RECORD OF DECISION

Matlack, Inc., Superfund Site
Woolwich Township, Gloucester County, New Jersey

United States Environmental Protection Agency
Region 2
New York, New York
September 2017

DECLARATION STATEMENT
RECORD OF DECISION

SITE NAME AND LOCATION

Matlack, Inc., Superfund Site
Woolwich Township, Gloucester County, New Jersey

EPA Superfund Site Identification Number NJD043584101

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy to remediate contaminated soil, groundwater, seep water, surface water and sediment associated with the Matlack, Inc., Superfund Site located in Woolwich Township, Gloucester County, New Jersey (the Site), which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §§ 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy. The Administrative Record Index (see Appendix 3) 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 on the proposed remedy in accordance with CERCLA Section 121(f), 42 U.S.C § 9621(f), and concurs with the selected remedy (see Appendix 4).

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy described in this document addresses the entire Site and is the first and only planned remedial phase or operable unit for the Site. The selected remedy addresses contaminated soil, groundwater, seep water, surface water and sediment. The major components of the remedy selected for the Site include the following:

- Installation of two permeable reactive barriers (PRBs) to provide passive treatment of aromatic and chlorinated volatile organic compounds (VOCs) and the semi-volatile organic compound (SVOC) 4-chloroanaline in groundwater;
- Excavation and off-site disposal of contaminated soil and sediment which acts as a source of further contamination to groundwater, seep water, surface water and sediment;

- Long-term monitoring to assure the effectiveness of the remedy over time; and
- Institutional controls until remedial action objectives (RAOs) are met, which may include establishment of a New Jersey Ground Water Classification Exception Area that restricts the use of the contaminated aquifer, along with deed notices that restrict development of the affected areas until the RAOs are met.

By remediating the groundwater and removing ongoing sources of contamination, the remedy also addresses contamination resulting from the discharge of groundwater to seeps, which has impacted seep water, surface water and sediment. In addition, by remediating the groundwater, potential future risks associated with inhalation of indoor air through vapor intrusion if a building or structure were to be built over the contaminated plumes will be addressed.

A pre-design investigation (PDI) will be needed to determine the horizontal and vertical extent of aromatic and chlorinated VOC impacts in soil, sediment and groundwater. Sampling will be conducted to the clay layer, and if additional soil and/or sediment excavation beyond that anticipated is needed, it will be conducted, as appropriate. In addition, while not anticipated based on the existing data, if dense non-aqueous phase liquid is found, it would be addressed in a future decision document. Furthermore, while not anticipated, reactive material within the PRB may need to be replaced after a period of time to fully remediate the groundwater. For purposes of costing, replacement of the PRB material is included five years after installation of the initial wall, and then, as a contingency, a second replacement is included 10 years after initial installation.

These actions are considered the final remedy for the Site. The estimated present-worth cost of the selected remedy is $4,020,000.

The environmental benefits of the selected remedy may be enhanced by consideration, during remedy design or implementation, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. § 9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatments (or resource recovery) technologies to the maximum extent practicable.

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on Site above levels that allow for unlimited use and unrestricted exposure, but it will take more than five years to attain the remediation goals, EPA will conduct a review within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the attached Decision Summary and the Administrative Record file for this Site.

- Chemicals of concern and their respective concentrations may be found in the "Results of Remedial Investigation" section.
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater are discussed in the "Current and Potential Future Site and Resource Uses" section.
- Baseline risks represented by the chemicals of concern may be found in the "Summary of Site Risks" section.
- Cleanup levels established for chemicals of concern and the basis for these levels may be found in the "Remedial Action Objectives" section.
- A discussion of principal threat waste may be found in the "Principal Threat Waste" section.
- Estimated capital, annual operation and maintenance, and total present-worth costs are discussed in the "Description of Remedial Alternatives" section.
- Key factors used in selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) may be found in the "Selected Remedy" and "Statutory Determinations" sections.

AUTHORIZING SIGNATURE

A. Carpenter

Angela Carpenter, Acting Director
Emergency & Remedial Response Division

9.29.17
Date

DECISION SUMMARY
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Woolwich Township, Gloucester County, New Jersey

United States Environmental Protection Agency
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New York, New York
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APPENDICES

SITE NAME AND LOCATION

The Matlack, Inc., Site (Matlack, or the Site), U.S. Environmental Protection Agency (EPA) Superfund Site Identification Number NJD043584101, is located along Route 322 East in Woolwich Township, Gloucester County, New Jersey (see Appendix 1, Figure 1). The selected remedy described herein addresses the entire Site and is the first and only planned remedial phase or operable unit for the Site. The selected remedy addresses contaminated soil, groundwater, seep water and sediment.

EPA is the lead agency and the New Jersey Department of Environmental Protection (NJDEP) is the support agency.

SITE DESCRIPTION AND HISTORY

The Site is bounded by Route 322 to the north, by woodlands to the east and west, and by a field leading down to Raccoon Creek to the south. Grand Sprute Run, about 600 feet west of former Matlack, Inc., property's western boundary, drains into Raccoon Creek. The Site includes Matlack, Inc.'s former Swedesboro Terminal that occupied the northern portion of a 72-acre parcel, as well as a portion of a parcel located immediately west and down-gradient of the former terminal.

A one-story building (formerly known as the terminal building with an attached tank-cleaning facility), is located in the northeast quadrant of the Site, and is surrounded on the north, east, and west by a paved parking lot and driveway. A former wastewater lagoon is located south of the former terminal building, and is presently in a field with various shrubs. The land use surrounding the Site is mixed use consisting of agricultural, commercial and residential. Matlack, Inc., transported chemicals, petrochemicals, and food-grade liquid in bulk using tank trailers (tankers) from 1962 until 2001. In 2001, the company submitted a petition for Chapter 11 bankruptcy and ceased operations.

The primary source of waste generation at the Site was the cleaning of tankers that had previously held a variety of substances including petroleum products, xylenes, benzene, toluene, glycol, styrene, wax, alum, resins, acids, naphthalene, various organic solvents, flammable substances, coal tar, and hazardous wastes.

From 1962 until 1976, Matlack, Inc., discharged the wastewater into an unlined surface impoundment (lagoon) located southwest of the terminal building. The lagoon and Site layout are shown on Appendix 1, Figure 2. After discontinuing the use of the surface impoundment in 1976, Matlack, Inc., began collecting its wastewater in multiple open-top, in-ground concrete tanks for temporary storage.

During the operating period, approximately 16 to 20 tank trailers per day were cleaned at the Swedesboro Terminal. Matlack, Inc., used various solvents, including tetrachloroethylene (PCE), methylene chloride, toluene, trichloroethylene (TCE), acetone, methanol, and ethanol, to

clean the tankers. The tanker cleaning operations generated from 5,000 to 15,000 gallons of wastewater per day, which was hauled off-site for treatment and disposal.
Matlack, Inc., discontinued tanker cleaning operations at the Site in November 1997, but continued to service and store its vehicles at the Swedesboro Terminal. The Site is currently operated by Liberty Kenworth, a medium and heavy duty truck sales and service center.

COMMUNITY PARTICIPATION

EPA has worked closely with local residents, public officials and other interested members of the community since it became involved with the Site in 2012. The Proposed Plan for the Site was released for public comment on August 23, 2017. The Proposed Plan and other Site-related documents were made available to the public in the administrative record file maintained by the Director for Community Affairs for the Township of Woolwich, 120 Village Green Drive, Woolwich Township, New Jersey, and at the EPA Region 2 Superfund Records Center located at 290 Broadway, New York, New York (see Appendix 3). The administrative record file is also available online at http://www.epa/gov/superfund/matlack.

The notice of availability of these documents was published in the *Star-Ledger* newspaper on August 23, 2017. The public comment period lasted 30 days and closed on September 22, 2017.

A public meeting was held on September 14, 2017, at the Woolwich Township Municipal Courtroom, 120 Village Green Drive, Woolwich, New Jersey, to discuss the findings of the Remedial Investigation (RI) and the Feasibility Study (FS) and to present EPA’s plan to the community. At this meeting, EPA representatives answered questions about the RI/FS and the remedial alternatives. Comments that were received by EPA at the public meeting and in writing during the public comment period are addressed in the Responsiveness Summary (see Appendix 5).

SCOPE AND ROLE OF RESPONSE ACTION

The Site is being addressed in its entirety as a single operable unit. The RI/FS was conducted for all contaminants, environmental media, and exposure pathways of concern. The selected remedy addresses contaminated soil, groundwater, seep water, surface water and sediment.

PRELIMINARY INVESTIGATIONS AND EARLY RESPONSE ACTIONS

NJDEP began investigating potential groundwater contamination at the Site in December 1982 in response to potable water well contamination in the area surrounding the facility. Investigations included sampling of groundwater, soil, surface water and sediment associated with identified areas of concern.

In May 1987, NJDEP and Matlack, Inc., entered into an Administrative Consent Order (ACO). Between 1990 and 2001, Matlack, Inc., conducted a two-phased investigation and remedial/removal actions to address source areas identified from previous investigations. One such action included installation of a groundwater treatment system that consisted of extraction wells, an infiltration trench and an aeration system to address groundwater contamination. This system operated from November 1995 to May 1997, and then again from June 2006 through 2011, under NJDEP operation. Additional actions included the removal of aboveground and underground storage tanks (ASTs and USTs) used for waste and petroleum, and the excavation and off-site disposal of contaminated soil.

NJDEP conducted additional investigation and sampling activities between 2002 and 2009. In September 2011, at the request of EPA, it completed a Site Reassessment (NJDEP 2011) to determine whether additional actions were necessary under CERCLA. The reassessment concluded that sources requiring further action under CERCLA were still present at the Site. EPA began Site assessment activities at the Site in 2012 and the Site was placed on the National Priorities List in 2013.

RESULTS OF THE REMEDIAL INVESTIGATION

RI activities were conducted by EPA in three phases: Phase 1 was conducted during July 2015, Phase 2 was conducted during March, April, and May 2016, and Phase 3 was conducted during July and August 2016. RI activities involved sampling surface water, seeps, sediment, soil, and existing and newly installed groundwater monitoring wells to further characterize the nature and extent of contamination.

Geology and Hydrogeology

Gloucester County is located within the Atlantic Coastal Plain physiographic province and is underlain by a wedge of unconsolidated sedimentary deposits that are Cretaceous to Recent in age. These deposits dip to the southeast and lie unconformably on bedrock. The unconsolidated sedimentary deposits consist of clay, silt, sand, and gravel of both marine and non-marine origin. In descending order, the stratigraphic units in the vicinity of the Matlack Site are the Pennsauken Formation, the Woodbury Clay, the Merchantville Formation, and the undifferentiated Magothy-Raritan Formations.

The Pennsauken Formation is a glacial terrace deposit of Pleistocene age and consists of a medium to coarse grained quartzose sand, with some gravel and clay. In some localized areas, the sands and gravels are indurated by ferruginous cement to form "ironstone." The formation can obtain a thickness of as much as 33 feet in the vicinity of the terminal. Underlying the Pennsauken Formation in the vicinity of the terminal is the Woodbury Clay of Cretaceous age. The Woodbury Clay generally consists of a dark blue to black blocky clay with occasional thin white sand streaks and late Cretaceous fossils of marine origin. The formation dips between 38 and 44 feet per mile to the southeast, and ranges in thickness from a few feet at the outcrop area to 80 feet elsewhere in Gloucester County, with an average thickness of about 50 feet. Underlying the Woodbury Clay, within the study area, is the Cretaceous Merchantville Formation. This formation consists of green to black glauconitic and micaceous silt and clay or quartzose or glauconitic sandy clay. In general, the formation dips to the southeast at about 43 feet per mile, and ranges in thickness from 45 to 70 feet, with an average thickness of between

50 and 60 feet. In Site borings advanced during prior investigations, the combined Woodbury Merchantville silt and clay ranged from 54 feet to 62 feet in thickness.

The Merchantville Formation overlies the Potomac-Raritan-Magothy Formations. The Raritan Formation consists of light-colored quartzose sand, clay, and some gravel, while the Magothy Formation is composed of beds of dark gray or black clay, commonly lignitic, alternating with white, micaceous, fine sand. The combined thickness of the two formations may be as much as 500 feet within Gloucester County. The Magothy Formation dips to the southeast towards the Atlantic Ocean at a rate of about 40 to 45 feet per mile, while the basal unit of the Raritan Formation dips about 60 feet or more per mile.

Grand Sprute Run, located approximately 600 feet west of the of the western boundary of the former Matlack, Inc., property, has incised through the Pennsauken Formation and is flowing on top of the Woodbury Clay. All of the groundwater in the Pennsauken Formation is therefore intercepted by Grand Sprute Run. The stream is approximately 1.25 miles long and discharges into Raccoon Creek. The lower third of the stream is mainly swamp, with negligible flow and many small, interconnected branches. The stream meanders greatly throughout its entire length, splitting and rejoining numerous times. The bottom is sandy to gravelly, with pockets of extremely soft mud and decaying organic debris away from the main channels. The total stream gradient is approximately 20 feet per mile, although most of this relief occurs in the upper half.

Measurements collected during Matlack, Inc.'s 1990 investigation indicated a maximum velocity of 0.22 to 0.76 feet per second. Channel depth ranges from a few inches to nearly 3 feet, while channel width varies from 2 feet to 10 feet or more. Much of the flow through the channel depends on the amount of organic debris, most notably fallen trees and branches, which block the channel and dams up the water behind it.

Site Characterization Summary and Results

Work conducted during the RI included the installation of soil borings and monitoring wells; the collection of groundwater samples from new and existing monitoring wells; and the collection of surface water samples, seep samples, and sediment samples from Grand Sprute Run. A well condition survey and land surveys (topographic and well/piezometer horizontal and vertical locations) were undertaken in support of the field investigation activities

<u>Soil</u>

Surface soil samples were collected to a depth of 0 to 2 feet below the ground surface. No VOCs were detected at concentrations above New Jersey Residential Direct Contact Soil Remediation Standards (NJRDCSRS). Semi-volatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs) were identified at concentrations slightly above the NJRDCSRS at isolated locations within the former lagoon area. Specifically, elevated concentrations were found at Soil Borings SB-4, SB-5 and B-16 (See Appendix 1, Figure 3).

The results of subsurface soil sampling (depth greater than 2 feet) indicated that the SVOCs benzyl butyl phthalate, bis(2-ethylhexyl) phthalate and napthalene were present in subsurface soil at concentrations above New Jersey Impact to Groundwater Soil Screening Levels (NJIGWSSL), based on sampling conducted during 2016.

The VOCs benzene, PCE, TCE, and total xylenes were identified during 2016 sampling at numerous locations at concentrations above the NJIGWSSL. Benzene, PCE, TCE and total xylenes were also identified during 2014 sampling at two locations at concentrations above IGWSSL. The SVOCs benzyl butyl phthalate, bis(2-ethylhexyl) phthalate, di-n-octylphthalate and naphthalene were also identified at concentrations above IGWSSL during 2014 at the same two locations.

Groundwater

The groundwater sampling locations for the RI are shown on Appendix 1, Figure 3. Results of groundwater sampling conducted at the Site indicate that impacts to groundwater from VOCs extend from the former lagoon area downgradient to monitoring wells MW-25, MW-26, and MW-27, located just east of Grand Sprute Run. To better evaluate the lateral extent of groundwater impacts, VOCs were grouped into those constituents primarily associated with potential impacts associated with petroleum hydrocarbon-related aromatic VOCs (such as benzene, toluene, ethylbenzene and xylene, commonly referred to as BTEX compounds) and those primarily associated with chlorinated VOCs (such as PCE, TCE, *cis*-1,2-dichlorethene, 1,1-dichloroethance, 1,2-dichloroethane and vinyl chloride).

The upgradient boundary of impacted groundwater is in the vicinity of monitoring well MW-06, with impacted groundwater generally following two paths downgradient to Grand Sprute Run. BTEX compounds, potentially present due to releases of diesel fuel-related compounds, generally flow to the west/northwest, beginning at MW-06 and travelling downgradient to monitoring wells PZ-01, MW-13, and MW-25. The highest concentration of total BTEX compounds was detected in the most downgradient well, which would indicate that the center of the impacted groundwater plume is now moving downgradient toward its discharge point in Grand Sprute Run.

Chlorinated VOCs were also identified in monitoring well MW-06 but generally flow in a more westerly direction, as defined by detections in monitoring wells PZ-02, MW-24, and MW-26. The highest concentration of chlorinated compounds was identified in monitoring well MW-24, which would indicate that the center of impacted groundwater for this plume is also moving toward its discharge point in Grand Sprute Run.

Vinyl chloride was also detected in monitoring wells MW-06, MW-13, MW-17, and MW-25 at concentrations both below and above relevant standards. The presence of this compound in monitoring wells where BTEX compounds have been identified is an indication that co-metabolic processes may be degrading chlorinated organics in the presence of the aromatic volatile organics where the two plumes overlap. The highest concentrations of chlorinated volatile organics (1,800 μg/l) were reported in monitoring well MW-24, with elevated concentrations extending to monitoring well MW-26 adjacent to Grand Sprute Run.

The exception to this pattern is methylene chloride, a chlorinated VOC, which was identified in monitoring well MW-06, but also identified in monitoring wells MW-13 and MW-25, which are otherwise associated with the BTEX plume. Since methylene chloride results obtained during the first round of sampling were not replicated during the second round of sampling, it is possible that this result is reflective of laboratory contamination rather than related to Site conditions.

VOCs were not detected in deep monitoring wells MW-01B, MW-02B, and MW-07B, which is an indication that the Woodbury Clay is serving as an effective barrier to the downward migration of VOC-impacted groundwater, with impacts isolated to the shallow Pennsauken Formation.

SVOC impacts were more limited in nature than those for VOCs, with 4-chloroanaline being the only SVOC that was identified within a particular pattern at the Site. The plume of groundwater impacted by 4-chloroanaline is narrow, being detected only in monitoring wells MW-06, MW-13 and MW-25 at elevated concentrations. The highest concentration of 4-chloroanaline was identified in the most upgradient well (MW-06), with decreasing concentrations observed within downgradient monitoring wells MW-13 and MW-25. The high concentration of 4-chloroanaline detected at monitoring well MW-06 supports the assumption that any source area remaining for groundwater impacts is located in the vicinity of this well. The SVOC 1,4-dioxane was also identified in groundwater across the Site but it does not appear to be Site-related. Unlike the VOCs or other SVOCs, 1,4-dioxane was identified in both shallow and two of three deep groundwater monitoring wells (MW-01B and MW-02B).

Impacts from inorganics appeared to be widespread at the Site, with Aluminum, arsenic, iron, and manganese being detected in a majority of the wells at concentrations above New Jersey groundwater quality standards (NJ GWQSs). These metals were also identified in each of the deep wells (MW-01B, MW-02B, and MW-07B) and in upgradient wells MW-01, MW-04, MW-10, MW-18, MW-22, and L-01 at concentrations close to or above their respective NJ GWQS, which is indicative of an upgradient off-site source or local background rather than an on-site source.

In summary, the results of groundwater sampling indicated that volatile and semi-volatile organic compounds are present in two distinct plumes at elevated concentrations. These plumes are shown as Group 1 (BTEX compounds) and Group 2 (chlorinated VOCs plus 4-chloroanaline) on Appendix 1, Figure 4.

Surface Water/Seep Sediment

The results of surface water sampling conducted during the 2016 RI indicate that chlorinated VOCs were identified in seep sampling location SW-03, which is located directly downgradient from monitoring wells MW-24 and MW-26. Chlorinated VOCs were also identified in nearby surface water samples SW-09, SW-10, and SW-11, obtained from within Grand Sprute Run. The highest concentration of chlorinated VOCs at the Site was identified in monitoring well MW-26; the presence of chlorinated VOCs in both seep and surface water samples downgradient from monitoring wells MW-24 and MW-26 is an indication that impacted groundwater from the Site is discharging to Grand Sprute Run.

The results of sediment sampling indicate that several chlorinated VOCs were identified at elevated concentrations in surface water and sediment samples located downgradient from the Site (primarily at seep sample location SW-03 and sediment sample location SED-3). The identification of chlorinated VOCs in downgradient sediment samples further supports the conclusion that a completed pathway exists for migration of these compounds from the Site to Grand Sprute Run.

SVOCs and inorganics were also identified in several sediment samples. However, these contaminants were not considered to be Site-related.

Contaminants Fate and Transport Summary

Site-related contaminants include VOCs and the SVOC 4-chloroanaline. These contaminants have been discharged at the ground surface and within the unsaturated zone soils through direct discharge, or through releases occurring from underground storage tanks and/or fuel transfer lines. Releases to vadose zone soils have migrated to the shallow, unconfined aquifer beneath the Site, and migrated through advection with the groundwater to its discharge point within Grand Sprute Run, located approximately 600 feet to the west of the Site. Groundwater samples collected from wells completed within the deeper aquifer below the Woodbury Clay did not indicate that COPCs identified within the shallow, unconfined aquifer had migrated vertically to the deeper aquifer.

Contamination present in surface soil, subsurface soil and sediment is providing an ongoing source of groundwater, seep water, surface water and sediment contamination.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Land Uses

The former Matlack, Inc., property is situated in a semi-rural area of Woolwich Township, New Jersey, with farmland located on the neighboring properties and residential and commercial uses on Route 322, approximately 800 feet from contaminated areas. The Liberty Kenworth facility occupies the majority of the former Matlack, Inc., property, though it is separated from the former lagoon by a fence. Farming and agriculture are a significant land use within the general vicinity. EPA expects that the land-use pattern at and surrounding the Site will not change.

Groundwater and Surface Water Use

Aquifers beneath the site serve as sources of drinking water for the area. Residential drinking water wells are in use within a quarter mile of the Site; however, as discussed below, the groundwater problems identified at the Site only affect the shallowest groundwater unit and not deeper units used for potable water. The direction of groundwater flow in the area is to the west-northwest toward Grand Sprute Run. Given its location, Grand Sprute Run is accessible for recreational uses.

SUMMARY OF SITE RISKS

As part of the RI/FS for the Site, a baseline risk assessment was conducted 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 if no actions or controls to mitigate such releases are taken, under current and future land and groundwater uses. The baseline risk assessment includes a human health risk assessment (HHRA) and a screening-level ecological risk assessment. 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 risk document summarizes the results of the baseline risk assessment for the Site.

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 (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 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 benchmark levels, defined by the NCP as an excess lifetime cancer risk greater than 1 x 10^{-6} to 1 x 10^{-4} (also commonly expressed as: 1E-06 to 1E-04) or a noncancer Hazard Index (HI) 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 COPCs in each medium were identified based on such factors as toxicity, frequency of detection, fate and transport of the contaminants in the environment, concentration, mobility, persistence and bioaccumulation.

The HHRA characterized the risk to human health from exposure to groundwater, soil, seep water, seep sediment and surface water at the Site. The COPCs were determined for each medium by comparing the available Site analytical data to appropriate risked-based screening criteria. As a result, 47 chemicals, including VOCs, SVOCs, pesticides, PCBs and inorganics, were retained as COPCs to be carried through to the remainder of the HHRA.

Only the COCs, or those chemicals requiring a response, are listed in Appendix 2, Table 1. However, a full list of all COPCs identified in the HHRA (which can be found in the *Final RI Appendix M: Human Health Risk Assessment Report*, dated July 20, 2017), is available in the administrative record for the Site.

Exposure Assessment

Consistent with Superfund guidance and policy, the HHRA is a baseline human health risk assessment and therefore assumes no remediation or institutional nor engineering controls to mitigate or remove hazardous substance releases are in place. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future land use conditions at the Site. The RME is defined as the greatest exposure that is reasonably expected to occur at a site.

The identification and selection of potential receptor populations was based on both current and potential future land uses of the Site. The Site is located within a portion of Woolwich Township zoned as RC-1 (Regional Center), and is currently being used as a medium and heavy truck sales and service facility operated by Liberty Kenworth. The land use surrounding the Site is mixed, consisting of agricultural, commercial and residential uses. As such, the following receptor populations were evaluated in the HHRA: future on-site worker, future on-site construction worker, future on-site resident (child and adult), current/future off-site resident (adult and child) and a current/future off-site recreator (adult and child).

The potential exposure pathways considered in the HHRA included inhalation of soil particulates and vapors; incidental ingestion of and dermal contact with soil particulates; groundwater ingestion, dermal contact and inhalation of groundwater; and incidental ingestion and dermal contact with seep water and sediment, along with surface water. In addition, for overall completeness, a screening evaluation was conducted to determine if the potential for vapor intrusion (VI) into indoor air from subsurface vapor sources exists. The VI screening evaluation consisted of comparing the maximum groundwater concentration of COPCs to both residential and commercial based Vapor Intrusion Screening Levels (VISLs) through the use of EPA's VISL Calculator.

A summary of all the exposure pathways considered in the HHRA can be found in Appendix 2, Table 2. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration (EPC) in each media of interest, which is usually an upper-bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. A summary of the exposure point concentrations for in each medium can be found in Appendix 2, Table 1. A comprehensive list of exposure point concentrations for all COPCs evaluated in the HHRA can be found in the Table 3 series of the HHRA document (HDR, 2017).

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 were 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 carcinogenic risks and noncancer hazards due to exposure to site chemicals are considered separately. In addition, consistent with current EPA policy, it was assumed that the toxic effects of site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the HHRA were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA guidance (http://www.epa.gov/oswer/riskassessment/pdf/tier3-toxicityvalue-whitepaper.pdf). This information is presented in Appendix 2, Table 3 (“Noncancer Toxicity Data Summary”) and Table 4 (“Cancer Toxicity Data Summary”). Additional toxicity information for all COPCs is presented in the HHRA for the Site.

