and Kirkwood Lake (Voorhees, New Jersey). Operable Unit 2 ("OU2") of the Site will address soil contamination present within the FMP area, LNAPL within and adjoining the FMP area, and contaminated soil and sediments within the upper quarter-mile of Hilliards Creek ("Upper Hilliards Creek"). The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, ("CERCLA") and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"). This decision is based on the Administrative Record established for this Site.

The State of New Jersey Department of Environmental Protection ("NJDEP") concurs, in part, with the selected remedy. NJDEP concurs with the selected alternative of soil removal including off-site soil disposal. However, the State of New Jersey does not concur with the capping and institutional control component of the selected soil alternative unless property owners provide their consent to the placement of a deed notice.

ASSESSMENT OF THE SITE

The remedial action selected in the ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The remedial action described in this document addresses the soil, sediment and LNAPL contamination at the Site. Lead and arsenic are the primary soil contaminants within the FMP area and within the floodplain soils and sediments of Upper Hilliards Creek. Co-located with lead and arsenic, but detected at a lesser frequency, are other metals as well as polycyclic aromatic hydrocarbons ("PAHs"), such as benzo(a)pyrene, and low levels of polychlorinated biphenyls ("PCBs"). Separate from the areas of contamination just described, are areas within

the FMP area impacted with LNAPL. The LNAPL has also migrated, east of the FMP area, beneath several residential properties along United States Avenue, Gibbsboro, New Jersey. The LNAPL also exists beneath Foster Avenue and United States Avenue.

The major components of the Soil Remedy include: a combination of excavation and capping of soils above cleanup goals; excavation of saturated soils which act as sources to shallow groundwater contamination; and excavation of shallow LNAPL, passive and active recovery, in-situ bioremediation (nutrient injections) and vapor recovery of deep LNAPL.

The details of the excavation and capping component of the remedy are as follows:

- Excluding PCB and arsenic sources, excavation, transportation, and off-site disposal of contaminated soil which exceeds cleanup goals to depths of up to four feet in Subareas 1 and 2.
- Excavation to a depth of approximately six feet of soil containing PCBs concentrations greater than 50 mg/kg in Subarea 1.
- Excavation of soil containing LNAPL from Subarea 4 to an approximate depth of five to seven feet.
- Excavation of pentachlorophenol ("PCP") to the water table in Subarea 5.
- Excavation of all soil and sediment contaminants greater than their cleanup goals in Subarea 6.
- Maintaining existing areas that serve as caps and expanding or installing caps where necessary in Subareas 1, 2, 4, and 5 where contamination remains above cleanup goals at depth.
- Removal of any underground structures that may be a source of contamination from all six subareas.
- Restoration and revegetation of remediated areas.
- Institutional controls ("ICs"), such as a deed notice, to inform the user of potential exposure to residual soils which exceed levels that allow for unrestricted use. ICs would be established for areas where soil contamination exceeds residential cleanup goals, including existing roadways.

This selected remedy will also remove contaminated saturated soil, which acts as a source to shallow groundwater contamination. By removing these saturated soils, the concentrations of contaminants in groundwater that exceed ground water quality standards are anticipated to be reduced. The specific actions to address sources of shallow groundwater contamination include:

- Within Subarea 1, excavation of saturated soils exceeding 50 mg/kg of arsenic to approximately 15 feet in depth.
- Within Subarea 5, excavation of saturated soils exceeding 15 mg/kg of PCP to approximately eight feet in depth.

This selected remedy will also address LNAPL contamination in Subareas 2 and 3 by utilizing bioremediation technology (in the form of nutrient injections), as well as passive and active LNAPL recovery systems. The specific actions to address LNAPL include:

- Implementation of a Pilot Study to determine nutrient quantities and injection spacing to conduct bioremediation of LNAPL contamination.
- Development and implementation of a large-scale network of nutrient injection wells, as part of bioremediation activities, throughout portions of the FMP area and off-property areas.
- Installation of a LNAPL recovery well system in Subarea 2.
- Installation of an LNAPL recovery trench in Subarea 4, to collect any mobile LNAPL and transport it off-site for proper treatment and disposal.
- Installation of soil gas recovery systems throughout portions of the FMP area and in off-property areas where LNAPL contamination exists and soil gas generated by LNAPL bioremediation could become a concern.
- ICs to indicate potential vapor intrusion issues in existing buildings should they be reoccupied before subsurface contamination is remediated to appropriate levels. Additionally, ICs that require that future buildings constructed over volatile contamination be subject to a vapor intrusion evaluation or be built with vapor intrusion mitigation systems until subsurface contamination is remediated to appropriate levels would be included.

The major components of the Sediment Remedy include:

- Construction of a stream diversion system to allow access to sediment.
- Excavation of contaminants to depths ranging from 2 to 7 feet below sediment surface.
- Removal of contaminated sediment from the culvert that connects Silver Lake to Hilliards Creek.
- Dewatering and processing of excavated sediment.
- Transportation and off-site disposal of dewatered sediment.
- Stream bank revegetation and restoration.

EPA expects that removal of contaminated floodplain soils and sediments will result in a decrease of surface water contaminants. Surface water monitoring in Upper Hilliards Creek will be included as part of the remedial action to assess any changes in contaminant conditions over time. If monitoring indicates that contamination levels have not decreased to below standards, EPA may require an action in the future. Future operable units will address site-related groundwater contamination ("OU3"), and the remaining portions of Hilliards Creek, Kirkwood Lake, and Silver Lake ("OU4").

DECLARATION OF STATUTORY DETERMINATIONS

Part 1: Statutory Requirements

The selected remedy is protective of human health and the environment, complies with federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost effective and utilizes permanent solutions and treatment technologies to the maximum extent practicable.

APPENDIX J: Statistical Analysis Comparing Southern Lots to Northern Lots on the Site
Riverside Industrial Park Superfund Site

The statistical analyses focused on the Lots that make up the northern and southern areas of the Site. USEPA has stated that the northern Lots on the Site were non-operational and that the southern area consists of Lots that may have been affected by paint manufacturing. Historical site data show that paint was not manufactured in the building on Lot 63 (Building #7), and Lot 63 is not included in the southern Lots.

A. Methods

For surface and sub-surface soil samples and for groundwater samples, when more than one sample was available, statistical analyses were conservatively based on the sample with the highest lead level. Boring holes were paired with wells based on proximity and gradient (see Tables 1 and 2 in main text). Maximum lead concentrations were not normally distributed and appropriate statistical methods were used to take that into account. Specifically:

- We compared continuous lead concentrations across Lots and areas using the non-parametric Wilcoxon rank sum test (WRS)
- We compared continuous lead concentrations across matrices (surface soil, sub-surface soil and groundwater) using the non-parametric Spearman correlation coefficient (SCC)
- We categorized soil lead concentrations into low (≤800 mg/kg) and high (>800 mg/kg) and compared proportions of samples in the high category using Fisher's exact test (FE)
- We categorized groundwater lead concentrations into three categories (≤5 µg/L vs. >5 µg/L to ≤25 µg/L vs. >25 µg/L) and compared groundwater samples using Fisher's exact test (FE)

A cut point of 0.05 was used to distinguish between statistically significant and non-significant p-values:

- If a p-value is >0.05, there is insufficient evidence of a difference between Lots, areas or sample matrices
- If a p-value is ≤0.05, there is evidence of a difference between Lots, areas or sample matrices

However, p-values can depend on many factors and were interpreted as part of the whole picture.

B. Results

Results from statistical analyses comparing surface soil, sub-surface soil and groundwater samples across southern Lots are summarized in Table J.1. Results from statistical analyses comparing samples across matrices (surface soil, sub-surface soil and groundwater) among the southern Lots are shown in Table J.2. Finally, results from statistical analyses comparing surface soil, sub-surface soil and groundwater samples between the southern and non-operational northern Lots are summarized in Table J.3. Tables J.4 and J.5 show results from comparisons across the northern Lots.

Table J.1: Results from statistical analyses comparing surface soil, sub-surface soil and groundwater samples across the southern Lots

Surface soil	Sub-surface soil
• Depending on the Lot, 0% to 50% of boring holes had maximum lead concentrations >800 mg/kg • Differences among Lots were not statistically significant (FE p=0.4155) • Maximum lead concentrations were borderline statistically non-significantly different among Lots (WRS p=0.0655; driven by lower than expected maximum lead concentrations in Lot 66)	• Depending on the Lot, 0% to 50% of boring holes had maximum lead concentrations >800 mg/kg • Differences among Lots were not statistically significant (FE p=0.3053) • Maximum lead concentrations were not statistically significantly different among Lots (WRS p=0.5151)
Groundwater	
• 71% of maximum groundwater lead concentrations were ≤25 µg/L; 29% of maximum groundwater lead concentrations were > 25 µg/kg • Differences in proportions of maximum groundwater lead concentrations in the low, medium and high groupings (≤5 µg/L vs. >5 µg/L to ≤25 µg/L vs. >25 µg/L) among Lots were statistically significant (FE p=0.0095) • Differences in groundwater maximum lead concentrations among Lots were statistically significantly (WRS p=0.0168)	

Table J.2: Results from statistical analyses comparing samples across matrices (surface soil, sub-surface soil and groundwater) among the southern Lots

<table>
<tr><th colspan="2">Sub-surface vs. surface</th></tr>
<tr><td colspan="2">No clear pattern was detected for the proportions of boring holes with greater maximum lead concentrations in surface than in sub-surface soil samples
Differences among Lots were not statistically significant (FE p=0.1131)</td></tr>
<tr><th>Groundwater vs. surface</th><th>Groundwater vs. sub-surface</th></tr>
<tr><td>Maximum groundwater lead concentrations were not statistically significantly correlated with maximum surface soil lead concentrations (SCC p=0.8004)
100% of maximum groundwater lead concentrations ≤5 µg/L corresponded to maximum surface soil lead levels ≤800 mg/kg
75% of maximum groundwater lead concentrations between 5 µg/L and 25 µg/L correspond to maximum surface soil/fill lead levels ≤800 mg/kg
100% of maximum groundwater lead measurements >25 µg/L corresponded to a maximum surface soil/fill lead level ≤800 mg/kg
Differences among Lots were not statistically significant (FE p=0.3053)</td><td>Maximum groundwater lead concentrations were not statistically significantly correlated with maximum sub-surface soil lead concentrations (SCC p=0.1733)
67% of maximum groundwater lead concentrations ≤5 µg/L correspond to maximum sub-surface soil/fill lead levels ≤800 mg/kg
80% of maximum groundwater lead concentrations between 5 µg/L and 25 µg/L corresponded to maximum sub-surface soil lead levels ≤800 mg/kg
67% of maximum groundwater lead measurements >25 µg/L corresponded to a maximum sub-surface soil/fill lead level ≤800 mg/kg
Differences among Lots were not statistically significant (FE p>0.90)</td></tr>
</table>

Table J.3: Results from statistical analyses comparing surface soil, sub-surface soil and groundwater samples between the southern and non-operational northern Lots

Surface	Sub-surface	Sub-surface vs. surface
• Maximum lead concentrations were not statistically significantly different between southern and non-operational northern Lots (WRS p=0.7912); and • Proportions of boring holes with maximum lead concentrations >800 mg/kg were not statistically significantly different between southern and non-operational northern Lots (FE p=0.5821)	• Maximum lead concentrations were statistically significantly different between southern and non-operational northern Lots (WRS p=0.0086); but • Proportions of boring holes with maximum lead concentrations >800 mg/kg were not statistically significantly different between southern and non-operational northern Lots (FE p>0.90)	• Proportions of boring holes with higher maximum lead concentrations in the sub-surface were statistically significantly different between southern and non-operational northern Lots (FE p=0.0123) but no clear pattern emerged
Groundwater		
• Maximum lead concentrations were not statistically significantly different between southern and non-operational northern Lots (WRS p=0.0891); and • Proportions of maximum groundwater lead concentrations falling into the ≤5 µg/L, 5 µg/L to 25 µg/L and >25 µg/L groups were not statistically significantly different between southern and non-operational northern Lots (FE p=0.3807)		

Table J.4: Results from statistical analyses comparing surface soil, sub-surface soil and groundwater samples across the northern Lots

Surface soil	Sub-surface soil
• Depending on the Lot, 0% to 40% of boring holes had maximum lead concentrations >800 mg/kg • Differences among Lots were not statistically significant (FE p=0.9313) • Maximum lead concentrations were not statistically different among Lots (WRS p=0.6343)	• Depending on the Lot, 0% to 80% of boring holes had maximum lead concentrations >800 mg/kg • Differences among Lots were statistically significant (FE p=0.0260; driven by Lot 70) • Maximum lead concentrations were statistically significantly different among Lots (WRS p=0.0264; driven by Lot 70)
Groundwater	
• 86% of maximum groundwater lead concentrations were ≤25 µg/L; 14% of maximum groundwater lead concentrations were > 25 µg/kg • Differences in proportions of maximum groundwater lead concentrations in the low, medium and high groupings (≤5 µg/L vs. >5 µg/L to ≤25 µg/L vs. >25 µg/L) among Lots were not statistically significant (FE p=0.1280) • Differences in groundwater maximum lead concentrations among Lots were statistically significantly (WRS p=0.0458)	

Table J.5: Results from statistical analyses comparing samples across matrices (surface soil, sub-surface soil and groundwater) among the northern Lots

<table>
<tr><th colspan="2">Sub-surface vs. surface</th></tr>
<tr><td colspan="2">No clear pattern was detected for the proportions of boring holes with greater maximum lead concentrations in surface than in sub-surface soil samples
Differences among Lots were not statistically significant (FE p=0.2318)</td></tr>
<tr><th>Groundwater vs. surface</th><th>Groundwater vs. sub-surface</th></tr>
<tr><td>Maximum groundwater lead concentrations were not statistically significantly correlated with maximum surface soil lead concentrations (SCC p=0.8576)
64% of maximum groundwater lead concentrations ≤5 µg/L corresponded to maximum surface soil lead levels ≤800 mg/kg
83% of maximum groundwater lead concentrations between 5 µg/L and 25 µg/L correspond to maximum surface soil/fill lead levels ≤800 mg/kg
100% of maximum groundwater lead measurements >25 µg/L corresponded to a maximum surface soil/fill lead level ≤800 mg/kg
Differences among Lots were not statistically significant (FE p=0.4892)</td><td>Maximum groundwater lead concentrations were statistically significantly correlated with maximum sub-surface soil lead concentrations (SCC p=0.0251)
80% of maximum groundwater lead concentrations ≤5 µg/L correspond to maximum sub-surface soil/fill lead levels ≤800 mg/kg
100% of maximum groundwater lead concentrations between 5 µg/L and 25 µg/L corresponded to maximum sub-surface soil lead levels ≤800 mg/kg
67% of maximum groundwater lead measurements >25 µg/L corresponded to a maximum sub-surface soil/fill lead level ≤800 mg/kg
Differences among Lots were not statistically significant (FE p>0.90)</td></tr>
</table>

Appendix K: Quantifying the Conceptual Site Models
Riverside Industrial Park Superfund Site

This appendix describes the method that was used to conduct a Fault Tree Analysis and assess the likelihood that either USEPA's CSM or the CSM based on the presence of historic fill advanced by PPG can correctly describe the Site data. The key to constructing a useful Fault Tree is to determine the suitable relationships between datasets to test and to develop quantitative estimates for those relationships. USEPA has presented a top-down infiltration model to describe the conditions present at the Riverside site. This CSM has the following components, which can be quantified using Site data:

- Lead in soil/fill is attributable to releases from historical operations;
- Lead is migrating from releases to surface soil/fill to subsurface soil/fill; and
- Lead that has migrated to subsurface soil/fill beneath the water tablesaturated zone is desorbing into groundwater.

First, we conducted a threshold evaluation where each sampling location (a well or soil bore) was judged as fitting the CSM or not. Next, we conducted a more quantitative correlation evaluation that looked at the ability of a linear regression to explain data variability, as measured using the r^2, for correlations between samples that USEPA's CSM would expect to be related.

For USEPA's CSM, the observations all need to be true for the CSM to be correct – there needs to be evidence of releases/spills, there needs to be infiltration into the subsurface and then further into the groundwater, and the groundwater concentrations should be stable, reflecting the stable soil/fill concentrations. The results of both the threshold and correlation analyses demonstrated that USEPA's CSM has done a poor job of describing site data and that the likelihood that this CSM is presenting an accurate description of site condition is less than 0.01%.

A. USEPA CSM Threshold Analysis

One straightforward way to quantify the CSM is look for groundwater or soil sample locations that match the features described in the CSM. This threshold evaluation essentially assigns a yes or no for each well or sample, if it fits each statement. The specific questions used were:

1. To assess potential spills/releases: are the elevated concentrations in operational areas found under pervious cover?
2. To assess infiltration: is the concentration in a sub-surface sample lower than the surface concentration within a soil bore?
3. To further assess infiltration: how many wells had potentially "matched" results? Here, wells were matched with soil bore locations using proximity and knowledge of flow directions. If a well has both soil/fill and groundwater concentrations above their respective PRGs, or both below the PRG, this was considered a match.
4. To assess if groundwater concentrations are adsorption controlled, we evaluated how many wells had variability in the groundwater concentrations within the allowed analytical variation (of 20%)?

Analyses of the available site date found: [26]

- Using the land cover analysis for the time until 1924 (described in Appendix E), there are 15 elevated surface samples found within the operational areas and 7 were found beneath pervious cover during the early operational period (before 1926). Therefore, potential spills/releases through pervious cover could describe 47% of the elevated samples.
- The number of soil bore locations where concentrations decreased from the surface sample to the next available depth in the same soil bore were identified. There are 90 soil bores with at least two measurements and the concentrations decreased from the surface in 50 of the soil bores. Therefore, infiltration could possibly explain 56% of the soil/fill samples.
- Using the "matched" well analysis, 16 wells were considered to have "matched" concentrations in the near soil borings (out of 31 total shallow wells). Therefore, infiltration to groundwater could possibly explain 52% of the groundwater results.
- Lastly, the stability of groundwater concentrations were evaluated using the allowable analytical variability (+/- 20%). Only 5 wells had concentrations that were within the analytical variability of the 30 wells with multiple samples. Therefore, adsorption from soil/fill can only describe groundwater conditions in 17% of the wells.

While each of these statements may be correct for 17% to 56% of the wells or soil bores evaluated, taken together this analysis shows that the overall CSM only has a likelihood of 2.3% of correctly describing the available data. This evaluation is summarized in the Fault Tree shown on Figure 1.

[26] These analyses do not conclude that the events assessed occurred. For instance, the assessment of land cover does not indicate that releases occurred; rather, it assesses whether conditions existed (*i.e.*, the presence of pervious and impervious cover) that would have precluded releases from reaching surface soils, then quantifies those conditions.