Risk Characterization

This step summarized and combined outputs of the exposure and toxicity assessments to provide a quantitative assessment of Site risks. Exposures were evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards.

Noncarcinogenic risks were assessed using a hazard index (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 for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The key concept for a noncancer HI is that a “threshold level” (measured as an 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 the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as 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).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1 indicates that the potential exists for noncarcinogenic 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 population exceeds 1, separate HI values are then calculated for those chemicals which are known to act on the same target organ or effect. These discrete HI values are then compared to the threshold limit of 1 to evaluate the potential for noncancer health effects on a specific target organ or effect. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. A summary of the noncarcinogenic risks associated with these chemicals for each exposure pathway is contained in Appendix 2, Table 5.

As summarized in Appendix 2, Table 5, the noncancer hazard estimates exceeded EPA's threshold value of 1 for the future on-site construction worker, future on-site child resident, future on-site adult resident and a current/future off-site child recreator. The total HI for the construction worker of 25, was primarily attributable to PCE, TCE, biphenyl and naphthalene in groundwater. The HI for an on-site child and adult resident were 59 and 46 respectively; exposure to PCE, TCE and 4-chloroaniline in groundwater drove the majority of the hazard exceedance. As for the child recreator, exposure to tetrachloroethylene, trichloroethylene and manganese in seeps was associated with a hazard index of 2. However, since manganese, a metal, is not considered to be Site-related, it was not retained as a COC.

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 IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unit-less probability (1×10^{-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 risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that 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 Superfund guidance identify the threshold for determining whether a remedial action is necessary as being an individual lifetime excess cancer risk in exceedance 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.

As summarized in Appendix 2, Table 6, results of the baseline HHRA indicated the total cancer risk estimate of 4.4×10^{-3} for the future on-site resident (child and adult) exceeded EPA's threshold criteria. Ethylbenzene, vinyl chloride and 4-chloraniline in groundwater were the primary COCs.

The potential for subsurface vapor intrusion (VI) into indoor air is evaluated when Site soils and/or groundwater are known or suspected to contain chemicals that are considered to be volatile. A comparison of maximum detected concentrations of volatile chemicals found in Site-wide groundwater to EPA's chemical-specific, risk-based groundwater vapor intrusion screening levels (VISL) was conducted as part of the HHRA. The VISLs provide groundwater levels associated with an indoor air concentration that represents a cancer risk ranging from 1×10^{-4} and 1×10^{-6} or a noncancer hazard quotient of 1. Concentrations exceeding these screening values indicate the potential for vapor intrusion exists. Results of the screening evaluation identified the following 9 chemicals at concentrations greater than residential and commercial VISLs: 1,2-dichloroethane, 1,4-dichlorobenzene, benzene, ethylbenzene, PCE, TCE, vinyl chloride, naphthalene and cyanide. Based on the results of the screening evaluation, the potential for vapor intrusion exists in the future timeframe if buildings were to be constructed overlying the plume. In summary, results of the HHRA for the Matlack Site found that exposure to VOCs and SVOCs in groundwater beneath the Site were associated with cancer and noncancer risk estimates that exceeded EPA's threshold criteria. The presence of volatile COCs were also found at levels that could be of concern for the future VI pathway. Furthermore, exposure to PCE, TCE and manganese present in seep water samples collected from Grand Sprute Run was associated with a noncancer hazard that slightly exceeded EPA's hazard index of 1 for the child recreator. However, as is noted above, manganese is not considered to be Site-related, and is therefore not retained as a COC.

Uncertainties

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

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data.

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.

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

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. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

A noteworthy source of uncertainty in the HHRA conducted for the Site deals with the fact that speciation data of total chromium into hexavalent and trivalent forms were not conducted as part of the RI sampling. Total chromium was identified as a COPC for soils, groundwater, seep sediment and surface water at the Site. To provide a conservative (*i.e.*, health-protective) assessment of potential risk, the more conservative hexavalent toxicity values were used for evaluation of risk and hazard stemming from exposure to total chromium in this HHRA. The risk characterization indicated that total chromium concentrations detected at the Site, while varying by media, result in cancer risks that were within EPA's risk range of 10^{-6} to 10^{-4}. Use of the hexavalent chromium cancer toxicity values for total chromium may not accurately reflect the dominant form of chromium species in the environment and therefore likely results in the overestimation of the cancer risks in Site media.

More detailed information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the comprehensive human health risk assessment report for the Site.

Ecological Risk Assessment Summary

A Screening Level Ecological Risk Assessment (SLERA) was conducted that focused on evaluating the potential for impacts to sensitive ecological receptors to Site-related constituents of concern through exposure to surface soil, surface water, sediment, and seep surface water and sediment. Compounds detected in these media were compared to ecological screening values to determine the potential for adverse effects to ecological receptors. A complete summary of the all exposure scenarios can be found in the Screening Level Ecological Risk Assessment in the administrative record.

The SLERA evaluated risk to ecological receptors using two different analyses, a standard SLERA evaluation and a refined SLERA evaluation that included less stringent assumptions and parameters. The initial evaluation used the maximum concentration of all detected compounds and the evaluation indicated that there is a potential ecological risk in surface soil, seep water, seep sediment and surface water of Grand Sprute Run due to exposure to VOCs, SVOCs and metals. Fifty-nine compounds were identified as COPCs in the initial SLERA evaluation. The SVOCs and metals were detected throughout the Site, while VOCs were associated with groundwater discharges originating from groundwater under the former lagoon that migrated to seeps and surface water through seep sediment. The historical description of activities that occurred at the Site indicate the discharge of VOCs into the former lagoon and soil resulted in contaminated groundwater, which then flowed towards Grand Sprute Run.

The second evaluation, identified as Step 3A, evaluated risks to ecological receptors exposed to the 95% upper-confidence limit (UCL) concentrations of COPCs as well as other refinements, such as compounds being associated with former Site activities (*i.e.*, Site-related compounds). The refined evaluation reduced the COPC list from 59 COPCs to 30. This analysis also resulted in a finding of unacceptable risk for ecological receptors exposed to VOCs in surface soil, seep water, seep sediment and surface water. This indicates that a remedial action is needed to address the presence of contamination in surface soil, seep water, seep sediment and surface water to prevent or eliminate exposure to ecological receptors.

Although SLERAs that identify unacceptable risk usually proceed to a BERA, where additional data and revised toxicity values are used to further evaluate the potential for ecological impacts, it is evident from the results of this SLERA, combined with the fate and transport of the groundwater, that the primary ecological issue is groundwater contamination discharging to the seeps and creek. The SLERA evaluations also identified impacts from surface soils, mainly from inorganic compounds. Given that the proposed remedial alternatives will address the soil in the former lagoon area, as well as the contaminated groundwater discharge to the seeps and creek, no additional ecological investigation is needed since the completed ecological exposure pathways will be eliminated with the implementation of the remedial actions.

Basis for Taking Action

Based on the results of the quantitative human health and ecological risk assessments, EPA has determined that actual or threatened releases of hazardous substances at and from the Site, if not addressed by the response action selected in this ROD, may present a current or potential threat to human health and the environment.

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) guidance, and site-specific risk-based levels and background (*i.e.*, reference area) concentrations.

The following RAOs were established for the Site:

- Control or remove source areas to prevent or minimize further impacts to groundwater, seep water, surface water and sediment.

- Prevent current and potential future unacceptable risks to human receptors through ingestion, dermal contact with and inhalation of contaminated groundwater.

- Prevent potential future unacceptable inhalation risks to human receptors through subsurface vapor intrusion into indoor air.

- Restore groundwater to its expected beneficial use to the extent practicable by reducing contaminant concentrations below the more stringent of federal maximum contaminant levels (MCLs), state MCLs and NJ GWQS.

- Prevent or minimize current and potential future unacceptable risks to ecological receptors through direct contact with or ingestion of contaminated soil, sediment and surface water.

Remediation Goals

EPA has adopted the preliminary remediation goals identified in the Proposed Plan as the final Remediation Goals (RGs) for Site-related COCs. The New Jersey Residential Direct Contact Soil Remediation Standards (NJDCSRSs) were selected as RGs for surface soil (top two feet) and the NJIGWSSLs for subsurface soil. For sediment, the lower of New Jersey's Freshwater Sediment Quality Criteria Lowest Effect Level and the Saline Water Effects Range Low criteria were selected as RGs. The lower of Federal MCLs, State MCLs and NJ GWQSs were selected as RGs for groundwater.

Achievement of these cleanup goals will also effectively address elevated concentrations in the seep and surface water. As such, no specific cleanup goals are selected for seep or surface water. Similarly, achievement of these cleanup goals will effectively address potential future unacceptable inhalation risks through subsurface vapor intrusion into indoor air.

A summary of all RGs for the Site is presented in Appendix 2, Table 7.

SUMMARY 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, be cost effective, and use permanent solutions, 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 reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site permanently and significantly. CERCLA Section 121(d), 42 § 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.

Remedial alternatives for the Site are summarized below. Capital costs are those expenditures that are required to construct a remedial alternative. Operation and maintenance (O&M) costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project, calculated using a discount rate of seven percent and up to a 30-year time interval. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy, negotiate performance of the remedy with the responsible parties, or procure contracts for design and construction. Detailed information regarding the alternatives can be found in the 2017 *Feasibility Study Report* (FS Report).

Three remedial alternatives were evaluated in the FS:

- No action
- Permeable reactive barriers with soil and sediment excavation, and institutional controls
- Air sparging/ventilation for soil and groundwater, with sediment excavation and instituational controls

These are alternatives are described in greater detail below.

Alternative 1: No Action

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. If no active remedial action is taken, contaminants already present in the soil, groundwater, seep water, surface water and sediment will remain and RAOs for the Site will not be met. It is assumed that land and groundwater resource use will not change over time, any existing institutional controls will remain in place and be enforced by other regulatory programs long-term, and human health and environmental risks for the Site essentially would be the same as those identified in the human health and ecological risk assessments.

Total Capital Cost:	*$0*
Total O&M:	*$0*
Total Periodic Cost:	*$0*
Total Present Net Worth:	*$0*
Timeframe:	*0 years*

Alternative 2: Permeable reactive barriers with soil and sediment excavation; institutional controls

This remedial alternative consists of installing two PRB trenches to provide passive treatment of the two groundwater plumes described previously. One wall would address the BTEX plume and the other would address the chlorinated VOCs plus the SVOC 4-chloranaline plume. (see Appendix 1, Figure 4).

Ongoing sources of this groundwater contamination will be addressed through excavation. Soil within the former unlined lagoon area will be excavated to the water table, an estimated depth of 10 feet below grade. Contaminated sediment will be excavated from impacted sediment/seep locations along Grand Sprute Run and disposed of off-site. The estimated volume of material to be excavated is 3,000 cubic yards of soil and 5 cubic yards of sediment.

By remediating the groundwater and removing ongoing sources of contamination, the remedy also addresses contamination resulting from the discharge of groundwater to seeps, which has impacted seep water, surface water and seep sediment. In addition, by remediating the groundwater, potential future risks associated with inhalation of indoor air were a building/structure to be built over the contaminated plumes will be addressed.

A PDI will be needed to determine the horizontal and vertical extent of contaminant impacts in soil, sediment and groundwater. Sampling will be conducted to the clay layer, and if additional soil and/or sediment excavation beyond that anticipated is needed for the action to meet RGs, it will be conducted, as appropriate. In addition, while not anticipated based on the existing data, if dense non-aqueous phase liquid is found, it would be addressed in a future decision document.

Long-term monitoring outside of the PRB capture zones will be needed to assure the effectiveness of the remedy over time, and institutional controls will assure the remedy remains protective while RAOs are being met. The institutional controls may include a New Jersey Ground Water Classification Exception Area that restricts the use of the contaminated aquifer, along with deed notices that restrict development of the affected areas.

While not anticipated, reactive material within the PRB may need to be replaced after a period of time to fully remediate the groundwater. For purposes of costing, replacement of the PRB material is included five years after installation of the initial wall, and then, as a contingency, a second replacement is included 10 years after initial installation. These costs are identified as "periodic costs," below. After removal of the source area (the former lagoon), the PRB will address the residual groundwater contamination through passive treatment. It is uncertain how long the PRB will need to remain in place. For purposes of costing, 30 years was assumed.

Total Capital Cost:	*$2,240,000*
Total O&M:	*$580,000*
Total Periodic Costs:	*$1,200,000*
Total Present Net Worth:	*$4,020,000*
Implementation Timeframe:	*1 year*
Remediation Timeframe:	*30 years*

Alternative 3: Air Sparging/Ventilation for soil and groundwater with sediment excavation; Institutional controls

This remedial alternative consists of the installation of an air sparging system to remediate the shallow aquifer groundwater contamination at the Site. Long Term Monitoring would also be needed as part of this alternative.

An air sparging system consists of a network of air injection ("sparging") wells installed into the saturated zone. The network of injection wells is designed so that all of the area requiring treatment is effectively aerated. This typically involves establishing overlapping radii of influence for the sparging well network. Air compressors are used to deliver oxygen under pressure. An aboveground process control system is used to monitor and adjust the air delivery equipment. Flow rates and pressures of injected air are based on Site conditions characterized during the PDI phase of the project and refined during pilot scale testing. These rates can be adjusted during full-scale remediation to accommodate observed results and increase remediation efficiency.

Impacted soil within the former unlined lagoon area will be addressed by installing a soil vapor extraction (SVE) system in conjunction with the air sparging system within the former lagoon area to address impacted vadose zone soil. Vacuum pumps will be used to remove VOCs from the subsurface for treatment via carbon adsorption. Additional testing will be needed to determine the effectiveness of this approach at addressing the SVOC (4-chloroanaline) portion of the groundwater plume.

Impacted sediment will be addressed through the excavation and off-site disposal of impacted sediment/seep locations along Grand Sprute Run. The estimated volume of sediment to be excavated is 5 cubic yards. Institutional controls similar to those described for Alternative 2 will assure the remedy remains protective while RAOs are being met.

Also similar to Alternative 2, a PDI will be needed to determine the horizontal and vertical extent of contaminant impacts in soil, sediment and groundwater. Sampling will be conducted to the clay layer, and if additional soil and/or sediment excavation beyond that anticipated is needed for the action to meet RGs, it will be conducted, as appropriate. In addition, while not anticipated based on the existing data, if dense non-aqueous phase liquid is found, it would be addressed in a future decision document.

For cost-estimating purposes, the air sparging and SVE systems are expected to take less than a year to install, and would then be operated for a period of approximately one year. Based upon experience at other sites, EPA expects that the effectiveness of these systems would begin to diminish after about one year of active remediation; therefore, bi-annual monitoring is anticipated for the first five years after initial installation, and then annual monitoring would continue until the RGs are reached, conservatively assumed to be 30 years.

Total Capital Cost:	*$3,088,000*
Total O&M:	*$581,267*
Total Periodic Cost:	*$25,000*

Total Present Net Worth: *$3,694,267*
Implementation Timeframe: *1 year*
Remediation Timeframe: *30 years*

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.

A comparative analysis of these alternatives based upon the nine evaluation criteria noted below follows.

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

1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Alternative 1, the no action alternative, is not protective of human health and the environment because it does not eliminate, reduce, or control risk of exposure to contaminated soil, groundwater, seep water, surface water and sediment through off-site disposal, other engineering controls, treatment or institutional controls.

The "no action" alternative was eliminated from further consideration under the remaining eight criteria because it is not protective of human health and the environment.

Alternative 2 would provide protection to current and potential future human and ecological receptors through the treatment of contaminated groundwater, excavation and off-site disposal of contaminated soil and sediment, monitoring to assure effectiveness and institutional controls.

Alternative 3 would also likely provide protection to current and potential future human and ecological receptors through the *in-situ* treatment of contaminated groundwater and of soil in the former lagoon, excavation and off-site disposal of contaminated sediment, monitoring to assure effectiveness, and institutional controls.

2. Compliance with applicable or relevant and appropriate requirements (ARARs)
Section 121 (d) of CERCLA, 42 U.S.C. § 9621(d), and Section 300.430(f)(1)(ii)(B) of the NCP, 40 CFR §300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under Section 121(d)(4) of CERCLA.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for invoking a waiver.

A complete list of ARARs can be found in Appendix 2, Table 8.

Both Alternative 2 and Alternative 3 should provide compliance with chemical-specific ARARs, because the contamination would either be treated or removed. However, bench-scale testing will be necessary to confirm that Alternative 3 can effectively achieve ARARs for 4-chloroanaline.

Location-specific ARARs and Action-specific ARARs would be met for both alternatives by proper design and implementation of the respective components of the remedy. The Location-specific and Action-specific ARARs for the disposal phase would be met with proper on-site waste management and selection of the disposal facility.

***Primary Balancing Criteria** – The next five criteria, criteria 3 through 7, 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.*

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3. Long-Term Effectiveness and Permanence
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Alternative 2 is expected to permanently remove VOCs and the SVOC 4-chloroanaline from impacted groundwater within the active treatment area through treatment. The PRBs would treat Site contaminants through permanent and irreversible processes, and would be effective in achieving RAOs and preventing further impacts to seep water, surface water and sediment.

Alternative 3 is expected to permanently remove VOCs from soil and groundwater within the active remedial area through treatment; however, treatment efficacy for the removal of the Site-related SVOC 4-chloroanaline is expected to be more moderate and bench-scale testing will be required bench-scale to evaluate this. Thus, Alternative 3 has a higher likelihood of leaving residues in the source areas that could potentially act as a continuing source to the groundwater, seep water, surface water and sediment.

Alternative 3 is likely to reduce VOC concentrations in groundwater more quickly than Alternative 2; however, the ability for this alternative to fully address VOCs in the soils is less certain, and the capability of SVE to reduce 4-chloroanaline concentrations as quickly as the other COCs will require bench-scale testing to confirm efficacy.

Soil and sediment excavation under Alternative 2 and sediment excavation under Alternative 3 would remove the sources of ongoing contamination from these impacted areas, thus providing long-term effectiveness and permanence. Institutional controls under Alternatives 2 and 3 would contribute to the protection of human health when properly implemented and maintained.

4. Reduction of Toxicity, Mobility, or Volume through Treatment
Reduction in Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment and the amount of contamination present.

Both Alternative 2 and Alternative 3 would provide reduction of toxicity, mobility, or volume of contamination through treatment.

PRBs under Alternative 2 permanently remove contaminants from the aquifer by adsorption and biogeochemical processes. The toxicity, mobility, and volume of contaminants in groundwater are reduced as contaminated groundwater passes through the PRBs located at the downgradient edges of both plumes.

Alternative 3 permanently removes VOCs from the aquifer within the active remedial area. Vapor-phase VOCs generated under Alternative 3 will be collected and treated with granular activated carbon, if necessary, and discharged to the atmosphere. Regeneration of the activated carbon will transform contaminants to harmless compounds, thereby reducing the toxicity of contaminants removed from the Site groundwater. Air sparging also serves to enhance the aerobic biodegradation of compounds, which may prove effective in reducing concentrations of 4-chloroanaline and other less volatile aromatic compounds in this portion of the plume.

5. Short-Term Effectiveness
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents and the environment during implementation.

Both Alternative 2 and Alternative 3 would be effective in the short term. The extent of excavation of soil and sediment required is relatively small and excavation activities would likely be completed in less than one year.

For Alternative 2, installation of the PRB would require minimal impacts to soil during installation. The timeframe for initial installation is expected to be approximately one month.

Short-term impacts for Alternative 3 are greater since it would require the installation of piping over the entire ground surface associated with the groundwater plume and soil remediation area, and the operation of blowers and vacuum pumps for the full duration of active remediation, which is estimated to be one year.

Both Alternatives 2 and 3 would result in some short-term impacts to the community, in the form of vehicular (truck) traffic and noise and dust from construction/excavation activities, although Alternative 2 would generate less truck traffic in the short term than Alternative 3 since the active work of installing the PRBs would be less intensive than installation and operation of the air sparging and SVE system.

Perimeter air monitoring and dust control measures would be required to address concerns over exposure to dust during activities.

6. Implementability
Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternative 2 can be easily implemented and requires a shorter duration to complete installation than Alternative 3. The PRBs are a passive treatment technology and will require little maintenance during the active life of the remediation. The PRB trench excavation under Alternative 2 can be performed using either standard excavation or one-pass trenching equipment. Due to the relatively steep slopes within the proposed location of the Area 1 PRB, Site preparation and re-grading may be required in selected locations prior to installation of the PRB.

The installation of air sparge/SVE system under Alternative 3 is a well-established technology and can be readily implemented at this Site; however, the air sparging system will require the installation of a significant number of air sparge/SVE well points (~500) as well as supporting piping, equipment and electric utilities both on and off the Site. Alternative 3 is also an active technology that will require ongoing operation and maintenance over the short duration (~1 year) anticipated for active remediation. The ability for this alternative to reduce the SVOC 4-chloroanaline concentrations as quickly as the other COCs will require bench-scale testing to confirm efficacy. Thus, the effectiveness of the *in-situ* SVE system to fully remediate the soils is uncertain, and the effectiveness of air sparging is dependent upon the ability of SVE to address the source area. As a result, Alternative 2 is considered more implementable than Alternative 3.

7. Cost
Cost includes estimated capital and annual operation and maintenance 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. 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 cost, operation and maintenance (O&M), and present worth costs for each alternative are discussed in detail in EPA’s FS. The cost estimates are based on the best available information. The present-worth cost for Alternative 2 assumes a 30 year timeframe, while the present-worth cost for Alternative 3 assumes a 1-year timeframe to implement, but a 30 year timeframe to reach RGs. While not anticipated, additional installations of the PRB under Alternative 2 may be needed to fully remediate the groundwater; therefore, for purposes of costing, a second installation is included five years after installation of the initial wall, and then, as a contingency, a third installation is included 10 years after initial installation.

The estimated total capital cost, O&M cost, periodic cost and total present-worth costs for each of the alternatives are as follows:

Alternative	Capital Cost	O&M	Periodic Cost	Present Worth Cost
2	$2,240,000	$582,000	$1,198,000	$4,020,000
3	$3,090,000	$259,000	$62,000	$3,410,000

***Modifying Criteria** – The final two evaluation criteria, criteria 8 and 9, 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.*

8. State Acceptance
State Agency acceptance considers whether the State and/or Support Agency agrees with EPA's analyses and recommendations.

NJDEP concurs with the selected remedy. A letter of concurrence is attached in Appendix IV.

9. Community Acceptance

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

On September 14, 2017, EPA held a formal public meeting on the proposed plan for this Site. All written and oral comments are addressed in detail in Appendix V, which is the Responsiveness Summary for this ROD. No comments received during the comment period for the proposed plan expressed disagreement with EPA's preferred alternative for the Site.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (40 CFR §300.430(a)(1)(iii)(A)). Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Non-principal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure.

Although VOCs in soil and sediment at the Site are a source of contamination to groundwater, seep water, surface water and sediment, these sources are not considered principal threat wastes at the Site. The primary media contaminated at the Site is groundwater.

SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the results of Site investigations, the detailed analysis of the alternatives and the public comments, EPA's selected remedy to address contaminated soil, groundwater, seep water, surface water and sediment at the Site is Alternative 2. The selected remedy addresses the entire Site and is the first and only planned remedial phase or operable unit for the Site. This alternative includes the following components:

- Installation of two PRBs to provide passive treatment of aromatic and VOCs and the SVOC 4-chloroanaline in groundwater;
- Excavation and off-site disposal of contaminated soil and sediment which acts as a source of further contamination to groundwater, seep water, surface water and sediment;
- Long-term monitoring to assure the effectiveness of the remedy over time; and
- Institutional controls until RAOs are met; the institutional controls may include a New Jersey Ground Water Classification Exception Area that restricts the use of the contaminated aquifer, along with deed notices that restrict development of the affected areas.

By remediating the groundwater and removing ongoing sources of contamination, the remedy also addresses contamination resulting from the discharge of groundwater to seeps, which has impacted seep water, surface water and sediment. In addition, by remediating the groundwater, potential future risks associated with inhalation of indoor air through vapor intrusion if a building/structure were to be built over the contaminated plumes will be addressed.

A PDI will be needed to determine the horizontal and vertical extent of contaminant impacts in soil, sediment and groundwater. Sampling will be conducted to the clay layer, and if additional soil and/or sediment excavation beyond that anticipated is needed, it will be conducted, as appropriate. In addition, while not anticipated based on the existing data, if dense non-aqueous phase liquid is found, it would be addressed in a future decision document.

The total estimated present-worth cost for the selected remedy is $4,020,000. For purposes of costing, a second installation of the PRBs is included five years after installation of the initial walls, and then, as a contingency, a third installation is included 10 years after initial installation. A more detailed, itemized list of costs for the selected remedy may be found in FS. The cost estimates, which are based on available information, are order of magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project.

These actions are considered the final remedy for the Site.

Expected Outcomes of the Selected Remedy

Implementation of Alternative 2 will eliminate current and potential future exposure to contaminants in soil, groundwater, seep water, surface water and sediment, and prevent further migration of contamination to groundwater, seep water, surface water and sediment.

Summary of the Rationale for the Selected Remedy

The selection of Alternative 2 provides the best balance of trade-offs among the alternatives with respect to the evaluation criteria. The selected alternative will be protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, is cost-effective, and will utilize permanent solutions and treatment technologies to the maximum extent practicable.

NJDEP concurs with the selected remedy.