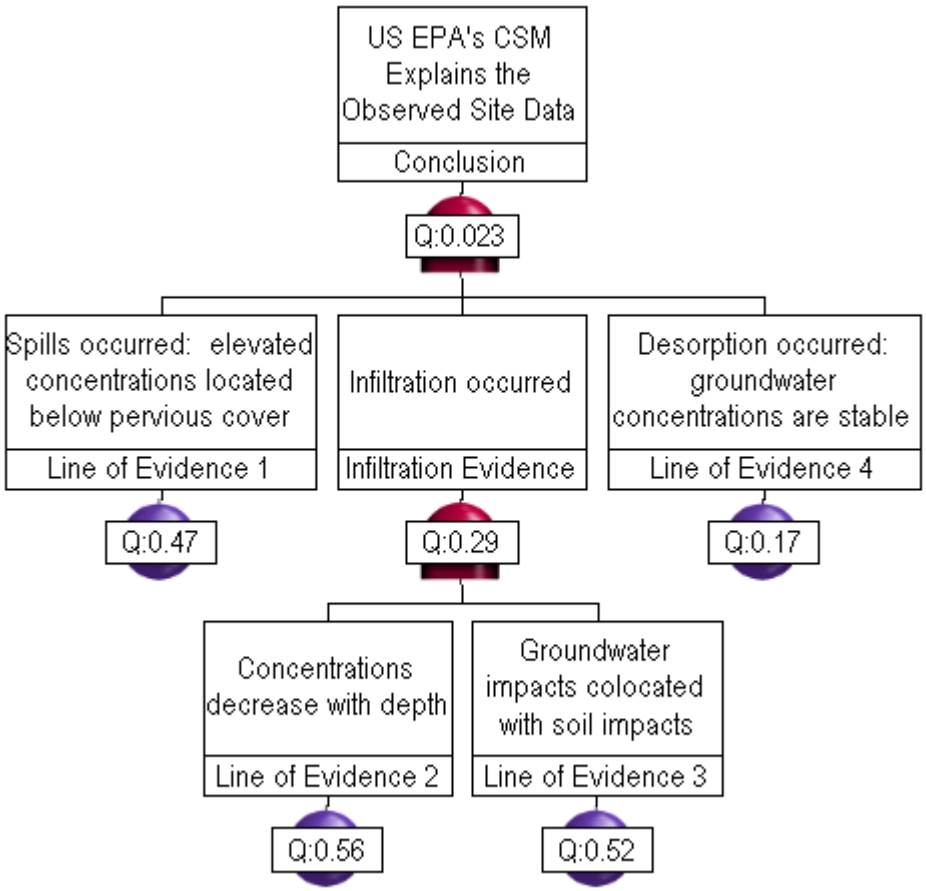


Figure K.1. Observed frequencies of sampling locations that conform with the CSM and summarized using a Fault Tree Analysis.

B. USEPA CSM Correlation Analysis

Instead of just assigning a Yes or No to evaluate the data, the approach can be refined by more quantitatively evaluating the strengths of the relationships in the data. Only the infiltration questions were refined at this stage:

> 2B. Are the surface and subsurface soil/fill concentrations correlated? Or rather, can the surface concentrations explain the variability in the sub-surface concentrations?
> 3B. Are the surface soil/fill concentrations predictive of groundwater concentrations?

Figure K.2 shows the surface soil/fill concentrations with the next deepest sample in the same soil bore. If infiltration of lead from surface spills was occurring, then high surface soil/fill should result in high sub-surface samples and the highest concentrations would be on the surface. The threshold approach only indicated if the concentration decreased. By performing a linear regression of the samples, the extremely poor fit between surface and sub-surface soil/fill samples is apparent. The coefficient of determination, the r^2, is 0.2, which means that 20% of variability in the sub-surface samples can be explained by the surface

concentrations, while 80% cannot. In addition, the highest sub-surface concentrations are nearly exclusively found beneath lower surface concentrations. If the same analysis is conducted using the log transformed data, the fit is even worse (r^2 = 0.09). This strongly demonstrates that there is no evidence of infiltration from surface spills within the soil bores.

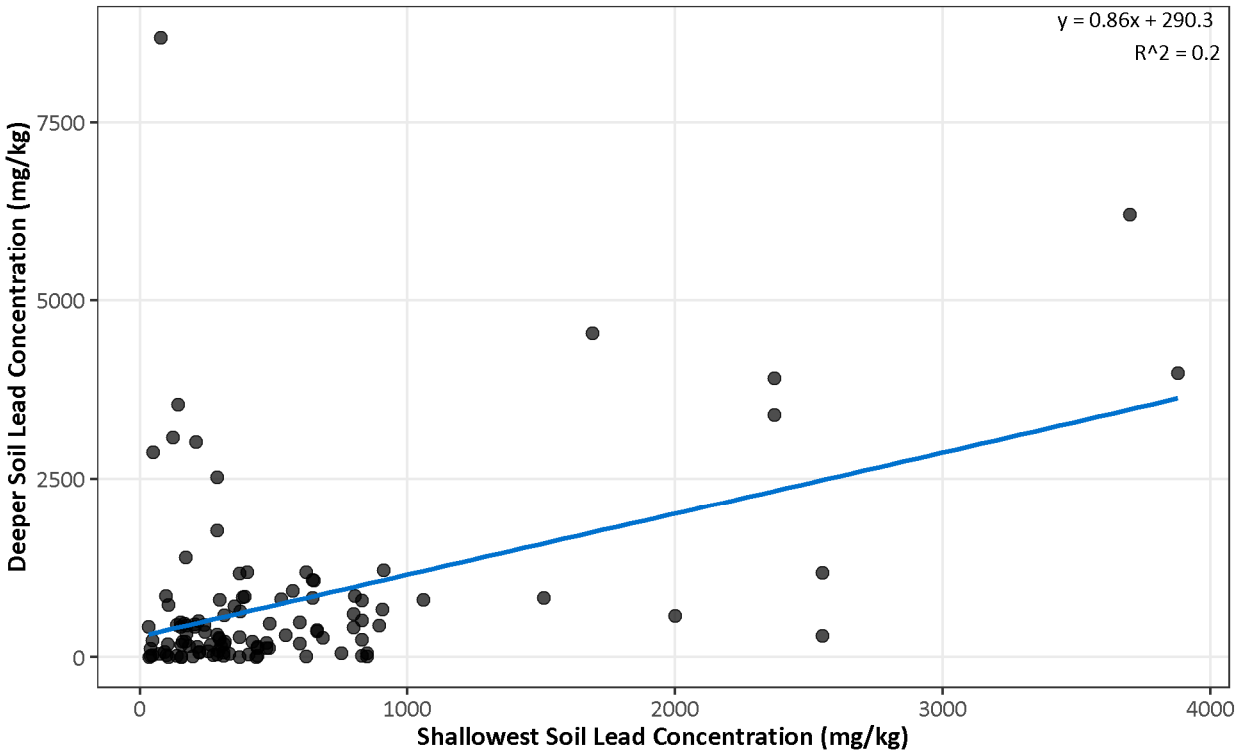
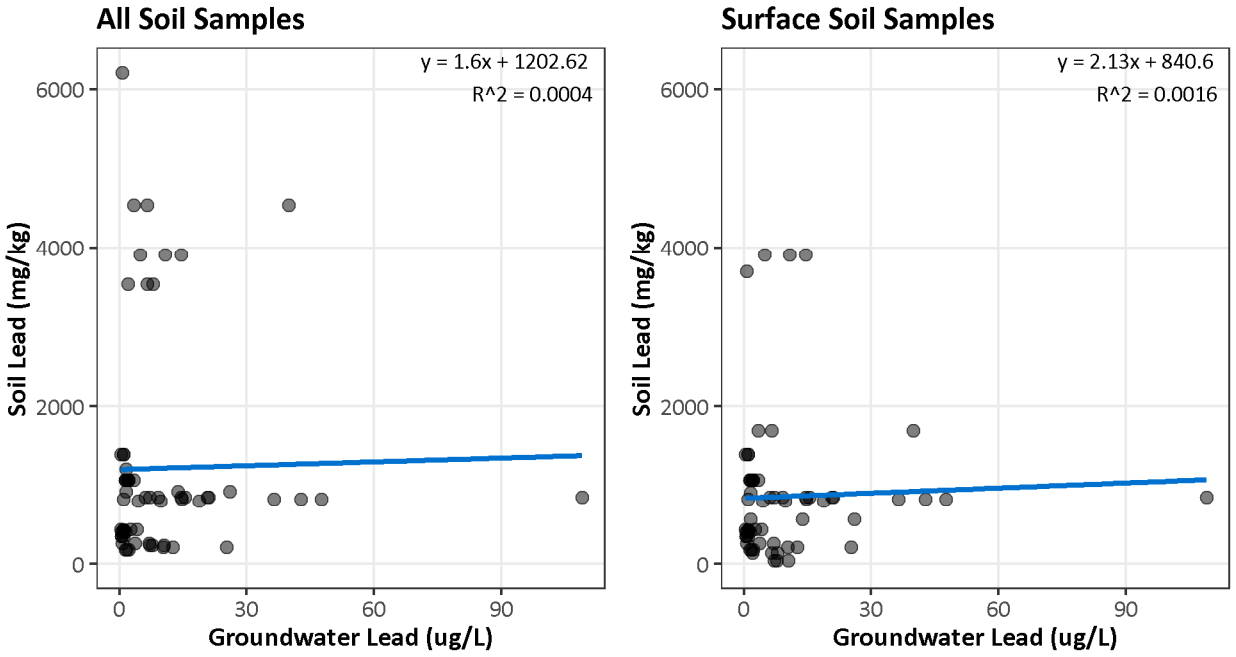


Figure K.2. Linear regression using the shallowest soil/fill lead concentrations and the next deeper sample for soil logs with multiple sampling depths.

To more quantitatively evaluate the potential link between groundwater and soil/fill concentrations, a linear regression was conducted for wells locations and soil bores that were located within 20 ft of each other. It is apparent that there is no relationship between groundwater concentrations and soil/fill concentrations using either only the surface samples or considering all depths (the r^2 is 0.004 and 0.0016, respectively and shown on Figure K.3). The correlation was calculated excluding the highest groundwater concentration at MW-118. The fits for both groups of soil/fill samples are extremely poor. If the data is log-transformed, the fit of the surface soil/fill sample to groundwater only improves to 0.0018. This strongly demonstrates that the surface soil/fill concentrations located with 20 ft of a monitoring well is not related to the observed groundwater concentrations. While no CSM can describe all of the variability found in environmental samples, these are extremely poor fits.



Groundwater wells were matched to the highest soil concentration from the nearest soil sampling location within 20 lateral feet

Figure K.3. Linear regression between groundwater and soil/fill concentrations for groundwater wells with a soil bore located within 20 ft using all sampling depths or just the surface sample.

Using the correlation approach, the amount of the Site data variability that the CSM is correctly explaining is only 0.003% (Figure K.4). USEPA's CSM cannot accurately account for:

- Elevated concentrations under the impervious cover;
- Soil/fill profiles that do not support infiltration within them or in groundwater concentrations that supposedly result from this infiltration; and
- Significant temporal variability in groundwater concentrations.

USEPA's CSM does a poor job describing each of these components and taken together the CSM cannot explain the data available in the USEPA-approved RIR.

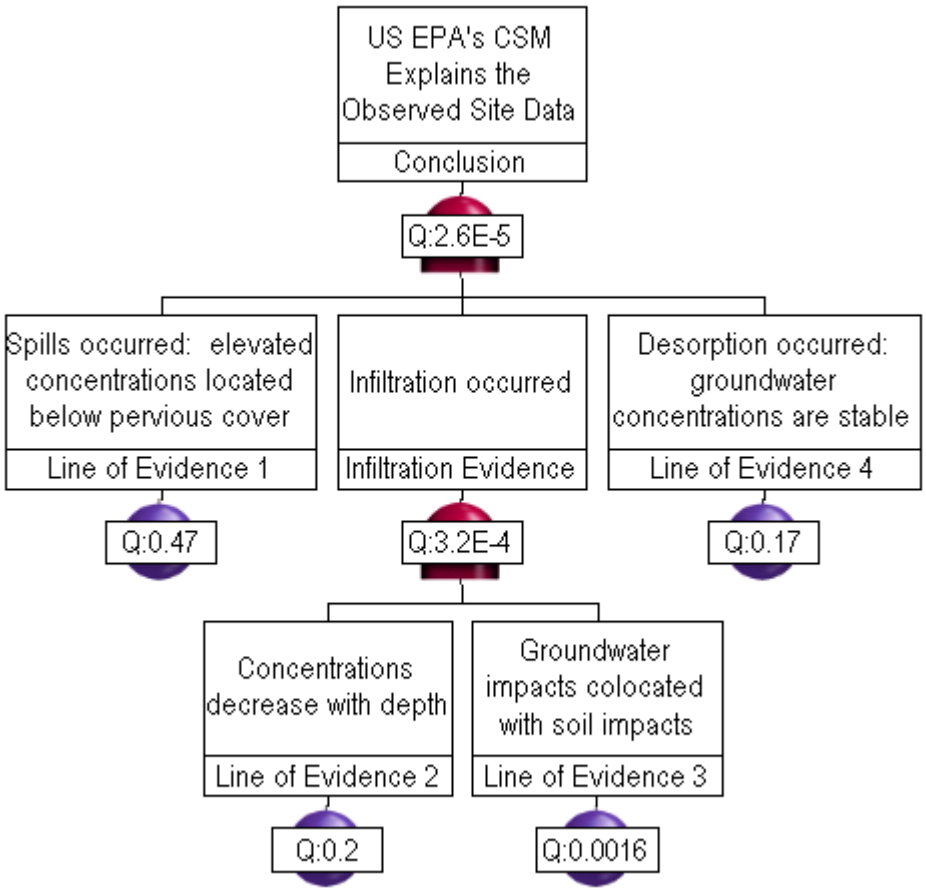


Figure K.4. Observed frequencies of sampling locations or regression analyses that conform with USEPA's CSM and summarized using a Fault Tree Analysis.

C. Evaluating Historic Fill as the Lead Source

Fault Tree Analysis can also be applied to evaluate the CSM that historic fill is the primary source of lead on the Site and that surface and subsurface soil/fill concentrations of lead are unrelated to groundwater concentrations of lead. This analysis is based on the following statements:

- Lead in soil/fill is attributable to a single source (which is historic fill).
- Distribution of lead in soil/fill is heterogeneous with no correlation with depth regardless of location on Site, both within soil bores and across the site.
- Lead in groundwater is not related to nearby soil/fill concentrations at any depth.

The Pb-Zn ratio is used to assess if a single source of lead or zinc is present on the site (Figure K.5). If the slope is constant across all concentrations and in all areas, then there is likely only one source for these

metals at the site. The log transformed data show that a single slope with a strong correlation (r^2 = 0.72) is present for the entire Site. The correlation remains strong even if the site is divided into the northern and southern portions.[27] The proportion of the data described by a single source is conservatively estimated at 72%. This is conservative since the variability not captured by this correlation is small and likely related to the heterogeneous nature of the historic fill materials. There is no evidence of an additional source of lead at the site.

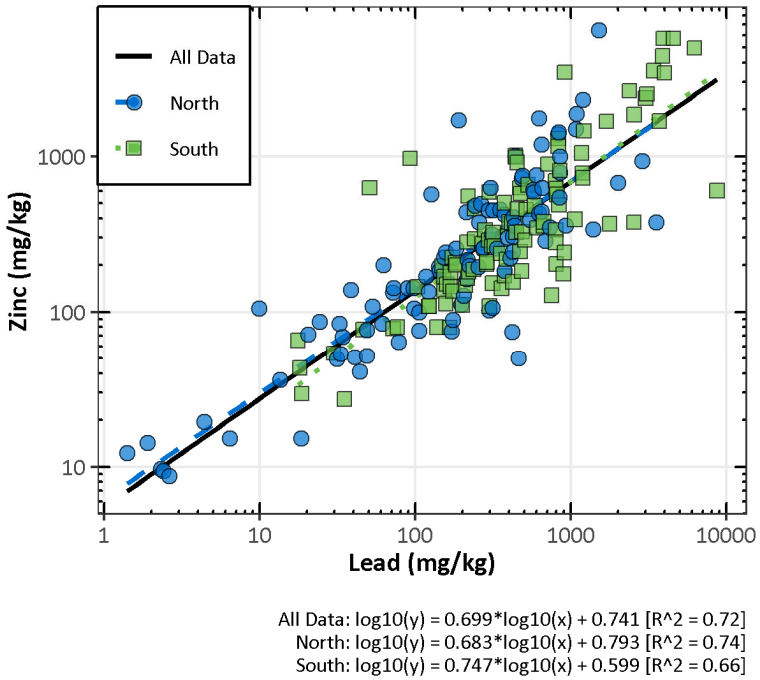


Figure K.5. Linear correlation for log-transformed lead and zinc concentrations in soil/fill. Samples from the northern and southern portions of the Site are shown in blue and green, respectively. Despite the different potential sources of the zinc and lead contamination, the correlations identified similar slopes.

Next, two relationships were used to evaluate the spatial distribution of lead on the site. First, the same correlation for surface and the next deeper sub-surface sample as was presented above for evaluating the USEPA's CSM can be applied again. Figure 6 shows the log- transformed linear regression for these samples. Here the correlation between surface and sub-surface concentrations is 0.09, indicating the 91% of the variability in the sub-surface soil/fill concentrations cannot be explained by (is not related to) the surface soil/fill concentrations.

[27] For purposes of the Fault Tree Analyses, Lot 63 is included in the southern portion of the Site.

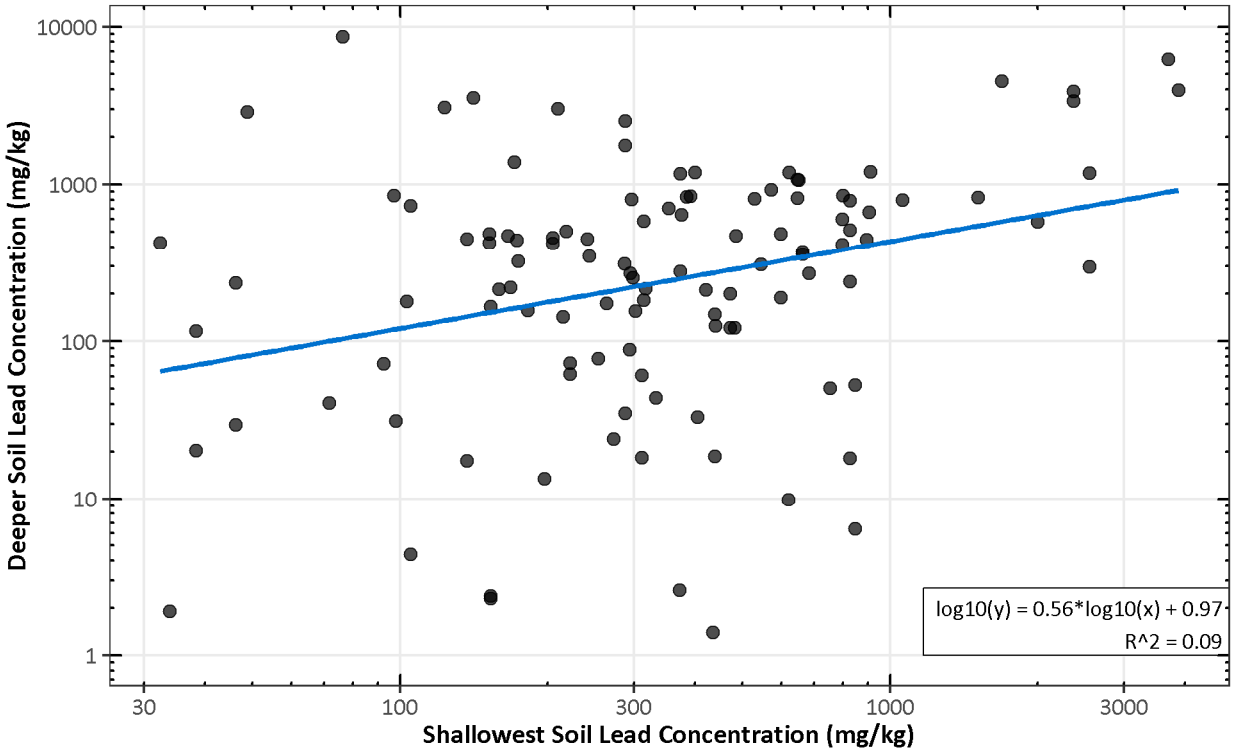


Figure K.6. Linear regression using the log-transformed shallowest soil/fill lead concentrations and the next deeper sample for soil bores with multiple sampling depths.