The preferred alternative satisfies the two threshold criteria and achieves the best combination of the five balancing criteria of the comparative analysis. This alternative is preferred for the following primary reasons:

- It will achieve the RAOs and cleanup goals in the most effective way;
- It will reduce the toxicity, mobility or volume of contamination through treatment for all COCs; bench-scale studies should not be needed to evaluate the effectiveness of the alternative at reducing COC concentrations;
- It is faster and easier to implement;
- It is expected to be more implementable than the other active alternative, with fewer short-term effectiveness issues; and
- It is a permanent remedy that will not require the implementation of permanent institutional controls once RAOs are achieved.

The implementation of this selected remedy will employ engineering controls and safe work practices to mitigate exposure to dust and to protect workers and the local community.

The environmental benefits of the selected remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy. This will include consideration of green remediation technologies and practices.

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 reduce the volume, toxicity, or mobility of hazardous substances as a principal element. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy, Alternative 2, will protect human health and the environment through removal, treatment and institutional controls. The selected remedy will eliminate exposure associated with contaminated soil, groundwater, seep water, surface water and sediment at the Site through removal and treatment. Soil excavation will eliminate the source of groundwater contamination and the installation of permeable reactive barrier walls will prevent future contamination of seep water, surface water and sediment. This action will result in the reduction of exposure levels to acceptable risk 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.

Compliance with ARARs

The selected remedy complies with chemical-specific, location-specific and action-specific ARARs. A complete list of the ARARs and other guidance that concern the selected remedy is presented in Appendix II, Table 8.

Cost-Effectiveness

EPA has determined that the selected remedy is cost-effective and represents reasonable value for the money to be spent. A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP § 300.4309f)(1)(ii)(D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (*i.e.*, were both protective of human health and ARAR-compliant). Overall effectiveness is based on the evaluations of long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness was then compared to costs to determine cost-effectiveness.

Each of the alternatives was subjected to a detailed cost analysis. In that analysis, capital and annual O&M costs were estimated and used to develop present-worth costs. The estimated present worth cost of the selected remedy for the Site is $4,020,000. Although Alternative 3 is less expensive than the selected remedy, EPA concluded that the short-term and long-term effectiveness, and the implementability of the selected remedy is superior to Alternative 3. The selected remedy is cost-effective as it has been determined to provide the greatest overall protectiveness for its present-worth cost.

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

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner for this Site. Of those alternatives that are protective of human health and the environment and comply with ARARs (or provide a basis for invoking an ARAR waiver), EPA has determined that the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element, the bias against off-site disposal without treatment, and State/support agency and community acceptance. Implementation of the selected remedy will eliminate current human and ecological receptors' exposure to contaminated soil, groundwater, seep water, surface water and sediment, will prevent future exposure to contaminated media and will utilize treatment as a principal element.

Preference for Treatment as a Principal Element

Treatment of groundwater is a principal component of the selected remedy. As such, the statutory preference for treatment is satisfied.

Five-Year Review Requirements

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on Site above levels that allow for unlimited use and unrestricted exposure, but it will take more than five years to attain the RGs, EPA will conduct a review within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

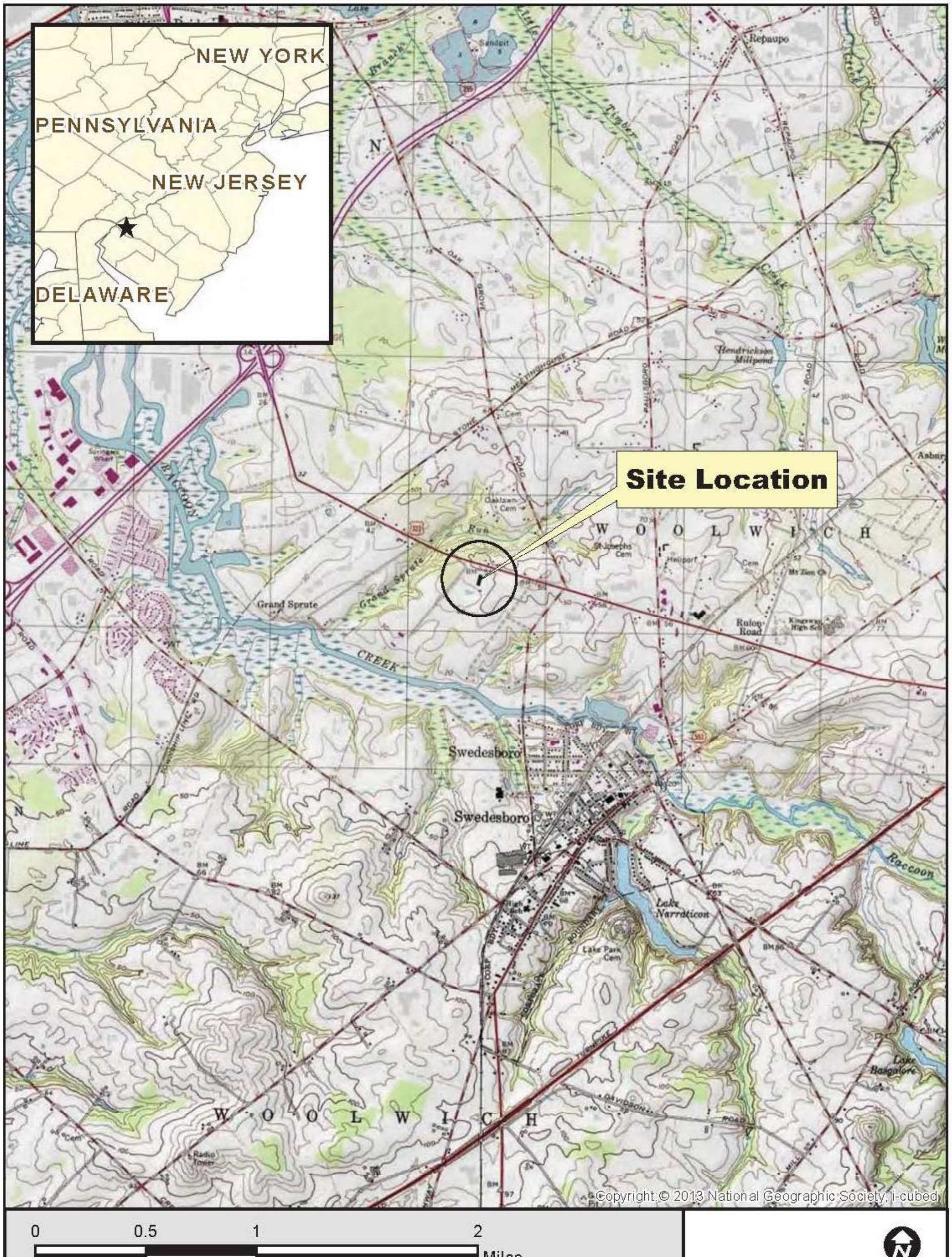
DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Matlack Site was released for a public comment period of 30 days on August 23, 2017. The public comment period ran until September 22, 2017. The Proposed Plan identified Alternative 2 (permeable reactive barriers with soil and sediment excavation, and institutional controls) as the preferred alternative for Site. EPA reviewed all written (including electronic formats such as e-mail) and verbal comments submitted during the public comment period and has determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, are necessary or appropriate.

APPENDIX 1

FIGURES

Figure 1



Source: United States Geological Survey Topographic Map. For more information on this map, visit http://goto.arcgisonline.com/maps/NGS_Topo_US_2D

HDR	Site Location Map Matlack Inc. Superfund Site Woolwich Township, Gloucester County, New Jersey	Job No.	Date	Figure No.
		10021567	JULY 2017	1

Figure 2

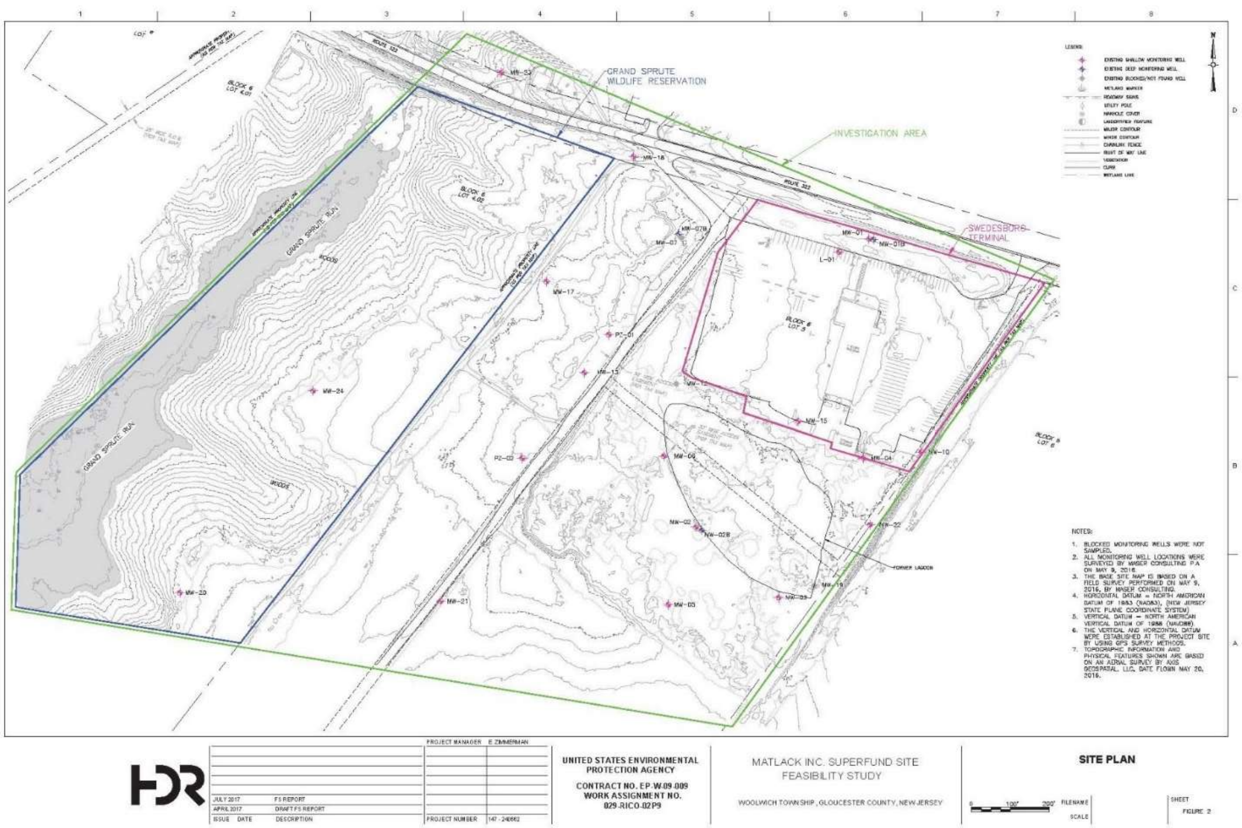
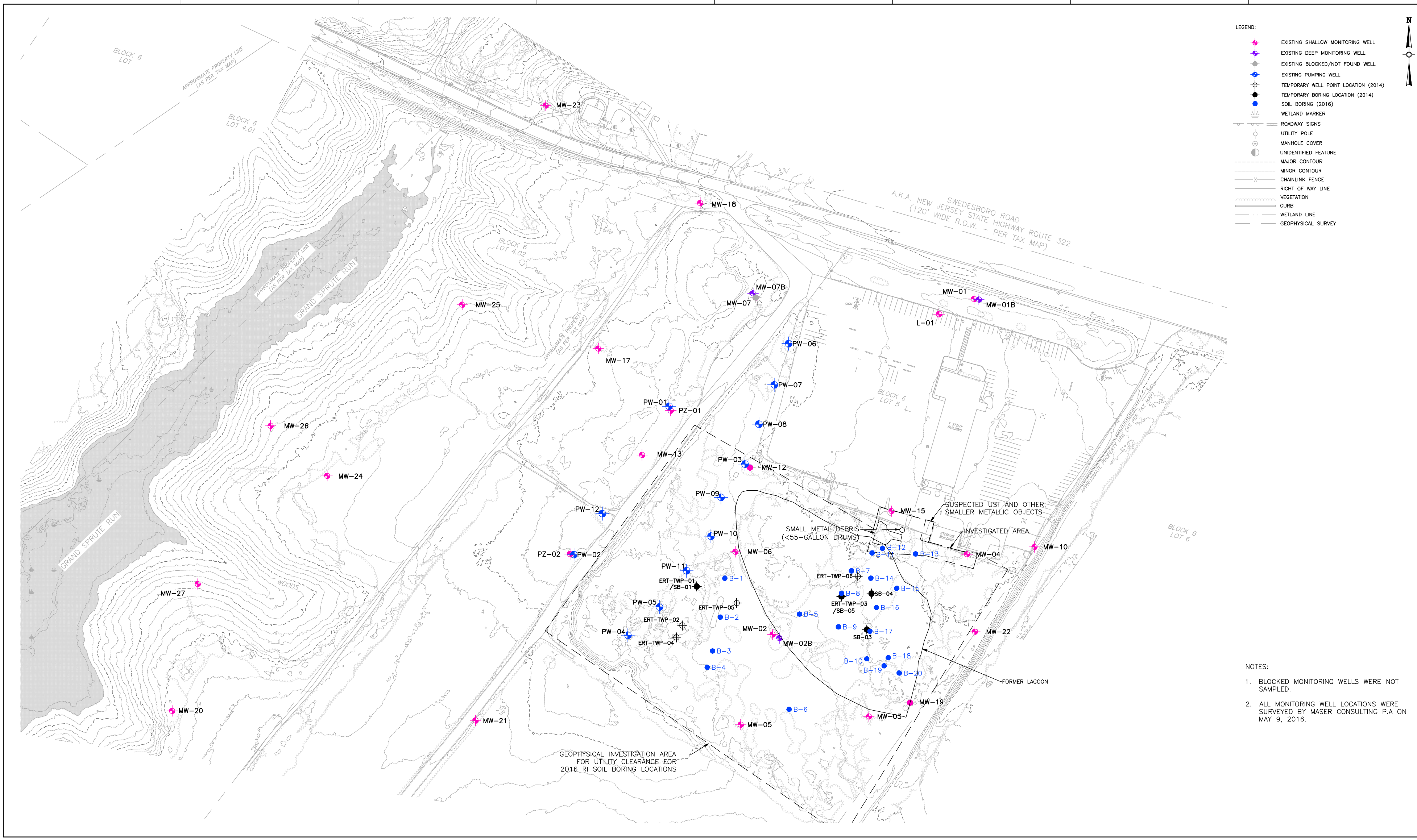

GRAND SPRUTE WILDLIFE RESERVATION
INVESTIGATION AREA
SWEDESBORO TERMINAL
GRAND SPRUTE RUN
FORMER LAGOON
MW-22
MW-16
MW-01
MW-01B
MW-02B
MW-03
MW-17
PZ-01
MW-13
MW-24
MW-15
MW-04
MW-10
PZ-02
MW-06
MW-02
MW-20
MW-21
MW-05
L-01
LEGEND
EXISTING SHALLOW MONITORING WELL
EXISTING DEEP MONITORING WELL
EXISTING BLOCKED/NOT FOUND WELL
WETLAND MARKER
UTILITY POLE
MANHOLE COVER
MAJOR CONTOUR
MINOR CONTOUR
CHAINLINK FENCE
RIGHT OF WAY LINE
VEGETATION
CURB
WETLAND LINE
NOTES:
1. BLOCKED MONITORING WELLS WERE NOT SAMPLED.
2. ALL MONITORING WELL LOCATIONS WERE SURVEYED BY MASER CONSULTING P.A ON MAY 9, 2016.
3. THE BASE SITE MAP IS BASED ON A FIELD SURVEY PERFORMED ON MAY 9, 2016, BY MASER CONSULTING.
4. HORIZONTAL DATUM = NORTH AMERICAN DATUM OF 1983 (NAD83), (NEW JERSEY STATE PLANE COORDINATE SYSTEM)
5. VERTICAL DATUM = NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
6. THE VERTICAL AND HORIZONTAL DATUM WERE ESTABLISHED AT THE PROJECT SITE BY USING GPS SURVEY METHODS.
7. TOPOGRAPHIC INFORMATION AND PHYSICAL FEATURES SHOWN ARE BASED ON AN AERIAL SURVEY BY AXIS GEOSPATIAL, LLC, DATE FLOWN MAY 20, 2016.
PROJECT MANAGER E ZIMMERMAN
JULY 2017 FS REPORT
APRIL 2017 DRAFT FS REPORT
ISSUE DATE DESCRIPTION
PROJECT NUMBER 147-240662
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 029-RICO-02P9
MATLACK INC. SUPERFUND SITE
FEASIBILITY STUDY
WOOLWICH TOWNSHIP, GLOUCESTER COUNTY, NEW JERSEY
SITE PLAN
0 100' 200'
FILENAME
SCALE
SHEET
FIGURE 2

Figure 3



HDR

ISSUE	DATE	DESCRIPTION
	JULY 2017	FS REPORT
	APRIL 2017	DRAFT FS REPORT

PROJECT MANAGER E. ZIMMERMAN

PROJECT NUMBER 147 - 240662

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 029-RICO-02P9

MATLACK INC. SUPERFUND SITE
FEASIBILITY STUDY
WOOLWICH TOWNSHIP, GLOUCESTER COUNTY, NEW JERSEY

SAMPLING LOCATIONS

0 100' 200'

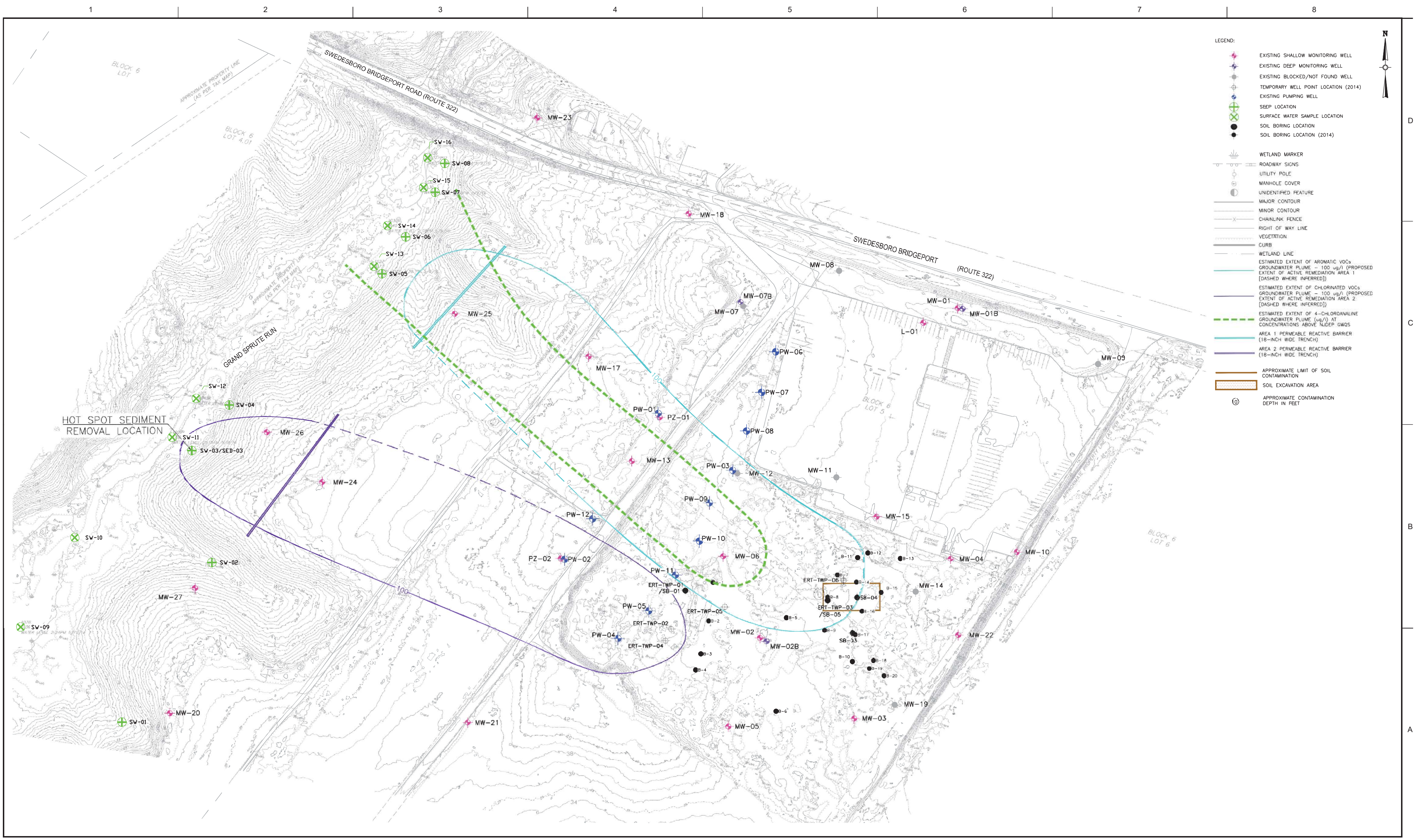
FILENAME

SCALE

SHEET

FIGURE 3

Figure 4



PROJECT MANAGER E. ZIMMERMAN

ISSUE	DATE	DESCRIPTION
	AUGUST 2017	FS REPORT
	APRIL 2017	DRAFT FS REPORT

PROJECT NUMBER 147 - 240662

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 029-RICO-02P9

MATLACK INC. SUPERFUND SITE
FEASIBILITY STUDY
WOOLWICH TOWNSHIP, GLOUCESTER COUNTY, NEW JERSEY

AREAS OF CONTAMINATION &SELECTED REMEDY

0 100' 200'

FILENAME

SCALE

SHEET
FIGURE 4

APPENDIX 2

TABLES

Table 1
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected (Qualifier)		Concentration Units	Frequency of Detection	Exposure Point Concentration[1] (EPC)	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Tapwater	Ethylbenzene	0.39 (J)	920	µg/L	11/47	195.8	µg/L	97.5% KM (Chebyshev) UCL
	4-Chloroaniline	9.9 (J)	6900	µg/L	5/46	1007	µg/L	Gamma Adjusted KM-UCL
	Biphenyl (diphenyl)	1 (J)	1.6	µg/L	3/46	1.6	µg/L	Maximum Concentration
	Naphthalene	3.2 (J)	68	µg/L	4/46	8.153	µg/L	95% KM (t) UCL
	Tetrachloroethylene	0.25 (J)	3000	µg/L	20/51	545.9	µg/L	97.5% KM (Chebyshev) UCL
	Trichloroethylene	0.081 (J)	160	µg/L	12/51	18.49	µg/L	95% KM (Chebyshev) UCL
	Vinyl Chloride	0.01 (J)	14	µg/L	13/37	2.566	µg/L	Gamma Adjusted KM-UCL

Scenario Timeframe: Current/Future
Medium: Seep Water
Exposure Medium: Seep Water

Exposure Point	Chemical of Concern	Concentration Detected (Qualifier)		Concentration Units	Frequency of Detection	Exposure Point Concentration[1] (EPC)	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Seep	Tetrachloroethylene	0.3 J	1700	µg/L	14/19	591	µg/L	Gamma Adjusted KM-UCL
	Trichloroethylene	0.34 J	150	µg/L	11/17	63	µg/L	Gamma Adjusted KM-UCL
	Manganese	34.7	7470	µg/L	8/8	7043	µg/L	95% Adjusted Gamma UCL

Footnotes:
(1) The UCLs were calculated using EPA's ProUCL software (Version 5.1.00); when available, UCLs were used as EPCs.

Definitions:
EPC = Exposure point concentration
J = Estimated value (qualifier)
µg/L = Microgram per liter
UCL = Upper confidence limit of mean

Table 1
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) along with exposure point concentrations (EPCs) for each of the COCs detected in site media (*i.e* ., the concentration used to estimate the exposure and risk from each COC). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

Table 2
Selection of Exposure Pathways

Scenario Timeframe	Source	Receptor Population	Receptor Age	Medium/ Exposure Medium	Exposure Point	Exposure Route	Type of Evaluation	Rationale for Selection or Exclusion of Exposure Pathway
Future	Unlined Waste Lagoon & Wastewater USTs (Chlorinated VOCs plume & BTEX plume)	On-Site Worker	Adult	Soil	Surface Soil (0-2 ft)	Ingestion Dermal	Quantitative	An on-site worker (indoor and outdoor) may come into contact with surface soil (0-2 ft); therefore, the pathway is evaluated quantitatively
					Outdoor Air	Inhalation		
				Groundwater	Tapwater	Ingestion	None	An on-site potable well is used for certain tasks (e.g., cleaning the floor with a hose), for hand washing and flushing toilets. Bottled water is currently supplied to employees for drinking; therefore, the dermal pathway is evaluated quantititiavely and the ingestion pathway is not evaluated. Inhalation via vapor intrusion using groundwater-derived vapor intrusion screening levels (VISLs).
						Dermal	Quantitative	
					Indoor/Outdoor Air	Inhalation	Quantitative	
Future		On-Site Construction Worker	Adult	Soil	Soil (0-10 ft)	Ingestion Dermal	Quantitative	Redevelopment of the site may occur; therefore, a future on-site construction worker's exposure to soil (0-10 ft) in a trench is evaluated quantitatively.
					Outdoor Air	Inhalation		
				Groundwater	Trench water	Ingestion Dermal	Quantitative	Redevelopment of the site may occur; therefore, a future on-site construction worker's exposure to groundwater in a trench is evaluated quantitatively. Inhalation via vapor intrusion is also evaluated using groundwater-derived VISLs.
						Inhalation		
Current/Future		Off-Site Resident	Adult	Groundwater	Tapwater	Ingestion Dermal	Qualitative	Exposure to groundwater by current off-site residents is evaluated qualitatively; analytical results from a private well survey indicate that no COPCs or other constituent are present above health-based standards in private wells. Groundwater flow is from the site to Grand Sprute Run and there are no intervening residences in this downgradient direction. The results of the quantitative evaluation of the on-site future resident risk from groundwater consumption are a conservative surrogate for this pathway and will be considered in the qualitative evaluation for off-site residents.
					Indoor Air	Inhalation		
			Child (0-6 years)	Groundwater	Tapwater	Ingestion Dermal		
					Indoor Air	Inhalation		
Future		On-Site Resident	Adult	Groundwater	Tapwater	Ingestion Dermal	Quantitative	The site could potentially be redeveloped with residences using private wells as potable water source; therefore, a future on-site resident's exposure to groundwater and indoor air contaminants via showering and vapor intrusion is evaluated quantitatively.
					Indoor Air	Inhalation		
				Soil	Surface Soil (0-2 ft)	Ingestion Dermal	Quantitative	The site could potentially be redeveloped with residences; therefore, a future on-site resident's exposure to surface soil is evaluated quantitatively.
					Outdoor Air	Inhalation		
			Child (0-6 years)	Groundwater	Tapwater	Ingestion Dermal	Quantitative	The site could potentially be redeveloped with residences using private wells as potable water source; therefore, a future on-site resident's exposure to groundwater and indoor air contaminants
					Indoor Air	Inhalation		
				Soil	Surface Soil (0-2 ft)	Ingestion Dermal	Quantitative	The site could potentially be redeveloped with residences; therefore, a future on-site resident's exposure to surface soil is evaluated quantitatively.
					Outdoor Air	Inhalation		
Current/Future		Off-Site Recreator	Adult	Soil	Surface Soil (0-2 ft)	Ingestion Dermal	Qualitative	Recreators may come into contact with surface soil while visiting Grand Sprute Run; however, an on-site worker's and resident's exposure to surface soil are more conservative scenarios than what could reasonably be expected for a recreator at this site.
					Outdoor Air	Inhalation		
				Seeps	Water & Sediment	Ingestion Dermal	Quantitative	Recreators may come into contact with seep water and sediment that are present along the banks of Grand Sprute Run.
				Surface Water	Surface Water	Ingestion Dermal	Quantitative	Recreators may come into contact with sediment while visiting Grand Sprute Run, portions of which that are shallow.
					Fish	Ingestion	Qualitative	Recreators may ingest fish caught from Grand Sprute Run (FW2-NT/SE2). The primary constituents of interest are volatile and unlikely to be present in significant concentrations in fish; therefore, this pathway is evaluated qualitatively.
				Sediment	Sediment	Ingestion Dermal	Quantitative	Recreators may come into contact with sediment while visiting Grand Sprute Run, portions of which that are shallow.
			Child (0-6 years)	Soil	Surface Soil (0-2 ft)	Ingestion Dermal	Qualitative	Recreators may come into contact with surface soil while visiting Grand Sprute Run; however, an on-site worker's and resident's exposure to surface soil are more conservative scenarios than what could reasonably be expected for a recreator at this site.
					Outdoor Air	Inhalation		
				Seeps	Water & Sediment	Ingestion Dermal	Quantitative	Recreators may come into contact with seep water and sediment that are present along the banks Grand Sprute Run.
				Surface Water	Surface Water	Ingestion Dermal	Quantitative	Recreators may come into contact with surface water while visiting Grand Sprute Run.
					Fish	Ingestion	Qualitative	Recreators may ingest fish caught from Grand Sprute Run (FW2-NT/SE2). The primary constituents of interest are volatile and unlikely to be present in significant concentrations in fish; therefore, this pathway is evaluated qualitatively.
				Sediment	Sediment	Ingestion Dermal	Quantitative	Recreators may come into contact with sediment while visiting Grand Sprute Run, portions of which that are shallow.

Definitions:

FW2-NT/SE2 = NJDEP's surface water category for Grande Sprute Run

Summary of Selection of Exposure Pathways

This table describes the exposure pathways associated with the varying media (soil, sediment, seeps, surface water and groundwater) that were evaluated in the risk assessment along with the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are also included.

Table 3
Noncancer Toxicity Data Summary

Pathway: Ingestion/Dermal

Chemicals of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD for Dermal[1]	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Source of RfD Target Organ	Dates of RfD Source Publication
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	Hepatic, renal	1000/1	IRIS	1/31/1987
4-Chloroaniline	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Lymphatic	3000/1	IRIS	8/22/1988
Biphenyl (diphenyl)	Chronic	5.0E-01	mg/kg-day	1	5.0E-01	mg/kg-day	Renal	30/10	IRIS	8/27/2013
Manganese[2]	Chronic	2.4E-02	mg/kg-day	0.04	9.6E-04	mg/kg-day	Nervous system	3.0	IRIS	5/1/1996
Naphthalene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Developmental	3000	IRIS	9/17/1998
Tetrachloroethylene	Chronic	6.0E-03	mg/kg-day	1	6.0E-03	mg/kg-day	Nervous	1000	IRIS	2/10/2012
Trichloroethylene	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Developmental, Hepatic, Renal, Nervous System, Lymphatic, Reproductive	100/1000/10	IRIS	9/28/2011
Vinyl Chloride	Chronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Hepatic	30	IRIS	8/7/2000

Pathway: Inhalation

Chemicals of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD (If available)	Inhalation RfD Units (If available)	Primary Target Organ	Combined Uncertainty /Modifying Factors	Source of RfC Target Organ	Dates of RfC Source Publication
Ethylbenzene	Chronic	1.0E+00	mg/m^3	NA	NA	Developmental	300	IRIS	3/1/1991
4-Chloroaniline	Chronic	NA	mg/m^3	NA	NA	NA	NA	NA	NA
Biphenyl (diphenyl)	Chronic	4.0E-04	mg/m^3	NA	NA	Respiratory, Hepatic, Renal	3,000	PPRTV-Appendix	4/4/2011
Manganese	Chronic	5.0E-05	mg/m^3	NA	NA	Nervous	100/1	IRIS	12/1/1993
Naphthalene	Chronic	3.0E-03	mg/m^3	NA	NA	Nervous, Respiratory	3000/1	IRIS	9/17/1998
Tetrachloroethylene	Chronic	4.0E-02	mg/m^3	NA	NA	Nervous	1,000	IRIS	2/10/2012
Trichloroethylene	Chronic	2.0E-03	mg/m^3	NA	NA	Developmental, Hepatic, Renal, Nervous, Lymphatic, Reproductive	10	IRIS	9/28/2011
Vinyl Chloride	Chronic	1.0E-01	mg/m^3	NA	NA	Hepatic	30	IRIS	8/7/2000

Footnotes:

(1) Adjusted RfD for Dermal = Oral RfD x Oral Absorption Efficiency for Dermal (Exhibit 4-1, RAGS E, 2004)

(2) The RfD for manganese was based on non-diet contributions as recommended in the IRIS assessment and User's Guide of the RSL tables; a modifying factor of 3 was also used.

Definitions:

IRIS = Integrated Risk Information System, U.S. EPA

NA = Not available

mg/m^3 = Milligrams per cubic meter

mg/kg-day = Milligrams per kilogram per day

PPRTV (Appendix) = PPRTV Screening Toxicity Values- available in the appendix of the PPRTV assessment

Table 4
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	Source	Date of Slope Factor Source Publication
Ethylbenzene	1.1E-02	$(mg/kg\text{-}day)^{-1}$	1.1E-02	$(mg/kg\text{-}day)^{-1}$	D	CAL EPA	1/20/2011
4-Chloroaniline	2.0E-01	$(mg/kg\text{-}day)^{-1}$	2.0E-01	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic to humans	PPRTV	9/30/2008
Biphenyl (diphenyl)	8.0E-03	$(mg/kg\text{-}day)^{-1}$	8.0E-03	$(mg/kg\text{-}day)^{-1}$	Suggestive evidence of carcinogenic potential	IRIS	8/27/2013
Manganese	NA	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
Naphthalene	NA	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	Carcinogenic potential cannot be determined	IRIS	9/17/1998
Tetrachloroethylene	2.1E-03	$(mg/kg\text{-}day)^{-1}$	2.1E-03	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic to humans	IRIS	2/10/2012
Trichloroethylene	4.6E-02	$(mg/kg\text{-}day)^{-1}$	4.6E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	9/28/2011
Vinyl Chloride	7.2E-01	$(mg/kg\text{-}day)^{-1}$	7.2E-01	$(mg/kg\text{-}day)^{-1}$	Known/likely human carcinogen	IRIS	8/7/2000

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline	Source	Date of Slope Factor Source Publication
Ethylbenzene	2.5E-06	$(\mu g/m^3)^{-1}$	NA	NA	D	CAL EPA	1/20/2011
4-Chloroaniline	NA	$(\mu g/m^3)^{-1}$	NA	NA	NA	NA	NA
Biphenyl (diphenyl)	NA	$(\mu g/m^3)^{-1}$	NA	NA	NA	NA	NA
Manganese	NA	$(\mu g/m^3)^{-1}$	NA	NA	D	NA	NA
Naphthalene	3.4E-05	$(\mu g/m^3)^{-1}$	NA	NA	C; Carcinogenic potential cannot be determined [US EPA, 1996]	CAL EPA	1/20/2011
Tetrachloroethylene	2.6E-07	$(\mu g/m^3)^{-1}$	NA	NA	Likely to be carcinogenic to humans	IRIS	2/10/2012
Trichloroethylene	4.1E-06	$(\mu g/m^3)^{-1}$	NA	NA	Carcinogenic to humans	IRIS	9/28/2011
Vinyl Chloride	4.4E-06	$(\mu g/m^3)^{-1}$	NA	NA	Known/likely human carcinogen	IRIS	8/7/2000

Definitions:

CAL EPA = Toxicity Criteria Database; Office of Environmental Health Hazard Assessment (OEHHA)
IRIS = Integrated Risk Information System, U.S. EPA
NA = Not available
PPRTV = Provisional Peer Reviewed Toxicity Values, U.S. EPA
$(\mu g/m^3)^{-1}$ = Per micrograms per cubic meter
$(mg/kg\text{-}day)^{-1}$ = Per milligrams per kilogram per day

EPA Weight of Evidence (EPA, 1986):

A = Human carcinogen
C = Possible human carcinogen - based on sufficient evidence of carcinogenicity in animals and inadequate or no evidence in humans
D = Not classifiable as to human carcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern at the Site. Toxicity data are provided for the ingestion, dermal and inhalation routes of exposure.

Table 5
Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: On-Site Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tapwater	Tetrachloroethylene	Nervous System	0.016	0.51	9.7	10
			Trichloroethylene	Developmental, Hepatic, Renal, Nervous, Lymphatic, Reproductive	0.0063	0.065	7.4	7.4
			Biphenyl (diphenyl)	Renal	0.00000055	0.000045	2.5	2.5
			Naphthalene	Developmental/ Nervous, Respiratory	0.00007	0.0027	2.0	2.0
			COC Total Hazard Index (HI) =					**21.9**
Groundwater Hazard Index Total[1] =								**25**
Receptor Hazard Index[1] =								**25**
Total Developmental HI across all media=								**7.7**
Total Hepatic HI across all media=								**10**
Total Lymphatic HI across all media=								**8.1**
Total Nervous HI across all media=								**21**
Total Renal System HI across all media=								**10**
Total Reproductive HI across all media=								**7.5**
Total Respiratory HI across all media=								**4.6**

Scenario Timeframe: Future
Receptor Population: On-Site Resident
Receptor Age: Child (0-6 years)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Sitewide Groundwater	Tapwater	Tetrachloroethylene	Nervous System	4.5	2.4	10	17
			Trichloroethylene	Developmental, Hepatic, Renal, Nervous, Lymphatic, Reproductive	1.8	0.27	6.9	9.0
			4-Chloroaniline	Lymphatic	13	0.76	NA	13
			COC Total Hazard Index (HI) =					**39.0**
Groundwater Hazard Index Total[1] =								**59**
Receptor Hazard Index[1] =								**60**
Total Developmental HI across all media=								**9.3**
Total Hepatic HI across all media=								**9.5**
Total Lymphatic HI across all media=								**24**
Total Nervous System HI across all media=								**38**
Total Renal HI across all media=								**9.5**
Total Reproductive HI across all media=								**9.9**

Scenario Timeframe: Future
Receptor Population: On-Site Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Sitewide Groundwater	Tapwater	Tetrachloroethylene	Nervous System	2.7	1.6	12	16
			Trichloroethylene	Developmental, Hepatic, Renal, Nervous, Lymphatic, Reproductive	1.1	0.18	8.1	9.4
			4-Chloroaniline	Lymphatic	7.5	0.51	NA	8
			COC Total Hazard Index (HI) =					**33.4**
Groundwater Hazard Index Total[1] =								**46**
Receptor Hazard Index[1] =								**46**
Total Developmental HI across all media=								**9.3**
Total Hepatic HI across all media=								**9.5**
Total Lymphatic HI across all media=								**24**
Total Nervous System HI across all media=								**38**
Total Renal HI across all media=								**9.5**
Total Reproductive HI across all media=								**9.9**

Table 5
Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Current/Future
Receptor Population: Off-Site Recreator
Receptor Age: Child (0-6 years)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Seep Water	Seep Water	Seep	Tetrachloroethylene	Nervous System	0.0090	0.52	NA	0.53
			Trichloroethylene	Developmental, Hepatic, Renal, Nervous, Lymphatic, Reproductive	0.011	0.20	NA	0.21
			Manganese**	Nervous System	0.027	0.81	NA	0.84
							COC Total Hazard Index (HI) =	1.6
							Seep Water Hazard Index Total[1] =	1.9
							Receptor Hazard Index[1] =	4.2
							Total Nervous System HI across all media=	3.3

Footnotes:
** Manganese is not considered to be site related and was not retained as a COC for purposes of remedy selection. It is shown in this table for informational purposes only.
(1) The HI represents the summed HQs 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.

Definitions:
HI = hazard index
HQ = hazard quotient
NA = Not available

Table 6
Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: On-site Resident
Receptor Age: Adult and child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Ethylbenzene	3.3E-05	1.7E-05	1.5E-04	2.0E-04
			Vinyl Chloride	1.2E-04	8.4E-06	3.9E-04	5.3E-04
			4-Chloroaniline	3.1E-03	1.8E-04	NA	3.3E-03
						COC Total Risk =	**4.0E-03**
						Groundwater Risk Total[1]=	**4.3E-03**
						Receptor Risk Total[1]=	**4.4E-03**

Footnotes:
(1) Total Risk values represent cumulative estimates from exposure to all chemicals of potential concern (COPCs) as identified in the RAGS D table 2 series, and not only from those identified in this table (*i.e.* , the chemicals of concern [COCs]).

Table 7
Remediation Goals

Contaminant	CAS Number	Criteria		Maximum Detected Concentration	Remediation Goal
Soil		**NJDEP RDCSRS (mg/kg)**	**NJDEP IGWSSL (mg/kg)**	**(mg/kg)**	**(mg/kg)**
VOCs					
Benzene	71-43-2	2	0.005	4	0.005
Tetrachloroethylene (PCE)	127-18-4	2	0.005	3	0.005
Trichlorethene (TCE)	79-01-6	7	0.01	33	0.01
Total Xylenes	1330-20-7	12,000	19	74	19
SVOCs					
Benzyl Butyl Phthalate	85-68-7	1,200	230	670	230
Bis(2-ethylhexyl) Phthalate	117-81-7	35	1,200	590	35
Naphthalene	91-20-3	6	25	420	6
Sediment		**NJDEP SQC LEL (mg/kg)**	**NJDEP SQC ER-L (mg/kg)**	**(mg/kg)**	**(mg/kg)**
Tetrachloroethylene (PCE)	127-18-4	0.990	0.45	5.8	0.45
Trichlorethene (TCE)	79-01-6	0.112	1.6	0.27	0.112
1,1,1-Trichloroethane	71-55-6	0.213	NA	1	0.213
Groundwater		**Federal MCL (ug/l)**	**NJDEP GWQS (ug/l)**	**(ug/l)**	**(ug/l)**
VOCs					
1,1,1-Trichloroethane	71-55-6	200	30	4,500	30
Benzene	71-43-2	5	1	51	1
Ethylbenzene	100-41-4	700	700	5,600	700
Tetrachloroethylene (PCE)	127-18-4	5	1	6,100	1
Trichlorethene (TCE)	79-01-6	5	1	720	1
Vinyl Chloride	75-01-4	2	1	6	1
Total Xylenes	1330-20-7	10,000	1,000	22,700	1,000
SVOCs					
4-Chloranaline	106-47-8	NA	30	6,900	30

Note: The remediation goal for each contaminant is the lowest of the options listed in the table.

TABLE 8 **Applicable or Relevant and Appropriate Requirements (ARARs)**			
CHEMICAL-SPECIFIC ARARS			
Type of ARAR	**Statute/Requirement**	**CITATION**	**Applicability/Relevance**
Federal	Safe Drinking Water Act	40 C.F.R. 141	Drinking water standards which apply to specific contaminants. (Relevant to remediation of groundwater.)
	Identification and Listing of Specific Hazardous Waste	40 CFR Part 261.3, 261.6, 261.10	Defines those wastes which are subject to regulation as hazardous wastes, and lists specific chemical and industry-source wastes.
State	New Jersey Safe Drinking Water Act regulations	N.J.A.C. 7:10	Drinking water standards which apply to specific contaminants and which are more stringent than federal standards. (Relevant to remediation of groundwater.)
	New Jersey Groundwater Quality Criteria	N.J.A.C. 7:9C	Standards for protection of groundwater quality. (Applicable to remediation of groundwater.)
	New Jersey Impact to Groundwater Soil Remediation Standards	NJDEP Guidance Document for Development of Impact to Groundwater Soil Remediation Standards, January 27, 2011	Document for development of impact to groundwater soil remediation standards and provides default screening values. (Applicable to excavation at greater than 2 feet below ground surface.)
	New Jersey Residential Direct Contact Soil Remediation Standards	N.J.A.C. 7:26-4.2	Establishes minimum remediation standards for direct contact exposure to soil. (Applicable to excavation at 0-2 feet below ground level.)

LOCATION-SPECIFIC ARARS			
Type of ARAR	**Statute/Requirement**	**CITATION**	**Applicability/Relevance**
Federal	National Environmental Policy Act	40 CFR Part 6 Appendix A	Statement of procedures on floodplain management and wetlands protection.
	Endangered Species Act	40 CFR 400 50 CFR 17, 81, 223, 224, 226, 402	Standards for the protection of threatened and endangered species (wildlife, marine and anadromous species and plants) and establish cooperation with the Federal and State Governments.
	Fish and Wildlife Conservation Act	16 USC 2901 et seq.	Established EPA policy and guidance for promoting the conservation of non-game fish and wildlife and their habitats.
	National Historic Preservation Act	16 USC 469 et seq.; 40 CFR 6301	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a Federally licensed activity or program.
State	Freshwater Wetlands Protection Act	NJSA 13:9B-1 et seq.	Requirements governing regulated activity disturbing freshwater wetlands
	Endangered and Non-Game Species Conservation Act	N.J.S.A. 23:2A-1	Standards for the protection of Federal and New Jersey threatened and endangered species.
	Endangered Plant Species List Act	N.J.S.A. 13:1B et seq.	Establishes the requirement to protection threatened and endangered plant species in New Jersey by developing and adopting a list.

ACTION-SPECIFIC ARARS			
Type of ARAR	**Statute/Requirement**	**CITATION**	**Applicability/Relevance**
Federal	Resource Conservation and Recovery Act (RCRA)	40 CFR 260-270; 42 USC 6901 et seq.	Establishes responsibilities and standards for the management of hazardous and non-hazardous waste.
	Clean Air Act	40 CFR 50	Establishes particulate and fugitive dust emission requirements.
	Solid Waste Disposal Act, as amended – Regulated levels for TCLP Constituents	42 U.S.C §6901-6992k; 40 C.F.R. Part 261	Specifies TCLP constituent levels for identifying wastes that exhibit toxicity characteristics.
	Clean Water Act (CWA)	33 USC 1251 et seq.	Procedures to preserve surface water quality by reducing direct pollutant discharges into waterways, finance municipal wastewater treatment facilities and manage polluted runoff.
	Ambient Water Quality Criteria (AWQC)	40 CFR 131, 401	Provides criteria developed for the protection of freshwater and marine aquatic life and for the protection of human health from the ingestion of water and/or organisms.
State	Well Construction and Maintenance	N.J.A.C. 7:9D	Establishes requirements for construction and decommission (sealing) of wells, and well driller / pump installer licensing.
	New Jersey Soil Erosion and Sediment Control Act	N.J.S.A. 4:24-39 et seq.	To establish soil erosion and sediment control standards for Department of Transportation certification of its projects to the Soil Conservation Districts.
	New Jersey Air Pollution Control Act	N.J.A.C. 7:27-8, 16	Establishes standards for discharge of pollutants to air.

	Technical Requirements for Site Remediation and Administrative Requirements for the Remediation of Contaminated Sites	N.J.A.C. 7:26E-8	Identifies requirements for institutional controls for contaminated soils left in place, and for contaminated groundwater; identifies administrative requirements for site remediation that may be applicable.
	Noise Control	N.J.A.C. 7:29	Establishes allowable noise levels.

Note: While not an ARAR, all relevant sections of the Occupational Safety and Health Standards and Safety and Health Regulations for Construction (29 CFR 1910 and 1926) will be complied with.

APPENDIX 3

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

08/23/2017

REGION ID: 02

Site Name: MATLACK INCORPORATED
CERCLIS ID: NJD043584101
OUID: 01
SSID: 02P9
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
510580	8/23/2017	ADMINISTRATIVE RECORD INDEX FOR OU1 FOR THE MATLACK INCORPORATED SITE	2	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
149511	09/01/2012	HAZARD RANKING SYSTEM (HRS) PACKAGE FOR THE MATLACK, INC. SITE, VOLUME 1 OF 6	2871	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WESTON SOLUTIONS, INC.)
145403	09/01/2012	HAZARD RANKING SYSTEM (HRS) PACKAGE FOR THE MATLACK, INC. SITE, VOLUME 2 OF 6	1029	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WESTON SOLUTIONS, INC.)
145404	09/01/2012	HAZARD RANKING SYSTEM (HRS) PACKAGE FOR THE MATLACK, INC. SITE, VOLUME 3 OF 6	1576	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WESTON SOLUTIONS, INC.)
145405	09/01/2012	HAZARD RANKING SYSTEM (HRS) PACKAGE FOR THE MATLACK, INC. SITE, VOLUME 4 OF 6	2075	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WESTON SOLUTIONS, INC.)
145406	09/01/2012	HAZARD RANKING SYSTEM (HRS) PACKAGE FOR THE MATLACK, INC. SITE, VOLUME 5 OF 6	1801	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WESTON SOLUTIONS, INC.)
145407	09/01/2012	HAZARD RANKING SYSTEM (HRS) PACKAGE FOR THE MATLACK, INC. SITE, VOLUME 6 OF 6	1115	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(WESTON SOLUTIONS, INC.)
503540	07/01/2015	REVISED REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN VOLUME 1 AND 2 FOR THE MATLACK INCORPORATED SITE	114	Report		(HDR)
503541	06/14/2017	FINAL REMEDIAL INVESTIGATION REPORT WITH TEXT, TABLES, AND FIGURES FOR THE MATLACK INCORPORATED SITE	135	Report		(HDR)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

08/23/2017

REGION ID: 02

Site Name: MATLACK INCORPORATED
CERCLIS ID: NJD043584101
OUID: 01
SSID: 02P9
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
503542	06/14/2017	FINAL REMEDIAL INVESTIGATION REPORT WITH APPENDICES A-O FOR THE MATLACK INCORPORATED SITE	1626	Report		(HDR)
473421	7/10/2017	SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT REPORT FOR THE MATLACK INCORPORATED SITE	218	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(HENNINGSON, DURHAM & RICHARDSON ARCHITECTURE AND ENGINEERING PC)
473420	7/20/2017	BASELINE HUMAN HEALTH RISK ASSESSMENT REPORT FOR THE MATLACK INCORPORATED SITE	349	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(HENNINGSON, DURHAM & RICHARDSON ARCHITECTURE AND ENGINEERING PC)
407813	08/18/2017	FINAL FEASIBILITY STUDY REPORT FOR THE MATLACK INCORPORATED SITE	119	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(HDR ENGINEERING INCORPORATED)|(HENNINGSON, DURHAM & RICHARDSON ARCHITECTURE AND ENGINEERING PC)
451907	08/23/2017	PROPOSED PLAN FOR THE MATLACK INCORPORATED SITE	17	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX 4

STATE LETTER

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SITE REMEDIATION & WASTE MANAGEMENT PROGRAM
Mail Code 401-06
P. O. Box 420
Trenton, New Jersey 08625-0420
Tel. #: 609-292-1250
Fax. #: 609-777-1914

BOB MARTIN
Commissioner

September 27, 2017

Ms. Angela Carpenter, Acting Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Re: Matlack, Inc. Superfund Site
Record of Decision
EPA ID# NJD043584101
DEP PI# 007390

Dear Ms. Carpenter:

The New Jersey Department of Environmental Protection (DEP) completed its review of the "Record of Decision, Matlack, Inc. Superfund Site, Woolwich Township, Gloucester County, New Jersey" prepared by the U.S. Environmental Protection Agency (EPA) Region II in September 2017 and concurs with the selected remedy to address all contaminated soil, groundwater, seep water, surface water and sediment at the site.