Second, the lack of correlation in the soil/fill concentration by depth for the Site as a whole was used to quantify that the lead distribution is heterogeneous throughout the Site (Figure K.7). The coefficient of determination for this data is just 0.0131; the variability that cannot be explained by this relationship is 0.9869. Thus, soil/fill concentrations are heterogeneous distributed among the sampling samples. Again, separating this data into the northern and southern portions of the Site does not change the conclusions.

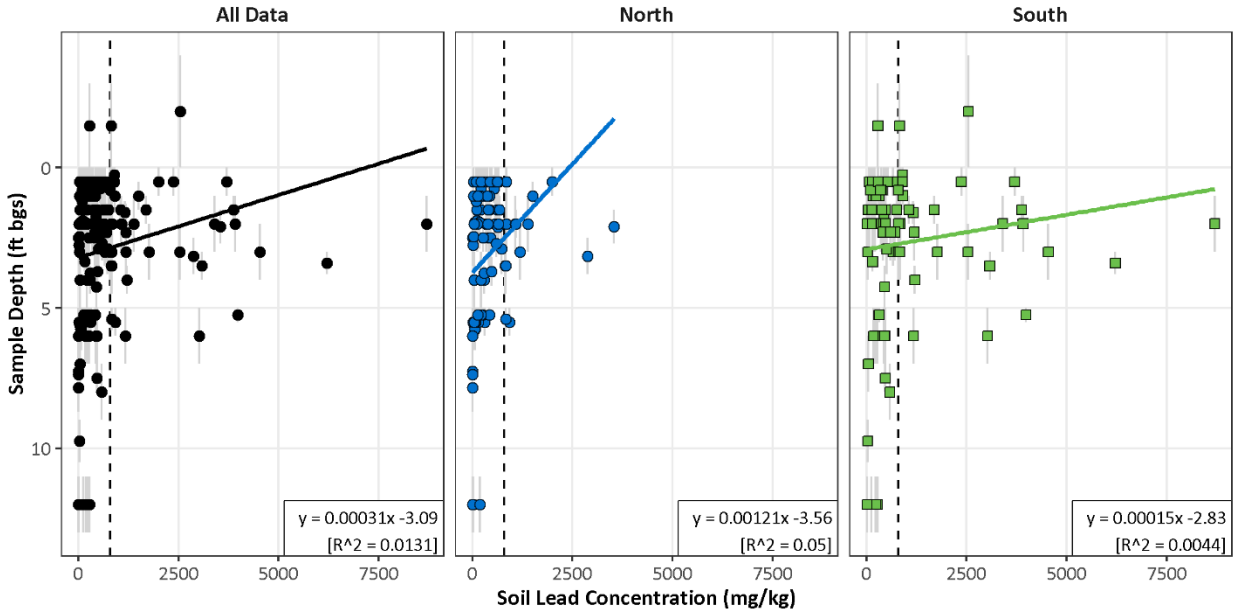
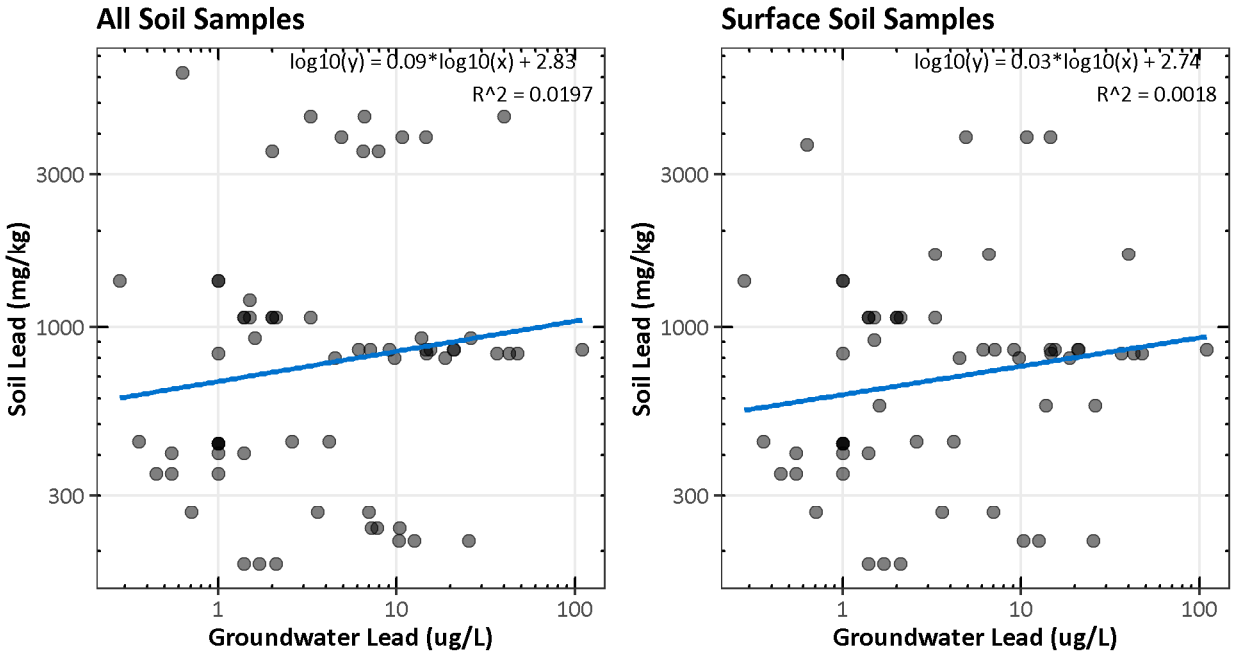


Figure K.7. Linear regression using soil/fill lead concentrations and sampling depth for the entire Site as well as the northern and southern portions separately.

Lastly, the lack of correlation between surface soil/concentrations and groundwater concentrations for the well and soil bore pairs located within 20 ft was used to support that these two measures are not related. The log-transformed data and linear regression is shown on Figure K.8. We conservatively used the correlation for all soil/fill depths, with a r^2 of 0.0197, as an estimate for the relationship of any soil/fill concentrations to groundwater concentrations. The variability that cannot be explained by this relationship is 0.9803.



Groundwater wells were matched to the highest soil concentration from the nearest soil sampling location within 20 lateral feet

Figure K.8. Linear regression between log-transformed groundwater and soil/fill concentrations for groundwater wells with a soil bore located within 20 ft using all sampling depths or just the surface sample.

Using the correlation approach to evaluate the CSM that historic fill is the primary source of lead on the site and that surface soil/fill concentrations are unrelated to groundwater concentrations, these analyses have found that this historic fill CSM has a 63% likelihood correctly describing the Site data (Figure K.9). This CSM has identified that:

- Lead concentrations in soil/fill are attributable to a single source and that there was no quantitative indication that an additional source of lead was present;
- Lead distribution across the site is heterogeneous and does not show correlations with depth regardless of the type of analysis or the section of the site evaluated; and
- Soil/fill concentrations from nearby soil bores located within 20 ft of a monitoring well are not related to groundwater concentrations.

The historic fill CSM presents a coherent explanation of the data available in the USEPA-approved RIR and adequately describes each of relationships between dataset evaluated. No CSM would be able to describe all of the variability found in environmental samples, but this CSM describes the majority of the variability found at the Site.

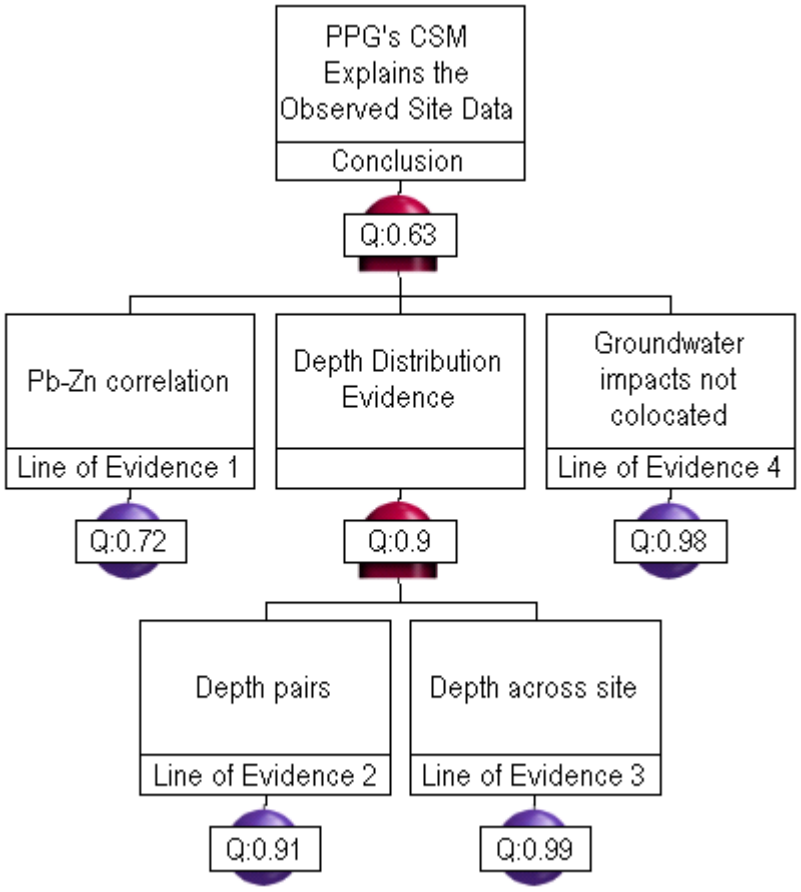


Figure K.9. The observed frequencies determined using the regression analyses that correctly describes the historic fill CSM and summarized using a Fault Tree Analysis.