Further, DEP appreciates that EPA included measures to ensure that the full horizontal and vertical extent of aromatic and chlorinated volatile organic compound (VOC) impacts in soil, sediment and groundwater will be delineated to successfully guide the selected cleanup remedy. The additional concern of determining if dense non-aqueous phase liquid is present at the site also is properly included in the cleanup document. Lastly, DEP's request for additional installations of the permeable reactive barrier walls, which may be needed to fully remediate the groundwater, have been included at appropriate timeframes to ensure groundwater meets remedial goals for the site.

The major components of the remedy selected for the site include the following:

- Installation of two permeable reactive barriers to provide passive treatment of aromatic and chlorinated VOCs and the semi-volatile organic compound 4-chloroanaline in groundwater;

- Excavation and off-site disposal of contaminated soil and sediment that acts as a source of further contamination to groundwater, seep water, surface water and sediment;
- Long-term monitoring to assure the effectiveness of the remedy over time; and,
- Institutional controls including a Classification Exception Area and deed notices until remedial action objectives are met.

By remediating the groundwater and removing ongoing sources of contamination, the remedy also addresses contamination resulting from the discharge of groundwater to seeps, which has impacted seep water, surface water and sediment. In addition, by remediating the groundwater, potential future risks associated with inhalation of indoor air through vapor intrusion if a building or structure were to be built over the contaminated plumes will be addressed.

DEP appreciates the opportunity to participate in the decision-making process to select an appropriate remedy for this site. Further, DEP is looking forward to future cooperation with EPA during remedial actions for this site to protect the Grand Sprute Run waterway and the local environment.

If you have any questions, please call me at 609-292-1250.

Sincerely,

Mark J. Pedersen
Assistant Commissioner
Site Remediation & Waste Management Program

C: Kenneth J. Kloo, Director, Division of Remediation Management, DEP
Edward Putnam, Assistant Director, Publicly Funded Response Element, DEP
Carole Petersen, Chief, New Jersey Remediation Branch, EPA Region II

APPENDIX 5

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

FOR THE

RECORD OF DECISION

MATLACK, INC., SUPERFUND SITE

WOOLWICH TOWNSHIP, GLOUCESTER COUNTY, NEW JERSEY

INTRODUCTION

This Responsiveness Summary provides a summary of comments and concerns provided during the public comment period related to the Proposed Plan (Attachment A) for Matlack, Inc., Superfund site (the Site) and provides the U.S. Environmental Protection Agency's (EPA's) responses to those comments. All comments summarized in this document have been considered in EPA's final decision in the selection of a remedy to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

All documentation which EPA used to develop the Proposed Plan and select the remedy in this Record of Decision (ROD), including EPA's Feasibility Study dated August 2017, are in the Administrative Record for the site which was made available to the public beginning August 23, 2017 in the information repositories maintained in the EPA Docket Room at the EPA Region 2 offices at 290 Broadway, New York, New York, at the Township of Woolwich Municipal Building, 120 Village Green Drive, Woolwich Township, New Jersey and on EPA's website for the site, www.epa.gov/superfund/matlack.

On August 23, 2017, EPA published a notice in the *Star Ledger* newspaper informing the public of the commencement of the public comment period for the Proposed Plan, the upcoming public meeting on September 14, 2017, the preferred remedy for the Site, contact information for EPA personnel, and the availability of site-related documents in the Administrative Record. Copies of the notice can be found in Attachment B of this appendix. The Proposed Plan is available at each of the repositories listed above, including online. The public comment period ran from August 23, 2017 to September 22, 2017. EPA held a public meeting on September 14, 2017 at 6:30 P.M. in the Woolwich Township Municipal Courtroom, 120 Village Green Drive, Woolwich, New Jersey, to present the findings of the Proposed Plan, and to answer questions from the public about the Proposed Plan, the remedial alternatives evaluated, and EPA's preferred alternative.

SUMMARY OF COMMENTS AND RESPONSES

A summary of the comments provided at the public meeting are provided below. The transcript from the public meeting and the comments submitted during the public comment period can be found in Attachments C and D, respectively, of this appendix.

Comment 1: The Township of Woolwich endorses EPA's preferred alternative.

EPA Response to Comment 1: EPA acknowledges the comment in support of its preferred alternative.

Comment 2: A commenter questioned whether the Site investigation activities, including those conducted as part of the EPA Remedial Investigation (RI), evaluated a comprehensive list of potential contaminants, given the nature of the business conducted at the Site. The commenter noted that the better the understanding of the nature and extent of contamination at the Site, the greater chance there is that an appropriate remedy will be selected and that it will succeed without the need for modification.

EPA Response to Comment 2: The Site was investigated, and a remedy was chosen, in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §§ 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. Consistent with CERCLA, the full suite of CERCLA hazardous substances was analyzed for at the site, including volatile organic compounds, semi-volatile organic compounds, metals, pesticides, and polychlorinated biphenyls. In addition, tentatively identified compounds (TICs) were reported in the remedial investigation report. TICs may include compounds that are not part of the full CERCLA suite of compounds. TICs that have high concentrations or frequent detections can be evaluated further to determine the identify and possible source. There were no compounds identified as TICs at the Site that required additional evaluation.

Comment 3: A commenter stated that the Site may be considered a former hazardous waste treatment, storage and disposal unit/facility, and could be subject to provisions of 40 CFR Part 264, Subpart F and Part 265, Subpart F.

EPA Response to Comment 3: Matlack, Inc., ceased operating a waste water lagoon on the Site in 1975. 40 CFR Part 264, Subpart F and Part 265, Subpart F are regulations that govern operation and permitting of hazardous waste facilities under the Resource Conservation and Recovery Act (RCRA), but RCRA was not enacted until 1980. Therefore, a permit would not have been required before 1980. In addition, Matlack has been out of business since 2001, having been liquidated in bankruptcy. Accordingly, RCRA permitting requirements do not apply to the Site.

Comment 4: The selected remedy includes the potential need to establish a Classification Exception Area (CEA) for the Site until Remedial Action Objectives (RAOs) are met. A commenter noted that the New Jersey Department of Environmental Protection (NJDEP) may require additional groundwater sampling as part of their CEA application/approval process.

EPA Response to Comment 4: If additional groundwater sampling is required as per NJDEP's CEA/Well Restriction Area application process, it will be conducted prior to submitting the full application package to NJDEP. Note that NJDEP is in agreement with the selected remedy, and a letter of concurrence is attached as Appendix 4 of the ROD.

Comment 5: A commenter asked EPA to confirm that the surficial geology is in fact the Pennsauken Formation, as described in the RI report, or if the initial underlying geology consists of the Englishtown Formation/Aquifer.

EPA Response to Comment 5: Based on a literature review, EPA has concluded that the surficial geology at the Site is in the Pennsauken Formation. This conclusion is primarily based on a document prepared by W.F Hardt and G.S. Hilten entitled, "Water resources and geology of Gloucester County, New Jersey." (New Jersey Department of Conservation and Economic Development Special Report 30, 130 p.1969).

Comment 6: A commenter asked EPA to explain the anomalously high total and dissolved iron concentrations in the April and July 2016 sampling results in MW-2B, and questioned the construction of this well.

EPA Response to Comment 6: Elevated iron concentrations were also identified in other wells around the Site, including MW-03, MW-06 and PZ-01. The highest concentration of iron was identified in monitoring well PZ-01. Monitoring well MW-2B was installed in 1984 and is a 4-inch diameter well installed to a depth of approximately 103 feet below ground surface. Naturally occurring iron is present in the aquifer, and EPA monitors the installation and integrity of wells on site to ensure proper construction.

Comment 7: A commenter stated that the map displayed on Page 120 of the RI report cannot be easily used to evaluate individual contaminant transport of the primary contaminants of concern, such as tetrachloroethylene, trichloroethylene, benzene and 4-chloroanaline.

EPA Response to Comment 7: EPA thinks the figures adequately display the data to assist in the decision-making process. For clarity, the chlorinated volatile organic plume identified as the southern-most plume includes tetrachloroethylene, trichloroethylene and other chlorinated volatile organics. The northern plume includes benzene and other aromatic volatile organics, and the 4-chloroanaline plume has been identified separately because if falls within the plume of aromatic volatile organics; but is itself a semi-volatile aromatic compound. Identifying each constituent plume would likely make it more difficult to evaluate the data on the figure.

Comment 8: A commenter notes that the concentration of contaminants in groundwater seems to be decreasing over time without any action taking place, and states that removal of the soil source area (former lagoon) will likely enhance this process. As such, the commenter states that the use of an active groundwater remediation approach in the form of permeable reactive barriers (PRBs) may not be necessary at all. The commenter recommends waiting for a period of time after excavation of the contaminated soil and monitoring to determine the best path forward.

EPA Response to Comment 8: The comment is noted. The details of the implementation of the remedial action, including timing and sequencing, will be evaluated during the remedial design process. While constituent concentrations in groundwater have, indeed, been decreasing over time, constituents are still present in groundwater at concentrations representing an unacceptable risk to human health and the environment at the point of discharge to Grand Sprute Run. Removal of the potential source area in concert with the use of a passive technology at the point of groundwater discharge is considered to represent the most appropriate remedy for the site.

Comment 9: A commenter observes that there is, in the commenter's opinion, unacceptable variability between sampling event results for several key parameters, and recommends identifying these issues and possibly resampling.

EPA Response to Comment 9: Variability exists in all environmental data sets. Multiple years of data was collected and evaluated to help inform the selection of a remedy. Additional groundwater, soil, seep water, surface water and sediment monitoring will be conducted during the pre-design investigation to further evaluate conditions prior to finalizing the design.

Comment 10: A commenter states that there since PRBs are passive in nature, there is no way of knowing how long it will take for all contaminants to eventually migrate through the walls, and that the timeframe for cleanup could be in excess of 100 years.

EPA Response to Comment 10: EPA agrees that the exact timeframe for RAOs to be met is unknown. The groundwater flow rate is measured and the timeframe for reaching RAOs may be more or less than the 30 years that is estimated in the Feasibility Study. This estimate will be refined during the remedial design, the performance of the remedy will be evaluated on an ongoing basis over time, and it will be optimized as necessary and appropriate.

Comment 11: A commenter notes that the reactive material used in the PRBs could be expended before all remediation goals are achieved.

EPA Response to Comment 11: EPA agrees this could occur, and has thus included in its cost estimate for the remedy two potential replacements of the reactive material within the PRB wall.

Comment 12: A commenter asked EPA to reconsider the inclusion of In-Situ Chemical Oxidation (ISCO) as a viable remedial alternative at this Site, and states that limited injections of oxidants in combination with long-term monitored natural attenuation may be effective.

EPA Response to Comment 12: The use of ISCO was considered during the Feasibility Study; however, it was not retained due to the potential for discharge of ISCO reagents to surface water within Grand Sprute Run and the potential ecological side-effects of that discharge. While ISCO could be effectively used within the potential source area, the use of a reactive barrier would still be necessary to prevent the discharge of contaminated groundwater to Grand Sprute Run.

Comment 13: A commenter notes that the remedial timeframe for Alternative 3, Air Sparging/Soil Vapor Extraction (AS/SVE), is much shorter than that for the selected remedy of PRBs with soil/sediment excavation, monitoring and institutional controls until RAOs are met. The commenter goes on to posit that AS/SVE is a proven technology with a near certain chance of success.

EPA Response to Comment 13: While AS/SVE is a proven method for the treatment of volatile organics in soil and groundwater, its efficacy for the treatment of semi-volatile compounds such as 4-chloroanaline has not been proven. In addition, the use of AS/SVE will result in much greater short-term disruption to the Site due to the presence of operating equipment, piping and utilities at the ground surface over the entire footprint of the groundwater plume.

Comment 14: A commenter notes that the PRB approach will require extensive bench scale testing to evaluate feasibility.

EPA Response to Comment 14: The use of PRBs has been demonstrated at numerous sites as an effective method for treatment of groundwater contamination. The specific configuration of each PRB wall will be determined via bench-scale testing during the design process; however, bench-scale or pilot-scale testing would be conducted to better determine the configuration and cost of any selected alternative, not just for the use of PRBs.

Comment 15: A commenter asked if there were any unacceptable risks to boaters in Grand Sprute Run. They noted that usage may increase in the coming years as part of the Township of Woolwich's master plan.

EPA Response to Comment 15: EPA did not evaluate this exposure scenario. However, a more conservative (i.e., health-protective) wading scenario was considered in the human health risk assessment, and exposure to surface water and sediment while boating in Grand Sprute Run is expected to be less than that of a wading scenario. Therefore, EPA thinks that boating on Grand Sprute Run would not be associated with elevated cancer risks or non-cancer health hazards. That said, EPA will continue to visually monitor the site on an on-going basis and, if necessary, will post signs or other institutional controls if warranted. This would be consistent with the selected remedy. It is EPA's understanding that Woolwich Township's Master Plan may lead to increased recreational use of this area, including Grand Sprute Run.

ATTACHED TO THIS RESPONSIVENESS SUMMARY ARE THE FOLLOWING:

Attachment A – Proposed Plan
Attachment B – Public Notice – *Star Ledger*
Attachment C – September 14, 2017 Public Meeting Transcript
Attachment D – Comments Submitted During Public Comment Period

Attachment A

Proposed Plan

Matlack, Inc. Superfund Site

Woolwich Township, Gloucester County, New Jersey

Superfund Proposed Plan *August 2017*

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the Preferred Alternative to remediate contaminated soil, groundwater, seep water and sediment associated with the Matlack Inc. Superfund Site (the Site) located in Woolwich Township, Gloucester County, New Jersey. The Preferred Alternative calls for the use of Permeable Reactive Barriers (PRBs) in combination with the excavation of contaminated soil and sediment as the final remedy to address contamination at the site. By remediating the groundwater and removing ongoing sources of contamination, the remedy also addresses contamination resulting from the discharge of groundwater to seeps, which has impacted surface water in the seep and Grand Sprute Run, as well as seep sediment.

EPA has completed remedial investigation (RI) activities at the site over three phases, from July 2015 to August 2016. The RI activities involved sampling surface water, seeps, sediment, soil, and groundwater to characterize the former waste disposal (lagoon) area and the extent of contamination.

This Proposed Plan includes summaries of cleanup alternatives evaluated for use to address contaminated soil, groundwater, seep water and sediment at the site. This Proposed Plan was developed by EPA, the lead agency for the Site, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA, in consultation with NJDEP, will select a final remedy for the contaminated media after reviewing and considering all information submitted during the 30-day public comment period. EPA, in consultation with NJDEP, may modify the Preferred Alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan as part of its community relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. 9617(a), and Section 300.435(c) (2) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the RI and Feasibility Study (FS) reports and other related documents, which can be found in the Administrative Record for this action. The location of the Administrative Record is provided below. EPA and

MARK YOUR CALENDARS

Public Comment Period:
August 23 - September 22, 2017
EPA will accept written comments on the Proposed Plan during the public comment period. Written comments should be addressed to:

Juan E. Davila
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 18th Floor
New York, NY 10007
Email: davila.juan@epa.gov

Written comments must be postmarked no later than September 22, 2017.

Public Meeting
September 14, 2017 at 6:30 P.M.
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at:

Woolwich Township Municipal Courtroom
120 Village Green Drive, Woolwich, NJ 08085

In addition, the administrative record is available on-line at:
www.epa.gov/superfund/matlack

NJDEP encourage the public to review these documents to gain a more comprehensive understanding of activities for the site.

COMMUNITY ROLE IN SELECTION PROCESS

This Proposed Plan is being issued to inform the public of EPA's preferred alternative to address contaminated soil, groundwater, seep water and sediment at the site and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred alternative. Changes to the preferred alternative, or a change to another alternative, may be made if public comments or additional data indicate that such a change would result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comments on all of the alternatives considered in the Proposed Plan, because EPA may select a remedy other than the preferred alternative. This Proposed Plan has been made available to the public for a public comment period that concludes on September 22, 2017.

A public meeting will be held during the public comment period to present the conclusions of the RI/FS, to elaborate further on the reasons for proposing the preferred alternative, and to receive public comments. The public meeting will include a presentation by EPA of the preferred alternative and other cleanup options.

Information concerning the public meeting and on submitting written comments can be found in the "Mark Your Calendars" text box on Page 1. Comments received at the public meeting, as well as written comments received during the public comment period, will be documented in the Responsiveness Summary section of the Record of Decision (ROD). The ROD is the document that explains which alternative has been selected and the basis for the selection of the remedy.

SCOPE AND ROLE OF THE ACTION

As with many Superfund sites, the contamination at this site is complex. Even so, the cleanup of the site is being managed as one operable unit, and thus this remedy is being considered the final action for this site, and it will address contaminated soil, groundwater, surface seeps and sediment associated with the site.

The active portion of the remedy focuses on the remediation of groundwater and removal of sources of contamination from soil and sediment. However, by taking these actions, the remedy also addresses contamination resulting from the discharge of groundwater to seeps, which has impacted surface water in the seep and Grand Sprute Run, as well as seep sediment.

SITE DESCRIPTION

The Site is located along Route 322 East in Woolwich Township, Gloucester County, New Jersey (Figure 1-1). The Site is bounded by Route 322 to the North, by woodlands to the east and west, and by field leading down to Raccoon Creek to the south. Grand Sprute Run, about 600 feet west of the Site's western boundary, drains into Raccoon Creek.

SITE BACKGROUND

The Site includes Matlack Inc.'s former Swedesboro Terminal that occupied the northern portion of a 72-acre parcel. The Site includes the investigation area as well as a northern portion of a parcel owned by the Grand Sprute Plantation that is located immediately west and down-gradient of the Site.

A one-story building (formerly known as the terminal building with an attached tank-cleaning facility), is located in the northeast quadrant of the Site, and is surrounded on the north, east, and west by a paved parking lot and driveway. A former wastewater lagoon is located south of the former terminal building, and is presently in a field with various shrubs. The land use surrounding the Site is mixed use consisting of agricultural, commercial and residential.

Matlack, Inc. transported chemicals, petrochemicals, and food-grade liquid in bulk using tank trailers (tankers) from 1962 until 2001 when the company submitted a petition for Chapter 11 bankruptcy and ceased operations.

The primary source of waste generation at the Site was the cleaning of tankers that had previously held a variety of substances including petroleum products, xylenes, benzene, toluene, glycol, styrene, wax, alum, resins, acids, naphthalene, various organic solvents, flammable substances, coal tar, and hazardous wastes.

From 1962 until 1976, Matlack, Inc. discharged the wastewater into an unlined surface impoundment (lagoon) located southwest of the terminal building. The lagoon and Site layout are shown on Figure 2. After discontinuing the use of the surface impoundment in 1976, Matlack, Inc. began collecting its wastewater in multiple open-top, in-ground concrete tanks for temporary storage.

During the operating period, from 16 to 20 tank trailers per day were cleaned at the Swedesboro Terminal. Matlack, Inc. used various solvents, including tetrachloroethene (PCE), methylene chloride, toluene, trichloroethene (TCE), acetone, methanol, and ethanol, to clean the tankers. The tanker cleaning operations generated from 5,000 to 15,000 gallons of wastewater per day, which was hauled off-site for treatment and disposal.

Matlack, Inc. discontinued tanker cleaning operations at the Site in November 1997, but continued to service and store its vehicles at the Swedesboro Terminal. The Site is currently operated by Liberty Kenworth, a medium and heavy duty truck sales and service center.

Site Geology and Hydrogeology

The geology encountered by the wells generally consists of fine to coarse sand (Pennsauken Formation) overlying clay (Woodbury Clay). Additionally, discontinuous gravel units were encountered between the sand and the clay units.

As discussed below, in 1987, NJDEP and Matlack, Inc. entered into an Administrative Consent Order (ACO). Between 1990 and 2001, Matlack Inc. conducted a two phase RI and remedial/removal actions to address source areas identified from previous investigations.

The Phase II Investigation performed by SAIC (SAIC 2001) revealed a low in the (Woodbury) clay surface at monitoring wells MW-6 and MW-12, and a high (mound) in the clay surface near pumping well PW-12 in the southeast area of the Site. Prior to that, a geophysical investigation performed by Environmental Resources Management, Inc. (ERM) as part of Phase I of the RI delineated the topography of the upper surface of the clay horizon.

Three outstanding features were noted in ERM's 1990 RI report:

- A clay surface high exists in the area of well MW-13 and further west, which appears to be above normal water table elevations and splits groundwater flow in the area.

- Another clay surface high, just below normal water elevation, exists in the area of well MW-7.

- A clay trough is evident, generally following a line west-southwest, from wells MW-15 through MW-6. A second trough splits off north-northwestward at an area approximately midpoint between wells MW-15 and MW-6, and continues between the two clay highs toward the area of well MW-17.

Investigations have determined that two separate hydrogeologic systems exist at the Site. A shallow unconfined aquifer exists under water table conditions (the Pennsauken Formation). This is underlain by the Woodbury clay, which acts as a confining unit preventing the vertical migration of groundwater contaminants.

Water level measurements indicate that the water table occurs from approximately 4 feet below the surface at the southeast comer of the Site to approximately 28 feet below the surface at the northwest corner of the Site. The gradient dips in a north-northwesterly direction towards Grand Sprute Run.

The clay trough and clay highs identified by the 1990 geophysical investigation were anticipated to exert some control on the direction of groundwater movement in the shallow aquifer. Groundwater elevations measured during 2016 indicated that groundwater in the shallow/unconfined aquifer flowed to the west-northwest toward Grand Sprute Run in the northern portion of the Site, while shallow groundwater in the southern portion of the Site flowed to the west-southwest toward a topographic low at Grand Sprute Run in the vicinity of monitoring well MW-27. The groundwater flow direction was not observed to vary greatly between the May and July 2016 monitoring rounds conducted as part of the RI.

The deep aquifer in the Magothy-Raritan Formations has been found to be separated from the upper unconfined aquifer by the Woodbury Clay confining unit, which is over 50 feet thick. Significant head differences (about 30 feet) between the aquifers imply considerable hydraulic separation. Groundwater in this aquifer flows towards the southeast.

Groundwater elevations in RI monitoring wells MW-1B, MW-2B and MW-7B indicate that flow in the deeper, confined aquifer below the Woodbury Clay flows to the west-southwest. The groundwater flow direction in this aquifer was also not observed to vary greatly between the May and July monitoring rounds, though groundwater elevations in the deeper aquifer were, on average, seven to eight feet lower in July than in May.

REMEDIAL INVESTIGATION AND EARLY RESPONSE ACTIONS

Early Response Actions

The NJDEP began investigating potential groundwater contamination at the Site in December 1982 in response to potable water well contamination in the area surrounding the facility. Investigations included sampling of groundwater, soil, surface water and sediment associated with identified areas of concern.

In May 1987, NJDEP and Matlack, Inc. entered into an ACO. Between 1990 and 2001, Matlack Inc. conducted a two phase investigation and remedial/removal actions to address source areas identified from previous investigations. One such action included installation of a groundwater treatment system that consisted of extraction wells, an infiltration trench and aeration system, which was operated from November 1995 to May 1997 and then again from June 2006 through 2011. Additional actions included the removal of aboveground and underground storage tanks (ASTs and USTs) used for waste and petroleum, and the excavation and off-site disposal of contaminated soil.

NJDEP conducted additional investigation and sampling activities between 2002 and 2009 and a site reassessment in 2011, at the request of EPA. EPA began investigation activities in 2012 and the Site was listed on the National Priorities List in 2013. In 2014, EPA conducted a site investigation to determine if the former unlined disposal lagoon or other nearby source areas were continuing to leak contaminants of potential concern to groundwater and thereby impacting Grand Sprute Run and associated wetlands located to the west of the Site.

Remedial Investigation

RI activities were conducted in three phases: Phase 1 was conducted during July 2015, Phase 2 was conducted during March, April, and May 2016, and Phase 3 was conducted during July and August 2016. RI activities involved sampling surface water, seeps, sediment, soil, and existing and newly installed groundwater monitoring wells to further characterize the former waste disposal (lagoon) area and the extent of both the petroleum hydrocarbon (PHC) and 4-chloroanaline plume (identified as the Area 1 plume) and the chlorinated volatile organic compound (VOC) plume (identified as the Area 2 plume) identified at the Site.

In surface soil samples collected (depth of 0-2 ft.), there were no VOCs detected at concentrations above New Jersey Residential Direct Contact Soil Remediation Standards (NJRDCSRS). Semi-volatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs) were identified at concentrations slightly above the NJRDCSRS at isolated locations within the former lagoon area.

The results of subsurface soil sampling (depth greater than 2 ft.) indicated that the SVOCs benzyl butyl phthalate, bis(2-ethylhexyl) phthalate and napthalene were present in subsurface soil at concentrations above New Jersey Impact to Groundwater Soil Screening Levels (NJIGWSSL), based on sampling conducted during 2016.

The VOCs benzene, PCE, TCE, and total xylenes were identified during 2016 sampling at numerous locations at concentrations above the NJIGWSSL. Benzene, PCE, TCE and total xylenes were also identified during 2014 sampling at two locations at concentrations above IGWSSL. The SVOCs benzyl butyl phthalate, bis(2-ethylhexyl) phthalate, di-n-octylphthalate and naphthalene were also identified at concentrations above IGWSSL during 2014 at the same two locations.

As noted, groundwater sampling indicates two distinct plumes: one plume consists of PHC-related aromatic VOCs (e.g., benzene) and the SVOC 4-chloroaniline; the other plume consists of chlorinated VOCs. The highest concentration detected of chlorinated VOCs was 1,800 µg/l and of aromatic compounds was 1,347 µg/l.

The results for surface water and sediment sampling indicated PCE and TCE were present in seep and sediment samples above New Jersey Surface Water Quality Criteria and New Jersey Sediment Quality Criteria, respectively.