From: Wheatley, Robert <[redacted]>
Sent: Thursday, January 28, 2021 10:37 AM
To: Smeraldi, Josh <Smeraldi.Josh@epa.gov>
Subject: Riverside Industrial Part

Hello Josh,
reaching out to better understand if this work will be bid publicly or through PPG? Please advise,
Rob

Robert L. Wheatley
SVP National Sales
Environmental Solutions and Services
VEOLIA NORTH AMERICA
cell [redacted]

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[redacted]
www.veolianorthamerica.com
https://www.veolianorthamerica.com/covid-19/important-message-environmental-solutions-services

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LATHAM & WATKINS LLP

February 19, 2021

VIA EMAIL

Dr. Josh Smeraldi
USEPA – Region II
Emergency and Remedial Response Division
290 Broadway, 18th Floor
New York, NY 10007

Re: Public Comment on Proposed Remedial Action Plan
Riverside Industrial Park Superfund Site - Essex County, Newark, New Jersey
CERCLA Docket No. 02-2014-2011

Dear Dr. Smeraldi:

On behalf of PPG Industries, Inc. ("PPG"), I am writing to supplement PPG's January 20, 2021 public comments on USEPA's Proposed Remedial Action Plan ("PRAP") for the Riverside Industrial Park Superfund Site (the "Site"). These supplemental public comments address technical information that USEPA failed to consider in its modification of the Feasibility Study Report ("FSR") for the Site, as evidenced by USEPA's February 2, 2021 written decision regarding dispute resolution proceedings with PPG relating to the FSR.

It is apparent from Region 2 Superfund and Emergency Management Director Pat Evangelista's (the "Director") February 2, 2021 dispute resolution decision (the "Dispute Decision") that USEPA failed to consider several material technical errors that PPG raised in response to USEPA's unilateral revisions to the FSR. The National Contingency Plan ("NCP") requires USEPA to consider ***all*** relevant data in evaluating remedial alternatives, especially data generated during the USEPA-approved remedial investigation ("RI"). [40 CFR 300.430(e); 40 CFR 300.5.] USEPA failed to do so. Specifically, USEPA ignored (1) a land cover analysis refuting USEPA's "top-down" infiltration model; (2) the lack of correlation between elevated contaminant of concern ("COC") levels in soil/fill and groundwater samples; (3) modeling detailing the ineffectiveness of USEPA's proposed remedial alternative; (4) conclusive evidence rebutting USEPA's theory that so-called "flappers" on Site buildings were pathways for releases of COCs into the environment onsite; and (5) statistical analyses rebutting USEPA's conceptual site model ("CSM").

USEPA has now, on multiple occasions, failed to adequately consider – and reconcile – the technical errors PPG has repeatedly identified in the FSR. The only conclusion PPG can draw from USEPA's insistence to ignore relevant data and analysis is that USEPA had, contrary to the NCP, preemptively selected a remedy for the Site and is now backfilling the administrative

record, through its unilateral revisions to the FSR, to support USEPA's preemptive remedy decision. Such retroactive agency decision-making is the quintessential example of arbitrary and capricious conduct, and consequently, the Proposed Remedial Action Plan ("PRAP") upon which the flawed FSR is based also is arbitrary and capricious.[1]

I. RELEVANT BACKGROUND

The Director's incomplete review of the evidence PPG submitted as part of the dispute resolution is part of a long list of questionable decisions that indicate USEPA's disregard for the requirements of the NCP. This includes making improper, last-minute changes to the FSR, unilaterally finalizing the FSR without acknowledging PPG's various material objections, rushing out a materially flawed PRAP based on said FSR, retroactively extending the public comment period for the PRAP five days after it had expired, and delaying its response to a Freedom of Information Act request that PPG submitted to obtain additional documents from the administrative record.

As described in detail in PPG's January 20, 2021 public comments, in early June 2020, and pursuant to the Site Administrative Settlement Agreement and Order on Consent ("ASAOC"), PPG provided USEPA with its proposed final draft of the FSR. In late June, USEPA conditionally approved PPG's draft FSR, providing a mark-up with several revisions for PPG to review and incorporate. PPG promptly raised concerns with USEPA's revisions, as these contained several changes regarding lead in groundwater at the Site that were unsupported by the technical record. Throughout the rest of June and the first half of July, PPG and USEPA exchanged various drafts of the FSR in a collaborative effort to correct technical errors introduced by USEPA's revisions to the FSR. Throughout this process, PPG continued to raise material concerns with USEPA's approach to lead onsite. In late July, however, USEPA abruptly changed its stance. Despite giving PPG until July 21 to provide further comments on the latest draft of the FSR, USEPA notified PPG at 3:46 pm on July 21 that it had unilaterally finalized and issued the FSR before ever receiving PPG's comments, which were sent at 10:00 pm that same day. On July 22, 2020, <u>just one day after</u> the finalization of the FSR by USEPA – and despite PPG's notice that it would be invoking dispute resolution to contest the FSR – USEPA issued the PRAP. On July 30, 2020, in response to USEPA's finalization of the materially flawed FSR – and the clearly rushed issuance of a defective PRAP – PPG invoked dispute resolution under the ASAOC.

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[1] USEPA also made the unusual decision to ***retroactively extend*** the public comment period for the Site PRAP. On January 25, 2021 – 5 days after the public comment deadline expired – USEPA issued a notice extending the public comment deadline from January 20, 2021 to February 19, 2021. A retroactive extension of the public comment period is not consistent with the NCP. In extending the deadline five days after its expiration, USEPA not only forced the public to submit its comments earlier than necessary, but also made it more difficult for PPG or others to address USEPA's then-forthcoming dispute resolution decision. This marks the latest chapter in USEPA's troubling disregard for CERCLA's procedural and substantive requirements at the Site. Manipulating the public comment deadline also enabled USEPA to obtain PPG's public comments on the PRAP and FSR on January 20 instead of February 19, which allowed USEPA to use those comments in preparing its February 2 dispute resolution decision.

The dispute resolution proceedings between PPG and USEPA have primarily centered on USEPA's materially flawed CSM that assumes that PPG's historical operations are the primary source of lead onsite. To the contrary, PPG has repeatedly shown that relevant Site data and scientific and statistical analyses indicate otherwise—that the lead onsite is primarily attributable to historic fill that is ubiquitous across the Site, and not to PPG's operations. On September 4, 2020, USEPA responded to PPG's invocation of dispute resolution with its statement of position. PPG responded with a reply on September 17, 2020, and USEPA submitted a sur-reply on November 3, 2020. On November 18, 2020, PPG gave USEPA a detailed technical presentation highlighting the various technical flaws with USEPA's CSM, and explaining why lead concentrations onsite were attributable to historic fill, not operations.[2] Lastly, on February 2, 2021, the Director issued his decision regarding the Site's dispute resolution proceedings. Despite the significant volume of material submitted as part of dispute resolution, the Director's decision is only six pages and does not even address most of PPG's material technical points.

II. DIRECTOR EVANGELISTA'S DECISION DEMONSTRATES THAT USEPA DID NOT CONSIDER SITE INFORMATION, IN VIOLATION OF THE NCP

The NCP states that the "primary objective of the feasibility study . . . is to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected." [40 CFR 300.430(e)(1).] Therefore, "[t]he development and evaluation of alternatives shall reflect the scope and complexity of the remedial action under consideration and the site problems being addressed." [Id.] Critically, "development of alternatives *shall be fully integrated with the site characterization activities of the remedial investigation*". [*Id.* (emphasis added).] The alternatives must take "into account the scope, characteristics, and complexity of the site problem that is being addressed." [40 CFR 300.430(e)(2); 40 CFR 300.5 (noting that the feasibility study "emphasizes data analysis . . . using data gathered *during the RI*" which "are used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives.") (emphasis added).] In short, the NCP dictates that remedial alternatives must be based on the relevant Site data, primarily as identified in the RI. Yet, as described below, USEPA did not consider relevant Site

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[2] Notably, on September 28, 2020, PPG submitted a targeted Freedom of Information Act ("FOIA") request seeking documents relating to USEPA's revisions to the FSR and the preparation of the PRAP from January through September 2020. In making this request, PPG sought to confirm whether USEPA had actually considered any of PPG's technical comments in good faith. Despite making several promises to deliver the requested information and agreeing to multiple deadlines in the months since PPG's request, USEPA has instead continuously asked for extensions to the agreed upon deadlines. On January 7, 2021, USEPA verbally requested a further extension of time to June 4, 2021 to respond to PPG's FOIA request, explicitly confirming that USEPA had no intention – and likely never had any intention – of producing any documents prior to the end of the public comment period. After repeated follow ups by PPG, USEPA produced a few dozen documents – out of what USEPA described as thousands of potentially relevant documents – the day before the public comment period closed on February 19, 2021. This defeats the purpose of PPG's original request, and appears to be a tactic to prevent PPG from incorporating these documents in its public comments and to withhold others until after the public comment period is over. The lack of timely substantive response to PPG's FOIA request further indicates that USEPA has been backfilling the administrative record to support its pre-selected remedy.

information in selecting its preferred remedies, first when unilaterally revising and finalizing the FSR, and now—as the Director's February 2 decision clearly shows—when subsequently reviewing the accuracy of said revisions during dispute resolution.