The maximum detected concentrations associated with each contaminant of concern (COC) and media are provided in Table 1, along with the Preliminary Remediation Goals.

PRINCIPAL THREATS

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. They include liquids and other highly mobile materials (e.g., solvents) or materials having high concentrations of toxic compounds. No "threshold level" of toxicity/risk has been established to equate to "principal threat" A detailed explanation of principle threat wastes can be found in the box, “What is a Principle Threat?”

Although VOCs in soil and sediment at the site may act as a limited source of contamination to groundwater, water seeps and sediment, these sources are not considered principal threat wastes at the site. The primary media contaminated at the site is groundwater.

SUMMARY OF SITE RISKS

As part of the RI/FS for the Site, a baseline risk assessment was conducted 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 if no actions to mitigate such releases are taken, under current and future land and groundwater uses. The baseline risk assessment includes a human health risk assessment (HHRA) and a screening-level ecological risk assessment (SLERA).

Human Health Risk Assessment

A four-step HHRA process was used for assessing site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification of Chemicals of Potential Concern (COPCs), Exposure Assessment, Toxicity Assessment, and Risk Characterization (see text box entitled “What is Risk and How is it Calculated” for additional explanation of these terms).

WHAT IS A “PRINCIPAL THREAT?”

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 ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) 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.

The HHRA began with the selection of chemicals in the various media found at the Site (i.e., groundwater, soil, seep water, seep sediment and surface water) that could potentially cause adverse health effects in exposed populations. As a result, 47 chemicals, including VOCs, SVOCs, pesticides, PCBs and inorganics were retained as COPCs and carried through to the remainder of the HHRA.

The identification and selection of potential receptor populations was based on both current and potential future land uses of the Site. The Site is located within a portion of Woolwich Township zoned as RC-1 (Regional Center), and is currently being used as a medium and heavy truck sales and service facility operated by Liberty Kenworth. Impacted groundwater associated with the site is not currently used for drinking water. Although the groundwater is currently not used for drinking water purposes, the HHRA assumed groundwater could be used as a source of drinking water in the future.

The land use surrounding the Site is mixed, consisting of agricultural, commercial and residential uses. As such, the following receptor populations were evaluated in the HHRA: future on-Site worker, future on-Site construction worker, future on-Site resident (child and adult), current/future off-Site resident (adult and child) and a current/future off-Site recreator (adult and child).

The potential exposure pathways considered in the HHRA included inhalation of soil particulates and vapors; incidental ingestion of and dermal contact with soil particulates; groundwater ingestion, dermal contact and inhalation of groundwater; and incidental ingestion and dermal contact with seep water and sediment along with surface water. In addition, for overall completeness, a screening evaluation was conducted to determine if the potential for vapor intrusion (VI) into indoor air from subsurface vapor sources exists. The VI screening evaluation consisted of comparing the maximum groundwater concentration of COPCs to both residential and commercial based Vapor Intrusion Screening Levels (VISLs) through the use of EPA's VISL Calculator.

Two types of toxic effects were evaluated for each receptor in the risk assessment: carcinogenic effects and non-carcinogenic effects. Calculated risk estimates for each receptor were compared to EPA's target threshold values for carcinogenic risk of 1×10^{-6} (one-in-one million) to 1×10^{-4} (one-in-ten thousand) and calculated hazard index (HI) to a target value of 1.

Summary of HHRA Results

This section provides a summary of the conclusions of the HHRA per media. The bolded values in Tables A through D highlight the cancer risk and noncancer hazards estimates that exceed EPA's threshold criteria. Further, media-specific COCs were identified in instances when the threshold criteria were exceeded. A complete discussion of all exposure scenarios evaluated can be found in the final HHRA Report for the site.

➢ ***Surface Soil***

Risks and hazards were evaluated for future exposure to on-site surface soil by a future child and adult resident and an adult worker. As summarized in Table A, the estimated cancer risks and noncancer hazards for all

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. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the contaminants of 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 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 are capable of causing 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 10^{-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 10^{-4} to 10^{-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.

receptor populations evaluated were found to be below or within EPA's target threshold values. Based on these results, there were no COCs identified for on-Site surface soils.

Table A: Summary of hazard and risks associated with surface soil

Receptor	Hazard Index	Cancer Risk
Future on-Site Worker	0.1	4.4×10^{-6}
Future on-Site Child Resident	1	7.7×10^{-5}
Future on-Site Adult Resident	0.2	

- ***Surface/Subsurface Soil***

Risks and hazards were evaluated for potential future exposure to surface and subsurface soil present on-Site by an adult construction worker. Results of the risk assessment indicated the estimated risk and hazards fell below EPA's threshold criteria (Table B). Consequently, COCs were not identified for on-Site surface and subsurface soils.

Table B: Summary of hazard and risks associated with surface/subsurface soil

Receptor	Hazard Index	Cancer Risk
Future on-Site Construction Worker	0.5	8.5×10^{-7}

Note that exposure to several metals, namely cobalt, iron, manganese and thallium, was associated with elevated noncancer hazard indices; however, since metals are not considered site-related, they were not retained as COCs for purposes of remedy selection.

- ***Groundwater***

Risks and hazards were evaluated for potential future exposure to groundwater beneath the Site. The populations of interest included the following future on-Site receptors: adult workers, construction workers and child and adult residents. As summarized in Table C, the hazard indices for the child resident (59), adult resident (46), and construction worker (25) exceeded EPA's threshold value of 1. In addition, the combined cancer estimates for the child and adult resident of 4.3×10^{-3} exceeded EPA's threshold range of 1×10^{-6} to 1×10^{-4}. The groundwater COCs varied by receptor population. For the future on-Site resident, groundwater COCs include ethylbenzene, PCE, TCE, vinyl chloride and 4-chloroaniline. Additionally, exposure to several metals, namely cobalt, iron, manganese and thallium, was associated with elevated noncancer hazard indices. However, since metals are not considered site-related they were not retained as COCs for purposes of remedy selection. Lastly, in addition to PCE and TCE, two additional VOCs (biphenyl and naphthalene) were identified as COCs via the inhalation pathway for the future on-Site construction worker working in a trench.

The potential for soil VI is evaluated when Site soils and/or groundwater are known or suspected to contain chemicals that are considered to be volatile. A comparison of maximum detected concentrations of volatile chemicals found in site-wide groundwater to EPA's chemical specific, risk-based groundwater VISLs. The VISLs provide groundwater levels associated with an indoor air concentration that represents a cancer risk ranging from 1×10^{-4} and 1×10^{-6} or a noncancer hazard quotient of 1. Concentrations exceeding these screening values indicate the potential for VI. Results of the screening evaluation identified the following nine chemicals at concentrations greater than the residential VISLs: 1,2-dichloroethane, 1,4-dichlorobenzene, benzene, ethylbenzene, PCE, TCE, vinyl chloride, naphthalene and cyanide. Based on the results of the screening evaluation, the potential for VI exists in the future timeframe if buildings were to be constructed overlying the plume.

Table C**:** Summary of hazard and risks associated with groundwater

Receptor	Hazard Index	Cancer Risk
Future on-Site Worker	0.6	2.7×10^{-5}
Future on-Site Construction Worker	**25**	1.6×10^{-5}
Future on-Site Child Resident	**59**	**4.3×10^{-3}**
Future on-Site Adult Resident	**46**	

➢ ***Seep Water, Seep Sediment and Surface Water***

Risks and hazards were evaluated for current and future exposure to seep water, seep sediments and surface water within Grand Sprute Run. The populations of interest included child and adult recreators who may visit the area and participate in recreational activities such as wading. The results of the risk assessment are

Table D**:** Summary of hazard and risks associated with seep water, sediment and surface water

Receptor	Hazard Index	Cancer Risk
Exposure Media: Seep Water		
Current/Future off-Site Child Recreator	**2**	6.0×10^{-6}
Current/Future off-Site Adult Recreator	0.9	
Exposure Media: Seep Sediment		
Current/Future off-Site Child Recreator	1	1.6×10^{-5}
Current/Future off-Site Adult Recreator	0.1	
Exposure Media: Surface Water		
Current/Future off-Site Child Recreator	1	7.0×10^{-6}
Current/Future off-Site Adult Recreator	0.5	

summarized per media in Table D. Exposure to seep water by a child recreator was the only receptor population that was found to exceeded EPA's threshold criteria. The associated hazard index of 2 was primarily attributable to PCE, TCE and manganese in seep water; however, manganese is not considered to be site related and was not retained as a COC for purposes of remedy selection.

In summary, results of the HHRA found that exposure to VOCs and SVOCs in groundwater beneath the Site was associated with cancer and noncancer risk estimates that exceeded EPA's threshold criteria. The presence of volatile COCs were also found at levels that could be of concern for the future VI pathway. Furthermore, exposure to PCE, TCE, and manganese present in seep water samples collected from Grand Sprute Run was associated with a noncancer hazard that slightly exceeded EPA's hazard index of 1.

Ecological Risk Assessment

A SLERA was conducted that focused on evaluating the potential for impacts to sensitive ecological receptors to site-related constituents of concern through exposure to surface soil, surface water, sediment, and seep surface water and sediment. Compounds detected in these media were compared to ecological screening values to determine the potential for adverse effects to ecological receptors. A complete summary of the exposure scenarios can be found in the SLERA in the administrative record.

The SLERA evaluated risk to ecological receptors using two different analyses, a standard SLERA evaluation and a refined SLERA evaluation that included less stringent assumptions and parameters. The initial evaluation used the maximum concentration of all detected compounds and the evaluation indicated that there is a potential ecological risk from surface soil, seep water, seep sediment and surface water of Grand Sprute Run due to exposure to VOCs, SVOCs and metals. Fifty-nine compounds were identified as COPCs in the initial SLERA evaluation. The SVOCs and metals were detected throughout the Site, while VOCs were associated with groundwater discharges originating from groundwater under the former lagoon that migrated to seeps and surface water through seep sediment. The historical description of activities that occurred at the Site indicate the discharge of VOCs into the former lagoons and soil resulted in contaminated groundwater, which then flowed towards Grand Sprute Run.

The second evaluation, identified as Step 3A, evaluated risks to ecological receptors exposed to the 95% upper-confidence limit (UCL) concentrations of COPCs. It also included other refinements, such as consideration of whether compounds are associated with former site activities (i.e., site-related compounds). The refined evaluation reduced the COPC list from 59 to 30 COPCs. This analysis also resulted in a finding of unacceptable risk for ecological receptors exposed to VOCs in surface soil, seep water, seep sediment and surface water. This indicates that a remedial action is needed to address the discharge of compounds in the soil, seep water and sediment and Grand Sprute Run to prevent or eliminate exposure to ecological receptors. Although SLERAs that identify unacceptable risk usually proceed to a Baseline Ecological Risk Assessment (BERA), where additional data and revised toxicity values are used to further evaluate the potential for ecological impacts, it is evident from the results of this SLERA, combined with the fate and transport of the groundwater, that the primary ecological issue is groundwater contamination discharging to the seeps and Grand Sprute Run. The SLERA evaluations also identified impacts from surface soils, mainly from inorganic compounds; however, these are currently not considered to be site related. Given that the proposed remedial alternatives will address the soil in the former lagoon area, as well as the contaminated groundwater discharge to the seeps and Grand Sprute Run, no additional ecological investigation is needed, as the completed ecological exposure pathways will be eliminated with the implementation of the remedial actions.

Risk Assessment Summary

Based on the results of the human health and ecological risk assessments a remedial action is necessary to protect public health, welfare and the environment from actual or threatened releases of hazardous substances.

It is EPA's judgment that the preferred alternative summarized in this Proposed Plan is necessary to protect 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), to-be-considered (TBC) guidance, and site-specific risk-based levels. The primary objective of any remedial strategy is overall protectiveness.

RAOs for soil at the Matlack Site are as follows:

- Control or remove source areas to prevent or minimize impacts to sediment and seep water, and further impacts to groundwater.
- Prevent current and potential future unacceptable risks to human receptors through ingestion, dermal contact with and inhalation of contaminated groundwater.
- Prevent current and potential future unacceptable inhalation risks to human receptors through subsurface vapor intrusion into indoor air.
- Restore groundwater to its expected beneficial use to the extent practicable by reducing contaminant concentrations below the more stringent of federal Maximum Contaminant Levels (MCLs), state MCLs and NJ Groundwater Quality Standards (GWQS).
- Prevent or minimize current and potential future unacceptable risks to ecological receptors through direct contact with or ingestion of contaminated soil, sediment and surface water.

To achieve these RAOs, EPA has selected cleanup goals for all COCs in soil, sediment and groundwater. These are summarized in Table 1, below, which also provides the basis for each proposed cleanup goal. Achievement of these cleanup goals will also effectively address elevated concentrations in the water seeps. As such, no specific cleanup goals are selected for surface water.

Table 1 - Preliminary Remediation Goals for Soil, Sediment and Groundwater
Matlack Inc. Superfund Site - Feasibility Study
Woolwich Township, Gloucester County, New Jersey

Constituents	CAS Number	Criteria		Maximum Detected Concentration	Preliminary Remediation Goals
Soil		*NJDEP RDCSRS (mg/kg)*	*NJDEP IGWSSL (mg/kg)*	*(mg/kg)*	*(mg/kg)* [1]
VOCs					
Benzene	71-43-2	2	0.005	4	0.005
Tetrachloroethylene (PCE)	127-18-4	2	0.005	3	0.005
Trichloroethene (TCE)	79-01-6	7	0.01	33	0.01
Total Xylenes	1330-20-7	12,000	19	74	19
SVOCs					
Benzyl Butyl Phthalate	85-68-7	1,200	230	670	230
bis(2-Ethylhexyl) Phthalate	117-81-7	35	1,200	590	35
Naphthalene	91-20-3	6	25	420	6
Sediment		*NJDEP SQC LEL (mg/kg)*	*NJDEP SQC ER-L (mg/kg)*	*(mg/kg)*	*(mg/kg)* [2]
Tetrachloroethylene (PCE)	127-18-4	0.990	0.45	5.8	0.45
Trichloroethene (TCE)	79-01-6	0.112	1.6	0.27	0.112
1,1,1-Trichloroethane	71-55-6	0.213	NA	1	0.213
Groundwater		*Federal MCL (ug/l)*	*NJDEP GWQS (ug/l)*	*(ug/l)*	*(ug/l)* [3]
VOCs					
1,1,1-Trichloroethane	71-55-6	200	30	4,500	30
Benzene	71-43-2	5	1	51	1
Ethylbenzene	100-41-4	700	700	5,600	700
Tetrachloroethylene (PCE)	127-18-4	5	1	6,100	1
Trichloroethene (TCE)	79-01-6	5	1	720	1
Vinyl Chloride	75-01-4	2	1	6	1
Total Xylenes	1330-20-7	10,000	1,000	22,700	1,000
SVOCs					
4-Chloroaniline	106-47-8	NA	30	6,900	30

Notes:
1. Preliminary Remediation Goals (PRGs) for soil are the lower of the New Jersey Department of Environmental Protection (NJDEP) Residential Direct Contact Soil Cleanup (RDCSC) Standards for soil in the depth range of 0-2 feet below ground surface (bgs), and NJDEP default Impact to Groundwater Soil Screening Level (IGWSSL) for soil in the depth range greater than 2 feet bgs (as of September 29, 2015).
2. PRGs for sediment are the lower of the NJDEP Freshwater Sediment Quality Criteria (FSQC), Lowest Effects Level (LEL) and saline water Effects Range Low (ER-L) criteria (as of March 10, 2009).
3. PRGs for groundwater are the lowest of the NJDEP Groundwater Quality Standards (N.J.A.C. 7:9C, effective March 4, 2014) for Class IIA Water, Interim Groundwater Quality Criteria, and USEPA National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs).

mg/kg - milligrams per kilograms
ug/l - micrograms per liter
VOCs - Volatile Organic Compounds
SVOCs - Semi-Volatile Organic Compounds
PRGs - Preliminary Remediation Goals

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practical. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

Potential technologies applicable to soil, groundwater, seep water and sediment remediation were identified and screened by effectiveness, implementability and cost criteria, with emphasis on effectiveness. Those technologies that passed the initial screening were then assembled into remedial alternatives.

The time frames below for construction do not include the time for designing a remedy, reaching remedy agreement with responsible parties if they are identified, or the time to procure necessary contracts.

Alternative 1 - No Action

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other groundwater remedial alternatives. If no active remedial action is taken, contaminants already present in the soil, groundwater, water seeps and sediment will remain and RAOs for the Site will not be met. It is assumed that land and groundwater resource use will not change over time, and human health and environmental risks for the Site essentially would be the same as those identified in the human health and ecological risk assessments. Because this alternative would result in hazardous substances, pollutants, or contaminants remaining at the properties above levels that would allow for unlimited use and unrestricted exposure, EPA would review conditions at the site every five years.

Total Capital Cost: *$0*
Total O&M: *$0*
Total Periodic Cost: *$0*
Total Present Net Worth: *$0*
Timeframe: *0 years*

Alternative 2 –Permeable Reactive barriers with soil and sediment excavation; institutional controls

This remedial alternative consists of installing two PRB trenches to provide passive treatments for aromatic VOCs and the SVOC 4-chloroanaline in Area 1 and chlorinated VOCs in Area 2 as shown on Figure 3 and described above.

Ongoing sources of this groundwater contamination will be addressed through excavation. Soil within the former unlined lagoon area will be excavated to the water table, an estimated depth of 10 feet below grade. Contaminated sediment will be excavated from impacted sediment/seep locations along Grand Sprute Run.

By remediating the groundwater and removing ongoing sources of contamination, the remedy also addresses contamination resulting from the discharge of groundwater to seeps, which has impacted surface water in the seep, as well as seep sediment.

A pre-design investigation (PDI) will be needed to determine the horizontal and vertical extent of aromatic and chlorinated VOCs impacts in soil, sediment and groundwater. Sampling will be conducted to the clay layer, and if additional soil and/or sediment excavation beyond that anticipated is needed, it will be conducted, as appropriate. In addition, while not anticipated based on the existing data, if dense non-aqueous phase liquid is found, it would be addressed in a future decision document.

Long-term monitoring outside of the PRB capture zones will also be needed to assure the effectiveness of the remedy over time, and institutional controls will assure the remedy remains protective while RAOs are being met. The institutional controls may include a New Jersey Ground Water Classification Exception Area that restricts the use of the contaminated aquifer, along with deed notices that restrict development of the affected areas.

While not anticipated, additional installations of the PRB may be needed to fully remediate the groundwater. For purposes of costing, a second installation is included five years after installation of the initial wall, and then, as a contingency, a third installation is included 10 years after initial installation.

Total Capital Cost:	*$2.24M*
Total O&M:	*$582K*
Total Periodic Cost:	*$1.198 K*
Total Present Net Worth:	*$4.02M*
Timeframe:	*30 years*

Alternative 3 – Air Sparging/Ventilation for soil and groundwater with sediment excavation; Institutional controls

This remedial alternative consists of the installation of an air sparging system to remediate the shallow aquifer groundwater contamination at the Site. Long Term Monitoring would also be needed as part of this alternative.

An air sparging system consists of a network of air injection ("sparging") wells installed into the saturated zone. The network of injection wells is designed so that all of the area requiring treatment is effectively aerated. This typically involves establishing overlapping radii of influence for the sparging well network. Air compressors are used to deliver oxygen under pressure. An aboveground process control system is used to monitor and adjust the air delivery equipment. Flow rates and pressures of injected air are based on site conditions characterized during the PDI phase of the project and refined during pilot scale testing. These rates can be adjusted during full-scale remediation to accommodate observed results and increase remediation efficiency. Impacted soil within the former unlined lagoon area will be addressed by installing a soil vapor extraction (SVE) system in conjunction with the air sparge system within the former lagoon area to address impacted vadose zone soil. Vacuum pumps will be used to remove VOCs from the subsurface for treatment via carbon adsorption.

Impacted sediment will be addressed through the excavation of impacted sediment/seep locations along Grand Sprute Run. Institutional controls similar to those described for Alternative 2 will assure the remedy remains protective while RAOs are being met.

Total Capital Cost:	*$3.09M*
Total O&M:	*$259K*
Total Periodic Cost:	*$62K*
Total Present Net Worth:	*$3.41M*
Timeframe:	*1 year*

EVALUATION OF ALTERNATIVES

EPA uses nine criteria to evaluate the remedial alternatives individually and against each other to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. A detailed analysis of each of the alternatives is in the FS.

Overall Protection of Human Health and the Environment

Since Alternative 1 would not address the risks posed by the site, it would not be protective of human health and the environment.

Alternatives 2 and 3 would provide adequate protection of human health and the environment by eliminating, reducing or controlling risk through treatment and removal of contamination.

Because the "no action" alternative, Alternative 1, is not protective of human health and the environment, it was eliminated from further consideration under the remaining eight criteria.

Compliance with Applicable or Relevant and Appropriate Requirements

Actions taken at any Superfund site must meet all applicable or relevant and appropriate requirements under federal and state laws or provide grounds for invoking a waiver of those requirements.

Both Alternative 2 and Alternative 3 should provide compliance with chemical-specific ARARs, because the contamination would either be treated or removed. However, bench-scale testing will be necessary to confirm that air sparging can effectively achieve ARARs for 4-chloroanaline.

Location-specific ARARs and Action-specific ARARs would both be met by proper design and implementation of the respective components of the remedy. The Location-specific and Action-specific ARARs for the disposal phase would be met with proper selection of the disposal facility.

Long-Term Effectiveness and Permanence

Alternative 2 is expected to permanently remove VOCs from soil within the former lagoon area, contaminated sediment from the seep location, and COCs from impacted groundwater within the active treatment area.

Alternative 3 would remove VOCs from groundwater within the active remedial areas effectively in a shorter timeframe (~1 year) than Alternative 2; however, treatment efficacy for the removal of 4-chloroanaline is expected to be more moderate and will require bench-scale testing to confirm the duration required to achieve remediation goals.

Under Alternative 2, the reactive medium of the PRB treats site contaminants through permanent and irreversible processes. PRBs would be effective in maintaining reduced groundwater contaminant concentrations for both VOCs and 4-chloroanaline downgradient of the site and preventing further migration to Grand Sprute Run over a long-term (~30 years) remedial timeframe.

The PRB under Alternative 2 would provide the most long-term effectiveness and permanence by reducing the contaminant concentrations in the plumes and restoring the aquifer thereby achieving the RAOs. Alternative 3 is likely to reduce VOC concentrations more quickly than Alternative 2; however, the ability for this alternative to reduce 4-chloroanaline concentrations as quickly as the other COCs will require bench-scale testing to confirm efficacy.

Institutional controls under Alternatives 2 and 3 would contribute to the protection of human health when properly implemented and maintained.

Soil excavation under Alternatives 2 and SVE treatment under Alternative 3 will provide active reduction in

THE NINE SUPERFUND EVALUATION CRITERIA

1. Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

4. Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

6. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. Cost includes estimated capital and annual operations and maintenance 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. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

***9.* Community Acceptance** considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

contaminant levels on-site, providing long term effectiveness or permanence.

Reduction of Toxicity, Mobility, Volume of Contamination through Treatment

Alternatives 2 and 3 will reduce the mass of COCs soil, sediment, water seeps and groundwater.

Alternative 2 will reduce toxicity, mobility, or volume of on-site contaminated soil by excavation and transportation of the soil to a permitted landfill for disposal. Alternative 3 will reduce the mass of VOCs/SVOCs in soil through transport to the vapor phase and potential adsorption on activated carbon.

PRBs under Alternative 2 permanently remove contaminants from the aquifer by adsorption and biogeochemical processes. Toxicity, mobility, and volume of contaminants in groundwater over a long-term (~30 years) remedial timeframe are reduced as contaminant groundwater passes through the PRBs located at the downgradient edges of the both plumes.

Alternative 3 permanently removes VOCs from the aquifer within the active remedial area in a shorter timeframe (~1 year) but will require bench-scale testing to confirm that it will effectively remove 4-chloroanaline, an SVOC, in that timeframe. Vapor-phase VOCs generated under Alternative 3 will be collected and treated with granular activated carbon, if necessary, and discharged to the atmosphere. Regeneration of the activated carbon will transform contaminants to harmless compounds, thereby reducing the toxicity of contaminants removed from the Site groundwater. Air sparging also serves to enhance the aerobic biodegradation of compounds, which may prove effective in reducing concentrations of 4-chloroanaline and other less volatile aromatic compounds in Area 1.

Short-Term Effectiveness

Both Alternative 2 and Alternative 3 would be effective in the short term. The extent of excavation of soil and/or sediment required is relatively small and excavation activities would be completed in less than one year.

For Alternative 2, installation of the PRB would require minimal impacts to soil during installation. The

timeframe for installation is expected to be approximately one month.

Short-term impacts for Alternative 3 are greater since it would require the installation of piping over the entire ground surface associated with the groundwater plume and soil remediation area, and the operation of blowers and vacuum pumps for the full duration of active remediation, which is estimated to be one year.

Implementability

Alternative 2 can be easily implemented and requires a shorter duration to complete installation. The PRBs are also a passive treatment technology and will require no maintenance during the active life of the remediation. The PRB trench excavation under Alternative 2 can be performed using either standard excavation or one-pass trenching equipment. Due to the relatively steep slopes within the proposed location of the Area 1 PRB, site preparation and re-grading may be required in selected locations prior to installation of the PRB.

The installation of air sparge/SVE system under Alternative 3 is a well-established technology and it can be readily implemented at this Site; however, the air sparging system will require the installation of a significant number of air sparge/SVE well points (~500) as well as supporting piping, equipment and electric utilities both on and off the site. Alternative 3 is also an active technology that will require ongoing operation and maintenance over the short duration (~1 year) anticipated for active remediation.