Throughout dispute resolution, PPG raised objections that USEPA's changes to the FSR were substantively flawed because they ignored relevant Site data showing that historic fill is the source of lead at the Site. In support of this objection, PPG delivered historical site information, results from the remedial investigation, statistical analyses and spatial correlation evaluations of soil and groundwater concentration results. In his decision, the Director erroneously concluded that USEPA had adequately addressed all of PPG's concerns, and that USEPA's revisions to the FSR did not violate the NCP because they adequately considered all relevant site data. [Dispute Decision at 2, 6.] However, the Director's decision itself ignored several key analyses that PPG raised and which specifically refute the very USEPA arguments the Director cited in support of his conclusion. In doing so, the Director's decision reaffirmed what PPG has been saying all along – that USEPA has repeatedly failed to consider all relevant Site data in modifying and finalizing its flawed FSR, and in advancing a rushed PRAP based on that FSR. The relevant technical analyses that the Director failed to acknowledge are as follows:

1) Impervious Materials Prevent COC Infiltration. The USEPA-approved Remedial Investigation Report ("RIR") for the Site established that the majority of the Site was covered by impervious materials. USEPA's dispute resolution submittals disregarded these findings, compelling PPG to provide a detailed analysis of the impervious cover that existed across the vast majority of operational areas at the Site in a November 18, 2020 technical presentation to USEPA. [Nov. 18 Dispute Resolution Technical Meeting Presentation at 8-13; Nov. 18 Dispute Resolution Technical Meeting Tr. at 13:19-18:15.] Impervious materials covered the areas USEPA asserts have lead exceedances attributable to releases. These impervious materials would have prevented the top down infiltration advanced by USEPA's site model, contradicting USEPA's theory that lead released during operations migrated from surface soil down to groundwater. Instead, the presence of impervious surfaces demonstrates that lead found in soil/fill or groundwater in these areas is attributable to historic fill.

During the meeting, USEPA had no substantive response to this information, and did not seem willing to meaningfully engage or consider any of the evidence presented by PPG, going so far as to call it "minimal" despite the substantial amount of evidence presented. [*See* Nov. 18 Dispute Resolution Technical Meeting Tr. at 63:12-63:17 ("[i]t seems like you already had your mind made up . . . you don't want to debate mismatched wells, you don't want to talk about impervious cover, you don't want to talk about the right match to historic fill"); *id.* at 64:16-64:19 ("[the Region is] not engaging in a discussion with PPG at this point, based on *minimal* information you present") (emphasis added).] Likewise, the Director's decision did not address this information *at all*.[3] PPG is only left to

[3] It is not surprising that the Director failed to consider all relevant evidence in making his decision. When providing the dispute resolution record to the Director for consideration, USEPA initially sent an incomplete record on November 19, 2020 that did not include the slide deck for PPG's November 18

conclude that USEPA did not consider this relevant information at any time during its unilateral revisions to the FSR or issuance of the PRAP.

2) **No Drains/Flappers to Release COCs.** In its September 4 Statement of Position, USEPA incorrectly claimed – without citation and based on a single photograph of Building #7 – that drains/flappers in "most" buildings onsite were used as pathways for lead releases to the environment. [USEPA Sept. 4 Dispute Resolution Statement of Position at 9-10 ("most buildings were constructed with drains and wall slots with hinged flappers at floor level to allow discharge of sweepings/floor washings to outside the building").] In its September 17 reply, PPG explained that this directly contradicted the observations in the USEPA-approved RIR. [PPG Sept. 17 Dispute Resolution Reply at 6.] There is not a single observation of any "flappers" in the USEPA-approved RIR, which also confirmed that the buildings at issue did not have drains. [RIR at 2-4 to 2-8; Site RI/FS Work Plan (2017) at 4-22.] The USEPA-approved RIR likewise did not identify a single release of lead-containing materials from these "flappers" or Site operations. In fact, even USEPA's FSR, which reflects unilateral revisions by USEPA to support its flawed CSM, contains ***no mention*** of these flappers. All of the RI/FS findings confirm that there were no such flappers or drains. It was not until USEPA needed to retroactively justify its CSM in dispute resolution that it presented its theory that "flappers" released lead at the Site in an attempt to backfill the record.

   USEPA's November 3 sur-reply persisted in asserting that these flappers were sources of lead releases from operations. [USEPA Nov. 3 Dispute Resolution Sur-Reply at 7 ("[USEPA] developed a CSM that accounts for the release of lead . . . via disposal of . . . waste through the 'hinged flappers'").] PPG definitively disproved this in its November 18 technical presentation to USEPA. PPG demonstrated that, based on the text stamped on the so-called "flappers," these devices were not used to release "lead contamination via disposal of floor sweeping/floor washing waste." [*Id.*] Instead, these devices were used solely to release water in the event of a fire (known as windshield scuppers). [Nov. 18 Dispute Resolution Technical Meeting Presentation at 14-15; Nov. 18 Dispute Resolution Technical Meeting Tr. at 19:12-19:15 ("[t]he device identified by EPA is not a flapper. It is not used for discharge of waste. The identified device is a windshield scupper, a component of standard fire water management systems").] USEPA had no response to this information.[4]

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presentation or the accompanying meeting transcript. On November 20, PPG emailed USEPA with concerns with this piecemeal approach, warning USEPA that it would likely skew the Director's consideration of the technical analyses presented. That the Director completely ignored PPG's analyses from the November 18 presentation all but confirms that PPG's concerns were well-placed.

4 USEPA presented a single photograph of a purported "flapper" at Building #7 in its Statement of Position, then asserted that "[e]levated concentrations of lead (greater than 800 mg/kg) have been detected in soil immediately outside Building #7." [USEPA Sept. 4 Dispute Resolution Statement of Position at 9-10.] Setting aside the fact that this device is not a "flapper" as USEPA asserts, USEPA also did not identify the location of this single flapper, nor did USEPA identify any exceedances near or attributable to this flapper – let alone the purported flappers present in "most" buildings for which USEPA presented zero evidence. [USEPA Sept. 4 Dispute Resolution Statement of Position at 9.] Moreover, to the extent there are lead

This fact refutes USEPA's only concrete suggestion of a pathway between Site operations and the environment with respect to lead. Yet the Director ignored it, and instead repeated USEPA's now-refuted assertions. [Dispute Decision at 2 ("the Region presented historical information that identified . . . the presence of drains/flapper in Site buildings").] Even if such "flappers" existed (and they do not), they would have discharged to areas covered by impervious surfaces, which would have prevented infiltration into Site soil/fill and then groundwater. USEPA has no explanation for how this supposed infiltration, which is critical to USEPA's CSM, FSR and PRAP, could have occurred through these impervious surfaces.

3) Statistical Analyses Regarding Soil/Fill and Groundwater Concentrations Rebut USEPA's CSM. During the November 18 presentation, PPG presented two fault tree analyses indicating that the majority of Site data included in the RIR cannot be explained by USEPA's CSM. [Nov. 18 Dispute Resolution Technical Meeting Tr. at 45:22-52:13.] The first fault tree analysis used a binary, yes-no approach for four different conditions that would need to be present for USEPA's CSM to be correct, concluding that USEPA's CSM only has miniscule 2.3 percent likelihood of being correct. [Nov. 18 Dispute Resolution Technical Meeting Presentation at 55-56; Nov. 18 Dispute Resolution Technical Meeting Tr. at 45:22-48:9 ("the overall CSM has a likelihood of just 2.3 percent of being correct").] The second analysis used linear regressions to determine the likelihood of the top-down infiltration described by USEPA, concluding that USEPA's CSM resulted in a similarly poor fit with the existing Site data. [Nov. 18 Dispute Resolution Technical Meeting Presentation at 57-62; Nov. 18 Dispute Resolution Technical Meeting Tr. at 49:3-51:18.] Additionally, PPG explained that comparisons of the concentrations between the southern and northern portions of the site did not yield statistically significant differences. [Nov. 18 Dispute Resolution Technical Meeting Presentation at 53.] Statistically significant differences would be expected if USEPA's CSM were accurate, as USEPA itself acknowledged that "the shallow groundwater on the northern side of the Site has not been substantially impacted by lead contamination." [Letter from J. Smeraldi (USEPA) to S. Krall (PPG) at 1 (July 14, 2020). PPG's analysis revealed that there is no convincing statistical evidence that the paint manufacturing operations onsite had any effect on surface soil/fill, subsurface soil/fill, or groundwater lead levels onsite. [Nov. 18 Dispute Resolution Technical Meeting Presentation at 40-53; Nov. 18 Dispute Resolution Technical Meeting Tr. at 40:5-45:21.] USEPA has provided no substantive response to these analyses, and the Director failed to acknowledge or mention either of these analyses in his decision.

4) 1D Modeling Demonstrates Remedy Ineffectiveness. PPG used 1D modeling to demonstrate that the pump and treat groundwater remedial alternatives proposed in USEPA's FSR, including the preferred remedial alternative selected in the PRAP, would be ineffective in achieving the goals for the Site. [Nov. 18 Dispute Resolution Technical

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exceedances in areas where flappers are not present, those exceedances are not explained by USEPA's CSM. Instead, such detections are consistent with the presence of historic fill across the Site.

Meeting Presentation at 64-67; Nov. 18 Dispute Resolution Technical Meeting Tr. at 52:15-54:2.] Indeed, using USEPA's ***own*** Kd values in calculations, this analysis showed that USEPA's groundwater alternatives would take over 500 years to possibly achieve the Site's preliminary remediation goals. [*Id.*] The Director made no effort to address this 1D modeling analysis in his response. Instead, the Director simply accepted USEPA's shallow, general defense of its proposed alternatives, stating that "the Region acknowledged that it is aware of the geochemical processes that affect the mobility of metals in the groundwater and the challenges associated with in-situ treatment of lead, and has explained that these processes *will be taken into account in remedy selection for the Site*." [Dispute Decision at 4 (emphasis added).] If the Director was suggesting that the selected remedy would somehow address this material technical issue, the Director is incorrect – USEPA's preferred remedy in the PRAP was selected from USEPA's materially flawed remedies in the FSR, and suffers from the same issues around impracticability. To the extent the Director's decision implies that USEPA could address this issue in the design phase, the Director ignores reality. By USEPA's own admission, the Kd values applicable to the Site mean that pump and treat remedies will not be able to achieve USEPA's preliminary remediation goals for the Site, no matter how the remedy is refined in the remedial design phase. This is a fundamental flaw in USEPA's FSR and PRAP that USEPA made no effort to address, despite PPG repeatedly raising concerns.

5) **Spatial Correlation and Co-located Samples Rebut USEPA's CSM.** In both its dispute resolution submittals and in the November 18 presentation, PPG provided a detailed spatial correlation analysis to rebut USEPA's CSM. PPG's analysis showed that elevated surface soil/fill lead levels onsite do not correspond with elevated groundwater lead levels and that low groundwater lead levels do not correspond with low surface soil/fill levels. [*See* PPG Sept. 17 Dispute Resolution Reply at 9-11; Nov. 18 Dispute Resolution Technical Meeting Presentation at 26-29.] This lack of correlation rebuts USEPA's theory that lead from operational releases had migrated through Site soil and into Site groundwater – if lead was migrating from the surface, data would have shown high surface soil/fill lead levels were correlated with high groundwater lead levels.[5] That is not what the data show. USEPA's response was that such spatial correlation analysis could not be undertaken due to a lack of continuous soil depth profiles in the saturated and unsaturated zones from co-located samples. [*See* Dispute Decision at 3.]

   USEPA and the Director's artificial restriction on how environmental data may be evaluated is illogical and an attempt to sidestep PPG's well-supported technical analyses. Spatial correlation and evaluation of co-located samples is possible without continuous

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5 The Director and USEPA have also failed to address the fact that lead is considered to be nearly immobile under the conditions found at the Site and that migration of the sort presumed by USEPA's top-down model would take thousands of years. This is yet another argument that PPG raised in its September 17 reply and which USEPA has chosen to ignore. Namely, using USEPA's own log K_d value of 3.7, estimated infiltration of lead from a pervious surface due to precipitation is less than a quarter of an inch in 100 years (0.4 cm) and infiltration to a depth of 3 feet would require 25,000 years. [PPG Sept. 17, 2020 Dispute Resolution Reply at 8; Nov. 18 Dispute Resolution Technical Meeting Presentation at 25.]

soil depth profiles, as PPG repeatedly demonstrated. [PPG Sept. 17 Dispute Resolution Reply at 9; Nov. 18 Dispute Resolution Technical Meeting Presentation at 26-29.] The Director made no attempt to address any of these analyses substantively in his decision. More fundamentally, USEPA and the Director's rationale for rejecting PPG's analyses directly contradicts USEPA's CSM because PPG's analyses and USEPA's CSM ***both rely*** on correlation of soil/fill and groundwater lead levels. The Director's decision makes this contradiction plain:

- "Furthermore, the Region stated that ***a spatial correlation between soil/fill and groundwater results*** and a depth profile analysis could only be conducted if the RI had included collection of a continuous soil depth profile in the saturated and unsaturated zone, from a boring located adjacent to or co-located with monitoring wells that were advanced across the Site in a grid. The RI did not include such sampling." [Dispute Decision at 3 (emphasis added).]

- "I find that the Region's determination that ***localized areas of elevated lead concentrations in the soil/fill are correlated with elevated groundwater lead*** and historic Site operations is supported by the data and analyses presented." [Dispute Decision at 3 (emphasis added).]

These two quotes show the arbitrary and capricious nature of USEPA's approach to Site data. When USEPA wanted to find justification for its CSM and proposed remedies, it relied on its conclusion that there was a general correlation between soil/fill and groundwater lead concentrations. But when PPG analyzed the same data set to evaluate USEPA's conclusion, PPG found and presented correlations that contradicted USEPA's views – correlations USEPA disregarded by asserting that Site data does not allow for correlation analysis. In other words, USEPA was allowed to analyze correlations in Site data, but PPG was not. USEPA cannot have it both ways. Either USEPA must consider the correlations presented by PPG (and USEPA did not, as the Director's decision makes clear), or USEPA must admit that the data does not allow for the correlation underpinning USEPA's CSM. USEPA's contradictory approach to Site data reflects the arbitrary and capricious nature of USEPA's revisions to the FSR and issuance of the PRAP.

III. CONCLUSION

The Director's dispute resolution decision confirms that USEPA has failed to account for relevant Site data that refutes USEPA's CSM, despite the NCP's requirements. First, USEPA ignored PPG's various technical objections when it unilaterally modified and finalized the FSR. Now, when given a second chance to consider PPG's key technical analyses, the Director himself has similarly failed to acknowledge the relevant Site data presented during dispute resolution. Accordingly, USEPA's FSR continues to be materially deficient, arbitrary, and

capricious. Likewise, the PRAP that USEPA prepared by using the flawed FSR is arbitrary and capricious.

Sincerely,

Gary P. Gengel, Esq.
of LATHAM & WATKINS LLP

cc: Mr. William Reilly, Esq. (USEPA)
Mr. Scott Krall (PPG)
Mr. Thomas Pearce, Esq. (Latham & Watkins LLP)

To Whom It May Concern,

Thank you for the opportunity to comment on the recommendations provided in the Riverside Superfund Site Proposal.

We would like to acknowledge that the current recommendations from the EPA should be implemented in conjunction with a revitalization/redevelopment plan developed by Al-Munir LLC. This recommendation includes designating two areas within the Riverside Industrial Park as spaces for agricultural production, education, administration, and housing. This additional recommendation will:

1. Support's Mayor Ras Baraka's on-going green infrastructure efforts found in the City of Newark's Newark Forward, Master Plan, and Newark Sustainability Action Plan
2. Allow for innovative mixed-use projects that provide larger access to food production, employment, and collaboration which leads to increased public awareness of environmental stewardship and better visitor experience.
3. Address a range of development and conservation strategies that help protect our natural environment and make our communities more attractive, economically stronger, and more socially diverse.
4. Empower children and adults how to learn about and investigate their environment, and to make intelligent, informed decisions about how they can take care of it.

In summary, this additional recommendation will directly address a multitude of health disparities adversely affecting the Newark community.

Please see below for additional details and pertinent literature.

Sincerely,

Bilal Walker, Masters of Child Policy and Advocacy 2022

Breonna Walker, Masters of Public Administration

Additional details:

Newark, New Jersey is a city populated almost entirely by 280,000 Black and Brown people burdened with an array of socioeconomic and environmental challenges, with 70 percent of the city composed of impervious surface that contributes to stormwater runoff. Due to poverty, many residents cannot afford basic necessities and lack access to nutritional products. As a major transit hub and port city, studies have revealed that less than 1/5 of Newark children meet recommendations for daily vegetable intake. “The lack of access to fresh, healthy food turns neighborhoods in urban cities into what is termed “food deserts,” a predominant issue in minority and low-income urban neighborhoods.” - Newark Science and Sustainability

In the United States, the EPA estimates that more food reaches landfills and incinerators than any other single material in our everyday trash, equating to about 21 percent of the waste stream. Reducing food waste will help the United States (U.S.) address climate change, as 20 percent of the total U.S. methane emissions come from landfills. By acquiring two of the vacant properties at Riverside Industrial Park the recommendation will provide organic locally grown food in our communities and out of our landfills, we can help address the 42 million Americans that live in food-insecure households. The lack of quality food access has directly contributed to disproportionate health disparities amongst Newark citizens that have only been heightened by the COVID19 virus.

Al-Munir LLC was founded by Bilal Walker in 2016 and is a New Jersey-based boutique education consulting company that specializes in providing children's programming, youth initiatives, creative placemaking, marketing, and educational services to grassroots organizations like non-profits and schools.

Jannah on Grafton initiative focuses: *Revitalization, Collaboration, Safety, and Volunteerism*

Through vacant lot activation, Al-Munir LLC to build a stronger, sustainable, and more self-reliant lower Grafton Avenue community.
References: Newark Forward, City of Newark Master Plan, the City of Newark, Sustainability Action Plan

Year 1 Goals

- Secure yearly sponsorships to satisfy $10,000 yearly operating budget
- Rehabilitate Lot 50 into a place suitable for urban gardening and access Grafton Avenue's perception of their community through focus groups and surveys
- Expand access to healthy food options to 20 North Ward residents through urban gardening
- Track the closure of the food disparity gap, amongst our sponsored cohort, through focus groups and seminars
- Partner with La Casa De Don Pedro to facilitate three workshops per quarter for North Ward residents
- Host three food giveaways per quarter for North Ward residents

Year 2 Goals

- Strengthen relationships with previous sponsors
- Continued rehabilitation of Lot 50 into a place suitable for urban gardening and access Grafton Avenue's perception of their community through focus groups and surveys
- Reaccess community perceptions of the lower Grafton Avenue community through focus groups and surveys
- Continued expansion access to healthy food options to 20 North Ward residents through urban gardening
- Reassess the closure of the food disparity gap, amongst our sponsored cohort, through focus groups and seminars
- Partner with La Casa De Don Pedro to facilitate five workshops per quarter for North Ward residents
- Host five food giveaways per quarter for North Ward residents

Clients of Al Munir LLC and our accomplishments

KIPP NJ: 2016 - 2019
Founded and developed two culturally relevant enrichment programs for KIPP NJ
Raised over $20,000 for operations

American Lung Association: 2019-2020
Founded Newark's 1st Asthma Awareness Day
Assisted the Newark Trust for Education in developing asthma training and policies for Newark Public Schools
Referenced in Corey Booker's Clean Air Sharp Minds Act

Partners
Table to Table
Skopos Hospitality Group
New Jersey Children's Foundation
La Casa De Don Pedro
Anibal Ramos Civic Association
Newark Science and Sustainability

Media publications

1. TEAM Academy club prepares Newark students for their futures
2. Catching our Breath walk dedicated to 13-year-old who died from asthma attack
3. 'It's killing children and no one is talking about it': Asthma is taking a steep toll on Newark's students and their schools
4. This Newark Couple is Transforming a Vacant Lot into a Community Garden
5. Newark Educators Transform Vacant Lot Into An Urban Garden