Cost

Total present worth costs for Alternatives 2 and 3 are summarized below:

Alternative 2: PRB with Soil/Sediment Excavation

- Total Present-Worth Cost **$4.02 M**
- 30 years of LTM

Alternative 3: Air Sparging with SVE and Sediment Removal

- Total Present-Worth Cost **$3.41 M**
- 1 year of air sparging and 4 years of LTM

State Acceptance

The State of New Jersey concurs with the preferred alternative as presented in this Proposed Plan.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the ROD. Based on public comment, the preferred alternative could be modified from the version presented in the proposed plan. The ROD is the document that formalizes the selection of the remedy for a site.

PREFERRED ALTERNATIVE

The Preferred Alternative for achieving remedial action objectives for contaminated soil, groundwater, water seeps and sediment associated with the site is Alternative 2, PRBs with soil and sediment excavation, and institutional controls. A detailed pre-design investigation will be conducted, and if additional soil and/or sediment excavation beyond that anticipated is necessary, it will be conducted, as appropriate. In addition, while a reinstallation of the PRBs may not be necessary, costs have been included for a second and, as a contingency, third installation of the PRBs.

Based on the information available at this time, EPA and NJDEP believe the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria.

The preferred alternative satisfies the two threshold criteria and achieves the best combination of the five balancing criteria of the comparative analysis. This alternative is preferred for the following reasons:

- It will achieve the RAOs and cleanup goals in the most effective way;
- It will reduce the toxicity, mobility or volume of contamination through treatment for all COCs. Bench-scale studies should not be needed to evaluate the effectiveness of the alternative at reducing COC concentrations.
- It is faster and easier to implement;
- It will present no visual impact once installed;
- It is less intrusive and will not be disruptive once installed for activities at the State Park; and
- It is a permanent remedy that will not require the implementation of permanent institutional controls once RAOs are achieved.

The EPA and NJDEP expect the preferred alternative to satisfy the following statutory requirements of CERCLA Section 121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element. EPA will assess the modifying criteria of community acceptance in the ROD following the close of the public comment period.

FOR FURTHER INFORMATION

The administrative record file, which contains copies of the Proposed Plan and supporting documentation, is available at the following locations:

EPA Region 2 Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday-Friday – 9 A.M. to 5 P.M.

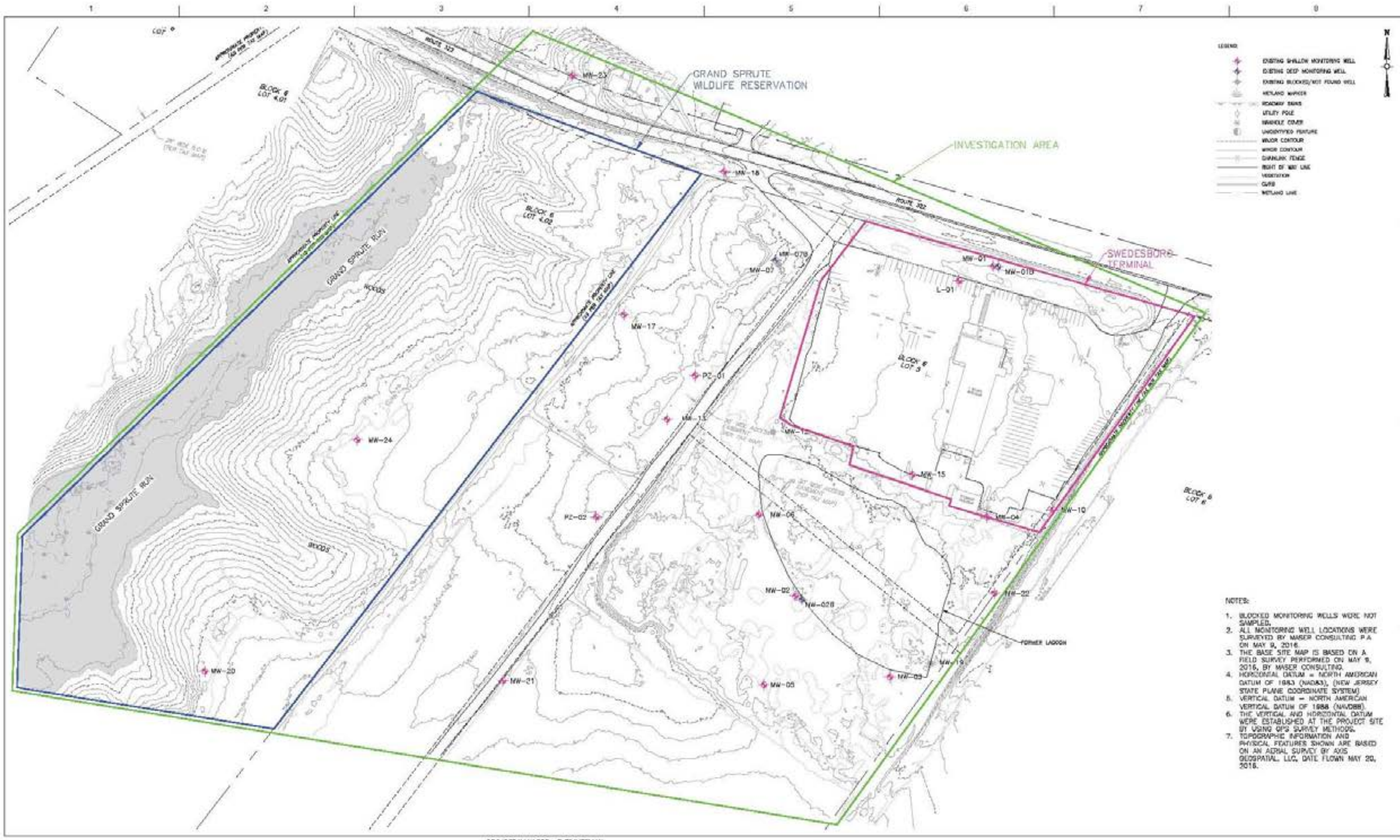
Township of Woolrich
Mr. Matthew Blake
Director for Community Affairs
120 Village Green drive
Woolwich Township NJ 08085
(856)467-2666, x-3101
Hours: Monday-Friday – 9 AM. To 5 PM.

In addition, select documents from the administrative record are available on-line at:

www.epa.gov/superfund/matlack

Source: United States Geological Survey Topographic Map. For more information on this map, visit http://goto.arcgisonline.com/maps/NGS_Topo_US_2D

HDR	Site Location Map Matlack Inc. Superfund Site Woolwich Township, Gloucester County, New Jersey	Job No.	Date	Figure No.
		10021567	JULY 2017	1



NOTES:

1. BLOCKED MONITORING WELLS WERE NOT SAMPLED.
2. ALL MONITORING WELL LOCATIONS WERE SURVEYED BY MASER CONSULTING P.A ON MAY 9, 2016.
3. THE BASE SITE MAP IS BASED ON A FIELD SURVEY PERFORMED ON MAY 9, 2016, BY MASER CONSULTING.
4. HORIZONTAL DATUM = NORTH AMERICAN DATUM OF 1983 (NAD83), (NEW JERSEY STATE PLANE COORDINATE SYSTEM)
5. VERTICAL DATUM = NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
6. THE VERTICAL AND HORIZONTAL DATUM WERE ESTABLISHED AT THE PROJECT SITE BY USING GPS SURVEY METHODS.
7. TOPOGRAPHIC INFORMATION AND PHYSICAL FEATURES SHOWN ARE BASED ON AN AERIAL SURVEY BY AXIS GEOSPATIAL, LLC, DATE FLOWN MAY 20, 2016.

HDR

ISSUE DATE	DESCRIPTION
JULY 2017	FS REPORT
APRIL 2017	DRAFT FS REPORT

PROJECT MANAGER E. ZIMMERMAN
PROJECT NUMBER 147-240662

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

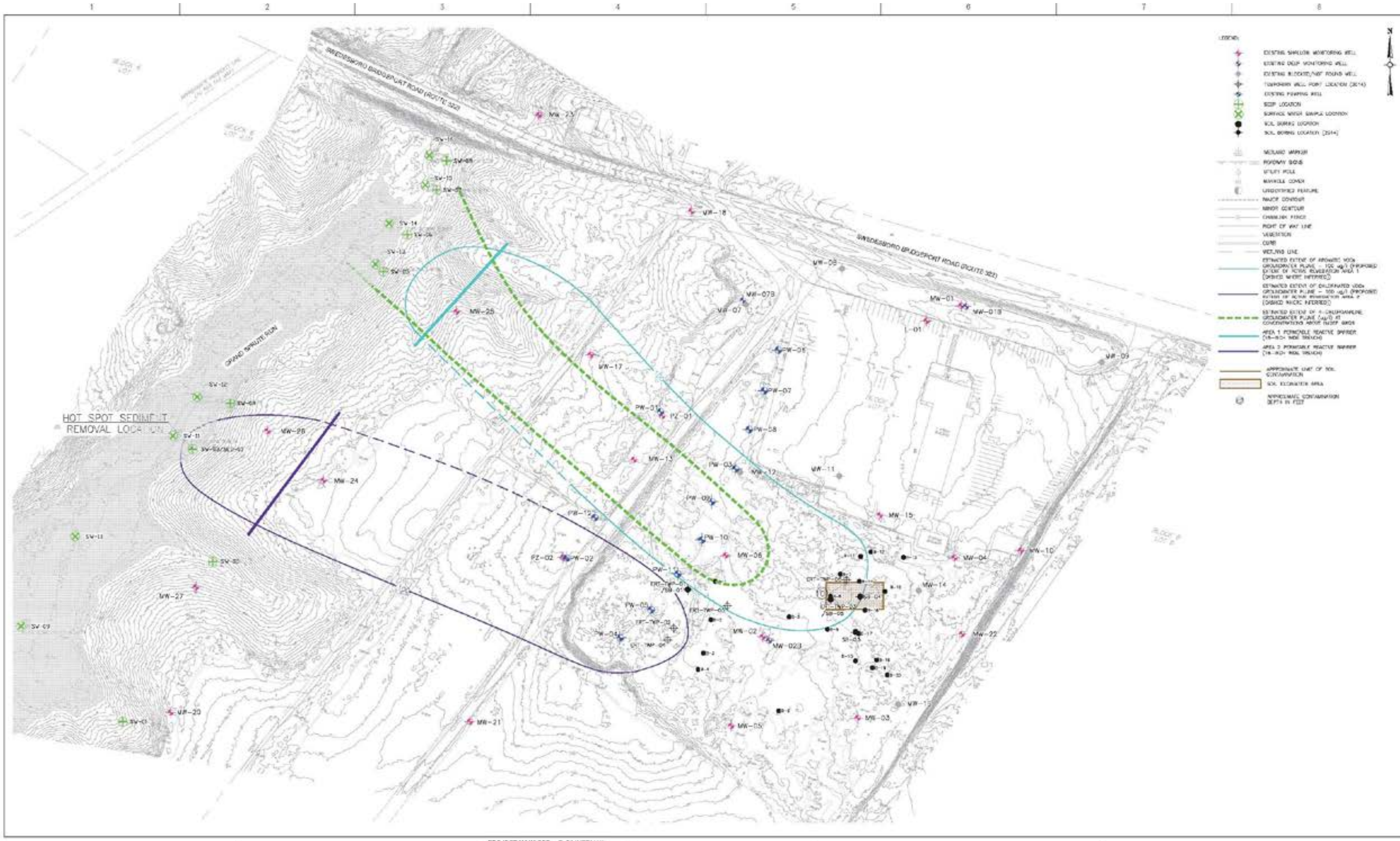
CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 029-RICO-02P9

MATLACK INC. SUPERFUND SITE
FEASIBILITY STUDY

WOOLWICH TOWNSHIP, GLOUCESTER COUNTY, NEW JERSEY

SITE PLAN

0 100' 200'
FILENAME
SCALE
SHEET
FIGURE 2



PROJECT MANAGER E. ZIMMERMAN

ISSUE	DATE	DESCRIPTION
AUGUST 2017		FS REPORT
APRIL 2017		DRAFT FS REPORT

PROJECT NUMBER 147-240902

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 029-RICO-02P9

MATLACK INC. SUPERFUND SITE
FEASIBILITY STUDY
WOOLWICH TOWNSHIP, GLOUCESTER COUNTY, NEW JERSEY

ALTERNATIVE 2 - PERMEABLE REACTIVE BARRIERS WITH SOIL/SEDIMENT EXCAVATION

0 100' 200'
FILENAME
SCALE

SHEET
FIGURE 15

Attachment B

Public Notice

EPA Invites Public Comment on Proposal to Cleanup Groundwater, Soil, Sediment and Seep Water at the Matlack, Inc. Superfund Site, Woolwich Township, NJ

The U.S. Environmental Protection Agency has issued a Proposed Plan to remediate localized groundwater, soil, sediment and seep water contamination associated with the Matlack, Inc. Superfund site. A 30-day public comment period on the Proposed Plan, which identifies the EPA's preferred cleanup plan and other cleanup options that were considered by the EPA, begins on August 23, 2017 and ends on September 22, 2017.

The EPA's preferred cleanup plan consists of the installation of underground treatment walls called Permeable Reactive Barriers (PRBs), as well as soil and sediment excavation, to address the contamination at the site. PRBs allow the passage of impacted groundwater through a passive chemical or biological treatment zone. As a result of past truck maintenance and tanker washing operations at the site, the soil, groundwater, sediment and seep water are contaminated with volatile and semi-volatile organic compounds, which can potentially harm people's health.

During the public comment period, the EPA will hold a public meeting in Woolwich Township, NJ to receive comments on the preferred cleanup plan and other options that were considered. The meeting will be held on September 14, 2017 at 6:30 pm at the Woolwich Township Municipal Courtroom, 120 Village Green Drive, Woolwich, NJ 08085.

The Proposed Plan is available at www.epa.gov/superfund/matlack or by calling Wanda Ayala, EPA's Community Involvement Coordinator, at (212) 637-3676 and requesting a copy by mail.

Written comments on the Proposed Plan, postmarked no later than September 22, 2017, may be mailed to Juan Davila, EPA, Project Manager, U.S. EPA, 290 Broadway, 18th floor, New York, NY 10007-1866 or emailed no later than September 22, 2017 to davila.juan@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 repositories:

Woolwich Township office located at 120 Village Green Drive, Woolwich, NJ 08085.

EPA Region 2 Superfund Records Center located at 290 Broadway, 18th Floor, New York, New York

Attachment C

Public Meeting Transcripts

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2

PROPOSED REMEDIAL ACTION PLAN

MATLACK, INC. SUPERFUND SITE PUBLIC MEETING

Woolwich Township
120 Village Green Drive
Swedesboro, NJ

September 14, 2017
6:36 p.m.

PRESENT:

CECILIA ECHOLS, Community Involvement Coordinator

STEPHANIE VAUGHAN, Section Chief for Mega Project

ULA KINAHAN, Risk Assessor

CHUCK NACE, Risk Assessor

JUAN DAVILA, Remedial Project Manager

BRADLEY WILLIAMS, Contractor for HDR

ERIC ZIMMERMAN, Contractor for HDR

MAYOR ALAN SCHWAGER, Woolwich Township

MATHEW BLAKE, Director of Community Development
Woolwich Township

- - -

MS. ECHOLS: Good evening, everyone. I am Cecilia Echols. And I am a Community Involvement Coordinator for the Region 2 EPA Office. I am standing in for Wanda Iyella, who was deployed to Puerto Rico. Once she gets back, she will be right back serving everyone here. Thank you all for coming out tonight. And I would like to thank Matt Blake with the Woolwich Township for allowing us to have this meeting in such a beautiful facility.

The purpose of tonight's meeting is to discuss the proposed planned cleanup for the contaminated soil, groundwater, seep water and sediment. Community Involvement is a program where we want the community to be involved in the decision making process for cleaning up sites that directly affect them in their community.

Today's presentation will be done by Juan Davila. He's the Remedial Project Manager for the site. We also have other EPA employees here. We have Stephanie Vaughan. She's the Section Chief for Mega Project. We have Chuck Nace. He's the Risk Assessor. Ula Kinahan. She's a Risk Assessor, as well. We also have two contractors who are working on the project with

HDR. That's Bradley Williams and Eric Zimmerman. We would like for all questions to be asked after the presentation. The Public Comment Period opened on August 23 and closes on September 22.

We have a stenographer here. She is taking all of our presentation and our notes and our comments and questions tonight. And it will become part of those response summary, then a record of decision will be prepared and signed by our Acting Regional Administrator Catherine McCabe. All documents can be found on the web page. And we do have an information repository here in this building. Thank you.

And now we will have Juan give the presentation.

MR. DAVILA: Good evening, everyone. My name is Juan Davila, Regional Project Manager for Matlack Superfund Site. The agenda for the evening will be the introduction and purpose, EPA and the Superfund Program, site history and investigation, remedial alternative for the site, preferred remedy, future work, and then we will have a question and comment section.

Why are we here tonight? We are here to discuss the preferred alternative and other cleanup option for Matlack, Inc. EPA will accept additional verbal comments until Friday September 22. All public comments will be considered and included formally in the Administrative Record. And EPA will assess public comments in its Record of Decision Responsive Summary.

The Superfund Process. The Superfund Process start with the discovery of the site followed by a preliminary assessment and the preliminary assessment shows that there is a problem. We do a site investigation. Then we propose the site for the national -- to be included on the National Priority List. Once the site is on the National Priority List, we do a remedial investigation to define site conditions and to determine the human and ecological risk. Followed by feasibility study, which will be followed by remedial alternatives using what we call the Nine Criterias.

The remedy proposed will be part of the proposed plan and public comment period. Remedy Selected will go into Record of Decision. Remedial design will be comprised of the pre-design sampling and the remedy design. And the Remedial Action will be construction and operation of the remedy.

If I am going to too fast for you guys, let me know.

Site Location. The site is located along Route 322 East, Woolwich Township. And it includes Matlack, Inc. former Swedesboro Terminal that occupied the northern portion of a 72-acre parcel of land. There is a one-story building, which is located on the northeast quadrant of the property. There is a former wastewater lagoon, which is located south of the former terminal building. The terminal building is currently leased by Liberty Kenworth. So, there is work there. There is a company there.

(Indicating with the Map) This will be the Matlack Site location. And this will be the property in question you will see that the lagoon and the trucking company on your right side. And then there will be the protected area on the left.

Site History. Matlack, Inc. transported chemicals, petrochemicals and food-grade liquid in bulk from 1962 to 2001. The primary source of waste generation was the cleaning of tankers that transported petroleum products, organic solvents, flammable substances, coal tar and hazardous wastes. They used various solvents, including tetrachloroethylene and trichloroethylene, acetone, methanol and ethanol in order to clean the tankers. And the cleaning operation generated between 5,000 and 15,000 gallons of wastewater per day.

From 1962 to 1976, Matlack, Inc. discharged the wastewater into an unlined surface impoundment or lagoon. And after this, they began sending the wastewater offsite for treatment and disposal. Matlack ceased operation and declared bankruptcy in 2001.

Our Site Investigation History. NJDEP began investigation for potential groundwater contamination in 1982. Between 1990 and 2001, Matlack, Inc. conducted investigations and cleanup activities under an Administrative Consent Order with New Jersey DEP. They installed groundwater treatment system that operated from 1995 to '97, and again from 2006 to 2011. They removed above ground and underground storage tanks. And, excavated contaminated soil and dispose of it offsite.

NJDEP conducted additional investigation and sampling activities between 2002 and 2009. At EPA request, the site was reassessed. EPA began its own investigation activities in 2012. The site was added to the National Priority List in 2013. In 2014, the Environmental Protection Agency initiated a remedial investigation and feasibility study for the site.

Remedial Investigation. The remedial investigation activities were conducted from July 2015 to August 2016. It included sampling of groundwater, soil, surface water, sediment and seeps, which is groundwater discharging to the surface.

Groundwater. The remedial investigation found the existence of two groundwater plumes. One plume consists of petroleum hydrocarbons and 4-chloroanaline. The other plume consists of chlorinated volatiles organic compounds.

Soil. Surface soil, from zero to two feet below the ground surface we found semi-volatile organic compounds and polychlorinated biphenyls. And they were found slightly above New Jersey DEP cleanup standards. And they were located at isolated locations within the former lagoon area.

Subsurface soil, which is greater than two feet below the ground surface, we found volatile and semi-volatile organic compounds found at concentrations slightly above New Jersey standards.

Surface Water, Sediment and Seeps. Our surface water we found tetrachloroethylene and trichloroethylene detected at concentrations below New Jersey DEP. Sediment, tetrachloroethylene and trichloroethylenes found in sediment above New Jersey DEP for sediment qualify criteria. For the seeps, tetrachloroethylene and trichloroethylene found in seep water above New Jersey water quality criteria.

That is a map showing the plumes. We have the plume on the south part which is containing the PHC. And we have the purple line representing the plume containing VOC. We have the dashed green line representing the 4-chloroanaline plume. So in reality, two plumes and we have what remains contaminate within the two.

Site Geology and Hydrogeology. We have

two separate hydrogeological systems exist at the site. We have a shallow unconfined aquifer which exists at the Pennsauken formation, which is 4 to 28 feet deep or below ground. And the groundwater flows west/northwest towards the Grand Sprute Run. The deep aquifer is the Magothy-Raritan formation. And the two aquifers are separated by the Woodbury Clay confining unit, which is over 50 feet thick.

Human Health Risk Assessment.

Groundwater, we have exposure to VOC and SVOCs in the shallow aquifer associated with cancer and non-cancer risk estimates that exceeded EPA's threshold criteria. We have seep water, tetrachloroethylene and trichloroethylene and manganese in seep water samples associated with non-cancer hazard that slightly exceeded the EPA hazard index of 1. Site-related contaminants -- arsenic, lead, PAH and pesticides -- were found in soil above Federal and State standards at the lagoon area. Direct exposure to contaminated soil poses an unacceptable human health risk to future users.

MS. VAUGHAN: Can you back up? I'm sorry. There is an error on the previous slide.

MR. DAVILA: Sorry.
MS. KINAHAN: Yeah.
MS. VAUGHAN: Go ahead.
MS. KINAHAN: The bottom for site related contaminants, there was none in the soil.
MR. DAVILA: None in the soil?
MS. KINAHAN: No.
MS. VAUGHAN: They are in soil, but not arsenic and lead and pesticides. I thought it was just the -- none of those. It was the TC, PC the chlorinated. None of the metals. And in the seep waters slide, the manganese shouldn't be there. I don't know how we --
MS. KINAHAN: Yeah.
MS. VAUGHAN: -- missed that.
Just for the record, the contaminants of concern are the chlorinated solvents and the 4-chloroanaline.
MS. KINAHAN: I can give summary of the results of this.
MR. DAVILA: Okay.
MS. KINAHAN: We had -- based on the risk assessment, future use of site groundwater for portable uses was found to be above our threshold criteria. The chemicals of concern

were trichloroethylene, tetrachloroethylene, 4-chloroanaline along with some other VOCs.

The risk assessment also found unacceptable non-cancer hazard for the current and future child recreator exposed to seep water. And the risk chemicals were trichloroethylene, tetrachloroethylene and manganese.

MR. DAVILA: Okay. Ecological Risk Assessment. The primary ecological risk is from groundwater contaminated with VOCs and primarily tetrachloroethylene and trichloroethylene discharging to the seeps and through the sediments into Grand Sprute Run. Our secondary ecological risk from exposure to metals in site soils in the former lagoon area.

Our Remedial Action Objectives are to control or remove source areas to prevent or minimize impacts to sediment and seep water and further impacts to groundwater; to prevent current and potential future unacceptable risks to human receptors through ingestions, dermal contact with inhalation of contaminated groundwater; prevent current and potential future unacceptable inhalation risks to human receptor through subsurface vapor intrusion into indoor air; restore groundwater to its expected beneficial use to the extent practicable by reducing contaminant concentrations below the more stringent of federal, state maximum contaminant levels and New Jersey groundwater quality standards; and to prevent or minimize current and potential future unacceptable risks to ecological receptor through direct contact with or ingestion of contaminated soil sediment and surface water.

Remedial Alternative. We have three remedial alternatives. Number 1 is no action. Number 2 will be a permeable reactive barrier with soil and sediment excavation and institutional controls. And Alternative 3 is the air sparging/ventilation for soil and groundwater with sediment excavation and institutional controls.

MS. VAUGHAN: Juan, I will say we always evaluate the No Action Alternative. It's a baseline to see if we did nothing, what would happen.

MR. DAVILA: Basically, this is done so public realize that they have more than one alternative. After we do remedial alternative, they would not feel that they one selected by the EPA go through the needs. They can always comment on that. We can just basically answer the questions.

We have the Nine Superfund Evaluation Criteria. Overall protection of human health and the environment; compliance with applicable or relevant requirements; long term effectiveness and permanence; reduction in toxicity, mobility or volume through treatment; short term effectiveness; implementability; cost; state acceptance and community acceptance.

Our Preferred Alternative is Alternative Number 2. We believe it will achieve the remedial action objective and the cleanup goals. It will reduce the toxicity, mobility or volume of contaminants through the treatment of all contaminants of concern. It is faster and easier to implement. It will present no visual impact once installed. It is less intrusive and will not be disruptive once installed for activities at the State Park.

MR. BLAKE: Can we jump back to the previous slide and see what were not recommended?

MS. VAUGHAN: Sure.

MS. ECHOLS: Go back to the
alternatives.

MS. VAUGHAN: Can you walk them through
what the three alternatives consists of? No
action the law requires.

MR. DAVILA: Okay. It comes down to
this. You saw the map with the two plumes,
groundwater. Basically, we are going to dig a
trench and we are going to fill with permeable
materials that will react with the contaminants
of concern.

MR. BLAKE: They will not go any
further?

MR. DAVILA: They will not go any
further. So contaminant react or will remain
there. Five years down the road, we will
basically remove this barrier. And if we sample
and we decide that, yes, the concentration in the
groundwater is below state standards, we will
fill the trench with clean dirt. And we just
remove the material that we use for the permeable
barrier.

MR. BLAKE: So the plume becomes
inactive. When it becomes inactive, we can
remove the barrier. But the contaminants will

remain in place with the understanding that the mobility has been arrested. It's no longer active?

MS. VAUGHAN: A key part of this remedy, though, is the other part, the soil and sediment excavation. The contaminant of the groundwater is coming from that remaining contamination in the soil and lagoon area.

MR. BLAKE: We should dig that out.

MR. DAVILA: Yes. We will move the source.

MR. BLAKE: Which is driving it.

MS. VAUGHAN: Yes.

MR. DAVILA: And we also remove the contaminant that reach -- which is not in the sediment. Because in VOCs, we just find in the site, the organics -- sorry.

Comes down to this. We will remove the source.

MR. BLAKE: Yes.

MR. DAVILA: We will have the barrier put up. And then we will remove the sediments of the hot spot that we have on the Grand Spruce Run, which we only found one.

MS. VAUGHAN: The groundwater as well as

at the Grand Sprute Run, it comes to the surface and the seeps. Where it is seeping to the surface is one area where the concentrations in the sediment there or the seep water are elevated. We will remove that, as well. If we remove the lagoon, the primary source and where the contamination is impacting the surface and then treat the groundwater in the ground, it essentially over time the contamination will go away. It will take time. It will take many years.

MR. BLAKE: Right.

MS. VAUGHAN: But it will be very -- after we excavate the source, you won't see it.

MR. BLAKE: That menu of contaminants they all will break down over time?

MS. VAUGHAN: Two separate.

MR. BLAKE: Plumes?

MS. VAUGHAN: So that we will have different reactive components to treat the two separate.

MR. BLAKE: Of course, the concentration will go down once you remove the source which is adding new contaminants to the plume.

MS. VAUGHAN: We may need to do more

than one installation.

MR. BLAKE: So, the idea is to avoid digging out all that forested area?

MR. DAVILA: Yes, absolutely. We want to do less damage as possible to the protective area. And you know, take into consideration that the groundwater for aquifers is not really utilized in the areas except for the -- to fill it. So, we think it's more most effective and will be a better solution.

MS. VAUGHAN: It would help if we described the other alternative.

MR. DAVILA: The other alternative?

MS. VAUGHAN: Just one more thing to add with that. We will do regular testing throughout this process to make sure things are working out as we plan. And we'll make adjustments as necessary if needed, you know. And we will test the groundwater to make sure the concentrations aren't affected.

MR. DAVILA: Alternative No. 3 was in the air sparging/ventilation for soil and groundwater. It involves basically you just have little wells on the plume, and you just inject air. And make the air just take a lot organics and pretty much just evaporate them with air and going to, you know, towards the surface. The problem with this is you need a lot of the the little wells to do this. And it's very intense and probably going to take a year. For that year, it's going to be like equipment all over the area.

MR. BLAKE: Basically, very disruptive.

MR. DAVILA: You will have two trucking companies in the area. Could be a series of accidents. I might guess also it's not going to be -- because we have petroleum contaminants, also. We don't think going to adapt completely effective.

MS. VAUGHAN: Particularly, we have heard Juan mention a couple times 4-chloroanaline. We don't have any confidence that this air sparging would address that contaminant. Even if we did this very invasive process over the course of a year, we may still need to do more such as installing the PRD, so the permeable drafted barrier.

So on balance, we think the Alternative 2 makes more sense than Alternative 3. It's a proven technology. It's been done at many sites across the country.

MAYOR SCHWAGER: So, if you put a barrier around the plume --

MR. DAVILA: No.

STENOGRAPHER: Just state your name.

MAYOR SCHWAGER: Alan Schwager, S-c-h-w-a-g-e-r. Do you need my address?

STENOGRAPHER: Oh, no.

MS. VAUGHAN: Are you the Mayor?

MAYOR SCHWAGER: I am.

MS. VAUGHAN: Your name sounded familiar.

MR. DAVILA: Let me just go back.

MS. VAUGHAN: You dig literally like a trench. You inject material into the trench that will react with the chemicals, so these chemicals will break down into non-hazards.

MR. DAVILA: You see these lines here, this is where we are planning to have the trenches.

MAYOR SCHWAGER: Trench across.

MR. DAVILA: And the trench will intersect each other so, you know, we will capture the entire property.

MAYOR SCHWAGER: You will capture?

MR. DAVILA: It will not go through. The trenches will intersect.

MAYOR SCHWAGER: What happens to the water? It comes out, it's treated.

MS. KINAHAN: It's treated while it passes the wall.

MR. BLAKE: It is permeable. Captures and filters out the contaminants?

MS. VAUGHAN: Correct.

MR. ZIMMERMAN: We have the barrier because where we propose to put the walls, you have a clay area. So, it's very easy to trench down to that depth.

MR. BLAKE: That defining layer, you are --

MR. ZIMMERMAN: The defining layer, the 50-foot layer of clay underneath the aquifer. The water stays on top of that clay layer into the sand and flows towards the creek. So Alternative 2 consists, in part, of trenching in front of the portion of plume where it's higher concentrations before it gets to the creek, filling it on the southern side with a combination of gravel and it's called zero valent irons. Very reactive iron filings.

It will react with the chlorinated organics in the south center, that's the purple one, and it turns it essentially to ethylene as it flows through this wall of gravel and iron filings. It comes out the other side. Chlorinated solvents are gone.

The northern plumes, both the 4-chloroanaline, green plume, and the petroleum hydrocarbons benzine, the blue plume, we would put a combination of gravel and granular activated carbon. The carbon will absorb gasoline constituents.

MR. BLAKE: You will trade up the carbon periodically?

MR. ZIMMERMAN: Right. You put enough in there, it's designed for the mass over ten-year period. As it's flowing through there, it's being hung up on the carbon, and then that gets dug out. Bottom plume reacts with chlorinated solvent so when it goes through it, there is nothing left. Being tested over time, the aquifer has been cleaning itself up over a period of ten years.

MAYOR SCHWAGER: I imagine.

MR. ZIMMERMAN: The highest

concentration is really --

MAYOR SCHWAGER: Start cleaning out today. You got to.

MS. VAUGHAN: And then once we remove the source, it will --

MR. ZIMMERMAN: Yeah. Frankly, the treatment system, the groundwater treatment that was put in over a period of ten years treated and then they injected treated water up right and turned.

MAYOR SCHWAGER: I thought they'd been treating groundwater out here.

MR. ZIMMERMAN: Correct. So the combination of removing the source area and the soil, before we did that, we would be taking samples called pre-designed investigation to identify specifically where the worst parts are and would come out. Same with the sediment on the stream bank going down the creek or the seeps are. Those hot spots would be excavated. And then reactive barrier treats the groundwater, over time it will be cleaned up.

MR. BLAKE: Can you just point out where the seeps are?

MR. DAVILA: Right on the Grand Sprute

Run.

MR. BLAKE: The designs out here?

MR. ZIMMERMAN: Yes. Those green dots are seep locations. And seep number three which somebody has a pointer.

MR. DAVILA: I believe it's right over there.

MR. BLAKE: Are these all seeps?

MS. KINAHAN: They are all seep samples.

MR. BLAKE: But only some of these are hot spots, right? You got all these seep samples, but only some of them are hot spots?

MR. ZIMMERMAN: Right.

MR. BLAKE: That's this one? (Indicating with pointer.)

MR. ZIMMERMAN: Yes.

MR. BLAKE: This is basically right at the bank edge.

MR. ZIMMERMAN: That's the bank of the creek.

MR. BLAKE: I hope that's not where I pulled my kayak out and had lunch.

MR. ZIMMERMAN: When you say hot spot, the concentrations are barely -- they are not even particular with that location. They are above ecological guidelines.

MAYOR SCHWAGER: Slightly. Your public hearing says "slightly." I noticed that.

Listen, and I know site remediation is really not an exact science. Are we talking five years? Ten years? Twenty years?

Best guess?

MS. VAUGHAN: Yeah, no. The excavation part, once we get --

MAYOR SCHWAGER: No. I'm talking about you're below standards, you are done, pull everything out, clean bill of health.

MS. VAUGHAN: The estimate we are going to put in the Record of Decision is 30 years. That's what we use for costing purpose, but it could be significantly less. It really could be. Once we are done with removing the source, you won't see --

MR. BLAKE: What's the timeline on the source removal?

MS. VAUGHAN: We have to go through -- once the Record of Decision is signed, we would then have to do a design which is our extension -- will require some additional investigation. If we were able to start immediately, we could probably start remedial action in a couple years, maybe less. You know, it's a --

MR. BLAKE: I mean, does the fact that people are boating out there, does that have any weight in moving up the timeline?

MS. VAUGHAN: Right. For the risk assessment, the water and --

MS. KINAHAN: We did -- what was above that threshold criteria was just above, was the scenario where a child would be playing in the seeps. So, be very direct contact. It's very conservative.

MR. BLAKE: Right. Little water on your hand from the paddle will not do it?

MS. VAUGHAN: It's really not.

MR. BLAKE: You are not concerned with human contact with the water to the extent its' --

MR. ZIMMERMAN: The surface water, I don't believe, was above anything for the record. It's just the seeps.

MR. BLAKE: That's the questions we might get. I want to be able to answer it.

MS. VAUGHAN: Another thing you saw in

the remedies is institutional controls. You know, what does that term mean? That means things like fences. That means things like well restriction areas, at least temporary. It could mean things like a deed restriction if necessary. Don't know that it would be.

If there were concern with that seep area, we can always put up a sign or --

MR. BLAKE: That seems overkill in your opinion?

MS. VAUGHAN: I think so. But if you're saying people are boating, docking like where the seeps is, I mean, we would be happy to go out there with you.

MS. KINAHAN: Right there that water is pretty shallow in this area.

MR. BLAKE: But I know that I see hunters out there. We just don't know if people might --

MAYOR SCHWAGER: You know, I would say right now probably not. But as the corridor develops commercially, once we get water and sewer infrastructure in place, you know, I have talked to the owner of Liberty years ago. And I believe once water and sewer, that land is going

to become very valuable.
It may -- you may want to reserve that right and we may reserve the right to ask you at some later date to maybe keep the world away from that.
MR. DAVILA: Absolutely.
MAYOR SCHWAGER: Right now, I don't know that there's much water out there.
MR. DAVILA: Part of the site there is.
MAYOR SCHWAGER: I'm sorry?
MR. DAVILA: Half of the site is to the State of New Jersey. It's only this area. It's only this area that is private property.
MAYOR SCHWAGER: Okay.
MR. DAVILA: Liberty is leasing this part. And this part is, you know, what is the Superfund Site.
MAYOR SCHWAGER: Okay.
MS. VAUGHAN: So --
MR. BLAKE: You would never know it was there.
MS. VAUGHAN: But it's a good point. The State of New Jersey does own that land. We -- they know -- we are in communication with them.

MR. BLAKE: Do they have to sign off then, I assume?

MS. VAUGHAN: Yes.

MR. BLAKE: You are comfortable with --

MS. VAUGHAN: Yes.

MAYOR SCHWAGER: Okay.

MS. VAUGHAN: We always have the ability, you know, throughout this process, you know, the community, the public's concerns are always, you know, we take that into account. We make adjustments as necessary. I know, showing us the master plan earlier.

MAYOR SCHWAGER: They are really concerned tonight, aren't they?

(Laughter)

MS. VAUGHAN: But I understand your point, they may become more concerned.

MAYOR SCHWAGER: In time. As the Township grows, you know, the concern today is this -- nobody knows is there. But 30 years is a long time.

MR. DAVILA: Yes.

MS. KINAHAN: Also as part of this remedy, every five years after the remedy is implemented, we do five year reviews where we see if the remedy is still protected, if the land use has changed. There is a process that makes sure that we keep on looking at these sites.

MR. DAVILA: That particular remedy is more of a source, is the only one which is in private property. The installation of the barriers and the removal of the sediment is on state protected area. So once we remove that soil, in the source area, we probably do it firsthand.

MS. VAUGHAN: They do. And we put -- we have risk analysis --

MAYOR SCHWAGER: Especially, when they know it's state owned. They are like, well, I own it.

MS. VAUGHAN: Right.

MAYOR SCHWAGER: Public Property, I got the right.

MR. BLAKE: It just might be valuable if somebody went out there and looked at the location where the seep is. Could be a hunting stand right there for all we know.

MS. KINAHAN: We've been out there. There isn't.

MR. BLAKE: Kids are drawn to water.

You know this.

MS. VAUGHAN: Ula and Chuck have both been out there.

MR. BLAKE: We would be remiss to not raise the concern. Sounds like a very remote risk, though.

MS. KINAHAN: It's hard to get there. It's pretty -- there is a lot of vegetation, or at this time of year it is.

MR. DAVILA: Pretty. Been in the area.

MS. VAUGHAN: From, I guess, the water.

MR. DAVILA: Only really want to kayak there.

MR. BLAKE: Well, understand that the state boat access point is right at the mouth of that creek. So when I went out last summer with the gentleman from the Department of Environmental Protection, there was like 40 kids out there. So, they didn't go up the creek because I knew about this. So, I made sure that we didn't lead a voyage of people up there not fully having the benefit of the presentation. People are leading groups out there, so you should be aware of that.

MR. DAVILA: Okay.

MS. KINAHAN: Thank you.

MR. DAVILA: We should again go. We finish, maybe a warning sign should be erected there.

MR. BLAKE: I don't know if that's what I'm saying. Just it's awareness for you to take into consideration.

MS. VAUGHAN: We will revisit it on an ongoing basis.

MR. BLAKE: The gentleman with the Department was Rick Brown from Coastal Land and Planning.

MR. DAVILA: Okay. So then description alternative, pretty much what we just talking about. Installation of the barriers, removal of the soil at the lagoon, removal of the contaminants sediment, hot spot, remediation of groundwater, and removal of soil and sediment sources and institutional controls will be put in place until remedial actions are met.

Our next steps is to sign the Record of Decision and to prepare remedial design with a detailed pre-design investigation. Additional soil and/or sediment excavation beyond that anticipated is necessary, it will be conducted.

Conduct the remedial action, additional installation of the underground reactive barrier wall may be needed; one or possibly two anticipated.

So, what we are thinking one will be all we need. But we are just making provisions if necessary.

MR. BLAKE: You have left that open as an option.

MR. DAVILA: That is an option. We are very conservative on our remedial design.

MS. VAUGHAN: If we didn't leave it as an option and we needed it, we might have to go through this process again.

MR. BLAKE: The Record Decision?

MR. DAVILA: As said before, any comments is until September 22. And you can address that to Mr. Juan Davila, Remedial Project Manager. Telephone number and email right on the screen.

MS. ECHOLS: Do you have any more questions? No?

MR. DAVILA: I think you already, already prepared for idea of what is warranted. If you just send an email to me, we will response to that, the Record of Decision.

MR. BLAKE: Communications has been very good from the beginning on this project, and I appreciate it.

MR. DAVILA: Absolutely.

MR. BLAKE: Been in touch for a couple years now. You guys have been very responsive.

MR. DAVILA: We are trying.

MS. ECHOLS: We want to thank each and every one of you for coming tonight. Thank you so much Woolwich Township for allowing us to have the meeting here.

Public Comment Period closes on September 22, so you have up until then to send in any questions to Juan. And we will just close here. Thank you very much.

(Public Meeting adjourned at 7:17 p.m.)

C E R T I F I C A T I O N

I, hereby certify that the proceedings and evidence noted are contained fully and accurately in the stenographic notes taken by me in the foregoing matter, and that this is a correct transcript of the same.

ANGELA M. KING, RPR
Court Reporter - Notary Public

(The foregoing certification of this transcript does not apply to any reproduction of the same by any means, unless under the direct control and/or supervision of the certifying reporter.)

Attachment D

Written Comments

September 20, 2017

Juan E. Davila
Remedial Project Manager
U.S. Environmental Protection Agency
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Email: davila.juan@epa.gov

Comments on Proposed Remedial Action Plan, August 2017 Superfund Proposed Plan and Supporting Documentation
Matlack, Inc. Superfund Site
Woolwich Township, Gloucester County, New Jersey

As attached, are various comments to the above. We thank you for the opportunity to provide comments and appreciate USEPA's decision in making the relevant documents available through your webpage.

Final Remedial Investigation Report, Matlack Inc. Superfund Site RI/FS Woolwich Township, Gloucester County, New Jersey, dated June 14, 2017

Within Section 4.3.2, HDR reports a list of analytes collected from site groundwater, however, it should be noted it does not appear **all potential** contaminants were evaluated through sampling. The nature of the site as a former hauler of raw chemicals, including wastes, makes a comprehensive assessment of potential chemicals disposed of at the site a priority.

No one can say for certainty what raw chemicals and wastes were disposed of at the site, simply based upon the nature of the business. The former lagoon/site may be considered a former hazardous waste treatment, storage, and disposal unit/facility, and could be subject to the provisions of 40 CFR Part 264, Subpart F and Part 265, Subpart F. More of a "shotgun" approach to potential contaminants should be considered; USEPA is asked the relevance of the Appendix IX list in 40 CFR 264 and 270) for example this type of site, but collect a very limited number of samples to keep costs at a minimum.

USEPA is asked to either provide such evidence a unique, comprehensive assessment was completed, complete such an assessment using the Appendix IX List, or conduct supplemental groundwater sampling for additional potential contaminants such as, but not limited to, the following:

- Glycols, based on transport history in Section 1.4;
- Alcohols, based on transport history in Section 1.4;
- Dissolved Petroleum and TOC, based on transport history in Section 1.4 and documented UST releases (Section 1.5);
- Acid Extractables, based on transport history in Section 1.4;
- Hexavalent Chromium; and
- Fluorotelomers. Within the past decade, these chemicals have proved to a specific contaminant of concern in southern New Jersey, due to their extensive releases at two (2) primary facilities; in Deepwater, NJ (Dupont), and Thorofare NJ (Elf Atochem/Ausimont and Solvay). It has been confirmed billions of gallons of groundwater is contaminated, yet

all potential sources remain unidentified. There exist the potential Matlack may have hauled raw material/wastes to/from these, and other unknown facilities, thus it would be prudent to collect a few representative samples from shallow wells to confirm fluorotelomers are not present in groundwater.

The requested sampling is sound science through elimination of data gaps, not technically difficult (as the monitoring wells/collection points already exist), not cost prohibitive (as only a few key wells could be targeted), and can be completed in a timely manner (during the next mandatory sampling event). Thus, USEPA has no technical, scientific, or cost justification to deny such a request, given the unique nature of past site operations.

The additional sampling data would serve to reinforce USEPA's own confidence in fully satisfying the respective ARARs regarding reduction/elimination of human health risks associated with the site, by identifying **all** contaminants in exceedance of the agreed-upon health standards, **prior** to the remedial phase, to ensure the chosen remedial action has the highest potential chance of success, with the minimal amount of associated funds incurred. USEPA can only strengthen its future position by addressing these data gaps presently, its concurrence additional sampling is warranted would reduce the potential of reopeners and give all interested parties a better feeling USEPA is aware of all issues at the site and has developed a remedial alternative to that effect.

Finally, NJDEP could eventually require supplemental sampling parameters as part of its requirements for completion of a future Classification Exception Area (CEA) for the groundwater plumes. As you may be aware, NJDEP requires **all** contaminants present above their respective GWQS be identified when instituting and tracking a long-term CEA. Thus, NJDEP may require the supplemental parameters if they feel the current data does not represent all potential contaminants in site groundwater.

Additional comments to the June 14, 2017 *Final RI Report* area as follows:

- Section 3.4.1, surficial geology is described as the Pennsauken Formation, however other references exist to suggest the initial underlying geology consists of the Englishtown Formation/Aquifer. USEPA is asked to clarify this position by comparing the site geologic logs with the descriptions of said geologic formations.
- Table 4-2B, page 2 of 9, USEPA is asked to explain the anomalously high total and dissolved iron concentrations in the April and July 2016 sampling events in well MW-2B. Could there be an issue with the construction of well MW-2B?
- Page 120 of 135, the current map display of total VOCs cannot be easily used in evaluating individual contaminant transport, it is requested USEPA consider preparing separate isoconcentration maps for the primary contaminants, such as PCE, TCE, Benzene, and 4-Chloroaniline to better assist in identifying potential contaminant hot-spots, to better understand groundwater flow direction, if the current well monitoring network sufficient, etc..
- In reviewing the most recent groundwater sampling results (2016), there appears to be marked decreases in concentrations over the limited sampling timeframe. Groundwater contaminant degradation over time appears to be rapidly occurring, to the point active groundwater remediation in the form of PRBs, may not even be necessary. This observation is even highlighted by the fact USEPA is planning to excavate soil hot-spots, thereby further reducing/eliminating soil contaminants leaching potential to groundwater,

ultimately improving groundwater quality over time. USEPA should allot some time to allow soils remediation to improve groundwater quality, perhaps during this period USEPA could complete the required bench scale testing as described in the respective *Final Feasibility Report*, dated August 2017.

- Several key sampling event results for PCE, TCE, Benzene and 4-Chloroaniline show an unacceptable variability between events. For example 4-Chloroaniline reportedly "decreased" in well MW-13 from 740 ppb (April 2016) to non-detect in the August 2016 event. However, 4-Chloroaniline "increased" in well MW-06 from 39 ppb (April 2016) to 6,900 in the July 2016 event. These results are concerning as they are not reproducible, and may suggest inconsistencies in sampling protocols, thus said results cannot be relied upon for critical decision making. Even dramatic decreases, like that observed above, could represent sampling variability, or significant improvements in groundwater quality, the latter only supporting the position active groundwater remediation may not even be necessary. At a minimum, each of these variability issues should be identified (where results differ by more than +/- 10%) and re-sampling should be considered.

<u>Final Feasibility Study Report, Matlack Inc. Superfund Site</u>
<u>Woolwich Township, Gloucester County, New Jersey, dated August 2017</u>

<u>Superfund Proposed Plan for the Matlack Site, August 2017</u>

The current chosen approach of Alternative 2 for groundwater (installation of permeable reactive barriers, or PRBs) may be premature. In fact, PRBs are passive in nature, relying on contaminants to migrate and eventually come in contact with the barrier, said contaminant movement being driven primarily by groundwater velocity and not considering contaminant adsorption to soils. USEPA is asked to seriously consider the timeframe it may take for all contaminants to eventually migrate to the PRBs, this could be on the order in excess of 100 years given the above; there simply is no method to determine how long it will take for the majority of contaminants to migrate to the PRBs. Additionally, whatever chemical is chosen to reside in the PRBs could be expended before all targeted contaminants even have a chance to reach the PRBs, as the reactive chemical installed (carbon, ZV-iron, etc..) may react out with undesirables such as naturally occurring organic carbons and acids, biodegradation byproducts, metals, etc…

- Page 85 of 119, USEPA is asked to reconsider the potential application of in-situ chemical injection (ISCO), relying on the critical assumption chemical reagents would need to be injected at pre-determined intervals throughout the entire areal extent of the VOC/SVOC plumes. This may not be the case, ISCO may only be required at yet to be determined groundwater hot-spots; once these are remediated long-term monitored natural attenuation may be appropriate for any residual contaminants. This observation is highlighted by the lack of contaminant-specific isocontour maps, which would aid in decision making.
- Section 8.1.3 describes the timeframe for remediation using PRBs to be approximately 30 years. As stated above, this may be considered a minimum timeframe, but more importantly, Alternative 3, (Air Sparging & SVE) as described in Section 8.1.4 cites a remedial timeframe of approximately 1 year. Both these timeframes are repeated in the August 2017 *Superfund Proposed Plan*, regardless, Alternative 2 may take, conservatively 20 times longer to implement, and is still subject to the limitation described above. It is acknowledged bench scale testing may be necessary to address 4-Chloroaniline, but

bench scale is common (see Table 5 and below, USEPA will already require bench scale tests for the PRB option) and can be completed at low cost, the priority should be the selection of the most effective and timely remedial action so USEPA has the greatest chance of success with the first, and presumably the only remedial action needed.

In summary, the choice of Alternative 2 (PRBs) is concerning when given the virtual 100% chance of success of implementing Alternative 3 (Air Sparging & SVE), which is a proven technology used successfully at thousands of sites and in many different geologic conditions. The potential application of groundwater hot-spot remediation via ISCO, the lack of evidence a funnel-gate or pass-through PRB system will capture all contaminated groundwater, and the potential active groundwater remediation may not be necessary once soils hot spots are remediated should all be carefully considered by USEPA before Alternative 2 is implemented. Finally, Section 6.1.5.2 states:

> *"The reactions within the PRB are dependent on pH, redox potential, contaminant concentrations, and other factors. The hydrogeology must be conductive (relatively shallow depth to groundwater and to an underlying hydraulic barrier) and a relatively shallow confining layer is needed to "key" into and thereby contain the system."*

The PRB approach will require extensive bench scale testing to determine if full-scale application is feasible. Thus, USEPA should acknowledge the limitations of PRBs and agree the ultimate remedial action will be chosen based upon the outcomes of the various bench scale test results proposed.

We thank USEPA for the opportunity to comment, and are available to answer any questions regarding the enclosed.

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REFERENCES

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